Management Training and Economics Education in Central and Eastern Europe

Project Managed by
School of Business • Indiana University • Bloomington, Indiana 47405

Project Director
Robert C. Klemkosky
Indiana University
Tel. (812) 855-8924
FAX (812) 855-8679

March 8, 1993

Program Assistant
Diana L. Humphrey
Indiana University
Tel. (812) 855-5944
FAX (812) 855-8679

Welcome to the Professional Managers Program! This unique program will improve your managerial skills that are needed to succeed in a free enterprise system. The program has been carefully designed by the Budapest University of Economic Sciences and MUCIA business schools, supported by the United States Agency for International Development.

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Our faculty team looks forward to sharing their insight and experience with you in this exciting program.

Robert C. Klemkosky

Robert C. Klemkosky
Project Director
Indiana University

PROFESSIONAL MANAGERS PROGRAM
LOGISTICAL TEAM

Robert C. Klemkosky - *Project Director*
Dean's Office
School of Business
10th & Fee Lane
Indiana University
Bloomington, IN 47405

tel. (812) 855-8924
FAX (812) 855-8679

Robert C. Klemkosky received his Ph.D. from Michigan State University. He is currently Fred T. Green Professor of Finance and Associate Dean of Research and Operations for the School of Business, Indiana University. Professor Klemkosky is former Chair, Finance Department at Indiana University. He is currently Project Director of a Midwest Universities Consortium for International Activities (MUCIA) multi-year grant, funded by USAID, for Management Training in Central Europe. He taught in Programa Ejecutivo sponsored by the Instituto de Estudios Superiores de Administracion in Caracas, Venezuela and at INSEAD in Fontainebleau, France. Professor Klemkosky teaches courses in the following areas: International Finance, Portfolio Analysis, Investments, Speculative Markets, Corporate Finance and Money and Capital Markets. His research has focused on three primary topics: 1) risk-return analysis, 2) market efficiency, and 3) options and futures. The research has entailed empirical investigations of the above topics and has resulted in numerous articles published in leading finance journals. He previously has served as Associate Editor for the Journal of Finance and has been Vice President of the Financial Management Association.

Ferenc Forgo - *Country Facilitator*
Budapest University of Economic Sciences
Department of Mathematics and
Computer Science
Budapest, 1093
Fővám tér 8
Hungary

tel. 361 117 4539
FAX 361 117 4505

Ferenc Forgo received his Masters degree (1965) and his Ph.D. (1974) in Operations Research from Budapest University of Economic Sciences. His teaching experience includes: University of Economics, Budapest (1965-92), Rutgers University, Camden, New Jersey (1984-85), and University of Southern California, Los Angeles (Summer of 1989, 1990, 1991). His teaching interests include: management science, calculus, probability and statistics for business, mathematical programming, and game theory. Professor Forgo's research interests are in the areas of mathematical programming, game theory, and decision science.

György Bogel - *Resident Field Assistant*
Associate Director,
Management Development Center
Budapest University of Economic Sciences
1087 Budapest, Konyves K. krt. 48-52
Hungary

tel. 36 1 134 4500
FAX 36 1 133 8936

MODULE TIME SCHEDULES

BUDAPEST, HUNGARY

Morning (AM)		Afternoon (PM)	
8:30-10:00	Class	1:30-3:00	Class
10:00-10:15	Break	3:00-3:15	Break
10:15-11:45	Class	3:15-4:45	Class
11:45-1:30	Lunch		

Session	Morning &/or Afternoon	Date
Human Resource Management	Morning & Afternoon Morning & Afternoon Morning	March 8 - Monday March 9 - Tuesday March 10 - Wednesday
Managerial Accounting	Afternoon Morning & Afternoon Morning & Afternoon	March 11 - Thursday March 12 - Friday March 13 - Saturday
Total Quality Management	Afternoon Morning & Afternoon Morning & Afternoon	April 15 - Thursday April 16 - Friday April 17 - Saturday
Marketing	Morning & Afternoon Morning & Afternoon Morning	April 19 - Monday April 20 - Tuesday April 21 - Wednesday
Managerial Economics & Industrial Organization	Morning & Afternoon Morning & Afternoon Morning	May 10 - Monday May 11 - Tuesday May 12 - Wednesday
Production & Logistics	Afternoon Morning & Afternoon Morning & Afternoon	May 13 - Thursday May 14 - Friday May 15 - Saturday
Finance	Afternoon Morning & Afternoon Morning & Afternoon	June 10 - Thursday June 11 - Friday June 12 - Saturday
Strategy	Morning & Afternoon Morning & Afternoon Morning	June 14 - Monday June 15 - Tuesday June 16 - Wednesday

PROFESSIONAL MANAGERS PROGRAM
Budapest, Hungary
March - June, 1993

MODULE TEAMS

FINANCE:
Andrew Karolyi (Ohio State University)
Francis Longstaff (Ohio State University)
Márta Sulyok-Pap (Budapest University of Economic Sciences)

HUMAN RESOURCE MANAGEMENT:
Phil Podsakoff (Indiana University)
Stuart Shepley (Indiana University)
Karoly Balaton (Budapest University of Economic Sciences)

MANAGERIAL ACCOUNTING:
Hanns Martin Schoenfeld (University of Illinois)
Byron R. Ross (University of Iowa)
Ádám Farkas (Budapest University of Economic Sciences)

MANAGERIAL ECONOMICS & INDUSTRIAL ORGANIZATION:
Bruce Jaffee (Indiana University)
Tom Sparrow (Purdue University)
Marton Vági (Budapest University of Economic Sciences)

MARKETING:
Gil Harrell (Michigan State University)
Pál Varjas (Budapest University of Economic Sciences)

PRODUCTION & LOGISTICS:
David Closs (Michigan State University)
Frederick Beier (University of Minnesota)
József Temesi (Budapest University of Economic Sciences)

STRATEGY:
Robert Pricer (University of Wisconsin Madison)
Alan Filley (University of Wisconsin Madison)
Laszlo Tihanyi (Budapest University of Economic Sciences)

TOTAL QUALITY MANAGEMENT:
Ram Narasimhan (Michigan State University)
John Anderson (University of Minnesota)
György Bőgel (Budapest University of Economic Sciences)

PROFESSIONAL MANAGERS PROGRAM
MUCIA FACULTY - 1993

John Anderson
Carlson School of Management
University of Minnesota
271 19th Ave. South
Minneapolis, MN 55455

tel. (612) 624-7316
FAX (612) 626-1316

Professor Anderson is an Associate Professor of Operations and Management Science at the Curtis L. Carlson School of Management at the University of Minnesota, Twin Cities. He received a B.S. in Chemical Engineering from the Institute of Technology, and his M.B.A. and Ph.D. from the School of Business Administration at the University of Minnesota, Twin Cities. Dr. Anderson has research interests in quality management, operations strategy, and problem formulation and has published articles in several of the well-known academic journals. Professor Anderson has been an active member of the Decision Sciences Institute, The Institute of Management Sciences, the American Society for Quality Control, the American Production and Inventory Control Society, and the Academy of Management. He has recently been nominated for President of the Decision Sciences Institute.

Fred J. Beier
Professor of Marketing & Logistics
Carlson School of Management
University of Minnesota
271 19th Ave. South
Minneapolis, MN 55455

tel. (612) 625-0352
FAX (612) 626-1316

Professor Beier received his B.S. in 1962, MBA in 1964, and PhD in 1969 all from the Ohio State University. He majored in Logistics with related studies in Marketing, Economics, and Quantitative Analysis. Professor Beier joined the University of Minnesota in 1967 where he currently is a Full Professor of Marketing and Logistics. From 1984 to 1991 he also held the position of Associate Dean of the Carlson School of Management. He has industrial experience in the railroad, steel, and agri-business industries. He also has held a variety of positions with the US Department of Transportation.

David J. Closs
Michigan State University
Department of Marketing & Transportation
315 Eppley Center
East Lansing, Michigan 48824-1121

tel. (517) 353-6381
FAX (517) 336-1112

Dr. David Closs is a Professor of Marketing and Logistics at Michigan State University. Dr. Closs has consulted in the areas of information technology, logistics systems, logistics modeling, inventory management, and forecasting for over 100 Fortune 500 firms. Dr. Closs has authored or co-authored two textbooks and over 50 articles. His current research focus is logistics information system applications.

Alan C. Filley
School of Business
1155 Observatory Drive
University of Wisconsin
Madison, WI 53706

tel. (608) 263-1664
FAX (608) 263-0477

Alan C. Filley is a professor in the University of Wisconsin School of Business. He is a Wisconsin Distinguished Professor and holds the W.T. "Bill" Graham Chair of Small Business and Entrepreneurship. He is the author of numerous articles and books on small business management and he has taught in both Central and Eastern Europe. He is the founder and director of The Enterprise Center which began in 1986.

Gilbert D. Harrell
Gilbert D. Harrell & Associates, Inc.
4762 Nakoma Drive
Okemos, MI 48864

tel. (517) 349-9600
FAX (517) 349-2762

Gil Harrell is Professor of Marketing at Michigan State University. His international research, consulting and teaching interests focus on marketing, strategic planning, sales management, marketing research and buyer behavior. His publications have appeared in the Journal of Marketing, Journal of Long Range Planning, Journal of Marketing Research, Journal of Consumer Research, Journal of Health Care Marketing, International Marketing Managerial Perspectives, and other journals. Dr. Harrell's text, Consumer Behavior, has been adopted widely by major universities. He is a regular participant in American Marketing Association Conference and the Association for Consumer Research. As a consultant, Gil Harrell specializes in systems for marketing strategy, marketing management,and planning. He has worked with numerous corporations in over 15 countries to create organizational change through the application of tools for effective marketing. Clients include ABB, Westinghouse, Eastman Kodak, General Motors, Brunswick Corporation, UPS, Detroit Edison, Delco Remy as well as others. Dr. Harrell's doctorate degree is from Pennsylvania State University.

Bruce L. Jaffee
Department of Business Economics
School of Business
Indiana University
Bloomington, IN 47405

tel. (812) 855-9219
FAX (812) 855-8679

Bruce L. Jaffee is Professor and Chairman in the Department of Business Economics and Public Policy at Indiana University. He has an A.B. degree (1967) from Brown University and a M.A. (1969) and a Ph.D. (1971), with distinction, in economics from Johns Hopkins University. From 1980 to 1984 he was the director of the doctoral programs in business at Indiana University. He has taught at Johns Hopkins University and the Stonier Graduate School of Banking and has worked as an economist for the U.S. Army Corps of Engineers Civil Works. In 1981 and 1990 he taught economics in a management education program at the Shanghai Institute of Mechanical Engineering, where he is also an advisory professor. He has given lectures on economic topics in New Zealand, China, and Slovenia as well as Central Europe. He is also the author of numerous articles and reports in the fields of public utility regulation, taxation, energy policy, and industry regulation. Current research deals with electricity pricing, public utility regulation, tax policy, economic development, and energy policy and forecasting.

George Andrew Karolyi
Department of Finance
College of Business
The Ohio State University
1775 College Road
Columbus, OH 43210

tel. (614) 292-1875
FAX (614) 292-2418

G. Andrew Karolyi is Assistant Professor of Finance in the College of Business of the Ohio State University. He holds a B.A. (Honors) degree in Economics from McGill University and M.B.A. and Ph.D. degrees in Finance from the Graduate School of Business of the University of Chicago. His recent publications have appeared in the Review of Financial Studies, The Journal of Finance, Journal of Financial Economics, Management Science as well as in two books on Japanese financial markets. His primary research interests focus on modeling and forecasting financial market volatility and on tests of asset pricing models.

Francis Longstaff
College of Business
The Ohio State University
1775 College Road
Columbus, OH 43210-1309

tel. (614) 292-1899
FAX (614) 292-2418

Professor Longstaff received a Bachelor of Arts Degree in Finance and in Accounting and a Masters of Business Administration Degree from the University of Utah. He then received a Ph.D. in Finance from the University of Chicago. Professor Longstaff is a Certified Public Accountant and a Chartered Financial Analyst. His business background includes working as a consultant with a multi-national accounting firm and as a research economist with the Chicago Board of Trade, the largest futures exchange in the World. He is currently an Associate Professor of Finance at the Ohio State University. His research areas include financial markets and investments.

Ram Narasimhan
230 Eppley Center
Department of Management
Eli Broad College of Business
Michigan State University
East Lansing, MI 48824

tel. (517) 353-5415
FAX (517) 336-1111

Ram Narasimhan is a Professor of Management in the Eli Broad Graduate School of Buisness at Michigan State University. He is widely published in Academic Journals such as Management Science, Decision Sciences, European Journal of Operations Research, and International Journal of Production Research. He has consulted with and conducted executive training for over 150 large and medium sized manufacturing firms. He has been a consultant for GM, Chrysler, Detroit-Edison, Blue Cross-Blue Shield, Allied Signal, MichCon and other firms and governmental agencies. He the Co-author of the recently published book "Computer Integrated Manufacturing." He is on the editorial board of the Journal of Operations Management. He a member of DSI, TIMS, APICS and the Academy of Management.

Philip M. Podsakoff
Department of Management
School of Business
Indiana University
Bloomington, IN 47405

tel. (812) 855-9209
FAX (812) 855-8679

Philip M. Podsakoff is a Professor of Personnel and Organizational Behavior. He received his doctoral degree in 1980 from Indiana University, and joined the faculty of the School of Business in 1982, after teaching for two years at Ohio State University. His major research interests include transactional and transformational leadership processes, the relationship between employee attitudes and behavior, the antecedents and consequences of employee "citizenship" behaviors, power and social influence processes, and field research methodologies. He is a member of the Academy of Management, and is past Chair and Program Chair of the Research Methods Division. He is the author or co-author of over 35 articles that have appeared in the Academy of Management Journal, Psychological Bulletin, Organizational Dynamics, The Leadership Quarterly, Sex Roles, and the Journal of Occupational Behavior, among other journal. Currently, he serves on the editorial board of three academic journal, and regularly serves as an ad hoc reviewer for several others. He has served as the Chair of Indiana University's Executive Education department, is the recipient of several university teaching awards, is a past Lilly Teaching Fellow, and has served as a consultant to several Fortune 500 Companies. Professor Podsakoff is currently on sabatical at INSEAD in France.

Robert W. Pricer
The School of Business
University of Wisconsin-Madison
1155 Observatory Drive
Madison, WI 53706

tel. (608) 263-3464
FAX (608) 263-0477

Robert Pricer is a Professor in the University of Wisconsin School of Business where he teaches Small Business Management, Entrepreneurship, Planning and Venture Financing. He initiated the Wisconsin Small Business Development Center program and was its director from 1977 to 1986. He is a former business owner and the author of numerous small business management articles. Dr. Pricer is the Associate Director of the Center for Small Business Management and Entrepreneurship and is Executive Director of the Wisconsin Rural Leadership Program.

Byron R. Ross
676 PHBA
The University of Iowa
Iowa City, Iowa 52242

tel. (319) 335-0948
FAX (319) 335-1956

Received his M.A., in Accounting at The University of Iowa and is a Certified Public Accountant. Previously he served as the President of the Iowa City Chamber of Commerce and other organizations and a Partner at the accounting firm, McGladrey & Pullen. As a professor at Iowa University he has taught such courses as: Financial Accounting Reporting, Cost Accounting for Management Analysis and Control, and Managerial Accounting. He is presently the faculty advisor for the Beta Alpha Psi, National Honorary Accounting Fraternity. In the spring of 1993, he received the Iowa University Outstanding Accounting Alumnus award.

Hanns Martin W. Schoenfeld
Dipl. Kfm; Dr.ver. pol. habil
University of Illinois
Department of Accountancy
302 Commerce West Building
1206 South Sixth Street
Champaign, IL 61820

tel. (217) 333-4530
FAX (217) 224-3118

Hanns Martin W. Schoenfeld is the H.T. Scovill Professor of Accountancy and also holds an appointment as professor of Business Administration. He received his MBA and DBA degrees from the University of Hamburg, Germany and his Ph.D. from the University of Braunschweig, Germany. He has taught at the University of Illinois since 1962 and specializes in accounting international accounting,and international business. He has lectured frequently at other universities and Executive Development Programs in the US, Mexico, Brazil, Austria, Belgium, Denmark, France, Germany, Great Britain, Poland, Switzerland, Japan, South East Asia and Australia. He is a member of the editorial boards of the Journal of International Accounting and The Accounting Historians Journal and has written or edited 14 books (in German and English) and published over 100 articles in US and European scholarly journals and professional handbooks. He has served as chairman of the International Accounting Section of the American Accounting Association and as President of the Academy of Accounting Historians. He is a consultant to several multinational corporations.

Stuart G. Shepley
Bradford Woods
Indiana University
5040 State Road 67 North
Martinsville, IN 46151

tel. (317) 342-2915
FAX (317) 349-1086

Stuart G. Shepley is Director of Management Training and Challenge Programs at Indiana University's 2300 acre Outdoor Leadership Center at Bradford Woods. He is also a part-time faculty member in the School of Health, Physical Education, and Recreation. He is an experienced teacher, facilitator, consultant, and administrator. Stuart has been Program Director at Bradford Woods for five years, since moving to the U.S. from England. In England, he was purchasing manager for an international coal mining company and a production manager for an engineering company. He has taught at both the graduate and undergraduate levels. Areas of expertise include experiential training methodologies, adventure-based counseling, and leadership. He is currently co-authoring a book in adventure-based counseling. Through his association with the Indiana University School of Business, he has consulted with many international companies, specifically in the area of developing and managing effective teams. Shepley holds undergraduate degrees in management studies and social work from schools in England, and a Master's degree from Indiana University.

F. T. Sparrow
IIES Schools of Engineering
1293 Potter Center Room 304
Purdue University
West Lafayette, IN 47907-1293

tel. (317) 494-7043
FAX (317) 494-2351

Dr. Sparrow received his Ph.D. in Economics and Operations Research form the University of Michigan and currently the Director of the Institute for Interdisciplinary Engineering Studies (IIES) and the State Utility Forecasting Group (SUFG). He is also a Professor of Industrial Engineering and Professor of Economics. Prior to his association with Purdue, Dr. Sparrow taught for 10 years at the Johns Hopkins University, as well as serving as chairperson of the Industrial Engineering Department at the University of Houston. Dr. Sparrow's primary concerns are interdisciplinary, with an emphasis on energy modeling and analysis, electrotechnology commercialization, industrial electrification, and transportation. He is the author or co-author of more than 90 papers, presentations, and reports on these topics, as well as on matters relating to economics, operations research, and industrial engineering. His honors include selection as a Ford Foundation Research Professor and invitations to speak before various organizations in the U.S., Europe, and Japan. Dr. Sparrow is consultant to various government agencies, electric utilities, and to the iron and steel industry.

PROFESSIONAL MANAGERS PROGRAM
BUDAPEST UNIVERSITY OF ECONOMIC SCIENCES FACULTY

Károly Balaton *- Human Resource Management*
Associate Professor
Department of Corporate Management
tel. 36 1 186 850/304

György Bogel *- Total Quality Management*
Associate Director,
Management Development Center
tel. 36 1 131 896

Ádám Farkas *- Managerial Accounting*
Professor's Assistant
Department of Finance
tel. 36 1 186 850/216

Márta Sulyok-Pap *- Finance*
Associate Professor
Department of Finance
tel. 36 1 186-850/216

József Temesi *- Production and Logistics*
Dean
Associate Professor
tel. 36 1 117 6725

Laszlo Tihanyi *- Strategy*
Associate Professor
tel. 36 1 183 037

Márton Vági *- Managerial Economics & Industrial Organization*
Professor's Assistant
Department of Economics
tel. 36 1 2667 218

Pál Varjas *- Marketing*
Associate Professor
Department of Marketing
tel: 36 1 118 076

HUMAN RESOURCE MANAGEMENT MODULE

March 8 - 10, 1993
Budapest, Hungary

Session	Day 1 - March 8	Day 2 - March 9	Day 3 - March 10
8:30-10:00	Introduction of Participants and Overview of HRM Module	Understanding & Improving Leadership Effectiveness	Critical Issues in Hungarian HRM
Break			
10:15-11:45	Understanding & Improving Leadership Effectiveness	Developing High Performance Teams	Critical Issues in Hungarian HRM
Lunch			
1:30-3:00	Understanding & Improving Leadership Effectiveness	Developing High Performance Teams	
Break			
3:15-4:45	Understanding & Improving Leadership Effectiveness	Developing High Performance Teams	

HUMAN RESOURCE MANAGEMENT
BUDAPEST, HUNGARY

BACKGROUND

The opening of Eastern Europe countries to free market systems and the global economy will undoubtedly cause many dramatic changes in the lives of managers in these countries over the next decade. Although some of these changes will require managers to come to better understanding of the "technical" or "quantitative" aspects of running a business (e.g., Market Economics, Accounting, Finance, Operations Management, Logistics/Distribution), other changes will require managers to learn more about how to effectively utilize human "resources."

The primary objective of this module is to provide participants in the program with a better understanding of some of the fundamental issues in "managing" human resources more effectively. Specifically, the material presented in this part of the program will be designed to help managers develop a better understanding of (a) the characteristics of effective versus ineffective work groups, (b) how to develop a more effective "teams" at work, (c) the strategies a manager can use to foster more cooperative relationships with their workers, (d) the characteristics of effective leaders, (e) how to improve leadership effectiveness, and (f) other issues related to the effective management of human resources at work. Although the discussion of some conceptual/theoretical issues will unavoidable, the major focus of this module will be on providing managers with practical tools and techniques that they can apply to their human resources problems.

The teaching approaches used in this module will include some traditional methods, such as classroom presentations and in-class discussions. However, several non-traditional methods, such as outdoor experiential initiatives and in-class simulations will also be used.

MAJOR PROGRAM COMPONENTS

I. DEVELOPING HIGH PERFORMANCE WORK GROUPS

Much has been written recently on the importance and potential impact of employee empowerment, participation, team building, and "self-directed" or "self-managed" work teams on enhancing organization effectiveness. Indeed, it has been noted by several leading management writers that the importance of "cross-functional" teams comprised of people with different skills, abilities, and perspectives, will become even more critical to managerial and organizational success in the next few decades, because organizations will be required to interact with more complex environmental and technological changes, and because many of these changes will demand more interdependencies among organizational work units. In addition, team building and self-managed work teams have also been identified as key components of the much talked about Japanese concepts of "Kaizen" (continuous productivity improvements) and "Wa" (developing team spirit and harmony).

However, despite many of the ringing endorsements for employee empowerment and team building, several problems remain for those leaders who want to incorporate such concepts into the organization. Among the most critical of these problems is identifying strategies that might be successfully used to develop such work teams, and to use these teams effectively. Thus, the major focus of this component of the HRM Module is to get participants to examine the characteristics of effective and ineffective teams, and discuss strategies for building more effective teams at work.

As part of this component of the program, we will use some "portable" team building/challenge course activities. Included among the objectives of this portion of the program are the following:

A. AWARENESS

All of the challenge course activities are designed to promote an increased awareness on the managers' part regarding: (a) their interpersonal and leadership skills, (b) how effectively they interact with a work group, and (c) what it takes to develop "high-performance" work teams.

B. GOAL-SETTING

Most of the exercises in the team building course require the group to develop and become committed to a specific goal they want to achieve. The goal-setting process that occurs on the course is not unlike the goal-setting that goes on in many organizations, and should help the managers understand the critical role played by goals in producing organizational effectiveness.

C. GROUP PROBLEM-SOLVING

In performing the activities we have designed for the "teams course," groups of managers are given a problem or "initiative" that is difficult, if not impossible, for one individual to solve my himself/herself. As a result, the groups must "pool" their resources in order to arrive at a solution. The group effort required is similar in many respects to the kinds of activities that occur in many organizations, such as the effort required to coordinate a management team. Thus, the group problem-solving aspect of the course should help the participants to achieve a better understanding of how to work together with others to solve organizational problems.

D. IMPROVED COMMUNICATION

Virtually all of the challenge activities require the participants to communicate effectively within their groups in order to be effective. These are the same skills that the participants will need to successfully mange others.

II. UNDERSTANDING AND IMPROVING LEADERSHIP EFFECTIVENESS

It has frequently been suggested that while managers "do things right", leaders "do the right things." Unfortunately, with the rapid changes that are taking place in Eastern Europe, it may be difficult to distinguish just what the "right things" are for a leader to do. Therefore, the focus of this component of the HRM Module is identify and discuss those behaviors that leaders need to perform to improve their effectiveness. More specifically, this component will focus on discussions of: (a) the "criteria" one might use to identify effective leaders, and (b) the identification of those specific behaviors that make some leaders more effective than others.

III. CRITICAL ISSUES IN MANAGING THE HUNGARIAN WORK FORCE

The major focus of this portion of the program will be devoted to a discussion of some critical HRM issues that are likely to be faced by Hungarian managers in the next decade. In order to accomplish this goal, case discussions related to Hungarian HRM issues will be used.

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From socialism to capitalism: the effects of Hungarian human resources practices

Jone L. Pearce, University of California, Irvine

Executive Overview

What are the human resources management practices within communist and formerly communist companies? Many of the managers from capitalist countries forming joint ventures with state-owned enterprises in communist and formerly communist countries have only superficial ideas about these enterprises' human resources management practices and their effects. The more lurid dysfunctional practices of these organizations are well known, and foreigners often (mistakenly) assume that these result from incompetence. However, such practices have evolved within complex systems of organizational behavior which were largely successful in achieving their real objectives: political control and production quantity.

This article presents a detailed analysis of four human resource management practices in Hungarian companies: (1) the weak performance pressures, (2) substantial pay-at-risk compensation systems, (3) promotion-through-connections, and (4) ambiguous responsibilities. These practices result in numerous dysfunctions: excessive bargaining between supervisors and subordinates, pervasive distrust, the de-legitimation of managers, and responsibility avoidance. Unfortunately, these practices are changing slowly, at best, under economic reform. The article concludes with suggestions for both local and foreign managers.

In My View

Executives from capitalist countries are rushing to form joint ventures with enterprises in the former communist countries of Central and Eastern Europe. Yet, what do these executives really know about the management practices and working relationships in these enterprises? While numerous newsletters and professional newsweeklies can provide detailed analyses of the political and legal environment for business, they provide only partial, but vivid, anecdotes about what happens inside these enterprises. Into this analytic vacuum have come untested assumptions, such as, "Employees do not work hard because they have no financial incentive."

Joint-ventures in reforming communist and formerly communist countries are fraught with difficulty under the best of circumstances. Unfortunately, they are made more difficult by a lack of understanding of the human resources management systems and resultant workplace behavior in these societies. Foreign managers eventually do learn to understand the terrain, but for many it is after a long and frustrating "trial by fire." Unfortunately, some expatriate managers grow so frustrated that their own anger interferes with their ability to build an effective organization. This report is intended to help managers from capitalist systems anticipate and manage in these rapidly changing environments. It describes the actual human resource management practices and analyzes some of their effects in the formerly communist country that has been most successful in attracting foreign investment.

15

This work also is written for local managers, consultants, and policy makers—those who face a historically unprecedented struggle to transform ineffective enterprises into successful competitors in international (and newly opened domestic) markets. It is actually much easier for the foreign managers: if they stay around long enough, they can build effective organizations, because they have their own "models" of how organizations should work. For the local managers, the perspective of a foreigner (speaking openly as a friend rather than politely as a guest) is particularly valuable now.

Why Hungary?

Hungary has probably come farther than the other Eastern bloc economies in the reorganization of its economic life toward market-driven enterprises. It began significant reform to encourage privately owned enterprises in 1968. Currently foreigners and locals have complete freedom to establish private, profit-making companies. It has nascent stock and bond markets and a vigorous political debate over ways to privatize the state-owned enterprises which still dominate the economy.

Hungary has also established, with Western partners, the first private graduate management school in an Eastern Bloc country, the International Management Center. The purposes of this school are to assist Hungarian managers in more effective management of their newly independent enterprises and to foster the development of private enterprise through entrepreneurship and the facilitation of joint ventures with foreign partners. In 1989, I spent a semester at this center located in Budapest training managers, and this article is based on my experiences of learning how to assist these managers to change their organizations.

Of course, Second World organizations differ in many significant ways from capitalist ones. The situation becomes even more complex as particular countries make radical legal and economic changes, while others have not. Even within Hungary there are wide variations—the executives of some state-owned enterprises aggressively move into new markets and streamline their operations, others attempt novel reorganizations (the actual effects of which no one can accurately forecast), and others nervously wait. One short article could not possibly do justice to all of the variety of management practice and employee behavior in these reforming countries, or even in Hungary's industrial sector. Choices had to be made. Human resources management features were selected that met two criteria: (1) They were focused on managerial practices in "economic enterprises" (what would be for-profit businesses in a capitalist economy), since these are the likely joint-venture partners for western companies; (2) They were practices that appeared to have their origin in the now-defunct communist system of political control, but which seem to have taken on a continuing life independent of their communist origins. This article is intended to be useful to both potential partners and local managers by openly describing some of the less attractive management practices and their effects on employees in a country that has overthrown communist political control. This analysis is not intended as a balanced representation of all aspects of management practice in formerly communist countries. Hungary has more than its share of successful organizations heroically transformed from bankruptcy to rapid growth and profitability in its state-owned as well as in its growing private sector. There is ample material for both the business-press hagiographers and the academic critics.

Human Resources Management Practices

Four features of human resources management practice are examined. First is the lack of focused attention to motivating individuals. While the problem originates in old government policies, the labor scarcities worsened by economic reform contribute to continuing weak performance pressures. The second feature,

10

contrary to what many outsiders assume, is the fact that Hungarian employees and managers have a large proportion of their pay "at risk"—a yearly bonus that can range from zero to 200 percent of base pay. Surprisingly, despite the assumption in the compensation literature that such contingent pay would result in positive outcomes, the actual behavioral and attitudinal effects are quite dysfunctional. Third, promotional policies traditionally were not based on performance assessment and procedural justice, which resulted in resentment among managers. Finally, ambiguity in accountability is widespread, exacerbating distrust and often leading to frustration and miscommunication.

Thus, a rapid pace of change may be an inevitable ingredient of the conversion from state-directed to market-driven economies, and this abruptness, itself, precipitates management challenges.

No doubt some of the observations presented here are more "Hungarian" than they are "reform-communist" and so may not apply in other formerly communist countries. Each country has its own unique culture, history, and comparative economic resources. Yet it is my belief that many of the experiences of these pioneering Hungarian organizations may prove useful in understanding management dilemmas in managing employees in other organizations emerging from command economies.

In addition, the economic structures in Hungary are changing rapidly (although some argue that they are not changing rapidly enough!), and some of the employee behavior described here may be influenced by the confusion generated from this rapid change. However, it may be that such a comprehensive economic reform cannot be managed and confined to a more orderly progression. Rather, it may inevitably reach a point, as it has in Hungary, at which there is a sudden avalanche of change. When enough people believe that economic reform will not go back, as in Hungary, there is a stampede to position oneself favorably for the new economic order. Thus, a rapid pace of change may be an inevitable ingredient of the conversion from state-directed to market-driven economies, and this abruptness, itself, precipitates management challenges.

The Economic Context

Before describing the four human resources management practices and their attitudinal effects, it is important to describe very briefly the economic context to establish the background for the changes that are occurring. Although Hungary has not had a true command economy for many years, for complex reasons[1], managers in its state-controlled enterprises have been facing an environment more similar to their command economy than to their capitalist neighbors. Even today, while Hungarian managers struggle to make their products more attractive to customers, for a great many state-controlled enterprises, change is coming slowly. Therefore, it is best to see the following description of the economic context as a description of the recent past that is no longer pertinent for many companies (especially private companies) but still is relevant for some (especially in the state sector).

Under conditions of government domination, managers' strategic attention is focused, not on markets, but on both supplies and "responsibilities."

There are important differences in the economic context of market-driven and state-controlled economies. These differences are most apparent in the "corporate strategies" that executives must adopt but are also relevant for understanding the pressures on individuals within the workplace.

A Seller's Market

The most important fundamental to understand is that state-dominated economies are "scarcity economies." This means that all components of organized activity are difficult to obtain—raw materials, labor, replacement parts, capital, . . . everything. In practice, it means that managers' major operational objective is to secure reliable supplies of needed credits, material, and labor. Since the governmental planning apparatus directs where managers' output should go and how much revenue they are to receive, markets as a revenue source simply do not receive the managerial attention paid them in market-driven companies.

17

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Most Companies are Monopolies
In a fully planned economy, one of the theoretical efficiencies is that the planners dedicate one (or a few) suppliers of a certain product to avoid the "waste" of duplicative competing products. Many enterprises thus become the only supplier of their product to the receiving enterprise and, therefore, have a responsibility to them. Since the producing enterprises often face shortages and other problems, it is difficult for them to be reliable in meeting their responsibilities. This sets the stage for the endless rounds of "bargaining" that characterize managing directors' lives: bargaining with suppliers, bargaining with "customers," and, as will be detailed later, bargaining with employees.

Executives Focus on Bargaining
In spite of their expanded autonomy under the reforms, Hungarian managing directors still must expend significant energy bargaining. In the now-defunct pure command economy, paying a higher price for the product was illegal; today it is entirely legal to use this "market solution." However, many impoverished state-owned enterprises do not have the foreign currency reserves to make expensive purchases on the western markets.

Forty years of a state-controlled economy have left an infrastructure of delivery contracts at artificial prices that make it virtually impossible for many state-owned enterprises to take advantage of their new market opportunities. Many managers are pursuing newly available markets but find that in the short term they are still trapped in a web of monopoly relationships that require perennial bargaining.

With what can these managers bargain? Sometimes they control something valued by the partner. Until the recent destabilizing changes, the most effective negotiating position had been to have "good connections" or influence with those on whom the partner depended. In Hungary, there is a common joke of a poor man who could not provide much financial support for his son. However, he did enroll his son in one school for a year, and then the next year enrolled him in another school for a year, and so on for his entire school career. Thus, the son always was able to find "an old school chum" who had friends in the right places or who had access to supplies, and the father provided an inheritance for his son that was worth much more than any sum of money. Unfortunately, under scarcity conditions, the threat is usually more viable than the promise, which leads to what one market-research company manager called "ugly, brutal, blood-running-under-the-door bargaining."

Of course, under the previous political system, the most important scarce supplies (such as investment credits and apartments at low rents) were controlled by members of the ruling communist party (in Hungary called the Hungarian Socialist Worker's Party). Good relations with key party members became necessary to cope with the primary strategic difficulty of securing credits and supplies faced by enterprise managers. Party membership was a virtual prerequisite for top managerial positions, and most executive careers moved up through the party apparatus, then over to executive positions in enterprises.

Note that this form of party influence over managers was not obtained through brute force and differed only in degree from the relationships many capitalist-economy executives must maintain—with bankers, for example. Today in Hungary, the party has disintegrated and no longer has a monopoly over all

sources of supply, but its former members do retain important positions and their collegial connections throughout the system. One of the ambiguities of the economic transformation is what happens when the individuals occupying key positions and their personal connections with one another have not changed but they are no longer "organized" through one (party) institution. At present, good connections are still vitally important in many aspects of managers' lives, whether they be state-owned enterprise managing directors, entrepreneurs, or foreign joint-venture partners.

For example, currently the Hungarian government is under severe financial pressure from the International Monetary Fund because the country is running a budget deficit, while trying to repay its large foreign debt. So the government has reached an agreement with the International Monetary Fund in which it is significantly reducing the supply of money to the economy. With such a large proportion of the economy state-owned and the banking system still dominated by state-owned companies, this monetary restriction has had a powerful effect on all enterprises. That is, short-term credit has been restricted and payments delayed, so large state enterprises have no cash to pay their suppliers, who then have no cash to pay their suppliers, and so on—resulting in a domino-effect cash squeeze throughout the economy. Yet when an enterprise finally does receive cash, who among their many creditors do they decide to pay first? Although they often are constrained by contractual obligations, it does happen that managers sometimes pay first those with whom they have "the best relations." Anyway, believing in this possibility, many suppliers consider it necessary to maintain continuous good relations with customers to protect their own enterprises.

As these examples illustrate, although Hungary has not been a fully command economy for more than twenty years, some aspects of the scarcity economy remain for many of its organizations. The government still owns nearly eighty-five percent of the country's capital stock. Privatization is proceeding slowly in all of the former communist countries. At present many enterprises are still tied to the contracts and relationships developed in the communist era, and many managers and employees firmly believe that cultivating good connections is the most effective use of their time.

Human Resource Practice #1: Weak Performance Pressure

The attention given to individual levels of employee and managerial performance are rooted in the former economic structure but, interestingly, have not changed notably in this early period of reform.

The lack of incentives and pressures for high levels of product quality and efficiency in state-owned monopolies is widely known. However, the manner by which these enterprise-level processes are translated into individual job performance expectations is more complex than many assume. While it is true that the lack of performance pressure at the top of the organization is reflected in weaker performance pressures on subordinates, the situation has been intensified by labor scarcity, and labor scarcity is becoming worse under reform.

Labor scarcity

Under the previous political system, necessities (food, schools, health care) were provided at nominal costs and wages were kept low as a matter of public policy—to prevent individuals from accumulating capital which might foster the rebirth of capitalism. This situation cannot change quickly for the state-owned enterprises, since there is no "market test" of employees' value. Therefore, for decades, wages and salaries in Hungary have been set at very low levels (particularly for professional and managerial workers) in comparison to western levels. In addition, Hungary was essentially a one-employer monopsony market for labor, which will force wages down.

19

To make matters worse, Hungarian state-owned enterprises developed a strong demand for (low-wage) employees, like state-owned bureaucracies everywhere that are not known for their excessive zeal to shrink the sizes of their organizations. Thus, under the previous system, many state-owned enterprises found that they had more jobs than employees willing to work for artificially low wages, leaving them with a labor scarcity, just as they faced a scarcity of material and capital when prices were set at low levels.

Under economic reform, the labor scarcity problem is worse. State enterprises' wages still are very low (partly because of legal restrictions and partly because many of these organizations face severe financial constraints as they seek to adapt to market conditions with constrained credit). Now, however, employees are able to leave for higher paying jobs in the burgeoning private sector; thus many state-owned enterprises are finding it difficult to attract and retain high quality labor. Similarly, the private companies are also encountering a shortage of labor, particularly of trained managers who speak foreign languages. The supply of Hungarians skilled in capitalist management practices, technical specialties, and languages lags well behind the rapidly growing demand.

Under these circumstances there was—and continues to be—weak pressure for high levels of individual performance. This is a result both of labor scarcity and of the fact that state-owned enterprises themselves do not receive significant pressure to produce at optimum levels of performance. Further, in this early period of reform, many of the private firms lack sufficiently meaningful competition which would motivate them to strive for internal efficiency or high levels of quality performance.

Neglect of Formal Performance Appraisal
Under these circumstances, the dearth of any systematic formal performance review practices should not be surprising. Some state-owned enterprises have performance appraisal systems, but personnel directors find it very difficult to interest their managerial colleagues in completing the evaluations unless the managing director issues a direct command to do so. Systematic individual performance evaluation simply is not a focus of attention for many managers.

Goal Conflicts in Foreign-local Joint Ventures
The labor scarcity has two important implications for foreign joint venture partners.

The first is a potential conflict of goals between foreign and local-state company managers planning a joint venture. Private companies and joint-ventures with foreign private companies do not face ceilings on wages and so can usually solve their labor scarcity problem by paying higher wages. Therefore, many managers of state-owned enterprises see the joint venture as an opportunity to raise wages, because they face a ruinous drain of their best employees to the private sector (and, of course, would like to see their own salaries raised). They see the foreign joint venture partner as a source of capital and as providing relief from onerous governmental restrictions. These needs are so pressing that local managers may not fully consider the fundamental changes that will be required in a joint venture.

The second implication is that scarcity in labor of skilled professional and managerial employees (especially those who speak English) will worsen in the next few years as more investment capital pours into these countries. For skilled professionals, wages are rising very rapidly, so investors must stay apprised of current pay rates and plan for significant inflation, especially in the pay of managerial employees.

20

Human Resources Practice #2: Substantial "Pay-At-Risk"
As a result of both debilitating labor shortages and the fact that in these enterprises it used to be virtually impossible to fire workers, a complex monetary bonus system was developed in communist enterprises. Under this system, bonuses may range from zero to 200 percent of an employee's base salary. The largest percentages were usually reserved for managers, but workers at even the lowest wage levels in most Hungarian enterprises have grown to expect yearly bonuses up to forty percent of their base pay. Experienced managers will recognize that this is much more than the usual two to seven percent differentials in capitalist-system merit pay systems. These bonuses are usually given at the sole discretion of the immediate supervisor or of a committee which includes party officials. Because performance pressures are weak, rarely are these large bonuses tied to clearly defined performance objectives. In a society where the average salary is $200 a month, most families need this additional money just to survive, so these bonuses have become very important to employees.

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The Communist Personnel Practice Capitalist Executives Love
Although this "conventional pay system" grew out of the distorted economic conditions of the previous political system, newly established private enterprises have been quick to adopt it. Even the non-governmental educational institution where I worked used it for the Hungarian faculty members (but wisely decided that the foreign faculty probably would not find it attractive). Yet what appears to be a very powerful set of incentives for performance motivation has had the perverse effect of establishing a relationship between supervisors and subordinates characterized by continuous bargaining and distrust.

Maybe there is a Reason why Companies Don't Really Pay for Performance
Conventional Hungarian managerial wisdom held that workers get their salaries for just showing up (and sometimes even that was not required), but if their supervisors wanted them to do any work, the supervisor must "pay" for it. As an illustration, a personnel director in a large industrial products company recounted that he wanted to revise one of his company's personnel systems and so convened a task force of his subordinates and representatives of affected departments to draft the new system. No overtime work was required; this would be considered a normal job assignment in the United States. Yet the personnel director said that his subordinate would not agree to work on the task force unless she was given a monetary bonus for this extra assignment. He said this was not an unusual situation but continued to be the normal expectation in all industries. So managers have learned that they must always "hold some of the bonus money back" for unexpected demands, and employees know of this reserve so they continuously strive to gain more through bargaining.

Continuous Supervisor-subordinate Bargaining
Managers and their subordinates find that they must continually haggle over job assignments and payments. Subordinates believe that this is the only way to get their "fair shares" of the bonus money, and since many managers spend their reserves in these small contracts, the employees may be right. Managers and subordinates grow to distrust one another, and the acrimonious bargaining reinforces the distrustful relationships. Although this system grew out of economic conditions that are no longer pertinent to most managers and employees, it has become the normatively accepted relationship between boss and subordinate and so continues, functionally autonomous from its origins.

In addition to the inertia rooted in expectations, this disagreeable situation seems also to be reinforced by the absence of concrete *a priori* criteria established for bonus payments. Only very recently have some state-owned enterprises begun tying executives' bonuses to enterprise earnings. Evidence for the importance of clear performance criteria is provided by the experience of a private

21

Japanese-Hungarian joint venture which also used large bonuses but had clear performance measures (as well as clear minimum standards with termination for any employee who could not reach them); this joint venture did not have the continual employee-supervisor bargaining and distrust described previously. It is ironic that a major supervisory complaint of Hungarian managers (constant haggling with subordinates) apparently could be alleviated by the formal performance appraisal systems that they are too busy to implement.

Management-by-special-favors
Finally, there is another kind of individual incentive that deserves mention. This is the practice by which managers turn a blind eye to employees' use of organizational resources for their own purposes and to their absenteeism. As is common in market-driven companies, many managers (particularly first-level supervisors) find that they can expand their available incentives by allowing deserving employees to "break the rules." For example, Sayles[2] argued that nothing legitimatizes a supervisor more than the ability to "successfully buffer" subordinates from outside demands, a process that may involve "covering up for them." One way in which managers can reward their best employees is by condoning these small illegitimate activities.

Although cheating and stealing certainly are familiar to managers in all countries and may be no more prevalent in state-dominated economies than in others, they do carry a different moral tone in countries emerging from communist control. Recall that Hungary had a political regime imposed on people against the popular will, and its totalitarian character meant that enterprises were harnessed for political control as well as the production of goods and services. Under these circumstances, cheating could be a form of heroic resistance. When rules were immoral, rule breaking became a moral act.

The fact that recent "prisoners" have been elevated to prominent governmental positions in Czechoslovakia and Poland on the basis of their widespread moral authority helps illustrate that rule breaking can have a more ambiguous interpretation in Eastern bloc countries. Of course, much of the cheating and stealing that takes place in Eastern bloc enterprises is done for the same narrow self-serving reasons as anywhere else.

Further ambiguity is introduced by the widespread resentment of the favors formerly extracted by party members and their allies. That is, a large portion of the misused enterprise resources went to party members and their good connections. Previously, fellow employees felt compelled to watch these practices in silence, but no longer. Thus, Hungarian managers and employees are moving out of a climate in which cheating was an acceptable form of resistance against detested bosses and unofficially, yet openly, tolerated for the politically favored.

Interestingly, Hungary's well-developed private economy may have exacerbated the complex emotional reactions many have to small-scale favors. With wages so low, most Hungarians long have held second and even third jobs in the private economy. With some notable exceptions, managers and employees at all levels have jobs on the side. With the widening freedoms for private enterprise, many professionals and managers in state-controlled industries with low barriers to entry (for example, computers) have become entrepreneurs running companies that sometimes directly compete with their first-job employers. (Hungarian entrepreneurs routinely retain their state-sector first-jobs for the job security, access to connections, and resources these jobs provide.) Thus, a resentful subordinate begins to whisper that the department head uses the enterprise vehicles to make deliveries for his pub. Colleagues wonder whether a manager's recommendation reflects his first- or second-job interests.

22

Even the state-owned enterprises routinely accept "second jobs" (private contract work). This allows them to increase employee compensation (contract work is not considered in wage ceilings) and provides revenue for capital improvements or new ventures. Yet, again, the presence of "state work" and "private work" in the same company creates powerful incentives to misuse state resources. I drove for some kilometers behind a large diesel delivery truck for one of the prominent state-owned enterprises that was towing a small private car—a very unlikely official business activity. Was the driver using the truck for his personal business or fulfilling a private contract for the enterprise?

Should Foreign Managers Cheat Too?
Some have argued that western joint venture managers must get along by going along with such local customs, no matter how personally repugnant.[3] Yet my observations suggest that this is a very risky practice. This management-by-special-favors and misuse of employer resources (or imagined practice based on the recent past) has a pernicious effect on interpersonal relations. While simultaneously bargaining for their own "favors" or rewards, co-workers resent the apparent special favors colleagues receive. It may be that the manager is simply acting to maintain internal equity for truly performance-justified reasons, but the secrecy in which it occurs breeds suspicion. Sometimes colleagues suspect a special favor when none has been given. When theft is tolerated, it is not clear whether or not this is justified compensation or the actions of a few bad individuals. Because bonuses and favors alike are given privately and are based on personal appeals and bargains, everyone suspects that someone else is getting a better deal, which fuels an escalating spiral of distrust. If managers want to prevent their subordinates from cheating them, they would be wise to become models of scrupulously honest behavior.

There is another reason to avoid these practices. Many observers believe that the overwhelming electoral defeats which have surprised the Communists stem from resentment at these corruptions in the workplace. Since foreign businesses in any country face potential scapegoating from resentful locals, adopting the more offensive practices of local elites may not be prudent.

Human Resources Practice #3: Promotion-through-Connections
In organizations without strong performance pressures, managerial positions become "awards" for loyalty or for having useful connections. As noted, it was the normal staffing practice to place loyal party members in executive positions. Under reform, this process initially accelerated.

Until very recently, many state-owned enterprises found that they were receiving so-called "parachutists"—party members in purely party or planning jobs who realized that they must secure a position in a company while they still retained some influence. Although this practice may have stopped with the waning of (Communist) party influence, most of these managers still retain their places. They may have the potential to be quite competent, but they have arrived illegitimately (in the eyes of their non-party subordinates and colleagues) and so face self-fulfilling expectations regarding their incompetence.[4] Parachutists' colleagues are further inflamed by their resentment of the damage the party has done to their economy, as well as past political abuses. This is not the sort of climate in which shared goals and mutual problem solving can be expected.

Another effect of this recent practice of promotion-through-connections is reflected in the following incident. At a management training retreat conducted for managers of a state-owned computer services enterprise, it was surprising to see one of the computer center managers toadying to the personnel director who was visiting on the final training day. He hung around the director whenever he could, and his previously aggressive demeanor turned sweet and mild. I had admired

this manager during the week as an aggressive fighter (even if he did step on a few toes). Yet now he followed this director around like a fawning puppy, literally waiting to be the last to see him at the end of the training. What could account for the starkly contrasting demeanors of this manager? Perhaps his first—the aggressive—demeanor was more authentic and he wanted to advance in the organization. However, the environment he perceived himself to be in was not one that rewarded displays of performance prowess, but rather one that rewarded toadying like a courtier. He apparently thought that the best way to get ahead in this computer services company was *not* to be aggressive in building markets for products (at which he might have been better) but rather to smile sweetly and serve as a handmaiden to the high-ranking. It may have been more visible because it has been particularly difficult for managers to demonstrate "loyalty" in these highly centralized organizations—loyalty to the supervisor is insufficient and opportunities to demonstrate loyalty to the truly powerful high-ranking executives are few. This manager's ingratiating behavior was very open, and so it would be plain to his colleagues and subordinates that he sought promotion by currying favor.

Management Jobs Discredited

Whether or not this manager had accurately analyzed the promotion criteria in his company, his behavior had the effect of delegitimizing him by suggesting that he only received his managerial position through toadying. Certainly it is possible to imagine that he may be professionally competent as well. What is worse, these actions have the larger systemic effect of delegitimizing all managers. Managerial activities are notoriously invisible to subordinates, and those at the bottom probably see only the most blatant currying—so they generalize that all managers get their jobs this way, which helps to fuel their resentment and distrust.

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Self-blame

Finally, in full circle, this hostility can be turned on oneself. Lövey[5] has described the deeply ingrained self-blame of some Hungarians. It can be seen as a reverse-image of the positive attributions to successful leaders described by Pfeffer.[6] He argued that we have a bias for seeking explanations for events in the actions and characters of individual people, rather than seeing events as the result of more abstract "structures," such as selection or reward systems. For example, when everything is going well the leader receives personal adulation, but when problems occur there is a rush to blame him or her personally. Consistent with this framework, some Hungarians attribute their economic problems and the dysfunctions and abuses of the last decades to national character traits. This unfortunate bias is probably exaggerated in a society where informal personal connections and relationships are so important.

Restoring Legitimacy

Although the political-economic system that led to these resentments has changed, the feelings of individuals change more slowly. The negative assumptions that many make about themselves, managers, and their work continue to be unexamined. Hostility and distrust appear to be the psychological residue of an imposed order in which one could accomplish work and make a decent life only through personal connections, appeals and bargains. Game theorists have argued that the rational response when one has been exploited is to be distrustful in all future exchanges.[7] Distrust breeds future distrust in a stable, self-perpetuating system. That is, even though most state-controlled enterprises are beginning to change their promotion criteria and making incentives contingent on performance, the pre-existing expectations and assumptions slow the acceptance and effectiveness of these new practices.

Human Resources Practice #4: Ambiguous Responsibilities
Finally, individual responsibility has been significantly more uncertain in Hungarian enterprises than in their capitalist counterparts. The traditionally hidden character of much of decision making in highly centralized state-controlled enterprises fosters ambiguous responsibilities. Many managers know very little about what their colleagues or bosses do or about others' goals and pressures. Unfortunately, some even feel that it is not their responsibility to understand these things.

Truncated Lateral and Downward Communication
In many of these large enterprises, managers have had little opportunity to understand their colleagues' problems, because communication has tended to be predominantly vertical with only informal communication across departments. Lateral problems could only be solved by special appeals to higher level authorities, and frustrated employees could only blame vague "top bosses."

Further, downward communication traditionally has not been open; rather, managers have tried to maintain their highly centralized power by withholding information from subordinates. Even high-ranking managers often did not understand the reasons behind directives from on high. It isn't surprising that insufficient information from higher levels was the universal complaint of Hungarian managers and employees.

Widespread Avoidance of Responsibility
Conversely, managers complained that their subordinates "avoid responsibility." I asked one manager who had spent several months working in a company in the United Kingdom what he found "most surprising" about the capitalist workplace. He replied that it was that the employees and managers worked so independently—that they initiated action on their own and yet knew when to ask questions.

Again, these problems of ambiguous responsibility are derived from the historical use of enterprises to control. Recall that individuals effectively organized in opposition to the regime in enterprises are a potential potent political threat, as illustrated by the political power of labor strikes in Poland and the Soviet Union. Further, if executives gained their jobs through party connections, not through technical expertise, they were loath to display their ignorance. Finally, when virtually the entire economy of a country is "centrally organized," a large complex bureaucracy is created, making it difficult for middle and lower ranking members to understand who makes which decisions. These historically fostered ambiguities are reflected in four different patterns of workplace interpersonal behavior.

Feelings of Personal Impotence
One dysfunction is the routine assumption that only those at higher ranks (than oneself) can take corrective action. For example, on several occasions I observed the following: at meetings complaints were voiced and participants agreed that these were serious issues, yet the meetings broke up without anyone taking responsibility for a next step in addressing the problems. It was not that these meeting participants were prevented from taking responsibility—they worked in a "new" foreign-Hungarian joint venture—it just didn't occur to anyone to do it. So the problems remained and festered. Under these circumstances, foreign managers can easily fall into the position of taking on all the responsibility, to the detriment of their organizations and themselves.

Credentials as Substitutes for Performance
Under conditions of ambiguity, even when managers had the best intentions to make performance-based decisions, they often did not have the information to do so. Since state enterprise owners (ministries) traditionally were not interested in

extracting information from their accounting systems regarding which lines of business or products were most profitable, these could not be the basis for decisions. Marketing functions, when they existed, were often handled by a foreign distributor (for export products) or by the executives in their spare time (for domestic products). So these organizations often lacked accurate, detailed information about customer preferences and changing market conditions. In practice, the only form of "individual merit" many managers could use was professional technical qualification, even if this was not particularly relevant to the job at hand. For example, a successful engineer in an oil industry enterprise who spoke English was placed in charge of the entire marketing function in this large organization—despite the fact that he had no experience in marketing. What was worse in the Hungarian context, he did not have the extensive network of personal contacts through which products would be marketed domestically. Several important customers were lost, and this formerly successful engineer left the enterprise.

Pervasive Distrust

The lack of clearly defined areas of responsibility also increases the distrust noted previously. An illustration of how these processes of personal bargains and ambiguity interact to produce distrust among shop-floor machinists is provided by Haraszti[8]:

Supplementary wages are our most frequent topic of conversation with the foremen. They have at their disposal a relatively large sum for the adjustment of individual wages. No one knows exactly how much, nor whether all or part of it is used up. The foremen's accounts never mention it, nor can you find any trace of it under either "deficits" or "outgoings" or in the official "bulletin of results." . . . The foremen, setters and inspectors never once mentioned the existence of supplements, and it was only some time after my arrival that I heard about it from old M. . . . Perhaps it is because no one knows anything precise about them. Only one thing is certain: the foremen resist paying supplementary wages. Each worker therefore concludes that if there are too many demands less will be left for him. . . . So each worker treats what he gets as a supplemental wage as a secret. . . . Information I got from other millers slipped out unawares in a moment of anger.

But everyone wants to seem knowledgeable—so this face-saving shrug has developed in which no actual information is exchanged. This adaptation to prior political and practical circumstances is understandable, and it is also characteristic of many ingrown bureaucracies in other countries with their opaque jargon and long managerial apprenticeships.

Imprecise Communication

An illustration of how these ambiguities are reflected in interpersonal communication practices is "the knowing shrug." The shrug is in response to a vague statement (preferably about the venality or stupidity of others) and communicates the message, "Well, sophisticated people like us know all about this, but what can one do about such things?" This kind of nonverbal communication best captures the widespread ambiguity in communications. For example, I had a great deal of difficulty getting a precise understanding of facts and events in many organizations. The answers were "perhaps," "I'm not sure," "We'll see." A manager said, "No one owns my company." Even presumably straightforward questions, such as, "Did the company council vote to break the regional divisions into limited liability companies at the last meeting?", were answered with a "Perhaps." When I aggressively pressed these managers for an American-style "straight answer," sometimes I received a long complicated story that really was best summarized as a "perhaps," yet other times it was clear that the manager really did not know the answer.

Under these circumstances, the wise individual has learned not to inquire too closely. Sometimes, finding out what is really going on is more exhausting than it is worth (and it used to be dangerous). But everyone wants to seem knowledgeable—so this face-saving shrug has developed in which no actual

information is exchanged. This adaptation to prior political and practical circumstances is understandable, and it is also characteristic of many ingrown bureaucracies in other countries with their opaque jargon and long managerial apprenticeships. However, it leads to two serious practical management problems.

How Can You Manage When You Can't Find Out What's Going On?
First, two individuals having completely different understandings may never "check their perceptions" with one another and thus may make errant judgments which lead to anger, blame, and poorer performance. Second, since individuals become used to communicating imprecisely, it is difficult to determine who has done what and who is responsible for which decisions. It can become impossible to trace where problems have occurred and to correct them. Rather, the powerful person at the top must assume all blame, all responsibility. When problems become visible, these top managers may be removed, but the structure and behavior patterns that led to the malperformance remain in place.

Early Reform Increases Ambiguity
Enterprises are revising their information systems and responsibilities will be necessarily clearer in the smaller disaggregations that currently are being formed from large state conglomerates (at least, the highest ranking manager will be more visible in a smaller organization). Yet, some of the early reforms also seem to increase ambiguity. For example, many limited liability companies are being formed from the departments of a state enterprise which still retains ownership of its former departments. How much daily control is retained by the former central office executives? Are the "limiteds" required to use the central services, such as personnel, that are still retained with the former-central-office-now-owner? Opinions differ widely on these questions, and no doubt these fresh opportunities for bargaining will keep Hungarian managers busy. Foreign managers need to understand that when suppliers, customers, and their own managers say "they didn't know," they may, indeed, not know.

The Practical Business of Building More Effective Organizations
Until relatively recently political conditions in communist countries have not permitted extensive open debate about their organizations. As an illustration, in 1973, Haraszti was tried and sentenced to prison for the work quoted previously. Despite the new political openness, many managerial practices originating under the communist political systems have fostered functionally autonomous assumptions and attitudes that have been slower to change. However, this should not be read to imply that these patterns are immutable. As was noted, many Hungarian enterprises have successfully adapted and are prospering. Rather, an open recognition of such patterns is the initial basis for their change. Once openly acknowledged, dysfunctional behaviors and assumptions can be managed through widely available organizational development techniques.

What Foreign Managers Can Do
In many respects, this change is much easier for foreign-controlled organizations. Hungarians expect managers from capitalist countries to manage differently. They see the success of these foreign organizations and want to learn from them. However, the dysfunctional assumptions do need to be recognized and addressed. This work was intended to alert expatriate managers and investors to some of the difficulties they will face in reforming communist and former communist countries.

This description has highlighted some of the dysfunctions in state-owned companies. Because patterns of relationships become established and habituated in organizations, it will be more difficult to address these dysfunctions in on-going state-owned enterprises than in newly established organizations. While there may be many good strategic reasons for a foreign company to form a joint venture with a local state-owned company, changing the human resources practices and

patterns of behavior will, by its nature and necessity, be more difficult than establishing those same practices and patterns in a newly created organization. Yet, even in new organizations, foreign managers will want to insure that their local colleagues do not inadvertently replicate familiar dysfunctional practices.

What Local Managers Can Do

Acknowledgement of the dysfunctions carried from the past is even more important for local managers in reforming and former communist countries. Because the patterns described here have been the norm in the past, they are less visible to those who have always lived with them. Yet recognition of the dysfunctions inherent in conventional human resources management practices is an important first step in correcting them.

Local managers face an additional serious problem. Because not many of these managers are used to assuming responsibility (since they could not realistically expect it before), some may happily let their foreign bosses assume responsibility. In Hungary today, state-owned companies are aggressively seeking foreign partners. I fear that for many it is not only for the tax and technological advantages but to find a new all-knowing, all-powerful "top boss" who will solve their problems for them. This is not only bad for the long-term development of Hungarian organizations, it is bad for the short-term career prospects of the local managers. Managers from profit-making companies expect all employees (and most especially their managers) to take the initiative and assume responsibility. Those who don't do so are tolerated as long as necessary and removed as soon as possible.

Endnotes

The author wishes to thank Imre Branyiczki, Daniel Fogel, Gábor Kornai, and Imre Lövey for their valuable comments on an earlier version of this work.

[1] Readers interested in learning more about central planned economies should see J. Kornai, *Economics of shortage* (Amsterdam: North Holland, 1980), and J. Kornai, "The Hungarian Reform Process: Visions, Hopes, and Reality," *Journal of Economic Literature*, 24 1986, 1687-1737.

[2] L.R. Sayles, *Leadership* (2nd ed.) (New York: McGraw-Hill, 1989).

[3] For example, see J.A. Wall, Jr., "Managers in the People's Republic of China," *The Executive*, IV(2), 1990, 19-32.

[4] R.M. Kanter, *Men and Women in the Corporation* (New York: Basic Books, 1977).

[5] I. Lövey, "The Whole Nation is Complaining," *Mozgo-Vilag, 12, Panaszkodik az Orszag*, 1986.

[6] J. Pfeffer, Management as Symbolic Action: The Creation and Maintenance of Organisational Paradigms, in L.L. Cummings and B.M. Staw (Eds.), *Research in Organisational Behavior*, Vol. 3. (Greenwich, CT: JAI Press, 1981).

[7] R. Axelrod, *The Evolution of Cooperation*, (New York: Basic Books, 1984).

[8] M. Haraszti, *A Worker in a Worker's State* (New York: Penguin Books, 1977).

About the Author

Jone L. Pearce is associate professor and associate dean of the Graduate School of Management, University of California, Irvine. She has published numerous articles and a book based on her research on the interactive effects of organizations' contextual pressures and organizational reward systems on organizational members' performance and interpersonal relationships. Her current work focuses on understanding 1) the human resource management strategies that American firms are adopting to gain greater competitive flexibility, and 2) the transformation of the state-owned enterprises in formerly communist countries to market-driven businesses.

Training for Organizational Excellence

An essay by the staff of Zenger-Miller, Inc.

Training For Organizational Excellence

EXCELLENCE IN PERSPECTIVE

Overwhelmingly, the research on excellent companies shows that they are the result of excellent management. It is not technology, geography, labor pools, government intervention, or any other external factor that makes the significant, long-term difference. It is the performance of management. It is the individual managers alone in their offices, in one-on-one interactions, and in their roles as group and team leaders, defining and transmitting the values, vision, and standards of the organization.[1,2,3]

It is also clear that sustained good management does not just happen. It is the product of planning, development, and training. Though it is hard to be conclusive, Tom Peters and Bob Waterman noted that there were enough signs of "training intensity" to suggest that training is highly related to organizational excellence.[4] We totally concur with their observations and wish to go on record as saying that formal and informal training processes are among the best tools available to management to begin immediately achieving more excellent organizational performance.

In this essay, we describe how the best training functions (see Note A) operate, and what is responsible for their substantial contribution to their organizations. We approach the subject from the vantage point of our work with hundreds of training functions in the private and public sectors, representing all major industries and services (see Note B). Our perspective in this essay is simply that excellent training functions operate differently than their non-excellent counterparts. They don't differ in resources as much as in behavior and management practices. Therefore, if a training function wants to make a more significant contribution to its organization, it helps to pattern its functioning after the excellent ones.

While most of our examples will be from the private sector, and we will often refer to companies or corporations, everything said here is meant to include the public sector. The same principles apply, and we see some of the best training functions in city, county, state, and federal government. They often have the luxury of taking a longer range view than their counterparts in the private sector.

Our hope is that these observations will be valuable to company Presidents and Vice Presidents, Directors of Human Resource Development, Training Managers, and those conducting training programs. We welcome your feedback regarding our conclusions, and invite you to contact anyone within the Zenger-Miller organization to discuss your reactions, your questions, and your ideas. The authors of this essay have lamented that they wish they had known these things at the beginning of their careers, rather than learning them the hard way later in life!

HOW THE BEST ONES DO IT

We see ten distinctive practices in the excellent training functions.

1. A Clear Vision of the Goal and Mission of Training

The excellent training functions have a clear and compelling vision of the individual and organizational results that their efforts are intended to achieve. They have a guiding picture of the behavior changes that need to occur on the job. There is less hoping to provide participants themselves with "awareness" and "insights" and more concern with developing action plans that they will implement back on the job. Their clarity of vision gives the best training functions the ability and a willingness to demonstrate the right way of doing things.

Underlying their clear vision is a deep and unswerving conviction that training really makes a difference in the daily performance of the organization, because it can alter and build the culture more directly and economically than any other management tool. Effective training organizations see their role as helping to define, and convey the positive values and culture of the organization. They see training as a prime vehicle through which executives can transmit their philosophy and values.

The most effective training functions are absolutely clear about the distinction between traditional education and the role of industrial training.[5] Their vision includes training participants in practical skills that can be used immediately for today's job, or they see their task as preparing people with the skills for tomorrow's job. In either case, their major emphasis is not on education; it is on demonstrable skills development. They teach theory and information only where those are relevant to the skill demands of the job.

Part of the vision of excellent training is a clear definition of the target population(s). Some less effective training functions seem to exist to "fix" a small cluster of individuals in the organization. But, the excellent training functions see their target as the influencing of large numbers, at all levels. They see training as analogous to good food and exercise, of vital benefit to everyone.

Some examples are:

- A large corporation brought all managers to a central facility for training to re-emphasize the corporate values that top management wanted to permeate through the organization. The role of managers and the skills needed to inculcate those values throughout the organization were taught and practiced.
- A company carefully defined the skill competencies that people needed in each job. Training was developed within the training function and also was purchased from outside training firms to provide these skills. This required a major redesign of many training programs that were more geared to teach theories and information, or which had previously not focused on specific competencies.

• A training manager successfully avoids falling for the latest fads in training by always evaluating new training ideas against the training function's vision.

• A director of training remarked, "My people are really tired of hearing theory that they can't apply. They want to know 'how to' about that whole parade of daily challenges that come into their office. That's what training is all about." She made "how to" the central focus of every program.

2. Tightly Linked to the Organization's Objectives

The effective training functions keep their focus riveted on their organization's goals.[6] They are constantly aware of the mission, objectives, and the genuine needs of the organization. They stay aware of these in a variety of ways, sometimes informal and sometimes highly structured and formal. But, they always channel training toward the important targets of the organization. They never forget who is paying the bill. (Not many years ago some leading social scientists in management and organization development defined the role of these functions as one of power redistribution. Such advocacy of training and development as a guerrilla warfare activity did much to alienate the function from management.)

Today, we see the best training functions aligning themselves with management to the greatest degree possible. Today's organization is being forced to attain higher productivity, both in the office as well as in the factory. The training function can help achieve that. Pressures for improved quality and for higher levels of customer service are common, as companies attempt to gain competitive advantages against others in world-wide markets. Training can help there, too.

The best training functions contribute to organizational excellence by helping the organization achieve both its immediate and longer-range goals. They develop a master plan of training that interlocks with the organization's master plan and tactical objectives. They are systems-oriented. They see the big picture.

They also see their role as serving the entire organization, not just some friendly middle managers or easy-to-reach supervisors. They recognize that the only true organizational change comes from a combined effect of "top-down" and "bottom-up" activities. They do not ignore the top executives, nor do they ignore an engineer who needs training to improve effectiveness in working with colleagues.

To understand their client's needs, the effective training functions burrow into the technical aspects of the business. They work hard to learn the operations, because that is the only way to fully understand the training needs that exist. They are not intimidated by technical terminology and realize that a certain degree of detailed knowledge of the business is necessary in order to function effectively in the organization.

Some examples are:

- Finding out about the goals of the business. They know what is planned for the business through in-depth interviews with executives, plus paying close attention to other sources such as executive speeches, company presentations to stock market analysts, public reports, and financial statements. This helps them to know what is important to management, and how the training plan must coordinate with the organization's plans.
- Getting out of the training office, and spending time with the line managers, supervisors, and individual contributors.
- Discovering the organizational issues that keep top executives awake at night, and applying training to help them with appropriate problems.
- Going to the critics of training, and finding out what needs they have. Effective training groups don't shy away from honest criticism or constructive feedback.
- Frequently following up on the results of training, to learn what is being applied.
- Involving many people at all levels in an effective, practical, needs analysis process.

3. Line Management Commitment and Involvement

While all organizations talk of management involvement and support, we suspect that many training programs really receive "permission" rather than true support. Trainers are given permission to spend money and take peoples' time, but real ownership of training by line management is often lacking.

The top training functions, by contrast, have generated an enthusiastic involvement of line managers. Line managers participate all the way, from defining training objectives to actually delivering some or all of the training.

True support for training can be measured in a number of ways. It certainly goes far beyond some statement made in the President's letter in the annual report or in some executive speech to all of the employees assembled in the cafeteria.

The most obvious test of line management support, commitment, and involvement is simply whether or not the senior executives are aware of the objectives and content of their organization's training programs. A senior training officer of a giant insurance company remarked, "The executives in my company do not have the foggiest idea about what we teach or why we teach it. I think some of them might be shocked."

Real support can begin with high-level management task forces that set policy, analyze needs, and recommend the allocation of resources. It begins when executives faithfully attend the kickoffs and graduations of all training programs. It comes when a manager insists on knowing whether or not participants are regularly attending the training sessions,

and clearing the way for them to attend if work pressures are getting in the way. True involvement comes when managers talk with their employees currently in training programs to find out what is being applied and how the managers can help.

Solid involvement and support is evidenced when management attends special sessions that expose them to the content and the skills of the programs being given to their participants. A high level of support comes when upper managers apply the skills being taught in training in their own management practice. For a select few, a final level of support comes when managers personally conduct training sessions.

Fundamentally, many training groups fail to receive total support because they never really ask for it in specific, precise terms. They ask for "support" and are told that the training function has management's "support." The problem is that "support" is never defined, and while upper management truly believes they are giving it, the training functions perceive they are receiving precious little.

In contrast, excellent training functions are precise with management about the support they expect and need; and therefore, they receive far more than their counterparts who are vague and/or who have low expectations.

It all boils down to the fact that the top training functions are outstanding internal marketers of training. Some professionals are put off by the notion of marketing. But, just as today's physicians and hospitals have learned that their survival depends on marketing, so must training professionals get comfortable with that fact. Fortunately, good marketing is never hucksterism. Instead, effective marketing means finding out what the client genuinely wants and needs, ensuring that your products and services meet those needs and wants, and then communicating effectively in an involving, participatory way how your services and products do just that.

Some examples of organizations achieving management ownership and involvement are:

- One corporation established an extremely high level training advisory committee. It included the executive vice president as the chairperson, and included many senior operating officers. This committee had its staff work done by the corporate training staff. It met regularly to review training needs, to set policy, to recommend the allocation of resources, and to give the strongest possible endorsement for training by the senior executives.
- Frequent correspondence is sent to line managers about what is happening to their employees who are in training sessions. Managers know exactly the content of training given to their people.
- Line managers select those to be trained, and letters inviting people to be participants are signed by their line manager.

• Line managers are consulted about what changes they hope to see in their employee's performance.

• Line managers conduct supervisory training sessions.

• Senior managers kick-off all management training programs and pass out certificates of completion at the end.

• Within a world-renowned R&D organization, a senior line manager is appointed to sponsor a group of middle management participants during a large training program. The senior manager, nicknamed "the angel," regularly attends sessions, meets with the participants regularly throughout the program, and is available to talk with participants about any of their questions regarding company policy or management practice.

• The president of a large company personally conducts part of the supervisory training program for newly appointed first-level managers. When asked how he could spare the time for this activity, he replies, "Where else could I spend time that has so much leverage for building the corporate culture?"

4. Excellent Management Practice Within The Training Function

The training function in excellent companies practices what it teaches. The budgets are well-prepared and submitted on time. The department's telephone is answered efficiently and courteously. Members are willing to take risks and experiment. The group is quality-minded and responsive. They accept responsibility and make themselves accountable for a return on the investment the organization makes in training. They are participative in their own management practices, but hold themselves accountable for high levels of performance. They are technically competent and knowledgeable about training content, methods, and management.

When line managers are rotated into the training function as a short-term, developmental experience, the effective ones waste no time in learning about training. Some people have argued that a manager is a manager of anything, and that people can move from one function to another and need not understand the technical dimensions of what they manage. That does not square with the research about what makes effective managers. They generally have, or quickly acquire a good grasp of the technology they are managing.

For training professionals the challenge seems to be one of remembering that they are business people who have the assignment of managing the training function, not training people who happen to be in a business organization.

One company president observed that it is easier to find capable line managers than it is to find high-quality staff managers. Once a good staff manager is found, he or she should be carefully nurtured. We observe this to be especially true of training executives.

It is common to joke about the dressmaker's daughter not having a dress, or the shoemaker's children having no shoes. It is hard for the rest of the organization to respect the training department unless it practices the management skills it teaches to others. When it is a good model, the training department becomes a catalyst in the organization, making major changes easier for all departments.

Some positive examples we see are:

- A well-written, meaningful annual training plan that can be shown to, and discussed with, any interested party.
- A sophisticated view about the expenditure of money. Some training functions believe they will be praised and rewarded for saving money. Instead, the excellent training functions spend money wisely, but realize that the greatest rewards come from producing good results for the organization; and that entails spending money intelligently.
- A training annual report that shows the number of people trained, the subjects covered, the cost per hour or day compared to budget, comparisons to previous years, demonstrable on-the-job behavioral results achieved, critical mass accomplished (see Point 8 in this essay) and key organizational goals accomplished.
- A positive, enthusiastic climate in the department when you walk in and meet people.
- A reputation for congruence. A line manager says, "The great thing about our training department is that you can do what they do, as well as what they say. That department is a terrific example of what every department in this company should be."
- A reputation for straightforwardness. One executive described a training manager, saying "She knows just when, where, and who to push. She is absolutely fearless in talking to upper executives, but they know she cares about making the organization more successful and no one ever gets offended."

5. Emphasis on Practicality and Transfer

During the last decade, we have witnessed a profound shift away from esoteric, theoretical, complex training.[7] We see a strong movement toward more practical, concrete, "What do I do on Monday morning?" training. Training has failed unless it moves from the classroom back to the job. This "transfer of training" must be the central preoccupation of the training department. Across all types and sizes of organizations, the whole Personnel function is being required to move toward providing more "line" results.[8] The excellent training functions are already well on their way.

This begins by focusing on the content. Rather than lecturing employees on the importance of being customer-oriented, the best training functions emphasize transferable things like, "Answer the phone after the second ring," "Call customers by name," or "Return phone calls within 8 hours." Instead of lectures to supervisors on Maslow's needs hierarchy, we see the best training functions having supervisors rehearse the behavioral skills of listening, asking questions, clarifying expectations, and coaching. Those are the skills that unleash motivation starting "next Monday morning."

Instead of theoretical lessons for middle managers on "control," we see the excellent training functions teaching managers how to develop sound, specific courses of action with employees, how to get employee commitment to those action plans, and how to get agreement with employees on specific follow-up ways to determine if things are working better.

Top training functions move toward practical teaching methods to teach their practical content. They use techniques that involve clear demonstrations and practice, always keeping in balance the cognitive element of training. They emphasize people leaving with practical new skills. While experiential techniques have successfully involved participants and provided new insights, there has been little evidence that tinker-toy towers and going-to-the-moon exercises have resulted in demonstrable changes in back-home behavior. Momentary insights and self-awareness have not been consistently transferred from the classroom to the job.

The basic test of practicality and transfer is whether the training has caused peoples' on-the-job behavior to change for the better, either permanently or for a reasonably long time. If that has not happened, then we have educated or entertained, but not trained.

The best training functions also know that training is not always the answer. They know when NOT to train, and they resist conducting training programs when the need is for individuals to take action on what they already know rather than to learn new things.

Some examples are:

- An organization replaced its highly theoretical management training programs with a new system that emphasized specific skills relevant to their practiced day-to-day needs, such as goal-setting with individuals, performance coaching, team development, and group problem-solving skills.
- A large aerospace company wished to improve the presentation skills of executives. Therefore, a major portion of the executives' development program was devoted to their actually delivering short presentations, and having those presentations videotaped for critique by themselves and by their group. A second presentation was given later in the session to measure the improvement of each participant.

• A chief executive contacted the training department to "fix" the customer service representatives. They were not being sufficiently courteous and responsive to customers. A training specialist proposed that the problem may not be a training problem, but appeared to be a personal motivation problem due to the lack of rewards for courtesy. The trainer proposed that each week the department identify the most courteous customer service representative and have that person's picture posted in a prominent place in the building. Within a month, courtesy noticeably improved.

• A problem-solving course had been used for many years and had been well received by managers. But, research showed that few people actually used the skills back on the job. A newer program was introduced that demonstrated people actually going through each of the steps of the problem-solving process. By allowing time to practice these skills in the classroom, the company began to see an immediate increase in the use of the skills outside of the classroom.

• Follow-up sessions were scheduled after the completion of a training course to ensure that the participants maintained their skills, and they were given frequent reminders of how to use them. A variety of techniques, including post-training assignments, buddy systems, and trainer follow-up discussions were added to make the follow-up process more complete.

6. Use of Multiple Sources to Assist Them

We observe that the most effective training functions do not attempt to design or conduct all of the training themselves. Instead, they see themselves as orchestrators, who marshal all available resources to provide the needed training activity. They are not jealous of line managers conducting training, of outside consultants with specialized skills, or of outside organizations which design instructional systems. They see themselves as the group responsible for making the most effective training occur, but not the ones who personally must do it all. They are willing to use available resources and to delegate.

Training functions typically suffer from lack of resources to meet enormous demands and needs. Their only hope to satisfy those needs is to be the catalyst that makes training happen rather than the sole creator and deliverer of training. The pressures of time, costs, and quality often lead to the use of outside resources, rather than only internal resources.

This willingness to use appropriate resources inside and outside their own organization allows excellent training departments to magnify their efforts and multiply their effectiveness.

Some examples of this are:

- An organization decided to have all of its supervisory training conducted by line managers, with the training department largely coordinating the activity. The initial evaluation results showed that the line managers were obtaining as good, if not better, results than training professionals. The trainers were freed to deliver other programs requiring highly specialized training skills for which they were uniquely qualified.
- An organization needed some specialized technical personnel. They arranged with a local junior college to develop a course to train these people. The company collaborated in the design of the course material and virtually guaranteed employment to the graduates of the program.
- Ten years ago, less than 30% of large organizations used packaged or "off-the-shelf" programs as part of their management training. Today, more than 80% use such programs for all or part of their management training efforts.
- An organization's supervisory training program carefully blended materials supplied by an outside vendor, which successfully taught skills, as well as important, internally-developed company information about procedures and policies. A program containing only one or the other in that particular organization would not have adequately prepared a new supervisor for survival or success.

7 A Sense of Urgency

The effective training functions bring a high energy and intensity to the task. They are less reflective, introspective, and philosophical, but focus on clearly defining the specific problem to be solved. Then, they are skillfully action-oriented and have a desire to get on with things—quickly. They model the initiative they seek from all managers.

While effective executives have widely varying styles, they seem to possess at least one trait in common. They have a sense of urgency, impatience, and restlessness with the status quo. If the training function is to receive management support, it cannot be too far out of harmony with the pace or rhythm of the organization.

The best training functions are staffed with some of the organizations' brightest people, who do not set unreasonable targets or schedules. Yet, they balance their planfulness with a commitment to waste no time getting programs underway and the goals accomplished. The training functions in excellent companies see their primary function as the delivery of high quality training that makes a difference in how people behave on the job. They never lose sight of the fact that they are being paid for results—soon.

The top training functions emphasize the immediate application of the skills being taught. They have instinctively learned what research has confirmed. If people do not quickly apply what they learn in training, it is highly unlikely that they will ever apply it.

• Some university professors teaching quantitative methods to business people learned that only a small percentage actually applied what they were taught. But, in probing further, they discovered that those who did use it had one common characteristic. The successful participants began to use the skills immediately—within a two-week period. If more time than two weeks elapsed, it became clear that there was little likelihood that change would ever occur.

The sense of urgency within effective training functions, therefore, is in two different areas. They respond quickly to training requests from responsible people in the organization; and they emphasize immediate application or implementation of the training content.

Some examples of taking action are:

• Confronting a Sales VP who was concerned about the level of sales, but who believed nothing could be done in the short run to remedy the situation. The training executive challenged the VP to try Training's team-building and team-training processes as a near-term way of improving sales performance. The VP accepted the challenge and, within six months, sales in the two districts involved increased 116% and 208%. Sales in districts receiving no training showed little or no change.

• Telling the Chairman of the Board that the core values of the organization were not reaching the lower levels of management. As a result, the organization committed $100,000 for the development of a program that would transfer the core values and desired management practices throughout the entire international organization. The program was being conducted company-wide within a year.

• Responding to the substantiated concerns of workers who were highly disgruntled with the behavior of their supervisors. Training began within one month, and the requesting employees quickly noted significant changes in how their supervisors related to them.

• Delivering an effective program to train the management team of an important, newly acquired chemical production plant within two weeks of receiving the request.

• Responding to management in 5 weeks with a program to train supervisors with the skills necessary to run effective quality circle meetings.

8. Achieve Critical Mass

There is an enormous difference between having 500 different courses with an average of 10 people attending each one, and having 10 courses with a cumulative average of 500 people attending each one. While the total number of training days is the same, the impact on the organization could not be more different. If those highly-attended 10 courses are fundamental, building block courses, which develop job skills and inculcate core strategic values, the impact of the whole system can be profound. But without such "critical mass" generated by wide attendance, the organizational impact of even the finest training program is soon dissipated.

Peter Drucker said that he thinks an organization must train at least 30% of any group in order to impact the entire group in any meaningful way. We concur with that observation. If a company wishes to develop its sales force, it can not train only 2% of them, and expect them to go back and transform all the rest.

On the other hand, we know of organizations that have enormous catalogs of courses rivaling those of universities. These are taught by internal staff or external consultants, and many employees attend several courses each year. (Companies, as well as universities, have professional students.) When these courses are offered cafeteria-style, there often is little critical mass created. Overall organization impact is small, since commonality of participant experience is relatively uncommon. Training becomes a remedial process, a reward, or a break in the routine for pockets of employees. But, training's impact on the overall organization is small.

This is very different from those who see training as a powerful means to change or to strengthen the culture of the organization, as well as a prime tool to transmit the values and vision of its top executives, while building demonstrable skills which directly improve job performance. While one perspective speaks mostly in terms of numbers of training days conducted, the excellent functions also speak in terms of percentages of target populations trained and critical mass created.

Examples of this are:

- A large organization developed a detailed implementation plan for a major training effort, including the precise means of rolling out the effort to the entire population over the next 18 months. The strategy and tactics were in place from the beginning, and they successfully trained 94% of the target group.
- Many Fortune 500 organizations are currently reassessing their training offerings, identifying key skill competencies at each organization level, and offering a limited core of training programs aimed to directly develop these competencies and whose content is linked logically between organization levels.
- An extremely successful computer company makes training mandatory. All managers, after being appointed to a new level in the organization, must attend a training program designed to give them skills needed to function well in that job. It also is mandatory that they attend the training within a certain number of weeks of being appointed to their new positions. Making this program obligatory impacts the entire population, and substantially influences the organization.
- Other companies obtain high levels of participation in training by generating intensive line management support and involvement and/or by promoting specific programs directly and extensively to the prospective participants.

9. Consistency

Most of us seek to buy products that we believe to be of consistently high quality. If we buy a product one day and it is good, only to buy the same product a week later and find it to be bad, we look for another brand. Sometimes we don't even rely on trying it ourselves; if the word-of-mouth says it's poor quality, we might not even consider it. In today's world, successful services are similar to successful products. If a service, like training, is to be widely marketed throughout an organization, it must be of consistently high quality.

The same training course often receives rave reviews and trenchant criticism when different people conduct it. Many training programs being delivered in organizations are extremely instructor dependent, and therefore are subject to such wide quality variations.

How can training be made more consistent? How can uniformly high quality be achieved? One approach used by top training functions is to place great emphasis on the training and monitoring of instructors. Another way is to emphasize carefully constructed learning designs. A third method is to place greater emphasis on the creation of high quality training materials. The combination of these three elements—well trained instructors, tightly constructed learning designs, and well-crafted training materials—has been demonstrated to produce highly consistent results.

The drive for consistency does not stop there, however. We see excellent training functions being intensely concerned with the harmony *between* their different training programs and with the overall consistency of the messages being delivered by training to the various levels of the organization.

Some examples are:

- One corporation had trainers monitor each other, with some attending classes taught by others; feedback was available from the visiting trainers. This develops consistency by building skills through peer feedback and by having instructors totally aware of what their colleagues are doing.
- Another organization decided to achieve more uniformity by emphasizing materials and methodology. They used computer-aided instruction and a new "box game" to teach the organization's fringe benefit program to all new employees. These made the learning more interesting and more consistent.

• The chairman of a large corporation's training committee remarked, "I heard disquieting comments from the participants in one of our pilot programs. They said that they had gotten a lot out of the course, and that it was primarily because of the excellent instructor." This executive was pleased about the trainer but worried that if the program was highly instructor dependent, then the program was in jeopardy of never being successfully "rolled out" across the organization. There just weren't sufficient charismatic instructors available who also had the technical competence to teach programs such as this on a broad scale. The organization elected to invest additional money in high quality materials that would reduce the program's virtually total dependence on the instructors and achieve higher consistency of delivery.

10. Evaluation of Results

The big questions facing every training function include, "Is this program really working?" "Does it do what we purport it will do?" "Is change really happening?" "Is this effort and expense really paying off?" "What evidence do we have that we are making a real difference to the organization?"

While we do not see all of the excellent training functions spending time and money on quantitative evaluation of training results, we consistently see a deep commitment to finding practical ways to determine if training is really paying off? They evaluate training using the measures that are most relevant to the management of their unique organization. Meaningful evaluation is always in the eye of the beholder. Therefore, some organizations collect examples of successes of training. Others rely on line managers to observe the results "on-the-job," and some have personnel on their staff who want controlled studies in order to more scientifically evaluate the behavior change of participants as a consequence of training. Still others are looking for bottom-line, hard measures of training's contributions.

One of the most dramatic changes in the last decade has been the increase in the number of organizations seeking practical ways to measure the results of training. We believe that to be a long awaited, healthy change.

Some examples are:

• One follow-up minded organization asks every supervisor and manager who attends training to write up a detailed description of the specific skills they have learned and how they will use them. Follow-up is conducted one month, three months, and six months after training to document results. Results are converted whenever possible into return on investment (ROI) percentages and/or dollar savings or gains.

• Another company requests that managers carefully observe their employees for two months following the employees' training. Then, managers are asked to document the behavior changes they see.

• More than 80 companies and government agencies have elected to rigorously evaluate their results produced from using a packaged supervisory training program. This includes giving questionnaires to the participants and bosses of those attending training. Questionnaires are administered before training and after training to measure the change over time. Experimental groups and control groups are used to help assure that observed changes are the result of training.

• One company, in conjunction with a major university, did a research project in which they developed extensive "bottom-line" rates, such as quality measures, absenteeism, tardiness, turnover, and labor grievances filed. They were able to see positive changes in most of these measures due to their training efforts.

• One company elected to use only one "hard" measure which was critically important to them—turnover. They trained 100 employees in the skills of being more effective individual contributors, using half-day sessions once a week for twelve weeks. The target population traditionally had turnover in excess of 50% per year. This group, after six months, had an annualized turnover rate of 18%.

CONCLUSION

As a final observation, we note that not all the high-performing training functions do all of these things we have described. Conversely, most training functions do some of these things. But, we observe that the excellent training functions consistently do more of them, do them more intensely, and persist over a longer period of time than their counterparts.

Most executives have come to realize that changing an organization is not a matter of issuing a command and having the organization suddenly take a new course. Instead, the executive is forced to nudge and push, model and reinforce, and gradually redirect the enterprise. Training can be a precision instrument to help create such organizational change, because of its objectives, content, and methods are controllable, ongoing, and pervasive.

Few tools exist to quickly and directly impact the organization. One of the most powerful of these is training. It has enormous potential to influence both individuals and the institution as a whole.

Unfortunately, training fulfills its potential in only a small portion of all organizations. We have presented here the characteristics of those training functions where training efforts excel. We believe that they present a valuable model from which we all can learn.

REFERENCES AND NOTES

Note A:

When we use the term "training function," we include more than the people in the training department. We believe it encompasses:

- The department or group which plans and conducts employee, supervisory, management, and executive training and development.
- The Organization Development staff which works with teams and systems.
- The technical training staff and its activities.
- The participation and involvement of line managers in planning and conducting training and development activities.
- The corporate policies and norms regarding training, i.e., is training voluntary or mandatory; is taking time for training important or frivolous?
- The amount and kind of financial and psychological support provided to training by senior management.

Note B:

Zenger-Miller works with hundreds of organizations, large and small, in the public and private sectors, in a broad range of industries, including almost half of the Fortune 500. Our involvement has been as training and organization development consultants, and as suppliers of packaged training systems to these organizations. Working in close proximity with our clients, we are able to see the inner decision-making processes, and able to witness the involvement of training departments with their line managements. We frequently attend sessions with upper management to discuss training. We especially enjoy working with trainers and training managers who strive to contribute to their organizations, and seek to have their training function operate like the best.

The professional staff members of Zenger-Miller each considered the question of "What's different about excellent training functions?" The conclusions stated here represent a consensus of the Zenger-Miller staff about the best training functions, and what differentiates them from others.

References

1. Peters, T. J. & Waterman, R. H., Jr. *In Search of Excellence.* New York: Harper and Rowe, 1982.
2. Mintzberg, H. *The Nature of Managerial Work.* New York: Harper and Rowe, 1973.
3. Kotter, J. P. *The General Managers.* New York: Free Press, 1982.
4. Peters, T. J. & Waterman, R. H., Jr. op. cit., pg. 264.
5. Zenger, J. H. "The Painful Turnabout in Training: From Maslow to Modelings." *Training and Development Journal,* December 3, 1980.
6. Zenger, J. H. and Blitzer, R. J. "How Training Managers Become Corporate Heroes/Heroines." *Training,* December, 1981.
7. Zenger, J. H. "The Great Training Robbery." *Sales Meetings,* 1961.
8. Drucker, Peter F. "Goodbye to the Old Personnel Department." *The Wall Street Journal,* May 22, 1986.
9. Zenger, J. H. and Hargis, K. "Assessing Training Results: It's Time to Take the Plunge" *Training and Development,* January 20, 1982.

HOW THE BEST ONES DO IT

1. A Clear Vision of the Goal and Mission of Training

2. Tightly Linked to the Organization's Objectives

3. Line Management Commitment and Involvement

4. Excellent Management Practice Within the Training Function

5. Emphasis on Practicality and Transfer

6. Use of Multiple Sources to Assist Them

7. A Sense of Urgency

8. Achieve Critical Mass

9. Consistency

10. Evaluation of Results

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Management under fire: the transformation of managers in the Soviet Union and Eastern Europe

Avraham Shama, University of New Mexico

Executive Overview

Imagine, if you will, managers, executives, and CEOs working in a stable, predictable, and centrally planned environment, where managerial functions such as production, pricing, exporting, planning, distribution, R&D, and personnel management are performed in a simple, almost mechanistic manner for more than forty years. Imagine, then, how bewildered these managers would become when, almost overnight, the static and predictable environment with which they have become so familiar and comfortable undergoes a total and drastic change.

That is exactly what happened to managers in the former Soviet bloc. Since the summer of 1989, the socialist regimes of virtually all central and eastern Europe, as well as the Soviet Union, have been liquidated and democratic governments instituted in many of the countries in this region. Coupled with this change were the moves from a centrally planned and centrally managed economy to a market-driven economy, from a very low inflation rate to rates ranging from 30 percent to 3,000 (yes, three thousand!) percent, from officially nonexistent unemployment to latent unemployment rates as high as thirty percent, from positive rates of economic growth to GNPs declining by as much as forty percent annually, and from producing and selling without the threat of competition to working in a highly competitive environment.

How exactly did these changes affect managers in state enterprises and their managerial decisions? How have they been coping with the sweeping political and economic changes? And how have they been adjusting to the evolving market economy? These were the basic research questions I set out to investigate in 1989, well before the symbolic collapse of communism with the fall of the Berlin Wall, and in 1991 when, once again, I interviewed managers in Czechoslovakia, Hungary, Poland, and Russia.

What I discovered is a fascinating, professionally compelling picture of managers who are going through a very rapid transformation which would make even the most high-paced Western managers dizzy. And while the picture is still emerging from the film's negative, adding more details and contrasts to an already unprecedented phenomenon, it is possible to scope out the transformation among managers in the four countries, compare them, discuss what the future may hold, and make some recommendations for Western managers.

Article

The Setting

A turning point in contemporary European history occurred in 1989 as one by one the countries of Eastern Europe began to liquidate their socialist regimes.[1] In the

47

second half that year, Solidarity took over both houses of the Polish parliament, the Velvet Revolution took place in Czechoslovakia, Hungary declared itself a democracy, and the Soviet Union abolished the monopoly of political power by the Communist party. The establishment of multi-party systems with democratic elections soon followed in Czechoslovakia, Hungary, and Poland. In the Soviet Union, free presidential elections took place in some of the republics, and the failed coup of August 18, 1991, indicates victory for political democracy. (For a summary of important events see Exhibit 1.) The pace of these changes has been so fast and unexpected that some analysts described the results as "The End of History," the new "Spring of Nations," and the new "European Concert."

A major factor in these changes was the need to transform the economies of these countries from command economies characterized by chronic shortage and inefficient and insufficient supply to free market economies characterized by abundant, consumer-responsive supplies of goods and services. Since this transformation was to affect more than 400 million consumers constituting in excess of ten percent of the world's population, its implications for our knowledge of managerial behavior are noteworthy and significant.

Study of the political and economic transformation of Eastern European countries generally reveals differences in the strategies and tools used in the transformation process, and indicates different social implications. While the acceptance of Western management concepts and tools before 1989 was extremely limited and lacked consideration of consumer satisfaction and operational efficiency, Czechoslovakia, Hungary, and Poland have been using strategies of more rapid change toward a market economy and political democracy than have other countries such as Romania and the Soviet Union. As a result, the economic and political transformation in the Soviet Union is fraught with numerous challenges and obstacles and, as a result, may fail.[2] At the same time, rapid change toward a market economy is associated with high inflation rates, recession, and threats of unemployment. For example, the annual inflation rate in Russia in 1992 is estimated at 3,000 percent; in Poland it was 1,200 percent and 120 percent in 1989 and 1990, respectively. This reduced the purchasing power of most people in these countries, especially that of retirees.[3]

Implementing a market economy in Eastern Europe has led to the increased use of Western business tools, such as marketing and accounting, as well as business school openings managed by American universities, such as the University of Pittsburgh and Fordham, and by several British universities.[4] And while changes toward a market economy constitute business opportunities for international business, which are being exploited by an increasing number of companies, such as McDonald's, U.S. West, Pizza Hut, Femtek, Apple, Ford, Digital Equipment and Toyota, our knowledge of management behavior during this transformation is scant and anecdotal. Several studies have focused on providing general business guidelines for Eastern Europe. For example: "Consumer products require minimal adaptation for sales in Eastern European markets . . . Western brand names should be retained . . . The distribution infrastructure in Eastern Europe is weak; in most countries, initial sales of Western consumer products will be restricted to the major cities."[5] This study concluded that countries like Hungary and Poland represent more lucrative business opportunities than such countries as Yugoslavia and the Soviet Union. Other studies ranked the countries of Eastern Europe by their attractiveness to international businesses, and reported that Hungary and Czechoslovakia should be much more attractive to international companies than the Soviet Union, Bulgaria, and Romania.[6] A more recent study examined business management in Yugoslavia before its 1992 breakdown and portrayed the development of consumer-orientation among marketing managers. It concluded that marketing in Yugoslavia will change from focusing on planners and

48

CZECHOSLOVAKIA

1989	Velvet Revolution
1990	Free multi-party elections
	Vaclav Havel chosen president
1991	Vaclav Klaus, Minister of Finance, implements economic shock therapy
	Implementation of privatization program begins
1992	Czech and Slovak republics split, President Havel resigns

HUNGARY

1989	Multi-party elections
1990	Privatization program draws political criticism
1991	Privitization program modified
	Steady course politics

POLAND

1989	Round Table negotiations
	General elections (June)
	First non-communist government
1990	Communist Polish United Workers Party liquidates itself
	Lech Walesa elected president
	Balcerowich begins economic shock therapy
1991	Lech Walesa begins presidency
	Privatization program to be implemented in Fall

SOVIET UNION

1989	Multi-candidate elections
1990	Removal of Section 6 (giving all political power to the Communist Party) from the constitution
	Continued legislation regarding co-ops
	More flexible legislation regarding joint ventures, business associations and leased enterprises (*arenda*)
	Several plans to transform economy (none implemented)
	Several republics declare independence
	Gorbachev becomes president (not by popular election)
1991	Yeltsin, by popular election, elected president of Russian Republic
	Gorbachev reaches agreement with nine republics to maintain unity within the Union while maintaining some independence
	Coup d'état fails (August 18-21)
	Commonwealth organized by republics of Russia, Byelorussia and Ukraine
	Others follow (December)

Exhibit 1. Political transformation in selected Eastern European countries: A summary of events.

regulators to satisfying consumers; from little or no competition to more competition; from little or no management control over marketing mix decisions to more control of such decisions; from little planning to more planning. The study stated that other eastern European countries, such as Czechoslovakia and Poland, have been undergoing a similar management transformation.[7] None of these studies, however, centers on the transformation of management in eastern Europe.

The goals of this study, which was carried out by personal interviews, were to:

1. outline the impact of a market economy on management in Czechoslovakia, Hungary, Poland and the Soviet Union
2. discuss how managers in these countries have been adjusting to market economy forces
3. point out implications for the future of management transformation in these countries and for global managers.

49

The interviews were conducted in the local language, followed similar schedules in all four countries, and generally focused on the impact of recent changes in the economy and what managers did to adjust to or exploit the emerging economic environment.[8] For each point or issue raised during the interviews, I tried to ascertain the degree of consensus and its direction. This resulted in four categories: 1) strong agreement, 2) agreement, 3) disagreement, and 4) strong disagreement. The study methodology is provided at the end of this article.

The Emerging Picture

Changes in the Macro-management Environment
Since 1989, Czechoslovakia, Hungary, and Poland have been using drastic means to move their countries from planned political and economic systems into systems of political democracy and market economy. On the other hand, in the Soviet Union these changes have been much more gradual, inconsistent, and often contradictory.

In all four countries, the resulting macro-economic environment facing state enterprises has been one of recession coupled with high rates of inflation—that is, stagflation. Furthermore, severe recession meant that many of the state enterprises in Czechoslovakia, Hungary, and Poland, which still constitute a large part of the economic powerhouses of these countries, lost their biggest customer, the Soviet Union. At the same time, tight wage controls reduced consumers' real purchasing power in these countries. By 1991, the net result was that consumer demand in Czechoslovakia, Hungary, and Poland met widely available supply, but consumers in these countries do not have enough purchasing power to satisfy their demand. In the Soviet Union, however, there are still conditions of shortage.

Table 1 provides economic performance data about these countries. Table 2 outlines relevant changes in the macro-management environment in the countries studied.

Impact on Management
The introduction of market economies in Czechoslovakia, Hungary, and Poland, and even the very limited market forces in the Soviet Union, have introduced

Table 1
Inflation Rate, Rate of Growth of Gross National Product (GNP) and Rate of Latent Unemployment in Selected Eastern European Countries 1989-91

	1989	1990	1991 (Jan-May)
		Inflation	
Soviet Union	20%	30%	60%
Czechoslovakia	*	50	45
Hungary	20	50	17
Poland	1200	120	45
		Growth of GNP	
Soviet Union	*	−10	−15
Czechoslovakia	*	−10	−15
Hungary	*	−8	−10
Poland	*	−12	−14
		Latent unemployment	
Soviet Union	35	30	30
Czechoslovakia	30	30	25
Hungary	30	30	20
Poland	30	30	25

* Unavailable

50

Table 2
Changes in the Macromanagement Environment in Czechoslovakia, Hungary, Poland and the USSR, 1989-1991

	Political	Economic
Czechoslovakia	Velvet Revolution Multi-party system and free selections President Havel resigns, July 1992 Czech and Slovak Republics agree to become independent in January 1993	Stabilization program Shock therapy privatization Internally convertible currency Stock market Tight monetary controls High inflation Unemployment Uncertainty Recession Outcome: From shortage to surplus (D > S → S > D)
Hungary	Declaration of democracy Multi-party system and free elections	Stabilization program Gradual privatization Internally convertible currency Stock market Inflation Tight monetary controls Unemployment Mild recession Outcome: From shortage to surplus (D > S → S > D)
Poland	Solidarity-led democracy Free elections Presidential elections	Stabilization and stock therapy Tight monetary control Easing run-away inflation Internally convertible currency Stock market Unemployment Recession Uncertainty Outcome: From shortage to surplus (D > S → S > D)
Soviet Union	Abolition of monopoly of Communist Party Restructuring (without elections) Free speech (Glasnost) Free elections in many of the 15 republics Failed coup of August 18, 1991 Soviet Commonwealth, December 1991	Many plans and inconsistent measures Still mostly centrally planned economy resulting in Shortages Recession Weak currency Outcome: D > S—no change

S = supply
D = demand

phenomena and forces unfamiliar to most managers. These pertain to such basics as the nature of the business environment, demand structure, and customer attitude. Even such familiar aspects of business as inventories and accounts receivable have attained unfamiliar dimensions. More specifically, enterprise managers in the four countries agreed or strongly agreed that the effects of the developing market economy included such forces as (see Table 3):[9]

- A higher level of competition. Virtually all the managers interviewed recognized the sudden emergence of competition for markets and customers, but either lacked the skills to develop and implement competitive business strategies or in some cases, especially in the large military-related industries, were forbidden by law to initiate any action. As one manager in a military related industry

51

Table 3
Impact on Management

	Soviet Union	Czechoslovakia	Hungary	Poland
Impact:				
Increased competition	yes	YES	yes	YES
Decreased government support	yes	YES	yes	YES
Decreased exports to eastern European countries	yes	YES	yes	YES
High inflation	YES	YES	yes	YES
Recession	YES	YES	yes	YES
Drastic reduction in demand	no	YES	yes	YES
High inventories	no	YES	yes	YES
Increasingly choosy consumers	no	YES	YES	YES
Increase in accounts payable	no	YES	yes	YES
Increase in accounts receivable	no	YES	yes	YES
Production orientation creating problems	no	YES	YES	YES
Product orientation not suitable for consumer markets	no	YES	YES	YES
Increasing difficulty of passing cost increases to customers	NO	YES	YES	YES
Distribution channels limited in number	YES	YES	YES	YES
Inefficient distribution channels	YES	YES	YES	YES
Added cost of hidden unemployment	yes	YES	YES	YES

YES = Strongly agree
yes = Agree
NO = Strongly disagree
no = Disagree

said, "I feel like a sitting duck. Even if I were able to come up with a competitive plan, it would be impossible for me to put it into action, because we have always gotten our production orders from the Army."

- A high level of inflation. Because of cost-oriented pricing, many enterprise managers proceeded to raise prices, disregarding the prices of competing imports. In markets open to imports, such as Czechoslovakia, Hungary, and Poland, these managers discovered that local demand for their products declined, while the demand for the competing imported products increased. A case in point is the demand for cars produced in eastern Europe, which has declined rapidly while the demand for foreign-made cars went up.
- Recession. The decline in demand meant that many of the managers interviewed had to scale down production, thus contributing to the decline in GNP and eroding the standard of living. This left managers in a quandary. As one of them said: "On the one hand, because of inflation I have to raise prices. On the other hand, because of the slow demand caused by recession, I have to lower prices. So I do not know what to do. I did not think anything like this, both inflation and recession happening at the same time, was possible."
- A sudden and significant drop in exports. Until mid-1991, many of the large enterprises in eastern Europe had export agreements with other COMECON countries, often accounting for most of their production runs. This situation, however, changed overnight, and the drop in orders was so fast, according to all the managers of large enterprises, that "We simply did not know what to do. We froze into inaction. We couldn't fire anybody. We hoped that things will change, and in the meantime we continued production, knowing that the build-up in inventories was a problem." Another manager added: "I realized that producing a limited number of products and relying on only a handful of customers was unhealthy, but there was little I could do."

52

- Insufficient distribution. All managers agreed that the distribution of products and services in their countries was incapable of reaching the consumer when and where the consumer wished. Most managers in Czechoslovakia, Hungary, and Poland were instituting changes in their distribution systems to be more responsive to consumer needs.

As most managers of state-owned enterprises were selected for their positions because of their links with the Communist party, they are simply not equipped to work in the context of free markets.

Because market economy forces were still in the early stages of evolution in the former Soviet Union, Soviet managers reported no impact on several decision areas listed in Table 3. Accordingly, Soviet managers did not experience drastic reduction in demand or the accumulation of inventories, they did not report that consumers have become more selective, and they had no problem with production orientation. This suggests that the process of converting to a market economy and using management tools suitable for a market economy is yet to develop fully.

It is interesting to note that in Hungary the impact of the market economy on management decisions was not as drastic as it was in Czechoslovakia and Poland because: 1) Hungary had a higher level of a working market economy before 1989 and, as a result, the impact of the market economy since 1989, though pronounced, was not as drastic, and 2) Hungary has been using a strategy of gradual conversion to a market economy, or "low-heat cooking" as one manager put it, rather than the transformation by shock therapy employed in Czechoslovakia and Poland.

These effects of the market economy made many managers realize how outdated was the fundamental business system based on central planning—an antithesis to the market system in which they now must operate. Specifically, they became aware that product quotas, production orientation, emphasis on quantity rather than quality, cost-oriented pricing, and disregard of customer satisfaction are archaic practices. They also learned that their management of human resources was outdated and not responsive to market forces.

However, the findings indicate that most managers in the Soviet Union, Czechoslovakia, and Poland, and many managers in Hungary, did not have the skills to adjust to and exploit business opportunities posed by the developing market economies. This attests to one of the most significant impacts of market forces: management obsolescence. As most managers of state-owned enterprises were selected for their positions because of their links with the Communist Party, they are simply not equipped to work in the context of free markets. As one interviewee said, "We don't have real managers—only old thinking. What we need is new thinking." Another added: "Our managers are selfish and unconcerned with the enterprise. . . . They don't have any people management skills."

Echoing this finding is CzechMate, an American group of management specialists which visited Czechoslovakia in June 1991 and 1992 to evaluate the skills and capabilities of Czechoslovak manufacturing companies in the areas of equipment and technology, manufacturing organization, production workers, engineering, and management. The consensus of these specialists was that management skills were the weakest of all the skills investigated. Speaking of managers of state-owned enterprises, one of these experts said: "Czechoslovak managers are prisoners of the past. They do not, cannot, adjust to a market economy. Whereas in a market economy they are expected to take the initiative, Czech managers still wait for production and distribution orders which stopped coming." A CzechMate follow up visit took place in June 1992, and included Czechoslovakia, soon to become two republics, and Romania.[10]

- 53

Management Adjustments
Adjustments to market economy forces have been made on two levels. One is th level of management within existing enterprises; the other is on the level of creating new privately owned companies.

State-Owned Companies. At first, confronted with increasing inventories and declining demand, state enterprise managers instituted temporary furloughs. As the situation continued to deteriorate, they drastically reduced the number of employees. In one case, the director of the Polish Likwidator PTHM Polmozbut explained, with a somber look and a desperate voice, "The number of our full-time employees declined from 2,000 in 1989 to 480 in mid-1991 [seventy-five percent]." Only the large poster on the wall more fitting for a *Playboy* centerfold than for the office of a CEO, echoed an easier time. In another case, the PZL-WOLA, the number of employees dropped from 4,400 to 3,400 (twenty-two percent) within the first six months of 1991. In the near future, it will be further reduced by another fifty percent to be consistent with the projected decline in demand. Whereas such reductions in the labor force have been taking place in Czechoslovakia, Hungary, and Poland, Soviet managers have only begun to address this issue.

At the same time, state-owned enterprises, especially the smaller ones and those with some exposure to Western markets, are increasing their market orientation, responsiveness to consumer needs, exports to the West, and diversification. In almost all cases, these adjustments are stimulating strategic management thinking and practice among managers in state-owned enterprises. As a Czech manager, echoing several Hungarian and Polish managers, told me:

We are slowly changing our management philosophy and practice. We are now more concerned with market forces than government plans. We try to research our target customers and offer them a more finished, better appealing product, and reward our employees based on merit, not seniority. . . . In the past, fifty percent of my time was spent writing reports which nobody read. Now I spend most of my effort focusing on how to sell and export our product, because if we want to stay alive my enterprise must compete for customers globally.

Managers in many of these companies in Czechoslovakia, Hungary, and Poland agree or strongly agree about the following aspects of the developing management philosophy (see Table 4):

- Becoming more market-oriented and consumer-responsive
- Improving product quality
- Changing product design, assortment, finishing, and packaging
- Increasing promotional efforts such as personal selling and point of purchase sales
- Increasing merchandising efforts
- Using competitive pricing
- Instituting promotional pricing and price discounts in some cases.

It is noteworthy that during the U.S. stagflation in the 1970s, American managers took adjustment measures similar to those adopted by Eastern European managers faced with stagflation in 1990-91.[11]

Perhaps the most striking adjustment among some of the state-owned enterprises in Hungary, Poland, and Czechoslovakia is the creation of a marketing function. Beginning as an effort to increase sales, people performing such a function invariably began to address issues pertaining to their product and marketing mix to satisfy consumers and increase demand. These sales people often perform the

54

Table 4
Management Adjustment in State-Owned Companies

	Soviet Union	Czechoslovakia	Hungary	Poland
Adjustment				
Drastic reduction in labor force	NO	YES	yes	YES
Greater market orientation	yes	YES	YES	YES
More consumer responsiveness	no	YES	YES	YES
Greater efforts to export to the West	no	YES	YES	YES
Diversification	no	YES	YES	YES
Improved product quality	no	YES	YES	YES
Enhanced product design, assortment, finish and packaging	no	YES	YES	YES
Increased productivity	no	yes	yes	yes
Competitive pricing	NO	yes	YES	yes
More promotional pricing	NO	yes	YES	yes
Some price-discounting	NO	yes	YES	yes
Greater use of promotion	NO	yes	YES	yes
Increased sales efforts	NO	yes	YES	yes
More point-of-purchase displays	NO	yes	YES	yes
More merchandising	no	YES	YES	YES
Increased number of distribution outlets	NO	yes	YES	yes
Increased retail business loans to customers	NO	yes	yes	yes
Beginning of marketing effort, including export	no	yes	YES	yes
Search for management and marketing education geared to market economies	yes	YES	YES	YES
Greater cooperation with I/E companies	yes	YES	YES	YES
Search for foreign investors	yes	YES	YES	YES

YES = Strongly agree
yes = Agree
NO = Strongly disagree
no = Disagree

role of a marketing department. In such a case, the institution of formal marketing departments cannot be far behind. Indeed, in 1992 in both Czechoslovakia and Russia, the American Marketing Association has established local chapters with the support of local professionals.

Soviet managers of state-owned enterprises, still operating in a shortage economy where demand is greater than supply, took very few adjustment measures, perhaps because the impact of the market economy on their operations has been very limited (see Table 4).

Private Enterprise. The emergence of privately owned companies (co-ops, in the Soviet Union) is one of the most significant developments toward a market economy in Eastern Europe. Facilitated by numerous changes legalizing private ownership of property as well as legislation aimed at privatizing state-owned companies, the performance of privately owned companies in Czechoslovakia and Poland, and especially in Hungary, is impressive.

The contribution of these companies to employment and gross national product in the past several years indicates further growth of the market economy in these countries. In Czechoslovakia, Hungary, and Poland most of these companies evolved from small state-owned companies in the retail, food, and service

55

business, while in the Soviet Union such companies are newly formed cooperatives, restaurants, and business services. It is estimated that as many as 5.2 million people were employed by Soviet cooperatives in 1990, while during the spring of 1991 forty to fifty small state-owned enterprises in Czechoslovakia were being privatized every week.[12]

Private companies often compete with state-owned companies, usually increasing the private companies' profits and consumer satisfaction. For example, ever since private companies were allowed to import cars to Poland, consumer choice has increased and relative prices have gone down. At the same time, sales and profits of private companies have been growing rapidly while sales by state-owned companies, when competing against private companies, have been suffering. This phenomenon has been observed in many cases, leading to the conclusion that, once again, competition leads to managerial efficiencies and benefits consumers.

Also, the marketization process throughout eastern Europe may be seen as a redistribution of power between consumers on the one hand and state-owned monopolies and the party-linked bureaucracy, or *nomenklatura*, on the other, in favor of consumers.[13]

Managers of private companies, usually also the proprietors, are strikingly different from directors of state-owned enterprises. They are younger, have more professional education and an entrepreneurial orientation, and are quick, flexible, and market oriented. As a result, they make greater use of management techniques and make profits through consumer satisfaction. They focus on satisfying consumers by improving product quality and distribution, by using promotion strategies and by pricing according to market demand. Table 5 presents profiles of the typical manager in privately owned and state-owned companies. These profiles too may be indicative of a redistribution of power between *nomenklatura* directors and professional managers.

Table 5
Characteristics of Management in Privately-Owned and State-Owned Companies

Managers of Private Companies	**Managers of State-Owned Companies**
Younger	Older
Professional education	*Nomenklatura*
Pro-change, hopeful for future	Anti-change, look to past
Sales background	Engineering background
Active, fast to act	Passive, slow to act
Flexible, open-minded	Rigid, closed-minded
Problem solvers	Stick to plan
Order-givers	Order-takers
Businessmen	Party men
Entrepreneurial, risk-takers	Conservative, risk-aversive
Strategic, externally-oriented	Operations focused, inside people
Market oriented	Plan oriented
Consumer oriented	Production oriented
Rely on market signals	Rely on personal contacts
Price according to market demand	Price according to costs
Use promotional tools	No use for promotion
Use more efficient distribution	Distribution is state-dictated
Pay for performance	Pay for grade
Speak languages of markets (English, German)	Speak language of past markets (eastern European)

What Does The Future Hold?
The future of management transformation in eastern Europe and the former Soviet Union is inescapably linked to the political and economic ups and downs of the evolving democracies.

Politically, the Soviet Union was liquidated in 1991 when its republics declared sovereignty, with most of the new states forming the very loose union of the Commonwealth of Independent States (CIS). Similarly, in mid-1992 the Czech republic and the Slovak republic were headed toward full separation. On the other hand, though Poland and Hungary include many opposing political forces, such forces continue to function within a single political system.

Economically, Czechoslovakia and Poland will continue their rapid transformation to a market economy, while Hungary will continue its gradual, balanced introduction of a market economy to those sectors naturally working under such a system. The republics in the CIS will probably follow different rates and paths in transforming their political and economic systems, with Russia proceeding on a rapid, more direct route.

So far, these transformations have resulted in:

1. privatization of numerous state enterprises in Czechoslovakia, Poland, and Hungary (almost all Czech enterprises are expected to be privatized by fall 1992),
2. short term hyperinflation in 1990-91 in Czechoslovakia, Hungary, and Poland, and in 1992 in the CIS, reducing the standard of living of most people in these countries,
3. management changes outlined in this article.

Economically, Czechoslovakia and Poland will continue their rapid transformation to a market economy, while Hungary will continue its gradual, balanced introduction of a market economy to those sectors naturally working under such a system.

While management in these countries will continue to change and adopt Western management philosophies and tools which mirror the natures of the still evolving political and economic democracies, Western professional schools and associations can play an active role in educating and training eastern European managers. Such a role may include executive development programs, basic business and management courses, MBA programs, internships in Western firms and business schools (and Western internships in eastern European firms), and the establishment of professional associations in the different countries of eastern Europe. These activities have been occurring increasingly since 1991. Thus, the University of Pittsburgh's Graduate School of Management will begin an MBA program in St. Petersburg in the fall of 1992 after its successes in Budapest (1988) and Prague (1991). Harvard Business School, Duke University, the University of Minnesota, and many other universities in both the U.S. and Europe, have developed special programs for East European managers, while Michigan State University has been sending faculty members and students to study business conditions in Eastern Europe and the University of Michigan has been given a $30 million gift to study "economies in transition." This heightened interest of Western business schools and associations in Eastern Europe is motivated by the realization that these countries represent vast untapped pools of students and professionals. For example, in 1990 the American Marketing Association (AMA) refused to waive the registration fees of several hard-currency-strapped management specialists who were scheduled to present papers at its Summer Conference. By 1992, the AMA was investing money in promoting marketing activities in several East European countries!

What Should Global Managers Do?
This article presented and discussed the on-going transformation of management in Czechoslovakia, Hungary, Poland, and the Soviet Union. It showed that whereas Czechoslovakia, Hungary, and Poland have adopted the use of market forces, the Soviet Union has introduced only a few changes toward a market economy. This difference is reflected in management perception and behavior in those countries.

Since Eastern bloc countries contain more than 400 million people, it is understandable that global managers are interested in exploiting export, licensing, joint venture, and direct investment opportunities in these countries. Considering the increasing number of Western and Japanese companies already conducting business in these countries or interested in setting up businesses there the implications of the present study may be particularly helpful to global managers.

From this vantage point, strategic market entry considerations are especially important because of the limited information available about markets in east European countries. While textbook procedures for market analysis may be helpful, their value in analyzing east European markets is often limited. This is because of the lack of information, the unreliability of available data, the different definitions and methods of accounting, such as valuation and depreciation, and the different written and unwritten rules governing business. As a Western manager, whose company recently entered an east European market, revealed: "We learned an expensive lesson when we realized that here in eastern Europe statistical data is often very 'soft,' and its business meaning quite different from what it is normally thought to be in the West."

In view of this, the following simple but crucial recommendations are made to global managers interested in opportunities presented by Eastern bloc countries:

1. Take small steps before running.
   Since business practices in eastern Europe are often markedly different from those to which global companies are accustomed, low scale initial involvement and investment in east European countries provide the global company and its managers with a chance to study new opportunities while already operating on a small scale in those countries. Also, such a presence makes it possible to develop alliances in those countries. Consistent with this recommendation is Toyota's market entry strategy in the Soviet Union. In 1990, Toyota sold 1,500 cars in the Soviet Union. In 1991 it is expected to sell 3,000 cars. Commenting on this strategy, Toyota's representative in the Soviet Union, Shatoshi Oky, said: "We like to be here and become familiar with the Soviet market."
2. Analyze each country separately.
   Though East European countries have many things in common, they are also dissimilar in many ways. As a result, they may represent different opportunities for global managers. Hence, use of different market entry strategies may be desirable in entering Czechoslovakia, Hungary, Poland, and the emerging states in the former Soviet Union.
3. Deal with entrepreneurs.
   As changes toward a market economy continue to take place, many east Europeans, whether in private business or in the public enterprises and government bureaucracy, have developed an eager "can-do" attitude. Identifying and dealing with these professionals can not only be a time-saver, but also can help avoid initial mistakes.
4. Capitalize on knowledgeable Westerners.
   Knowledgeable Westerners, especially those who grew up in east European countries but were educated and employed in the West, are well suited to bridge cultural and business differences. This strategy has been used successfully by GE and Schwinn in Hungary.

Finally, since consumer markets represent immediate opportunities, the global manager is advised to export or produce only good-quality products, because consumers in these countries value quality and are willing to pay for it. And since those satisfied with product quality are very likely to be repeat purchasers and become brand loyal, providing them with service will keep them and their friends coming back. As one interviewee said, "The last thing consumers need here is products of shoddy quality. We have plenty of such products already."

Endnotes

The author would like to thank Jana Matesova (Czechoslovak Management Center), Tamás Mellár (Hungarian Institute for Privatization Studies), Bogdan Radomski (Warsaw School of Economics), and Sergey Sementsov (USSR Academy of the National Economy) for their invaluable help in data collection, and the Anderson Schools of Management for a research grant and the Warsaw School of Economics and the Czechoslovak Management Center for material contributions in support of this study.

[1] For purposes of convenience, we shall use the term "East Europe" or "eastern Europe" to include the former Soviet Union. In those cases where I would like to differentiate between the former Soviet Union and other eastern European countries, I shall refer to specific countries by name.

[2] This was the consensus among the panelists at a Special Session on Perestroika at the 1990 Annual Meeting of the American Marketing Association held in Chicago. Members of the panel included Drs. Marshall Goldman (Institute for Russia Studies, Harvard University), William Lazer (Florida Atlantic University), Miro Kline (Ljubljana University, Slovenia), Philip Kotler (Kellogg School of Management, Northwestern University), and Avraham Shama (Robert O. Anderson School of Management, University of New Mexico). For additional background information see A. Shama (Ed.), *Perestroika: A Comparative Perspective* (New York: Praeger, 1992).

[3] See R. Gajecki, "Achievements of and Challenges to Perestroika in Poland," paper presented at the 1991 Annual Conference of the International Strategic Management Society, Stockholm (Sweden).

[4] See A. Shama & C. McMahan, "Plotting the Perestroika Revolution," *The Chartered Accountant*, 1990; A. Shama & C. McMahan, "Perestroika and Soviet Accounting: From Planned to Free Market Economy," *International Journal of Accounting*, 25, 1991, 155-169; and A. Shama, "A Comparative Study of Economic and Political Democratization in Eastern Europe," *International Journal of Management*, 8(2), 656-661.

[5] A. Quelch, E. Joachinsthaler, & J. Nueno, "After the Wall: Marketing Guidelines for Eastern Europe," *Sloan Management Review*, Winter 1991, 82-92.

[6] See, for example, C. LaFollette, "East Europe: Tread Softly Joint Venture," *Financial Executive*, September/October 1990, 10-15, and A. Shama & S. Gellenthien, "Comparing the Soviet Union and Eastern Europe," in A. Shama (Ed.), *Perestroika: A Comparative Perspective* (New York: Praeger, 1992), 105-118.

[7] A. Shama, "Managing Marketing During Stagflation in Yugoslavia," *International Marketing Review*, 9(1), 1992, 44-56.

[8] In 1989, I interviewed 43 managers in the Soviet Union, Poland, and Hungary. Since this data collection phase began before the "Velvet Revolution," a research visit to Czechoslovakia was impossible. In 1991, I interviewed fifty-one managers in Czechoslovakia, Hungary, Poland, and the Soviet Union. See study methodology.

[9] See also: M. Dobrowski, M. Federowcz, & A. Levitas, *State Enterprise Adjustments*, Gdansk-Warsaw: The Research Center for Marketing and Property Reform in Gdansk, 1990. Also, please note that while the responses of managers in the Soviet Union and Hungary are similar in some instances, such responses represent different realities. Soviet managers have only begun to feel some of the pressures created by market forces, while Hungarian managers historically have some experience with market forces, so that the situation in Hungary since 1989 is not such a drastic departure from the past as it is in Poland and Czechoslovakia.

[10] For a report of the CzechMate team, see L. Osborn, *The CzechMate Project: A Report and Recommendations Relevant to the State of the Art and Science of Marketing in the Czech and Slovak Federal Republics* (Chicago: American Marketing Association, 1992).

[11] See for example, E. Kelley & L. Scheewe, "Buyer Behavior in a Stagflation Shortage Economy," *Journal of Marketing*, 39, April 1975, 44-50; P. Kotler, "The Major Tasks of Marketing Management," *Journal of Marketing*, 39, October 1973, 42-49; P. Kotler, "Marketing During Periods of Shortage," *Journal of Marketing*, 38, July 1974, 20-29; A. Shama, "Coping with Stagflation: Voluntary Simplicity," *Journal of Marketing*, 45, July 1981, 120-134; and A. Shama, Management in an Era of Stagflation," *Journal of Marketing*, 42, July 1978, 43-52.

[12] For a more detailed discussion of the future of the Soviet economy, see A. Shama & S. Sementsov, "The Collapse of the Soviet Ministries: Economic and Legal Transformation," *International Executive*, 34(2), 1992, 131-150.

[13] For more details on the impact of the market economy on consumers, see A. Shama, "Toward the Transformation of Consumers in Eastern Europe," *International Marketing Review*, forthcoming.

Study Methodology

I used a qualitative research approach because it is a powerful means of studying new trends and scoping new phenomena related to the transformation of socialist economies from planned to market-driven systems. Specifically, I used interviews because they are an effective tool to uncover different behavioral motivations on the part of managers. Needless to say, as probability samples were not used, one cannot generalize the findings of this study. However, the phenomena scoped and the trends uncovered serve to enhance knowledge of managerial behavior in

59

eastern Europe and provide fundamental information for management specialists. Finally, it should be noted that data from 1989 served as baseline information for the present article rather than as part of a longitudinal study. As a result, this article focuses primarily on the 1991 data. The study design and interview schedule follows:

Study design and interview schedule

	Number of managers	
	1989	*1991*
USSR	14	11
Poland	14	10
Hungary	15	12
Czechoslovakia	0	18
TOTAL	43	51

Interview schedule

I. Management environment
1. Please tell us about the overall economic situation in your country.
2. Please tell us about the overall political situation in your country.
3. In general, what conditions face managers in this country?

II. Impact on management
So far, what have been the effects on you as a manager pertaining to (see Table 3 for findings):
1. inflation
2. unemployment
3. competition
4. export
5. production
6. size of labor force
7. pricing
8. distribution
9. marketing
10. government support
11. inventory levels
12. accounts payable and receivable

III. Management adjustments
How did you adjust to the above effects (see Tables 4 and 5 for findings)?
1. reduce labor force
2. become more competitive
3. change production
4. become more consumer responsive
5. improve product quality
6. diversify
7. use competitive pricing
8. increase distribution efforts/outlets
9. increase productivity
10. export to the West
11. increase marketing efforts
12. search for foreign investors

About the Author

Avraham Shama is a professor of management at the Anderson School of Management, University of New Mexico, Albuquerque. His book, *Perestroika: A comparative perspective*, was recently published by Praeger, and his survey of management practices in Eastern Europe is under way.

DO NOT WRITE IN THIS AREA

THE PROFESSIONAL MANAGER PROGRAM
HUMAN RESOURCE MANAGEMENT
Budapest, Hungary

PLEASE USE PENCIL

	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly Disagree 5
1. The objectives of this course were clear to me.	1	2	3	4	5
2. The course exceeded my expectations.	1	2	3	4	5
3. The instructor(s) communicated effectively.	1	2	3	4	5
4. The instructor(s) made the subject matter more meaningful through the use of examples.	1	2	3	4	5
5. The instructor(s) encouraged participants to be involved in discussions.	1	2	3	4	5
6. The instructor(s) presented up-to-date material and information.	1	2	3	4	5
7. The instructor(s) was(were) well prepared and organized.	1	2	3	4	5
8. The instructor(s) did a good job of relating this course with other parts of the program.	1	2	3	4	5
9. The quantity and depth of material covered were appropriate for the allotted time.	1	2	3	4	5
10. I feel that I have a good understanding of the topics covered in this course.	1	2	3	4	5
11. This course helped me gain useful knowledge and/or skills.	1	2	3	4	5
12. I was pleased with the amount of interaction I had with the faculty in the course.	1	2	3	4	5
13. The participants enriched the course by sharing their ideas and experiences.	1	2	3	4	5
14. Overall, I would rate this course as an outstanding educational experience.	1	2	3	4	5

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29

	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

MANAGERIAL ACCOUNTING MODULE

March 11 - 13, 1993
Budapest, Hungary

Session	Day 1 - March 11	Day 2 - March 12	Day 3 - March 13
8:30-10:00		Format & Contents of Published Financial Statements	Traditional Cost Accounting Concepts
Break			
10:15-11:45		Format & Contents of Published Financial Statements	Cost Allocation & Reallocation
Lunch			
1:30-3:00	The Function of Accounting in a Market Economy	The Function of Management Accounting	Usefulness of Management Accounting
Break			
3:15-4:45	Format & Contents of Published Financial Statements	Cost Behavior & Break Even Point Analysis and Determination of Cost Curves	New Developments in Cost Accounting

Budapest

MUCIA/AID PROJECT

MANAGEMENT TRAINING AND ECONOMICS EDUCATION IN CENTRAL AND EASTERN EUROPE

ACCOUNTING MODULE 1993

FIRST 1/2 DAY	TOPICS
	I. FINANCIAL ACCOUNTING
13:30 - 15:00	1. The Function of Accounting in a Market Economy a. Overall Purpose and General Concepts (US Conceptual Statements and basic accounting principles) b. Private Sector Rules in The USA (FASB, GASB, SEC, AICPA) c. Legislated Rules in the EC EC Directives #4, 7, and 8, Legislation in Individual Countries, (Corporation Laws and Accounting Laws, Role of Tax Authorities)
15:15 - 16:45	2. Format and Contents of Published Financial Statements a) Balance Sheet, Income Statement, Cash-Flow Statement (Discussion of major items and rules; e.g., valuation, depreciation, consolidation, leased assets, deferred taxes, etc)

LEARNING GOAL OF FIRST TWO SESSIONS: To understand the objectives of financial statements, their contents, and the rules which have to be followed to put together reliable information.

64

Accounting and Auditing Rules

(Private Sector System)

GAAP (Generally Accepted Accounting Principles)

issued by FASB:

1. SFAC (Statements of Financial Accounting Concepts)

2. SFAS (Statements of Financial Accounting Standards)

GAAS (Generally Accepted Auditing Standards)

issued by AICPA Auditing Standards Board

1. SAS (Statements of Auditing Standards)

2. Auditing Review Services

3. Quality Control

4. Professional Ethics

US Organizations involved in developing accounting rules

SEC (Securities and Exchange Commission)

AICPA (American Institute of Certified Public Accountants)

FASB (Financial Accounting Standards Board)

GASB (Governmental Accounting Standards Board)

CASB (Cost Accounting Standards Board)

CONCEPTUAL FRAMEWORK UNDERLYING FINANCIAL ACCOUNTING

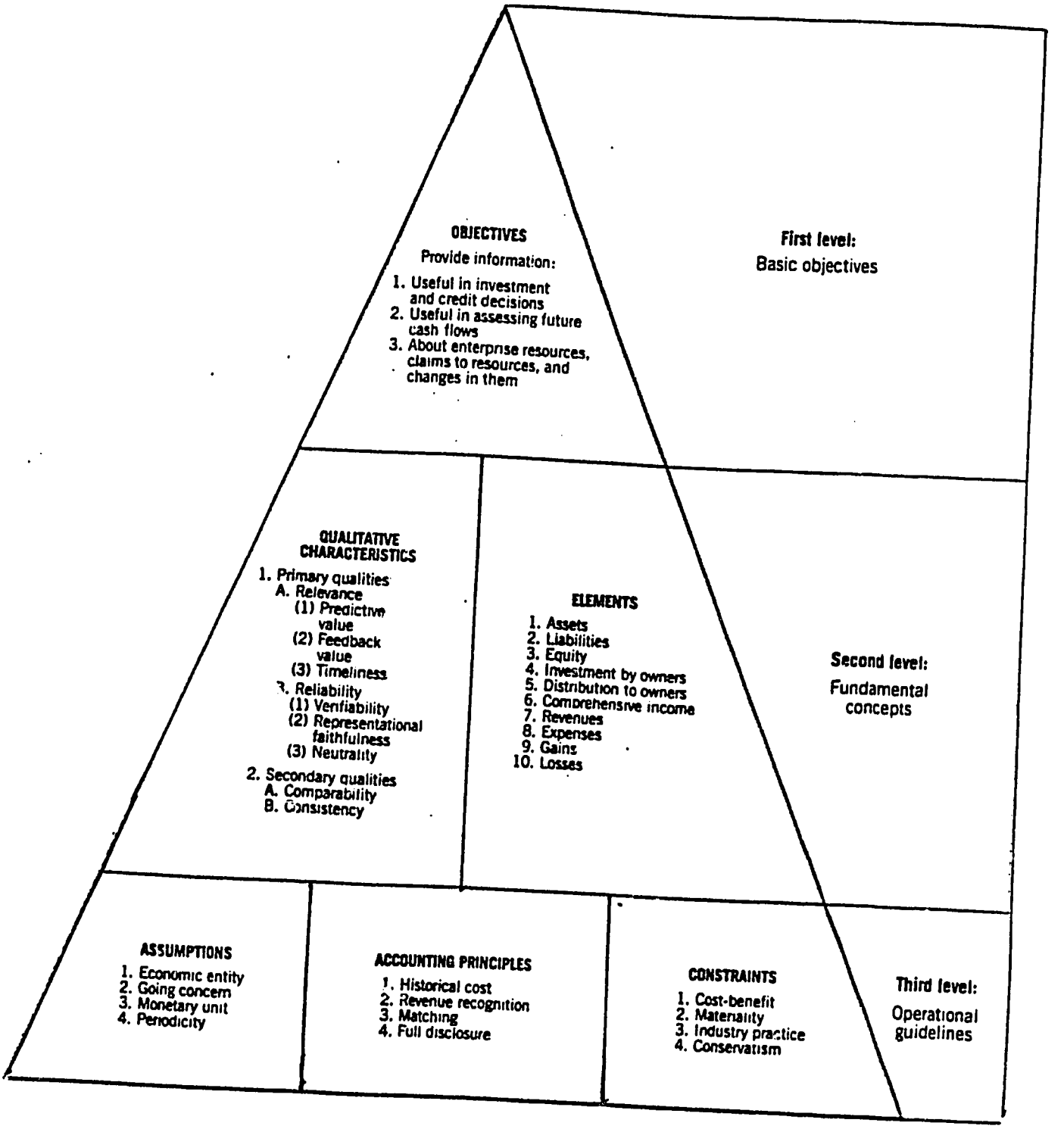
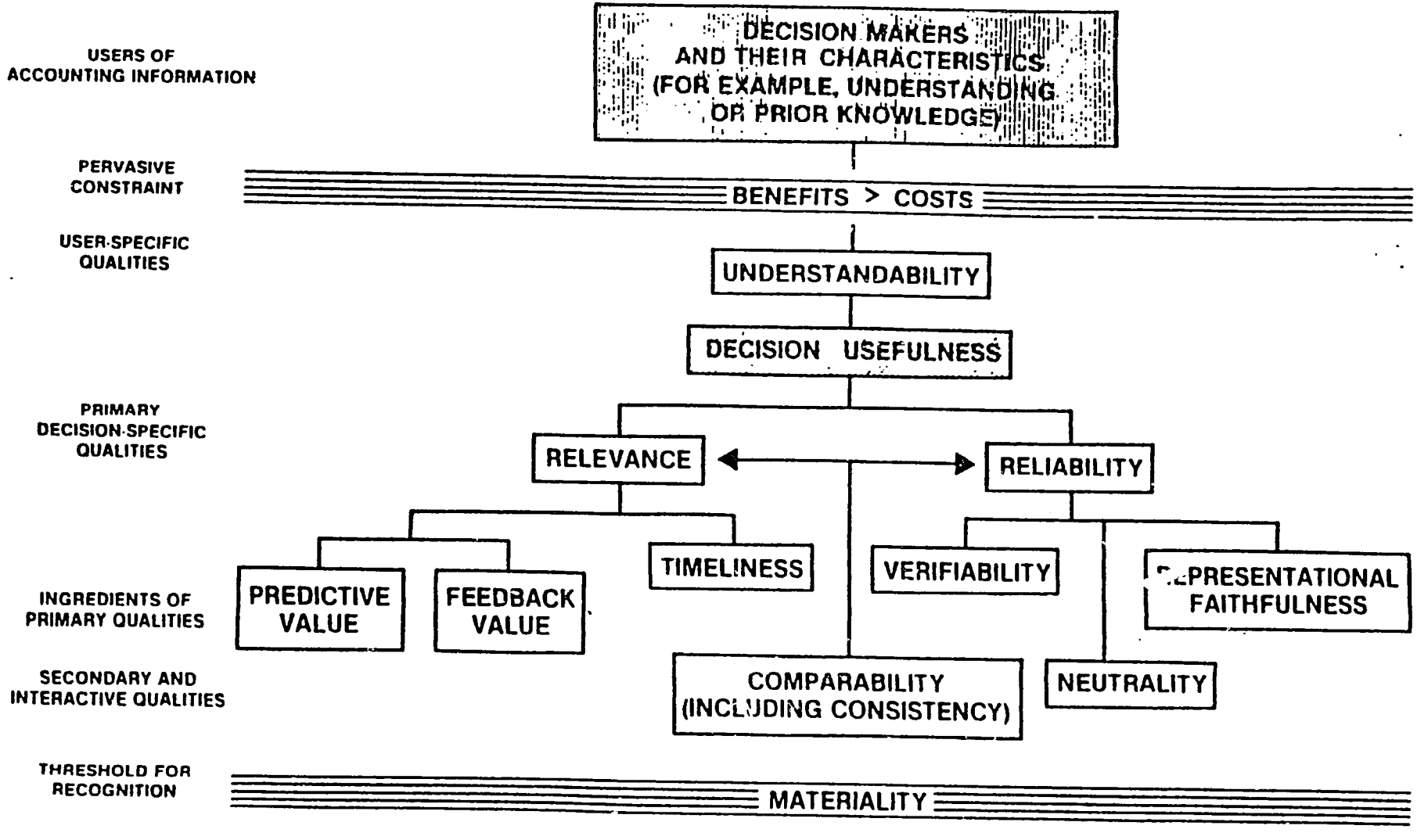


FIGURE 1

A HIERARCHY OF ACCOUNTING QUALITIES



Special Issues in US Accounting

(Private Sector Based System)

Financial Statements: Balance Sheet

(annual statements) Income statement

Statement of retained earnings

Cash flow statement

Quarterly statements

Accounting policies

Valuation of assets:

fixed assets and depreciation

marketable securities

investments in affiliated and associated companies

leased assets

capital leases

operating leases

inventories

Other disclosure issues

Treasury stock

Deferred taxes

Contingencies and provisions

Prior period adjustments

Related parties disclosure

Post retirement benefits

Pensions

Earnings per share

Consolidation and segmental reporting

Translation

Inflation accounting

European Accounting

(Law based system)

EC Directives (Recommend by European Commission, passed by Council of Ministers)

4th Directive Regulates Content, Valuation and Publication of Financial Statements

Balance Sheet and Income Statement

Must be incorporated into national laws

7th Directive Regulates Financial Statement Consolidation (Principles: > 50 ownership; control; subsidiaries of the same industry)

8th Directive Regulates Qualifications and Independence of Auditors

Comparative Balance Sheets
December 31, 19x6 and 19x5
(in thousands)

	Year 19x6	Year 19x5	Increase or (Decrease) Amount	Increase or (Decrease) Percentage	Common-size Statement 19x6	Common-size Statement 19x5
Assets						
Current assets:						
Cash	$ 800	$ 700	$ 100	14.3	.7	.6
Marketable securities	450	300	150	50.0	.4	.3
Accounts receivable, net	12,000	11,000	1,000	9.1	10.0	9.9
Inventory	20,000	17,000	3,000	17.6	16.7	15.3
Prepaid expenses	250	300	(50)	(16.7)	.2	.3
Total current assets	33,500	29,300	4,200	14.3	28.0	26.4
Long-term investments	500	550	(50)	(9.1)	.4	.5
Property, furnishings, and equipment:						
Land	6,000	6,000	–0–	–0–	5.0	5.4
Buildings, net	55,000	52,000	3,000	5.8	45.8	47.0
Equipment and furnishings, net	25,000	23,000	2,000	8.7	20.8	20.7
Total property, furnishings, and equipment	86,000	81,000	5,000	6.2	71.6	73.1
Total assets	$120,000	$110,850	$9,150	8.3	100.0	100.0
Liabilities and Stockholders' Equity						
Current liabilities:						
Accounts payable	7,500	7,050	450	6.4	6.3	6.3
Accrued expenses	2,200	2,100	100	4.8	1.8	1.9
Notes payable	3,000	3,200	(200)	(6.3)	2.5	2.9
Total current liabilities	12,700	12,350	350	2.8	10.6	11.1
Long-term liabilities:						
Bonds payable ($1,000 face value; 10%)	37,300	35,700	1,600	4.5	31.1	32.2
Total liabilities	50,000	48,050	1,950	4.1	41.7	43.3
Stockholders' equity:						
Preferred stock ($100 par value; 8%)	6,000	6,000	–0–	–0–	5.0	5.4
Common stock ($10 par value)*	25,000	24,000	1,000	4.2	20.8	21.7
Additional paid-in capital	4,000	3,800	200	5.3	3.3	3.4
Retained earnings	35,000	29,000	6,000	20.7	29.2	26.2
Total stockholders' equity	70,000	62,800	7,200	11.5	58.3	56.7
Total liabilities and stockholders' equity	$120,000	$110,850	$9,150	8.3	100.0	100.0

* 100,000 shares of common stock were issued on January 1, 19x6. Since these shares were outstanding during the entire year, the weighted-average number of shares outstanding in 19x6 was 2,500,000 shares.

13

Exhibit 18-3. Comparative Income and Retained Earnings Statements

Contemporary Interiors, Inc.
Comparative Income and Retained Earnings Statements
For the Years Ended December 31, 19x6 and 19x5
(in thousands)

	Year		Increase or (Decrease)		Common-size Statements	
	19x6	19x5	Amount	Percentage	19x6	19x5
Sales	$87,000	$82,000	$5,000	6.1	100.0	100.0
Cost of goods sold	60,930	56,350	4,580	8.1	70.0	68.7
Gross margin	26,070	25,650	420	1.6	30.0	31.3
Operating expenses:						
Selling expenses	5,000	4,600	400	8.7	5.7	5.6
Administrative expenses	2,000	2,100	(100)	(4.8)	2.3	2.6
Total operating expenses	7,000	6,700	300	4.5	8.0	8.2
Operating income	19,070	18,950	120	.6	21.9	23.1
Interest expense	4,030	3,890	140	3.6	4.6	4.7
Income before taxes	15,040	15,060	(20)	(.1)	17.3	18.4
Income tax expense	3,760	3,800	(40)	(1.1)	4.3	4.6
Net income	11,280	11,260	20	.2	13.0	13.8
Dividends on preferred stock	480	480	–0–	–0–		
Net income available to common stockholders	10,800	10,780	$ 20	.2		
Dividends on common stock	4,800	4,600	200	4.3		
Net income added to retained earnings	6,000	6,180	(180)	(2.9)		
Retained earnings, January 1	29,000	22,820	6,180	27.1		
Retained earnings, December 31	$35,000	$29,000	$6,000	20.7		

Trend Analysis

	19x6	19x5	19x4	19x3	19x2	19x1
Sales	$87,000	$82,000	$78,000	$74,800	$73,000	$72,000
Net income	11,280	11,260	11,000	10,500	10,200	9,900

(A) Trend Analysis in Dollars
(measured in thousands)

	19x6	19x5	19x4	19x3	19x2	19x1
Sales	121*	114†	108	104	101	100
Net income	114	114	111	106	103	100

(B) Trend Analysis in Percentages

*121% = $87,000 ÷ $72,000
†114% = $82,000 ÷ $72,000

DEUTSCHE XYZ GMBH, FRANKFURT (MAIN)

Balance sheet at December 31, 1990

Assets	Disclosure requirements for the following size companies: Small	Medium	Large
Unpaid capital (A.)	X	X	X
Start-up and expansion costs (B.)	X	X	X
Fixed assets (C.)	X	X	X
Intangibles (I)	X	X	X
Concessions, trademarks and similar rights and licenses (1.)			X
Goodwill (2.)		X	X
Payments on account (3.)			X
Tangible assets (II)	X	X	X
Land and buildings (1.)		X	X
Machinery (2.)		X	X
Equipment and fixtures (3.)		X	X
Payments on account and construction in progress (4.)		X	X
Investments (III)	X	X	X
Holdings in associated businesses (1.)		X	X
Loans to associated businesses (2.)		X	X
Holdings in other businesses (3.)		X	X
Loans to other businesses in which a holding is held (4.)		X	X
Other loan term securities (5.)			X
Other loans (6.)			X
(Loans 2, 4 and 6 include DM... secured by mortgage on real estate)			
Current assets (D.)	X	X	X
Inventories (I)	X	X	X
Raw materials (1.)			X
WIP (2.)			X
Finished goods (3.)			X
Payments on account (4.)			X
Receivables and other assets (II)	X	X	X
Receivables from customers (of which not due within one year, DM...) (1.)			X
Receivables from associated businesses (of which not due within one year, DM...) (2.)		X	X
Receivables from businesses in which a holding is held (of which not due within one year, DM...) (3.)		X	X
Receivables from GmbH shareholders (4.)		X	X
Other assets (of which not due within one year, DM...) (5.)		X	X
Securities (III)	X	X	X
In associated companies (1.)		X	X
Own shares (2.)		X	X
Other securities (3.)		X	X
Cash (IV)	X	X	X
Prepaid taxes (E.)	X	X	X
Prepayments (F.)	X	X	X
Loan discount (1.)		X	X
Other (2.)		X	X
Accumulated deficit uncovered by shareholders' equity (G.)			

Capital and liabilities	Disclosure requirements for the following size companies: Small	Medium	Large
Shareholders' equity (A.)	X	X	X
Issued share capital (I)	X	X	X
Capital reserve (II)	X	X	X
Revenue reserves (III)	X	X	X
Legal reserve (1.)			X
Reserve for own shares (2.)			X
Reserves required by the company's statutes (3.)			X
Other reserves (4.)			X
Profits/losses brought forward (IV)	X	X	X
Profits/losses for the year (V)	X	X	X
Writedowns and provisions made for tax purposes only (B.)	X	X	X
Accruals (C.)	X	X	X
Pensions (1.)			X
Taxes (2.)			X
Deferred taxes (3.)			X
Other (4.)			X
Payables (D.)	X	X	X
Loans (of which convertible DM...) (of which not due within one year, DM...) (1.)		X	X
Banks (of which not due within one year, DM ...) (2.)		X	X
Payments on account received (3.)			X
Trade payables (of which not due within one year, DM...) (4.)			X
Notes payable (of which not due within one year, DM...) (5.)			X
Associated businesses (of which not due within one year, DM...) (6.)		X	X
Business in which a holding is held (of which not due within one year, DM...) (7.)		X	X
Other liabilities (of which taxes DM...and social security DM...) (of which not due within one year, DM...) (8.)		X	X
Deferred income (E.)	X	X	X

Profit and loss account for the year January 1 to December 31, 1990

Cost of sales presentation	Type of cost presentation	January 1 to December 31, 1990 DM	DM	Comparatives 1989 DM
Sales revenue (1.)	Sales revenue (1.)			
Cost of goods sold (2.)	Increase/decrease in finished goods and WIP (2.)			
Gross profit (3.)	Other expenses capitalized (3.)			
Selling expenses (4.)	Other operating income (4.)			
General administration expenses (5.)	Release of writedowns and provisions made for tax purposes only (a.)			
Other operating income (6.)	Other (b.)			
Release of writedowns and provisions made for tax purposes (a.)	Cost of materials (5.)			
Other (b.)	Raw materials and goods (a.)			
Other operating expenses (7.)	Services (b.)			
Release of writedowns and provisions made for tax purposes only (a.)	Cost of employment (6.)			
Other (b.)	Wages and salaries (a.)			
	Social security and pension costs, including retirement pensions DM... (b.)			
	Depreciation (7.)			
	Fixed assets and start-up and expansion costs (a.)			
	Current assets insofar as unusual or nonrecurring (b.)			
	Other operating expenses (8.)			
	Release of writedowns and provisions made for tax purposes only (a.)			
	Other (b.)			
Income from profit pooling agreements (8.)	Income from profit pooling agreements (9.)			
Income from investments, including associated companies DM... (9.)	Income from investments, including associated companies DM... (10.)			
Income from other securities and investments, including associated companies DM... (10.)	Income from other securities and investments, including associated companies DM... (11.)			
Other interest and similar income, including associated companies DM... (11.)	Other interest and similar income, including associated companies DM... (12.)			
Losses assumed under pooling agreements (12.)	Losses assumed under pooling agreements (13.)			
Depreciation of investments and securities (13.)	Depreciation of investments and securities (14.)			
Interest and similar expenses, including to associated companies (14.)	Interest and similar expenses, including to associated companies (15.)			
Operating income (15.)	Operating income (16.)			
Nonrecurring income (16.)	Nonrecurring income (17.)			
Nonrecurring expenditure (17.)	Nonrecurring expenditure (18.)			
Nonrecurring result (18.)	Nonrecurring result (19.)			
Taxes on income (19.)	Taxes on income (20.)			
Other taxes (20.)	Other taxes (21.)			
Income from transfer of a loss (21.)	Income from transfer of a loss (22.)			
Profit transferred under a pooling agreement (22.)	Profit transferred under a pooling agreement (23.)			
Net income/net loss (23.)	Profit/loss for year (24.)			

Consolidated balance sheet

Assets

(Dollar amounts in thousands)

	December 31, 19X1 $	19X0 $
Current assets:		
Cash and cash equivalents	7,430	XX
Marketable equity securities at lower of cost or market (Note)	2,610	XX
Other marketable securities at cost (quoted market value, 19X1—$2,100; 19X0—$XX)	1,740	XX
	4,350	XX
Notes and accounts receivable:		
Notes receivable less unearned finance charges (19X1—$340; 19X0—$XX)	2,280	XX
Accounts receivable, including receivables from U.S. government (19X1—$4,650; 19X0—$XX)	16,860	XX
	19,140	XX
Less—Allowance for doubtful accounts	370	XX
	18,770	XX
Inventories, at lower of average cost or market:		
Finished goods	4,580	XX
Work in process	7,210	XX
Raw materials and supplies	1,900	XX
Costs incurred on uncompleted contracts	10,230	XX
	23,920	XX
Less—Progress payments received	8,690	XX
	15,230	XX
Prepaid expenses	320	XX
Total current assets	46,100	XX
Property, plant and equipment, at cost:		
Land	6,410	XX
Buildings	12,770	XX
Machinery, equipment, and furniture and fixtures	20,340	XX
	39,520	XX
Less—Accumulated depreciation (Note)	12,560	XX
	26,960	XX
Goodwill, at cost less accumulated amortization (19X1—$2,120; 19X1—$XX)	2,330	XX
Deferred charges (Note)	1,290	XX
	76,680	XX

Liabilities and shareholders' equity

(Dollar amounts in thousands)

	December 31, 19X1 $	19X0 $
Current liabilities:		
Notes payable (Note)	9,720	XX
Current portion of long-term debt	210	XX
Current portion of obligations under capital leases	530	XX
Accounts payable—Trade	7,260	XX
Dividends payable	300	XX
Income taxes (Note)	1,520	XX
Other accounts payable and accrued expenses	5,350	XX
Total current liabilities	24,890	XX
Long-term debt (Note)	14,530	XX
Obligations under capital leases (Note)	3,390	XX
Deferred income taxes (Note)	2,960	XX
Total liabilities	45,770	XX
Shareholder's equity:		
Common stock, without par value—10,000,000 shares authorized; 1,680,000 shares issued at stated value of $1.00 a share	1,680	XX
Capital in excess of par or stated value	10,080	XX
Retained earnings	19,600	XX
	31,360	XX
Less—22,500 shares of common stock in treasury, at cost	450	XX
	30,910	XX
Commitments and contingent liabilities (Note)		
	76,680	XX

Note:

The accompanying notes are an integral part of these financial statements.

Consolidated statement of income

(Dollar amounts in thousands)

	Year ended December 31, 19X1	19X0
	$	$
Net sales	60,820	XX
Other operating expenses	2,040	XX
	62,860	XX
Cost of products sold	39,610	XX
Selling and administrative expenses	10,730	XX
Depreciation and operating expenses	2,170	XX
Other costs and operating expenses	3,540	XX
	56,050	XX
Income from operations	6,810	XX
Other income:		
Interest income	710	XX
Gain from fire insurance proceeds	490	XX
Miscellaneous other income	240	XX
	8,250	XX
Other deductions:		
Interest cost incurred and commitment fees on loans	1,970	XX
Miscellaneous	1,050	XX
	5,230	XX
Provision for taxes on income (Note)	2,330	XX
Net income	2,900	XX

Note:

The accompanying notes are an integral part of these financial statements.

Consolidated statement of retained earnings

(Dollar amounts in thousands)

	Year ended December 31, 19X1	19X0
	$	$
Balance at beginning of year	19,500	XX
Net income for the year	2,900	XX
Dividends:		
5% in common stock (80,000 shares at fair value of $20.00 per share)	(1,600)	—
Cash (19X1—$0.75 per share; 19X0—$0.XX per share)	(1,200)	(XX)
Balance at end of year	19,600	XX

Note:

The accompanying notes are an integral part of these financial statements.

Consolidated statement of cash flows (Indirect method)

(Dollar amounts in thousands)

	Year ended December 31, 19X1	19X0
	$	%
Cash flows from operating activities		
Net income	2,900	XX
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation	1,950	XX
Amortization of goodwill	220	XX
Provision for losses on accounts receivable	200	XX
Gain on sale of facility	(10)	XX
Payment received on installment note receivable for sale of inventory	100	XX
Decrease in accounts receivable	250	XX
Increase in inventory	(2,250)	XX
Increase in prepaid expenses	(150)	XX
Increase in accounts payable	2,300	XX
Increase in income taxes payable	1,030	XX
Increase in deferred taxes	150	XX
Decrease in other accounts payable and accrued expenses	(100)	XX
Total adjustments	3,690	XX
Net cash provided by operating activities	6,590	XX
Cash flows from investing activities		
Proceeds from sale of facility	140	XX
Capital expenditures	(6,550)	XX
Net cash used in investing activities	(6,410)	XX
Cash flows from financing activities		
Principal payments under capital lease obligation	(200)	XX
Proceeds from issuance of long-term debt	3,500	XX
Purchase of treasury stock	(450)	XX
Dividends paid	(1,200)	XX
Net cash provided by financing activities	1,650	XX
Net increase in cash and cash equivalents	1,830	XX
Cash and cash equivalents at the beginning of year	5,600	XX
Cash and cash equivalents at end of year	7,430	XX

III Neues Recht im Vergleich zu US-amerikanischen GAAP

Nachfolgend wird in Form einer Übersicht versucht, wesentliche Grundsätze und Vorschriften des geltenden neuen deutschen Bilanzierungsrechts den amerikanischen GAAP gegenüberzustellen, um so auf Auffassungsdifferenzen zwischen beiden Rechtskreisen aufmerksam zu machen. Dabei sollen grundsätzliche Unterschiede verdeutlicht werden; auf Hinweise auf die einzelnen Vorschriften und Rechtsquellen wurde in diesem Kapitel bewußt verzichtet.

HGB und GoB	*US-GAAP*
Rechtliche Grundlagen	
Gesetz (HGB, AktG usw.)	SEC – Bestimmungen
GoB (teilweise kodifiziert durch HGB, BFH Urteile, usw.)	APB und FASB-Gutachten
Auslegung ist an dem im Verkehr Erforderlichen orientiert	Auslegung ist mehr an dem im Verkehr Üblichen orientiert
Bestandteile des Jahresabschlusses:	
Bilanz	Bilanz und Eigenkapitalentwicklung
GuV	GuV
Anhang	Anhang (notes)
–	Kapitalflußrechnung
mit Vorjahresvergleich	mit Vergleich der vorausgegangenen zwei Jahre (ausgenommen die Bilanz)
Allgemeine Bilanzierungsgrundsätze	
Gläubigerschutz orientierter Jahresabschluß mit Betonung des Vorsichtsprinzips (mit Imparitäts- und Realisationsprinzip)	Aktionärsorientierter Jahresabschluß mit Betonung des Periodenergebnisses (strenge Periodenabgrenzung)
Maßgeblichkeitsprinzip der Handels- für die Steuerbilanz	–
Vollständigkeit und Wesentlichkeit	Wesentlichkeit (stärker betont) und Vollständigkeit
Vergleichbarkeit – Bilanzidentität – Bewertungsstetigkeit	Vergleichbarkeit – Bewertungsstetigkeit wird als Grunderfordernis der Bilanzierung gesehen – Durchbrechung der Bilanzidentität ist begründet offenzulegen
Wirtschaftliche Betrachtungsweise vor formaljuristischer Form	Wirtschaftliche Betrachtungsweise (in der Anwendung stärker betont)

III New Accounting Law in Comparison with US GAAP

In the following we provide in tabular form a summary of the more important principles and regulations in the new German accounting law contrasted with US GAAP in order to crystalize the main differences between the two sets of conventions. The aim is to emphasise basic differences; a detailed analysis of regulations and legal sources was deliberately avoided within the framework of this introduction.

HGB and GoB	*US GAAP*
Legal Bases	
Laws (HGB, AktG, etc.)	SEC rules.
Required accounting principles (partly codified in HGB, Supreme Tax Court decisions, etc.)	APB opinions, FASB statements
Interpretation is based on required practice	Interpretation is based more on consensus and authoritative support
Components of Financial Statements	
Balance sheet.	Balance sheet Statement of retained earnings.
Profit and loss account. Notes.	Profit and loss account. Notes. Statement of changes in financial position/cash flow statement.
Comparative figures required	Comparatives for two years (only one year's comparatives in balance sheet)
General Accounting Principles	
Financial statements oriented towards protection of creditors with emphasis on the prudence concept (imparity and realisation principles)	Capital market orientation with emphasis on consistent disclosure of results (exact periodic income measurement)
Authoritative position of the financial statements for tax return purposes	–
Completeness and materiality	Completeness and materiality (with greater emphasis on materiality)
Comparability – formal balance sheet continuity – consistency in valuation	Comparability – reclassifications permitted in justified cases and to be disclosed – consistency in valuation is a basic requirement of accounting
Economic substance over legal form	Principle of substance over form given greater emphasis

HGB und GoB	US-GAAP
	Angemessene Abschreibungen Eingeschränkte Abwertungsmöglichkeiten
Langfristige Fertigung	
Gewinnrealisierung erfolgt grundsätzlich erst bei Teilabrechnungen	Gewinnrealisierung möglichst periodengerecht, anteilmäßig nach Leistungsfortschritt
Wertpapiere	
Bilanzierung zu Anschaffungskosten	
es sei denn, der Kurswert der entsprechenden Wertpapierkategorie ist niedriger	es sei denn, der Kurswert des gesamten Portefeuilles ist niedriger
Rückstellungen	
Pensionsrückstellungen	
Bilanziell nicht vergleichbar, weil	
Rückstellungsbildung	Abführung an rechtliche selbständige Pensionsfonds
GuV-mäßig grundsätzlich vergleichbar	
Änderung der Pensionszusage führt zur Belastung des entsprechenden Jahres	Änderungen werden auf restliche Dienstjahre verteilt (Periodenabgrenzung)
Sonstige Rückstellungen	
müssen ursächlich vergangenheitsbezogen sein; der Eintritt muß	
möglich und vertretbar sein	wahrscheinlich und abschätzbar sein
Aufwandsrückstellungen sind möglich	Es muß stets eine Verpflichtung gegenüber Dritten bestehen
Latente Steuern	
passivisch – Bilanzierungspflicht aktivisch – Bilanzierungswahlrecht mit Ausschüttungssperre	generell – Bilanzierungspflicht
Bemessungsgrundlage: zukünftige Steuerminderung/-erhöhung	Bemessungsgrundlage: Steuererhöhung/-verminderung im Jahr der Entstehung
Gewinn- und Verlustrechnung	
Gesamtkostenverfahren oder Umsatzkostenverfahren	Umsatzkostenverfahren
Konzernabschluß	
Währungsumrechnung	
Keine vorgeschriebene Methode; in jedem Fall erläuterungspflichtig	Stichtagskurse: Bilanz Durchschnittskurse: GuV

HGB and GoB	US GAAP
	Appropriate portion of depreciation. Limited ability to make write-downs.
Long-term construction-type contracts	
Completed contract method (total contract or previously agreed sections)	Percentage of completion method
Securities	
at cost	
Unless quoted/market value of the individual security is lower	Unless quoted/market value of whole portfolio is lower
Accruals	
Pension accruals	
Balance sheet treatment not comparable because	
Costs are accrued in the balance sheet	Costs are funded in independent pension funds
Profit and loss treatment basically similar	
Change in pension benefits charged in full in the year of change	Effect of changed assumptions and plan benefits are spread over active years of service (matching principle)
Other accruals	
Cause must lie in a past event; charge must be	
possible and reasonable	probable and estimable
Expense anticipation accruals are permitted in certain cases	There must exist a commitment to a third party
Deferred Taxes	
Liabilities must be accrued	Generally: Comprehensive tax allocation must be reflected in the financial statements
Optional recording of prepaid taxes	
Liability method	Deferral method
Profit and Loss Account	
Type of expenditure or Cost of sales format	Cost of sales/operational format
Consolidated Financial Statements	
Foreign Currency Translation	
No prescribed method; Must be described in notes	Balance sheet at year-end rates; Profit and loss account at average rates

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ACCOUNTING MODULE 1993

SECOND 1/2 DAY	TOPICS
8:30 - 10:00	b) Understanding and evaluating Financial Statements (balance sheet and income statement): Analysis of financial statement example
10:15 - 11:45	Understanding and Evaluating Financial Statements (cash-flow statement and basic ratios)

LEARNING GOAL OF SECOND TWO SESSIONS: To acquire the ability to read and understand the contents of the annual report of a major corporation.

UNDERSTANDING AND EVALUATING FINANCIAL STATEMENTS
SECOND 1/2 DAY - 13:30 - 16:45

TYPICAL MANUFACTURING COMPANY, INC.
YEARS ENDED DECEMBER 31, 19X9 AND 19X8

NOTE: ALL DATA IN THOUSANDS EXCEPT PER SHARE FIGURES

BALANCE SHEET ANALYSIS:

CERTAIN BASIC RATIOS:

WORKING CAPITAL:

CURRENT ASSETS - CURRENT LIABILITIES = WORKING CAPITAL

19X9:
$400,000 - $170,000 = $230,000

19X8:
$380,000 - $181,000 = $199,000

CURRENT RATIO:

CURRENT ASSETS/CURRENT LIABILITIES = CURRENT RATIO

19X9:
$400,000/$170,000 = 2.35 TO 1

19X8:
$380,000/$181,000 = 2.10 TO 1

NET QUICK ASSETS:

QUICK ASSETS - CURRENT LIABILITIES = NET QUICK ASSETS

19X9:
$216,000 - $170,000 = $46,000

19X8:
$192,000 - $181,000 = $11,000

QUICK ASSETS RATIO:

QUICK ASSETS/CURRENT LIABILITIES = QUICK ASSETS RATIO

19X9:
$216,000/$170,000 = 1.27 TO 1

19X8:
$192,000/$181,000 = 1.06 TO 1

82

TRENDS - CERTAIN RELATED ACCOUNTS:

	19X9	19X8	19X9/19X8
ACCOUNTS RECEIVABLE	$156,000	$145,000	1.08
INVENTORIES	180,000	185,000	.97
PREPAID EXPENSES	4,000	3,000	NOT MATERIAL
ACCOUNTS PAYABLE	60,000	57,000	1.05
ACCRUED EXPENSES	30,000	36,000	.83
NET SALES	765,000	725,000	1.06
COST OF SALES	535,000	517,000	1.04
GROSS MARGIN	230,000	208,000	1.11
SELLING, GENERAL AND ADMINISTRATIVE EXPENSES	96,804	109,500	.88
OPERATING INCOME	105,196	73,500	1.43
NET INCOME	47,750	40,500	1.18
EARNINGS PER COMMON SHARE	$3.16	$2.77	1.14

OTHER RELATED DATA:

NUMBER OF WEEKS SALES IN ACCOUNTS RECEIVABLE:

SALES/ACCOUNTS RECEIVABLE = TURNOVER
52/TURNOVER = NUMBER OF WEEKS SALES IN ACCOUNTS RECEIVABLE

19X9:
$765,000/$156,000 = 4.90 TIMES
52/4.90 = 10.6 WEEKS SALES IN ACCOUNTS RECEIVABLE

19X8:
$725,000,000/$145,000 = 5.0 TIMES
52/5 = 10.4 WEEKS SALES IN ACCOUNTS RECEIVABLE

83

NUMBER OF WEEKS SALES IN INVENTORIES:

COST OF SALES/INVENTORIES = TURNOVER
52/TURNOVER = NUMBER OF WEEKS SALES IN INVENTORY

19X9:
$535,000/$180,000 = 2.97 TIMES
52/2.97 = 17.5 WEEKS SALES IN INVENTORY

19X8:
$517,000/$185,000 = 2.80 TIMES
52/2.80 = 18.6 DAYS SALES IN INVENTORY

NUMBER OF WEEKS PURCHASES IN ACCOUNTS PAYABLE:

COST OF SALES/ACCOUNTS PAYABLE = TURNOVER
52/TURNOVER = NUMBER OF WEEKS PURCHASES IN ACCOUNTS PAYABLE

19X9:
$535,000/$60,000 = 8.92 TIMES
52/8.92 = 5.8 DAYS PURCHASES IN ACCOUNTS PAYABLE

19X8:
$517,000/$57,000 = 9.07 TIMES
52/9.07 = 5.7 DAYS PURCHASES IN ACCOUNTS PAYABLE

LONG-TERM DEBT TO EQUITY RATIO:

LONG-TERM DEBT/EQUITY = LONG-TERM DEBT TO EQUITY RATIO

19X9:
$130,000/$346,000 = .38 TO 1

19X8:
$130,000/$305,600 = .43 TO 1

BORROWED FUNDS TO EQUITY RATIO:

CURRENT NOTES PAYABLE + LONG-TERM DEBT/EQUITY = BORROWED FUNDS TO EQUITY RATIO

19X9:
$181,000/$346,000 = .52 TO 1

19X8:
$191,000/$305,600 = .63 TO 1

84

NET BOOK VALUE PER SHARE OF COMMON STOCK:

SHAREHOLDERS' EQUITY - PREFERRED STOCK - INTANGIBLES (SOMETIMES)/NUMBER OF COMMON SHARES ISSUED AND OUTSTANDING = NET BOOK VALUE PER SHARE OF COMMON STOCK

19X9:
$338,000/14,499,000 = $22.53

19X8:
$297,600/14,499,000 = $20.52

INCOME STATEMENT ANALYSIS:

CERTAIN INCOME STATEMENT ITEMS AS A % OF SALES:

	19X9	19X8
SALES	100.0%	100.0%
COST OF SALES	69.9	71.3
GROSS MARGIN	31.1	28.7
OPERATING EXPENSES:		
DEPRECIATION	3.7	3.5
SELLING, GENERAL AND ADMINISTRATIVE EXPENSES	12.6	15.1
OPERATING INCOME	13.8	10.1
NET INCOME	6.2	5.6

$ AMOUNT OF SALES FOR EACH $ INVESTED IN NET PROPERTY, PLANT AND EQUIPMENT:

SALES/NET PROPERTY, PLANT AND EQUIPMENT = $ AMOUNT OF SALES FOR EACH $ INVESTED IN NET PROPERTY, PLANT AND EQUIPMENT

19X9:
$765,000/385,000 = $1.99

19X8:
$625,000/346,600 = $1.80

85

$ AMOUNT OF NET OPERATING INCOME FOR EACH $ INVESTED IN NET, PROPERTY, PLANT AND EQUIPMENT:

OPERATING INCOME/NET PROPERTY, PLANT AND EQUIPMENT = $ AMOUNT OF OPERATING INCOME FOR EACH $ INVESTED IN NET PROPERTY, PLANT AND EQUIPMENT

19X9:
$105,196/385,000 = $.27

19X8:
$73,500/346,600 = $.21

ASSET TURNOVER RATIO:

NET SALES/TOTAL ASSETS = ASSET TURNOVER RATIO

19X9:
$765,000/$662,000 = 1.16 TO 1

19X8:
$725,000/$631,600 = 1.15 TO 1

RETURN ON EQUITY:

PROFIT/SALES X SALES/CAPITAL = RETURN ON EQUITY

19X9:
$47,750/$305,600 = 15.6%

19X8:
$40,500/$281,800 = 14.4%

86

STATEMENT OF CASH FLOWS ANALYSIS:

THE FOUR BASIC FINANCIAL STATEMENTS ARE INTERLOCKED WITH THE STATEMENT OF CASH FLOWS

BALANCE SHEET:

CURRENT ASSETS AND LIABILITIES ARE A PRIMARY SOURCE FOR DATA REPORTED AS "ADJUSTMENTS TO RECONCILE NET INCOME TO NET CASH FROM OPERATIONS". EXCEPTIONS - DEPRECIATION, CHANGES IN DEFERRED INCOME TAXES AND CHANGES IN CURRENT NOTES PAYABLE.

NON-CURRENT ASSETS ARE THE PRIMARY SOURCE FOR DATA REPORTED AS "CASH FLOWS FROM INVESTING ACTIVITIES".

NON-CURRENT LIABILITIES IS ONE OF THE PRIMARY SOURCES FOR DATA REPORTED AS "CASH FLOWS FROM FINANCING ACTIVITIES".

STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY IS ONE OF THE PRIMARY SOURCES FOR DATA REPORTED AS "CASH FLOWS FROM FINANCING ACTIVITIES".

INCOME STATEMENT - THE INCOME STATEMENT IS THE SOURCE OF "NET INCOME" SHOWN IN THE STATEMENT OF CASH FLOWS.

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ACCOUNTING MODULE 1993

THIRD 1/2 DAY	TOPICS
	II. MANAGERIAL ACCOUNTING
13:30 - 15:00	1. The Function of Management Accounting a) Purpose and Organization of Managerial Accounting b) Differences between Financial and Managerial Accounting
15:15 - 16:45	2. Cost Behavior and Break Even Point Analysis (single and multiple product analysis; inclusion of taxes) 3. Determination of Cost Curves

LEARNING GOAL OF THIRD 1/2 DAY: To understand the need for and the usefulness of cost data for a company in a market environment; to appreciate the necessity of developing a management accounting system for decision making.

MANAGEMENT ACTIVITIES

1. DECISION-MAKING.

2. PLANNING.

3. DIRECTING.

4. CONTROLLING.

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MANAGERIAL ACCOUNTING:

What is managerial accounting?

Purpose of managerial accounting

Differences between managerial and financial accounting

asic managerial accounting procedures

OBJECTIVES OF MANAGERIAL ACCOUNTING

1. PROVIDING INFORMATION.
2. ASSISTING IN DIRECTING AND CONTROLLING.
3. MOTIVATING MANAGERS.
4. MEASURING PERFORMANCE.

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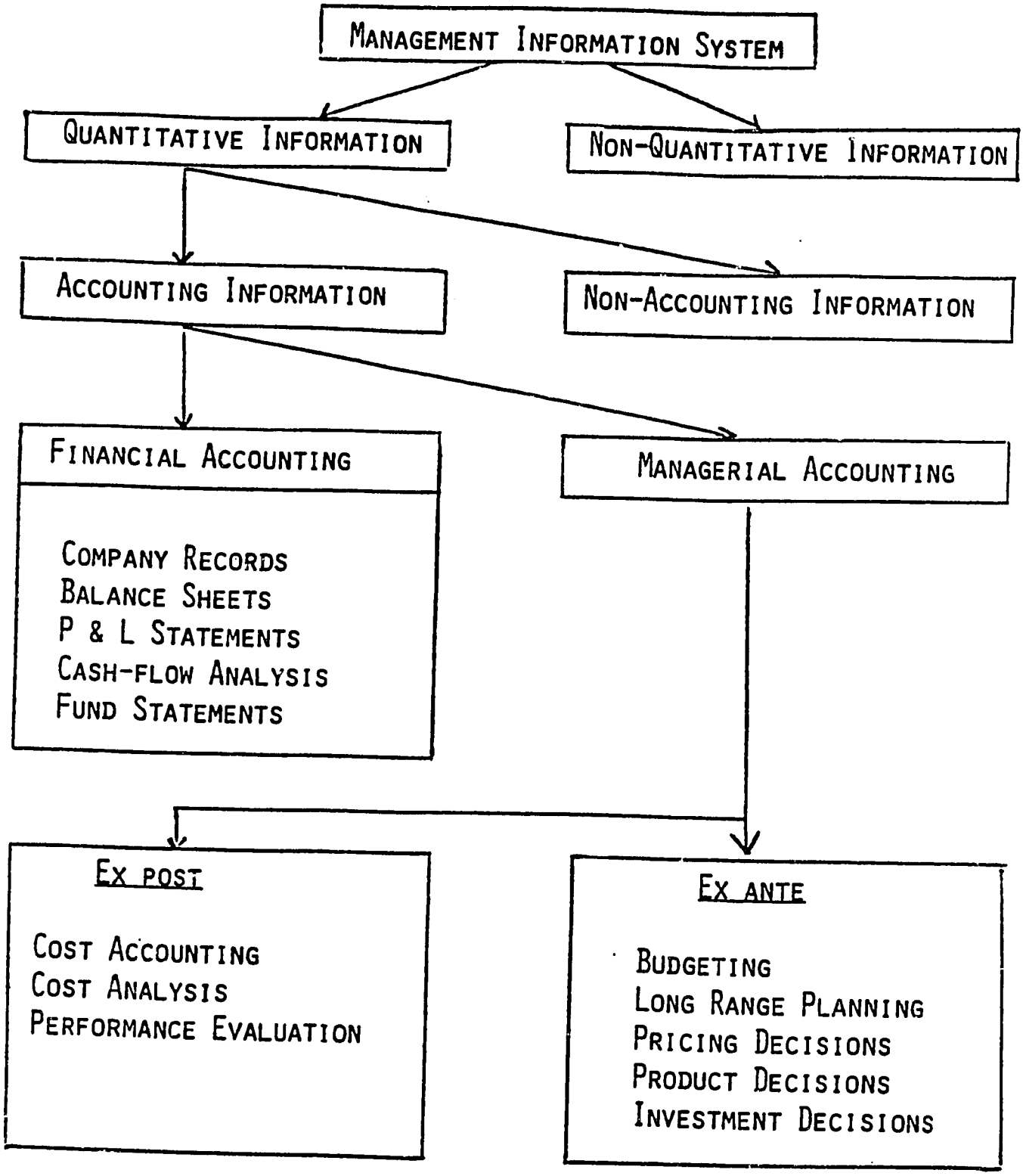
MANAGEMENT INFORMATION SYSTEM
QUANTITATIVE INFORMATION
NON-QUANTITATIVE INFORMATION
ACCOUNTING INFORMATION
NON-ACCOUNTING INFORMATION
FINANCIAL ACCOUNTING
COMPANY RECORDS
BALANCE SHEETS
P & L STATEMENTS
CASH-FLOW ANALYSIS
FUND STATEMENTS
MANAGERIAL ACCOUNTING
EX POST
COST ACCOUNTING
COST ANALYSIS
PERFORMANCE EVALUATION
EX ANTE
BUDGETING
LONG RANGE PLANNING
PRICING DECISIONS
PRODUCT DECISIONS
INVESTMENT DECISIONS

MANAGERIAL AND FINANCIAL ACCOUNTING

MANAGERIAL ACCOUNTING

PREPARATION OF INFORMATION FOR DECISION MAKING, PLANNING, DIRECTING AND CONTROLLING AN ORGANIZATION'S OPERATIONS.

↓

INTERNAL USERS OF INFORMATION

MANAGERS AT ALL LEVELS IN THE ORGANIZATION.

FINANCIAL ACCOUNTING

PREPARATION OF PUBLISHED FINANCIAL STATEMENTS AND OTHER FINANCIAL REPORTS.

↓

EXTERNAL USERS OF INFORMATION

STOCKHOLDERS, FINANCIAL ANALYSTS, LENDERS, UNIONS, CONSUMER GROUPS AND GOVERNMENTAL AGENCIES.

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DIFFERENCE BETWEEN

FINANCIAL ACCOUNTING	MANAGERIAL ACCOUNTING
1. REGULATED BY 3RD PARTIES (FASB, SEC)	1. NON-REGULATED (EXCEPTION: GOVERNMENT CONTRACTS CASB)
2. STANDARDIZED AND REQUIRED	2. TAYLOR-MADE FOR BUSINESS ENTITY; OPTIONAL
3. PAST-ORIENTED DATA	3. PAST-ORIENTED DATA (ANALYSIS) FUTURE-ORIENTED DATA (DECISIONS)
4. FOR OUTSIDE USERS (OBJECTIVE)	4. FOR INSIDE USE (REASONABLE AND RELEVANT)
5. RESTRICTED TO FINANCIAL DATA	5. DATA NOT RESTRICTED (DEPEND ON DECISION NEEDS)
6. SUBJECT TO OUTSIDE AUDIT	6. ONLY INSIDE AUDIT
7. COMPLETENESS REQUIREMENT	7. RELEVANCY AND SUFFICIENCY REQUIREMENT
8. ACCURACY REQUIREMENT	8. RELATIVE ACCURACY
9. ROUTINE RECORD-KEEPING	9. ROUTINE AND NON-ROUTINE RECORDS
10. TIME HORIZON: FISCAL YEAR	10. TIME HORIZON: DECISION DEPENDENT
11. DATA COLLECTED FOR BUSINESS ENTITY (OR SEGMENT)	11. DATA FOR SMALLER SEGMENTS (BASED ON CONTROL NEEDS)
12. TRADITIONAL FINANCIAL (MONETARY DATA)	12. MONETARY AND NON-MONETARY DATA
13. USES TRADITIONAL ACCOUNTING PROCEDURES	13. MULTI-DISCIPLINARY APPROACH
14. OVERALL CONTROL	14. ACTIVITY CONTROL

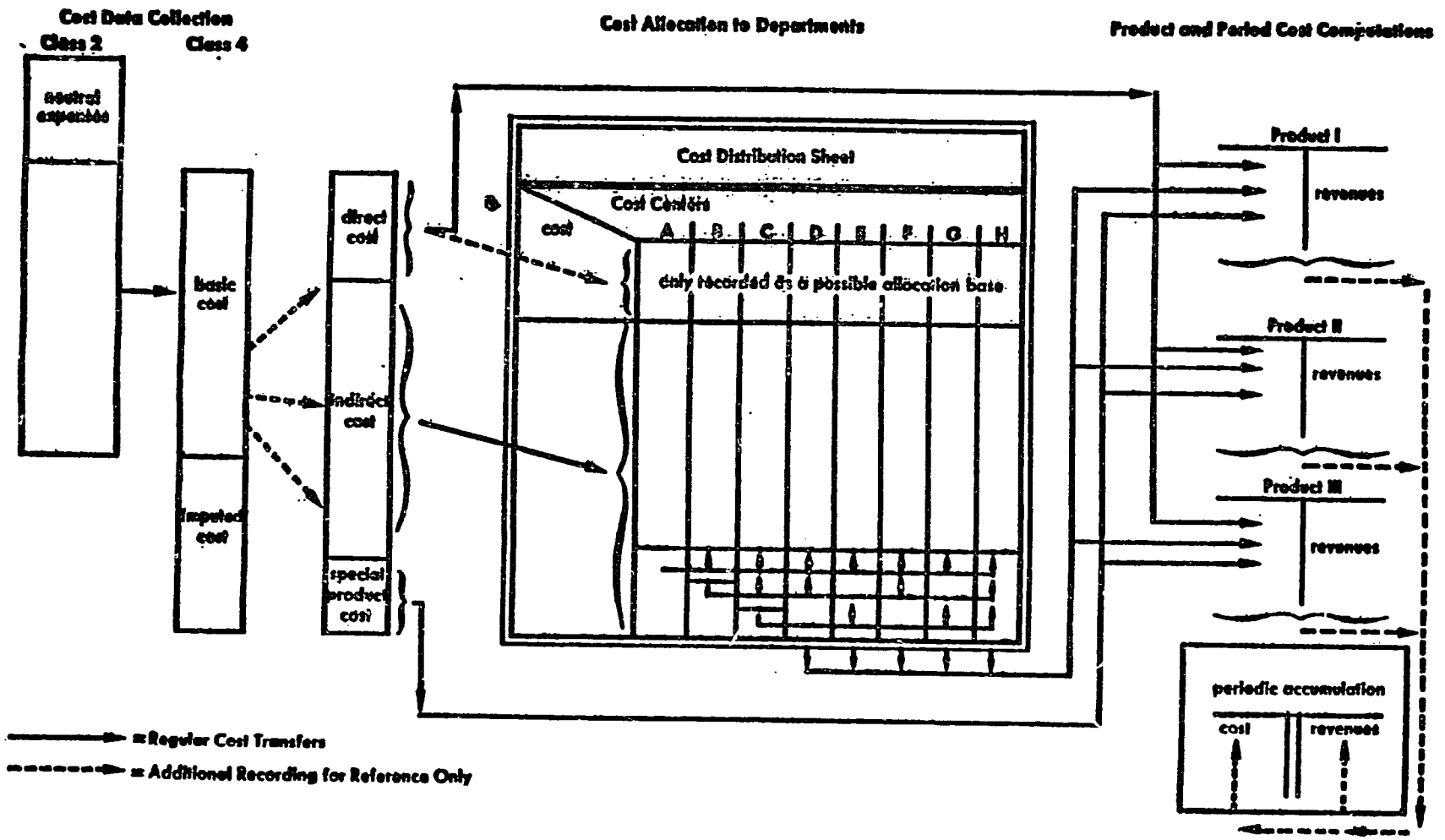


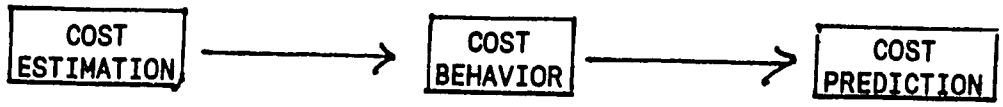
Exhibit 2: Systematic Representation of Costing System.

COST BEHAVIOR AND BREAK-EVEN POINT ANALYSIS

THIRD 1/2 DAY - 10:30 - 12:00

COST BEHAVIOR AND BREAK-EVEN POINT ANALYSIS
AND DETERMINATION OF COST CURVES
THIRD 1/2 DAY - 10:30 -12:00

COST BEHAVIOR:



THE PROCESS OF DETERMINING COST BEHAVIOR. OFTEN FOCUSES ON HISTORICAL DATA

THE RELATIONSHIP BETWEEN COST AND ACTIVITY

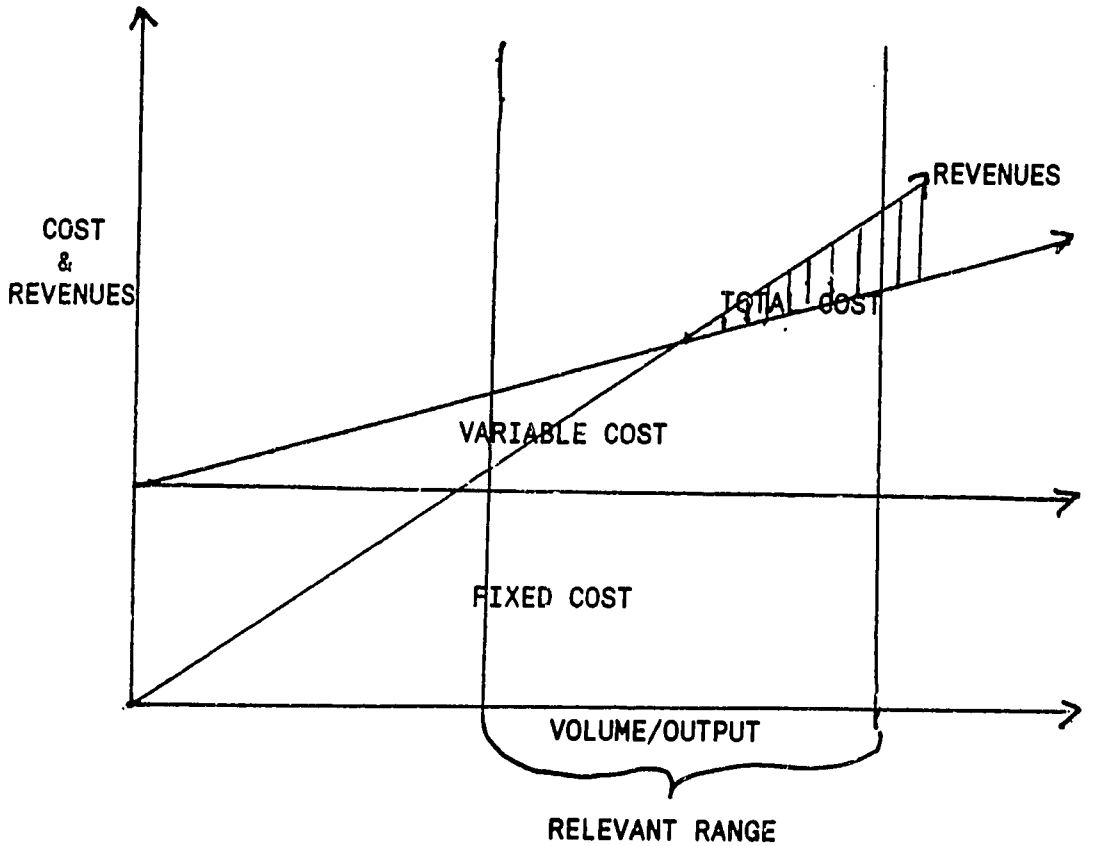
USING KNOWLEDGE OF COST BEHAVIOR TO FORECAST THE LEVEL OF COST AT A PARTICULAR LEVEL OF ACTIVITY. FOCUS IS ON THE FUTURE.

VARIABLE COSTS - COSTS THAT CHANGE IN TOTAL IN DIRECT PROPORTION TO A CHANGE IN ACTIVITY LEVEL.

FIXED COSTS - COSTS THAT REMAIN UNCHANGED IN TOTAL AS THE ACTIVITY LEVEL VARIES.

SEMIVARIABLE COSTS - COSTS THAT HAVE BOTH FIXED AND VARIABLE COMPONENTS. A PORTION OF THE COSTS CHANGE IN TOTAL IN DIRECT PROPORTION TO A CHANGE IN ACTIVITY LEVEL AND A PORTION REMAINS UNCHANGED IN TOTAL AS THE ACTIVITY LEVEL VARIES.

BREAK-EVEN POINT ANALYSIS



BASIC FORMULA:

REVENUES (R) = FIXED COST (FC) + VARIABLE COST (VC) + NET INCOME (NI)

R = SALES PRICE (P) X QUANTITY (X)

TOTAL COST (TC) = FC + VC

P - VC = CONTRIBUTION MARGIN (CM)

(P - VC)(X) = FC + NI AND BREAKEVEN IS WHEN NI = 0

FORMULA WITH INCOME TAXES:

MARGINAL TAX RATE (M)

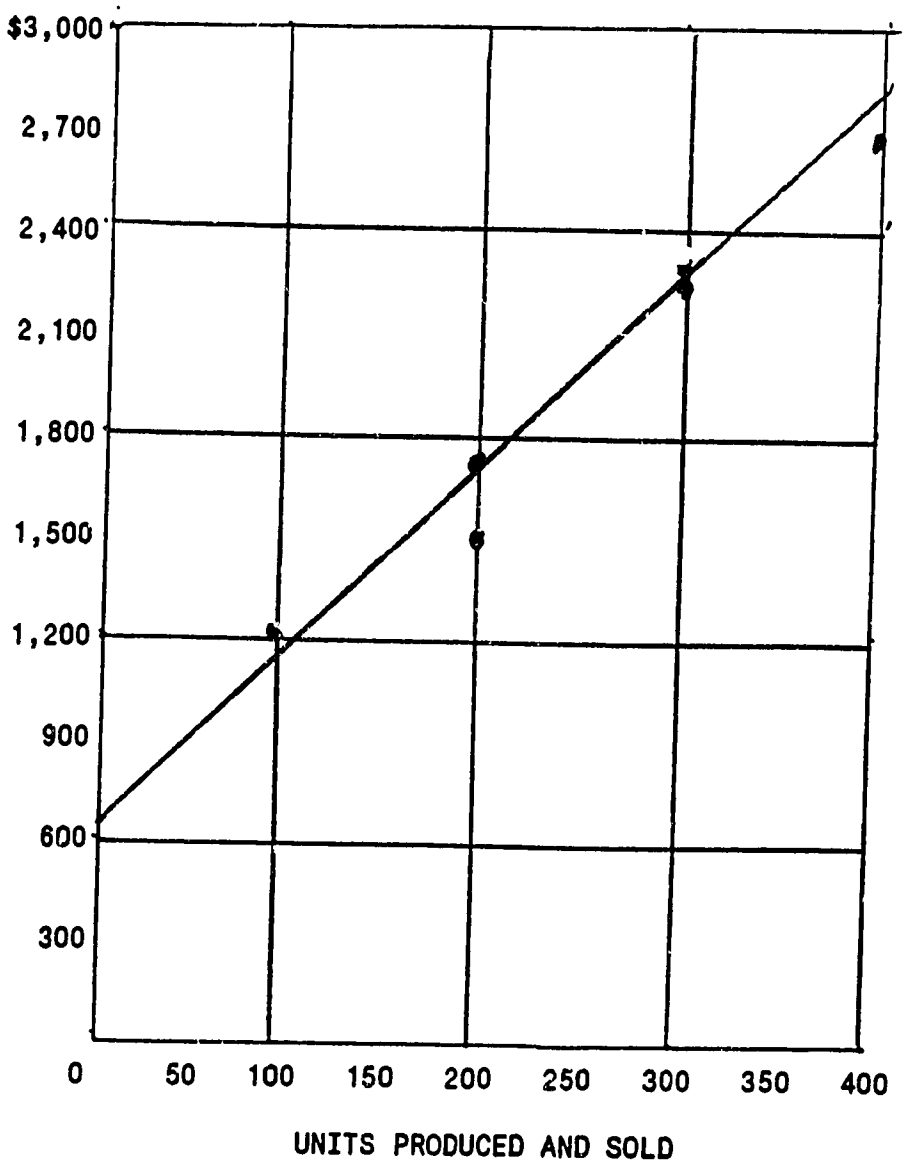
NI = (1-M)[P(X) - VC(X) - FC]

DETERMINATION OF FIXED AND VARIABLE COSTS USING VARIOUS METHODS AND BREAK-EVEN POINT

THE CANDY CO. PRODUCES A CANDY BAR THAT IS ESPECIALLY POPULAR IN EASTERN EUROPE. THE PRODUCT SELLS FOR $10 PER UNIT. THE COMPANY HAS BEEN IN OPERATION FOR 6 MONTHS AND REALIZES THAT THERE IS A PROBLEM IN ESTIMATING OVERHEAD COSTS. THE DATA TO DATE ARE:

MONTH	PRODUCTION	OVERHEAD COST
1	100	$ 1,200
2	200	1,500
3	300	2,250
4	200	1,750
5	300	2,300
6	400	2,700
	1,500	$11,700
	=====	=======

ESTIMATED FIXED AND VARIABLE COSTS USING A SCATTERGRAPH:



NO OUTLYERS - DATA LOOKS REASONABLE

FIXED OVERHEAD APPEARS TO BE APPROXIMATELY $650

TOTAL COST = FC + VC

TEST USING TWO OF THE ACTUAL OUTPUTS:

$1,750 = $650 + VC(200)

200VC = 900

VC = $4.50 PER UNIT

$1,200 = $650 + VC(100)

100VC = $550

VC = $5.50

BASED ON SCATTERGRAPH, VARIABLE COSTS ARE APPROXIMATELY $5.00 PER UNIT AND FIXED COSTS ARE $650.

COST FORMULA USING THE HIGH-LOW METHOD:

	PRODUCTION	OVERHEAD COST
HIGH	400	$2,700
LOW	100	1,200
DIFFERENCE	300	$1,500

VC PER UNIT = CHANGE/UNITS = $1,500/300 = $5.00 PER UNIT

FC = TOTAL COSTS (TC) - VC(X)

FC = $2,700 - 5(VC)

FC = $2,700 - $2,000 = $700

REASONABLY GOOD FIT COMPARED TO SCATTERGRAPH

NOTE - REGRESSION GIVES BEST ANSWER

BREAKEVEN POINT WITH A SALES PRICE OF $10 PER UNIT, FIXED COSTS OF $700 AND VARIABLE COSTS OF $5.00 PER UNIT

($10 - $5)(X) = $700 + $0 $5X = $700 X = 140 UNITS TO BREAK-EVEN

SALES NEEDED TO NET $100 ASSUMING A MARGINAL INCOME TAX RATE OF 40%:

$100 = (1 - .40)[1-(X) - 5(X) - 700}

$100 = (.60)[5(X) - 700]

$100 = 3(X) - 420 3(X) = 520 X = 173 UNITS

100

EXAMPLE USING MULTIPLE PRODUCTS

MANUFACTURER OF STOVES - THREE PRODUCTS:

	GOOD	BETTER	BEST
SALES PRICE	$400	$500	$700
VARIABLE COSTS	$250	$300	$400
CONTRIBUTION MARGIN	$150	$200	$300

TOTAL FIXED COSTS - $600,000

BREAKEVEN:

CM(X) = FC + NI AND NI = $0

$150(X_1) + 200(X_2) + 300(X_3) = 600,000$

"GOOD" BREAKEVEN = 600,000/150CM = 4,000 UNITS
"BETTER" BREAKEVEN = 600,000/200CM = 3,000 UNITS
"BEST" BREAKEVEN = 600,000/300CM = 2,000 UNITS

BREAKEVEN - ASSUME A RATIO OF 1:1:1:

AVERAGE CONTRIBUTION MARGIN = $150 + $200 + $300 = $650/3 = $216.67

216.67(X) = 600,000
X = 2,769 TOTAL UNITS = 923 UNITS OF EACH

BREAKEVEN - ASSUME A RATIO OF 3:5:2:

AVERAGE CONTRIBUTION MARGIN = $450 + $1,000 + $600 = $2,050/10 = $205

205.00(X) = $600,000
X = 2,927 TOTAL UNITS

GOOD	- .30(2,927) =	878 UNITS X $150 =	$131,700
BETTER	- .50(2,927) =	1,464 UNITS X $200 =	292,800
BEST	- .20(2,927) =	585 UNITS X $300 =	175,500
TOTAL CONTRIBUTION MARGIN			$600,000
TOTAL FIXED COSTS			600,000
NET INCOME			$ 0

Budapest

MUCIA/AID PROJECT

MANAGEMENT TRAINING AND ECONOMICS EDUCATION IN CENTRAL AND EASTERN EUROPE

ACCOUNTING MODULE 1993

FOURTH 1/2 DAY	TOPICS
8:30 - 10:00	4. Traditional Cost Accounting Concepts a) process costing b) job costing c) standard cost
10:15 - 11:45	5. Cost Allocation and Reallocation a) Cost allocation to departments b) Cost reallocation between Departments c) Difficult to allocate common and joint cost

LEARNING GOAL OF FOURTH 1/2 DAY: To become familiar with traditional costing procedures. This is necessary to develop a reliable costing system, understand its pitfalls and to be able to make adjustments when needed.

TRADITIONAL COST ACCOUNTING CONCEPTS

PROCESS COSTING:

A PRODUCT-COSTING SYSTEM IN WHICH PRODUCTION COSTS ARE AVERAGED OVER A LARGE NUMBER OF PRODUCT UNITS. USED BY FIRMS THAT PRODUCE LARGE NUMBERS OF NEARLY IDENTICAL PRODUCTS. TYPICAL INDUSTRIES WOULD BE ASPIRIN MANUFACTURING, BREWERIES, LUMBER, TEXTILES, SHOES, CLOTHING, ETC..

THERE ARE FIVE MAJOR STEPS OM ACCOUNTING FOR PROCESS COSTS:

1. SUMMARIZE THE FLOW OF THE PHYSICAL UNITS
2. COMPUTE THE OUTPUT IN TERMS OF EQUIVALENT UNITS
3. SUMMARIZE THE TOTAL COSTS TO ACCOUNT FOR
4. COMPUTE UNIT COSTS
5. APPLY TOTAL COSTS TO UNITS IN ENDIN' 'ORK-IN-PROCESS (WIP) AND TO UNITS COMPLETED

EQUIVALENT UNITS - A PHYSICAL MEASURE OF DEPARTMENTAL WORK ACCOMPLISHED IN A COST CATEGORY OVER A SPECIFIED PERIOD OF TIME WHERE THE UNIT OF MEASURE IS "COMPLETED" UNITS OF PRODUCT.

SEE ENCLOSED FOR POSSIBLE FORMAT FOR ALLOCATING COSTS AND DETERMINING ENDING WORK-IN-PROCESS (WIP) INVENTORY

JOB-ORDER COSTING SYSTEM:

A PRODUCT-COSTING SYSTEM IN WHICH COSTS ARE ASSIGNED TO BATCHES OR JOB ORDERS OF PRODUCTION. USED BY FIRMS THAT PRODUCE RELATIVELY SMALL NUMBERS OF DISSIMILAR PRODUCTS. TYPICAL JOB COSTING SITUATIONS WOULD BE AUTO REPAIR SHOPS, PRINTING SHOPS, SERVICE FIRMS SUCH AS LAWYERS, COST-PLUS CONTRACTS, ETC..

FLOW OF COSTS - SEE DIAGRAM

STANDARD COSTS:

A STANDARD COST IS A PER-UNIT COST THAT A COMPANY SHOULD INCUR TO MAKE A UNIT OF PRODUCT. COMPANIES USE STANDARD COSTS FOR MATERIALS, DIRECT LABOR AND VARIABLE OVERHEAD. A STANDARD FIXED COST PER UNIT CAN BE USED AND THE PREDETERMINED OVERHEAD RATE IS OFTEN BASED TWO THINGS (1) THE CHOICE OF MEASURE OF ACTIVITY (NUMBER OF LABOR HOURS, MACHINE HOURS, ETC.) AND (2) A LEVEL OF ACTIVITY. THE ACTIVITY COULD BE BUDGETED ACTIVITY, NORMAL CAPACITY OR PRACTICAL CAPACITY.

ADVANTAGES OF STANDARD COSTING:

1. STANDARD COSTS ENABLE THE MANAGERIAL ACCOUNTANT TO COMPUTE THE STANDARD ALLOWABLE COST, GIVEN ACTUAL OUTPUT, WHICH SERVES AS A SENSIBLE BENCHMARK TO COMPARE WITH ACTUAL COST.
2. ENABLES MANAGERS TO EMPLOY "MANAGEMENT BY EXCEPTION".
3. STANDARD COSTS CAN BE USED FOR PERFORMANCE EVALUATION AND FOR MOTIVATING EMPLOYEES.
4. IF USED PROPERLY, RESULTS IN A MORE STABLE PRODUCT COST.
5. A STANDARD COSTING SYSTEM IS USUALLY LESS EXPENSIVE TO OPERATE.

104

BASIC DATA FOR JOB PROCESS COSTING ILLUSTRATION

WORK-IN-PROCESS BEGINNING:	
UNITS	20,000
	======
DIRECT MATERIAL - 100% COMPLETE	$50,000
CONVERSION COSTS - 10% COMPLETE	7,200
TOTAL BEGINNING WORK-IN-PROCESS	$57,200
	=======
UNITS STARTED DURING MONTH	30,000
UNITS COMPLETED DURING MONTH AND TRANSFERRED OUT	40,000
WORK-IN-PROCESS ENDING:	
UNITS	10,000
	======
DIRECT MATERIAL	100% COMPLETE
CONVERSION COSTS	50% COMPLETE
COSTS INCURRED DURING MONTH:	
DIRECT MATERIAL	$ 90,000
CONVERSION COSTS:	========
DIRECT LABOR	$ 86.000
APPLIED MANUFACTURING OVERHEAD	107,500
TOTAL CONVERSION COSTS	$193,500
	========

JOB PROCESS COSTING

	(STEP 1) PHYSICAL UNITS	<----------(STEP 2)----------> DIRECT MATERIAL	DIRECT LABOR (CONVERSION COSTS)	OVERHEAD (CONVERSION COSTS)
QUANTITY TO ACCOUNT FOR:				
WIP BEG. (100%)	20,000			
STARTED OR TRANSFERRED IN	30,000			
TOTAL	50,000			
ACCOUNTED FOR AS FOLLOWS:				
COMPLETED TRANSFERED OUT DURING PERIOD	40,000	40,000	40,000	40,000
WIP END (100%)	10,000	10,000	5,000	5,000
	50,000			
WORK DONE TO DATE		50,000	45,000	45,000
LESS EQUIV UNITS FOR WORK DONE ON BEGINNING INVENTORY IN PREVIOUS PERIODS		(20,000)	(2,000)	(2,000)
WORK DONE DURING CURRENT PERIOD ONLY		30,000	43,000	43,000

	<------(STEP 3)--------> TOTAL COSTS	/ EQUIV. UNITS	= (STEP 4) UNIT COSTS
COSTS TO ACCOUNT FOR:			
DIRECT MATERIAL:			
BEGINNING INVENTORY	$ 50,000	20,000	$2.50
CURRENT PERIOD PURCHASES	90,000	30,000	3.00
TOTAL MATERIALS AVAILABLE	$ 140,000	50,000	$ 2.80
CONVERSION COSTS:			
BEGINNING INVENTORY	$ 7200	2,000	$ 3.60
CURRENT PERIOD EXPENSES	193,500	43,000	4.50
TOTAL CONVERSION COSTS AVAILABLE	$ 200,700	45,000	$ 4.46
TOTAL COSTS	$ 340,700		

(STEP 5)

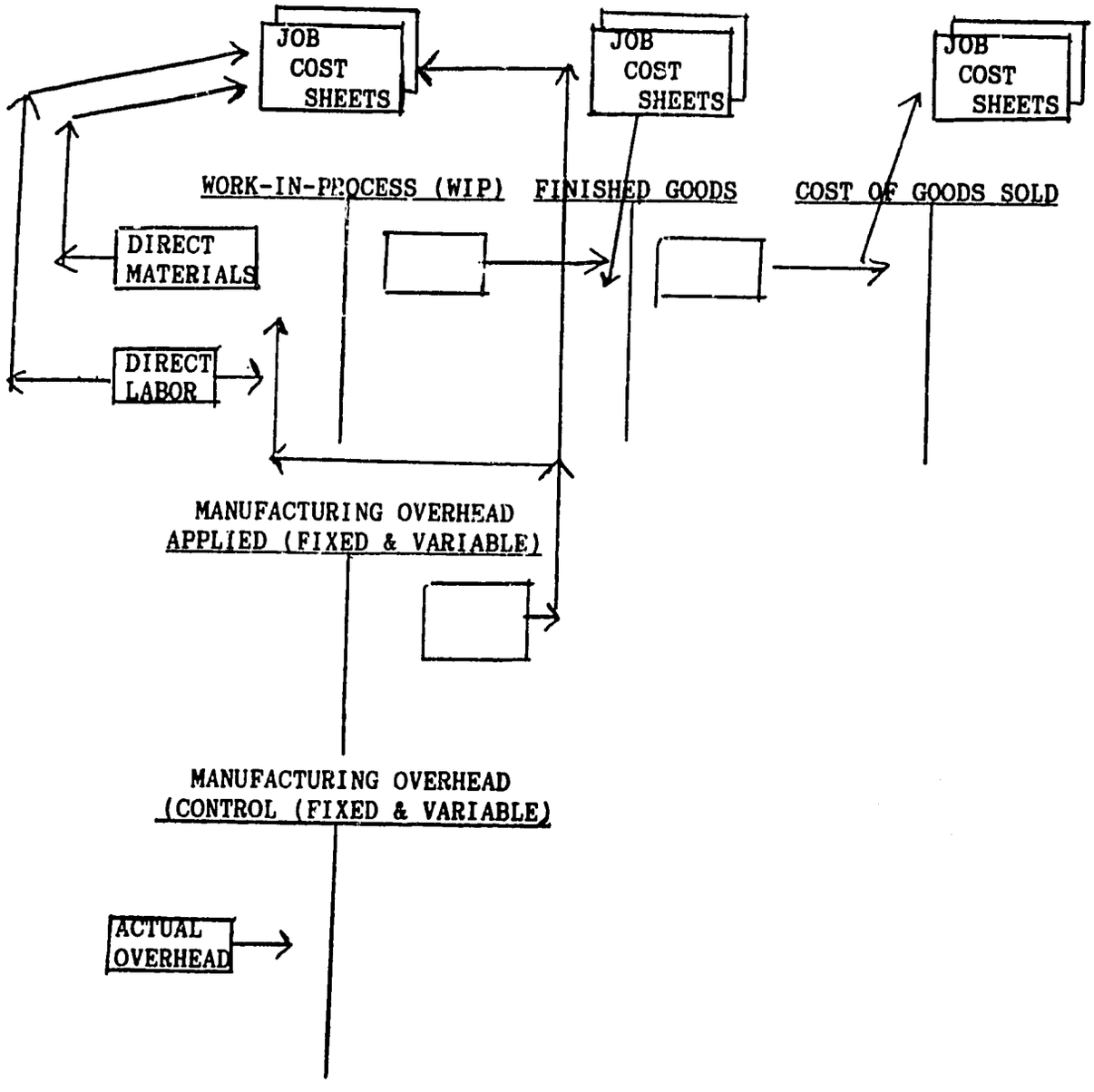
TOTAL COSTS TO UNITS IN WORK-IN-PROCESS AND TO UNITS COMPLETED:

ENDING WORK-IN-PROCESS:		
DIRECT MATERIALS	$28,000	($2.80 x10,000)
CONVERSION COSTS	22,300	($4.46 x 5,000)
TOTAL TO ENDING WORK-IN-PROCESS	$ 50,300	
TRANSFERRED OUT - TOTAL COSTS LESS ENDING WIP	$ 290,400	

(USED WEIGHTED-AVERAGE METHOD)

156

JOB ORDER COST SYSTEM
DIAGRAM OF KEY PRODUCT COST ACCOUNTS



107

JOB COSTING ILLUSTRATION

"THE PRINT SHOP" RECEIVED AND ORDER FOR 500 WEDDING ANNOUNCEMENTS WITH ENVELOPES. THEY QUOTED A PRICE FOR THE JOB OF $275.

THEY ALLOCATE OVERHEAD AS FOLLOWS:
ENGRAVING DEPARTMENT - $6.00 FOR EACH HOUR OF DIRECT LABOR
PRINTING DEPARTMENT - $25.00 FOR EACH HOUR OF DIRECT LABOR

THE JOB SHEET CONTAINED THE FOLLOWING INFORMATION AFTER THE JOB WAS COMPLETED:

	MATERIALS	LABOR	OVERHEAD
ENGRAVING DEPARTMENT:			
1 PLATE @ $78.00	$ 78.00		
2 HOURS @ $8.00 PER HOUR		$16.00	
2 HOURS @ ^.00			$12.00
PRINTING DEPARTMENT:			
1 POUND HIGH GLOSS INK	20.00		
1/2 REAM PAPER	7.00		
1/2 HOUR @ $10.00		5.00	
1/2 HOUR @ $25.00			12.50
STOCK SUPPLIES:			
ENVELOPES	30.00		
TOTALS	$135.00	$21.00	$24.50

SALES PRICE	$275.00
TOTAL COSTS ABOVE	180.50
	$ 94.50

108

PROBLEM USING STANDARD COSTS
WOODEN CRATE MANUFACTURING

	STANDARD QUANTITY	STANDARD PRICE	STANDARD COST
MATERIALS	20 FEET	$0.10	$2.00
DIRECT LABOR	1/2 HOUR	$6.00	3.00
VARIABLE OVERHEAD	1/2 HOUR	$2.00	1.00
TOTAL STANDARD VARIABLE COST PER CRATE			$6.00

ACTUAL RESULTS:

CRATES PRODUCED	1,000
MATERIALS PURCHASED (23,000 FEET)	$2,415
DIRECT LABOR (480 HOURS AT $6.10)	$2,928
VARIABLE OVERHEAD INCURRED	$ 980
TOTAL ACTUAL COSTS	$6,323

STANDARD COSTS APPLIED:

MATERIAL COSTS APPLIED - 1,000 X $2.00	$2,000
DIRECT LABOR COSTS APPLIED - 1,000 X $3.00	$3,000
VARIABLE OVERHEAD COSTS APPLIED - 1,000 X $1.00	$1,000
TOTAL COSTS APPLIED	$6,000

ANALYSIS OF VARIANCES:

MATERIALS:

PRICE VARIANCE = ACTUAL QUANTITY X (STANDARD PRICE - ACTUAL PRICE)
= 23,000 FEET X ($.100 - $.105)
($115) = 23,000 FEET X ($.005)

USE VARIANCE = STANDARD PRICE X (STANDARD QUANTITY - ACTUAL QUANTITY)
= $.10 X (20,000 - 23,000)
($300) = $.10 X (3,000)

TOTAL MATERIAL VARIANCE - $415 UNFAVORABLE

101

LABOR:

PRICE VARIANCE = ACTUAL QUANTITY X (STANDARD PRICE - ACTUAL PRICE)

= 480 HOURS X ($6.00 - $6.10)

($48) = 480 HOURS X ($.10)

USE VARIANCE = STANDARD PRICE X (STANDARD QUANTITY - ACTUAL QUANTITY)

= $6.00 X (500 - 480)

$120 = $6.00 X 20

TOTAL LABOR VARIANCE - $72 FAVORABLE

VARIABLE OVERHEAD:

SPENDING VARIANCE = (ACTUAL LABOR HOURS X ACTUAL RATE) - (ACUTAL LABOR HOURS X STANDARD RATE)

= (480 X $2.042) - (480 - $2.00)

($20) = $980 - $960

EFFICIENCY VARIANCE = (ACTUAL LABOR HOURS X STANDARD RATE) - (STANDARD LABOR HOURS X STANDARD RATE)

= (480 X $2.00) - (500 X $2.00)

$40 = $960 - $1,000

TOTAL VARIABLE OVERHEAD VARIANCE - $20 FAVORABLE

110

Cost Allocation Methods:

Purpose: Allocate all tracable coststo dependents (causation principle).

Methods: Direct Method

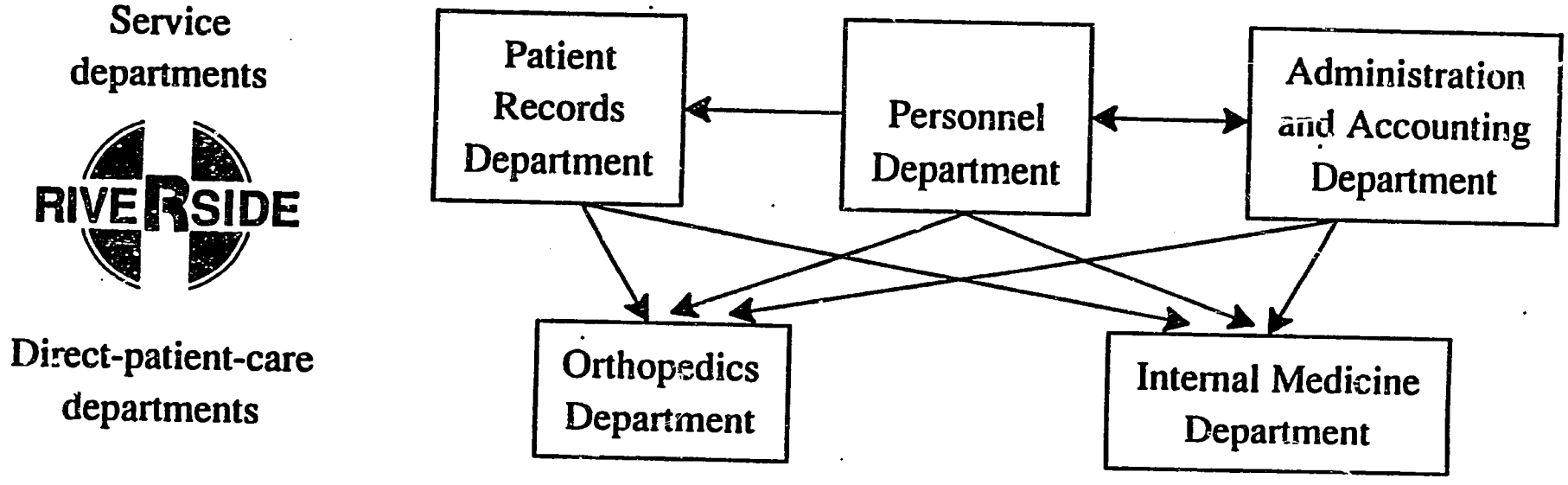
Step-Down Method

Dual Allocation Method

Reciprocal-Services Method

SERVICE DEPARTMENTS AND PRODUCING DEPARTMENTS

Exhibit 17-1. Organization Chart for Riverside Clinic*



* The arrows in the organization chart depict the provision of service by the three service departments. For example, the Personnel Department serves the Patient Records Department, but not vice versa.

Exhibit 17-5. Provision of Services by Service Departments: Longrun Average Usage, Riverside Clinic

User of Service		Provider of Service: Patient Records	Personnel	Administration and Accounting
Service departments	Patient Records	—	10%	—
	Personnel	—	—	10%
	Administration and Accounting	—	10%	—
Direct-patient-care departments	Orthopedics	40%	20%	45%
	Internal Medicine	60%	60%	45%

Exhibit 17-2. Provision of Services by Service Departments in 19x1: Riverside Clinic

User of Service		Provider of Service: Patient Records	Personnel	Administration and Accounting
Service departments	Patient Records	—	5%	–
	Personnel	—	—	9%
	Administration and Accounting	—	20%	–
Direct-patient-care departments	Orthopedics	30%	25%	35%
	Internal Medicine	70%	50%	60%

(A) Percentage of Service Output Consumed by Using Departments

Service Department	Allocation Bases
Patient Records	Annual patient loads
Personnel	Number of employees
Administration and Accounting	Size of department (measured in square feet of space)

(B) Allocation Bases

Service Department	Variable Cost	Fixed Cost	Total Cost to Be Allocated
Patient Records	$24.000	$ 76.000	$100.000
Personnel	15.000	45.000	60.000
Administration and Accounting	47.500	142.500	190.000
Total	$86.500	$263.500	$350.000

(C) Service-Department Costs

Exhibit 17-3. Direct Method of Service-Department Cost Allocation: Riverside Clinic

Provider of Service	Cost to Be Allocated	Direct-Patient-Care Departments Using Services: Orthopedics Proportion	Orthopedics Amount	Internal Medicine Proportion	Internal Medicine Amount
Patient Records	$100,000	3/10	$ 30,000	7/10	$ 70,000
Personnel	60,000	25/75	20,000	50/75	40,000
Administration and Accounting	190,000	35/95	70,000	60/95	120,000
Total	$350,000		120,000		230,000
			Grand total = $350,000		

Exhibit 17-4. Step-Down Method of Service-Department Cost Allocation: Riverside Clinic

	Service Departments: Personnel	Administration and Accounting	Patient Records	Direct-Patient-Care Departments: Orthopedics	Internal Medicine
Costs prior to allocation	$60,000	$190,000	$100,000		
Allocation of Personnel Department costs	$60,000 →	12,000 (20/100)†	3,000 (5/100)	$ 15,000 (25/100)	$ 30,000 (50/100)
Allocation of Administrative and Accounting Department costs		$202,000 →		74,421* (35/95)	127,579* (60/95)
Allocation of Patient Records Department costs			$103,000 →	30,900 (30/100)	72,100 (70/100)
Total cost allocated to each department				$120,321	$229,679
Total cost allocated to direct-patient-care departments				$350,000	

* Rounded.

† Fractions in parentheses are relative proportions of service department's output consumed by departments to which costs are allocated.

Exhibit 17-6. Dual Allocation Combined With Direct Method: Riverside Clinic

I. Variable Costs

Provider of Service	Cost to be Allocated	Direct-Patient-Care Departments Using Services: Orthopedics Proportion	Orthopedics Amount	Internal Medicine Proportion	Internal Medicine Amount
Patient Records	$ 24,000	3/10	$ 7,200	7/10	$ 16,800
Personnel	15,000	25/75	5,000	50/75	10,000
Administration and Accounting	47,500	35/95	17,500	60/95	30,000
Total variable cost	$ 86,500		$ 29,700		$ 56,800
II. Fixed Costs					
Patient Records	$ 76,000	4/10	$ 30,400	6/10	$ 45,600
Personnel	45,000	20/80	11,250	60/80	33,750
Administration and Accounting	142,500	45/90	71,250	45/90	71,250
Total fixed cost	$263,500		$112,900		$150,600
Total cost (variable + fixed)	$350,000		$142,600		$207,400
			Grand total =		$350,000

Exhibit 17-10. Reciprocal-Services Method of Service Department Cost Allocation: Riverside Clinic

	Service Departments			Direct-Patient Care Departments	
	Personnel	Administration and Accounting	Patient Records	Orthopedics	Internal Medicine
Traceable costs	$60,000	$190,000	$100,000		
Allocation of Personnel Department costs	(70,202)	14,040* (.20)	3,510* (.05)	$17,551* (.25)	$ 35,101 (.50)
Allocation of Administrative and Accounting Department costs	10,202 (.05)†	(204,040)	–0– (0)	71,414 (.35)	122,424 (.60)
Allocation of Patient Records Department costs	–0– (0)	–0– (0)	(103,510)	31,053(.30)	72,457 (.70)
Total cost allocated to each direct-patient-care department				$120,018	$229,982
Total costs allocated				$350,000	

*Rounded.

†Percentages in parentheses are relative proportions of a service department's output consumed by departments to which costs are allocated (from Exhibit 17-2, panel A).

$$R = 100.000 + .05\,P$$
$$P = 60.000 + .05\,A$$
$$A = 190.000 + .20\,P$$

Solution:

$P = 60{,}000 + .05\,(190{,}000 + .20\,P)$
$P = 60{,}000 + 9{,}500 + .01\,P$
$.99\,P = 69{,}500$
$P = 70{,}202$ (rounded)

$A = 190{,}000 + .20\,P$
$A = 190{,}000 + (.20)\,(70{,}202)$
$A = 204{,}040$ (rounded)

$R = 100{,}000 + .05\,P$
$R = 100{,}000 + (.05)(70{,}202)$
$R = 103{,}510$ (rounded)

Exhibit 17-8. Joint Processing of Cocoa Beans: International Chocolate Company

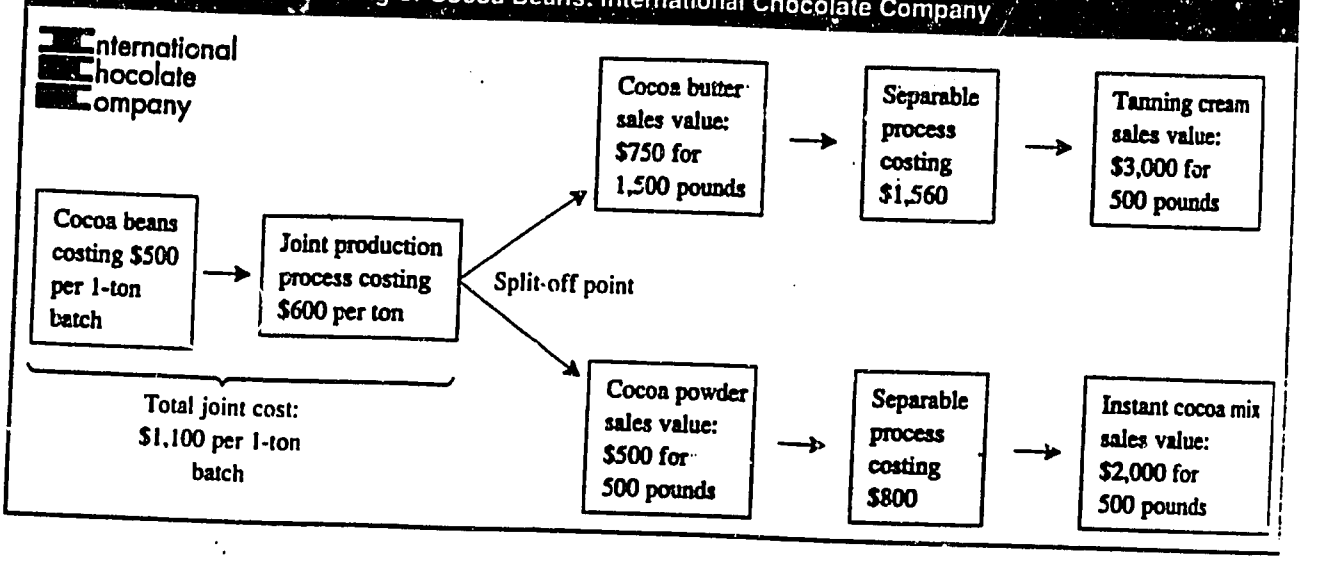


Exhibit 17-9. Methods for Allocating Joint Product Costs:

Joint Cost	Joint Products	Weight at Split-off Point	Relative Proportion	Allocation of Joint Cost
$1,100	Cocoa butter	1,500 pounds	3/4	$ 825
	Cocoa powder	500 pounds	1/4	275
	Total joint cost allocated			$1,100

(A) Physical-Units Method

Joint Cost	Joint Products	Sales Value at Split-off Point	Relative Proportion	Allocation of Joint Cost
$1,100	Cocoa butter	$750	3/5	$ 660
	Cocoa powder	500	2/5	440
	Total joint cost allocated			$1,100

(B) Relative-Sales-Value Method

Joint Cost	Joint Products	Sales Value of Final Product	Separable Cost of Processing	Net Realizable Value	Relative Proportion	Allocation of Joint Cost
$1,100	Tanning cream	$3,000	$1,560	$1,440*	6/11	$ 600
	Instant cocoa mix	2,000	800	1,200*	5/11	500
	Total joint cost allocated					$1,100

(C) Net-Realizable-Value Method

*Sales value of final product	-	separable cost of processing	=	net realizable value
$3,000	-	$1,560	=	$1,440
2,000	-	800	=	1,200

International Chocolate Company

Budapest

MUCIA/AID PROJECT

MANAGEMENT TRAINING AND ECONOMICS EDUCATION IN CENTRAL AND EASTERN EUROPE

ACCOUNTING MODULE 1993

FIFTH 1/2 DAY	TOPICS
13:30 - 15:00	2. Usefulness of Management Accounting for decision-making a) Absorption Costing and Direct Costing - the two most important approaches to arrange cost data b) Using relevant cost for special decision (e.g., equipment replacement, make or buy)
15:15 - 16:45	3. New Developments in Cost Accounting a) Activity Costing and its role in highly competitive markets b) The fixed cost problem and its importance for the company (development of new costing approaches such as life cycle costing and strategic costing; distinguish between value-adding and non-value adding activities; understand value-chain concept)

LEARNING GOAL OF FIFTH 1/2 DAY: To understand various current approaches to select appropriate cost for decision making and to understand how changes in technology and market forces will influence cost selection for long and short term decisions.

USEFULNESS OF MANAGEMENT ACCOUNTING FOR
DECISION MAKING
FIFTH 1/2 DAY - 8:30 -10:00

ABSORPTION COSTING AND DIRECT COSTING
SPECIAL DECISIONS

Absorption Costing and Direct Costing:

Absorption Costing (Full Costing):
Absorption costing - Complies with Generally Accepted Accounting Principles which requires that the unit cost of manufactured goods include all direct and indirect manufacturing costs, both fixed and variable. The inventory costs can be determined using either Actual Costs, Normal Costs, or Standard Costs.

Direct Costing (Variable Costing):
Only the direct costs included in the manufacturing of a product are used in determining the inventory value of the unsold units. Fixed costs are expensed as incurred. The inventory costs can be determined using either Actual Costs, Normal Costs, or Standard Costs. The concept stresses that the lump-sum amount of all fixed costs must be recouped before any net income emerges.

Special Decisions:

Relevant costs are future costs that differ across alternatives. All decisions relate to the future; accordingly, only future costs can be relevant to decisions.
Make or buy decisions - At any given time, an organization performs certain activities with its own resources, and it pays outside firms to perform certain other activities. It should constantly seek to improve the balance between these two types of activities by asking: Should we contract with some outside party to perform some function that we are now performing ourselves, or should we ourselves perform some function that we now pay an outside party to do?

Capital budgeting is concerned with the acquisition of long-term assets and usually involves the significant outlay of funds. Because capital budgeting decisions place large amounts of resources at risk for long periods of time and simultaneously impact the future development of the firm, they are among the most important decisions managers make.
Various methods are used in comparing the financial viability of various projects that are competing for the same funds.

HANDOUT
ABSORPTION VS. DIRECT COSTING

ASSUMPTIONS:

Beginning inventory, period 1	0 units
Production volume	100 units per period
Sales volume, period 1	80 units @ $50
Sales volume, period 2	120 units @ $50
Standard variable costs:	
Prime costs (Sum of Direct Labor and Materials)	$15 per unit
Other variable costs	$5 per unit
Budgeted fixed production overhead	$1,000 per period
Standard full absorption cost:	
Variable - as above	$20 per unit
Fixed $1,000/100 units	$10 per unit
Selling and administrative costs - all fixed	$1,400 per period
Sales price - both periods	$50 per unit

Actual fixed costs for both periods equaled budgeted fixed costs

120

INCOME STATEMENT
PERIOD 1

	Absorption Costing (Unit cost = $)		Variable Costing (Unit cost = $)	
Sales (80 units @ $50)		$_____		$_____
Cost of goods sold:				
Beginning inventory	$_____		$_____	
Cost of goods produced (100 units)	_____		_____	
Available for sale	_____		_____	
Less: Ending inventory (20 units)	_____		_____	
Cost of goods sold (80 units)		_____		_____
Gross margin		$_____		$_____
Less: Period costs:				
Production overhead	$_____		$_____	
Selling and administrative	_____		_____	
Total period costs		_____		_____
Income (Loss)		$ ==========		$ ==========

INCOME STATEMENT
PERIOD 2

	Absorption Costing (Unit cost = $)		Variable Costing (Unit cost = $)	
Sales (120 units @ $50)		$_____		$_____
Cost of goods sold:				
Beginning inventory	$_____		$_____	
Cost of goods produced (100 units)	_____		_____	
Available for sale	_____		_____	
Less: Ending inventory (0 units)	_____		_____	
Cost of goods sold (120 units)		_____		_____
Gross margin		$_____		$_____
Less: Period costs:				
Production overhead	$_____		$_____	
Selling and administrative	_____		_____	
Total period costs		_____		_____
Income (Loss)		$ ==========		$ ==========

121

PROBLEM
MAKE OR BUY DECISION

ASSUMPTIONS:

XYZ Company now makes a major component for its final product. A manager has prepared the following estimates of costs at the expected volume of 20,000 units:

Materials @ $2.00 per unit	$ 40,000
Direct labor @ $5.00 per unit	100,000
Variable overhead @ $3.00 per unit	60,000
Allocated fixed overhead (building depreciation, heat and light, etc.)	120,000
Total costs	$320,000

An outside supplier offers to supply the component at $14.00 per unit, which would be $280,000 for 20,000 units. Should the offer be accepted?

	Relevant Costs for Decision	
	Make	Buy
Materials	$_____	$_____
Direct labor	_____	_____
Variable overhead	_____	_____
Allocated fixed costs	_____	_____
Purchase price	_____	_____
Total	$_____	$_____

PROBLEM
EQUIPMENT REPLACEMENT

ASSUMPTIONS:

XYZ Company now makes a major component for its final product. A manager has prepared the following estimates of costs at the expected volume of 20,000 units:

Materials @ $2.00 per unit	$ 40,000
Direct labor @ $5.00 per unit	100,000
Variable overhead @ $3.00 per unit	60,000
Allocated fixed overhead (building depreciation, heat and light, etc.)	120,000
Total costs	$320,000

They have the opportunity to purchase a piece of equipment that will increase their capacity to 30,000 units, will reduce the Direct Labor to $1.00 per unit and the Variable Overhead to $.50 per unit. If the new equipment is purchased, Allocated Fixed Overhead will increase to $240,000, which amount includes the depreciation on the new equipment and a reasonable return on the amount expended for the new equipment.

Should they acquire the new piece of equipment?

	New Equipment Make
Materials	$_____
Direct labor	_____
Variable overhead	_____
Allocated fixed costs	_____
Purchase price	_____
Total	$

NEW DEVELOPMENTS IN COSTING:

Activity based cost systems (ABC systems)

Why are they needed?

How do these ABC systems work?

Value adding and non-value adding activities

Other measures used for performance control

Exhibit 1. *The Global Competitor (Continuous Flow)*

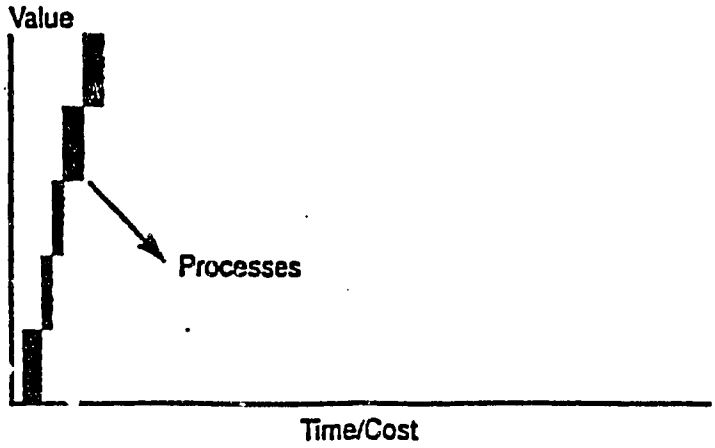


Exhibit 2. *Creating Value Since The 1950s (Uneven Flow)*

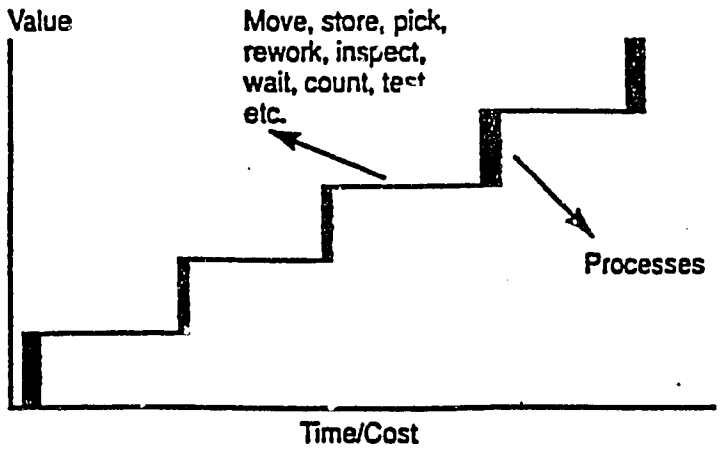


Exhibit 3. *Creating Value Circa 1925 (Nearly Continuous Flow)*

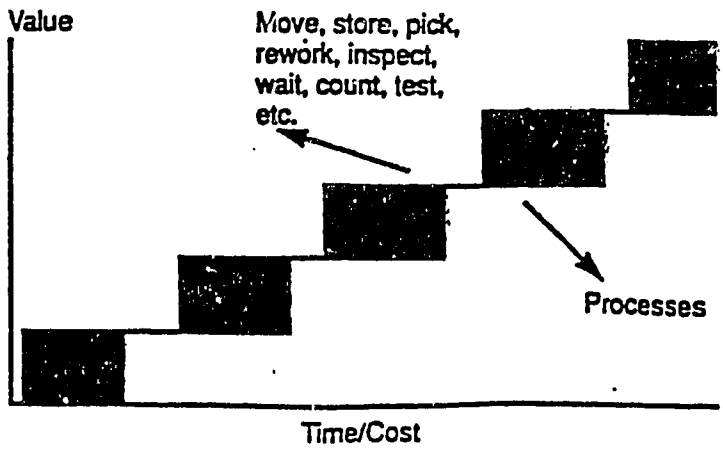
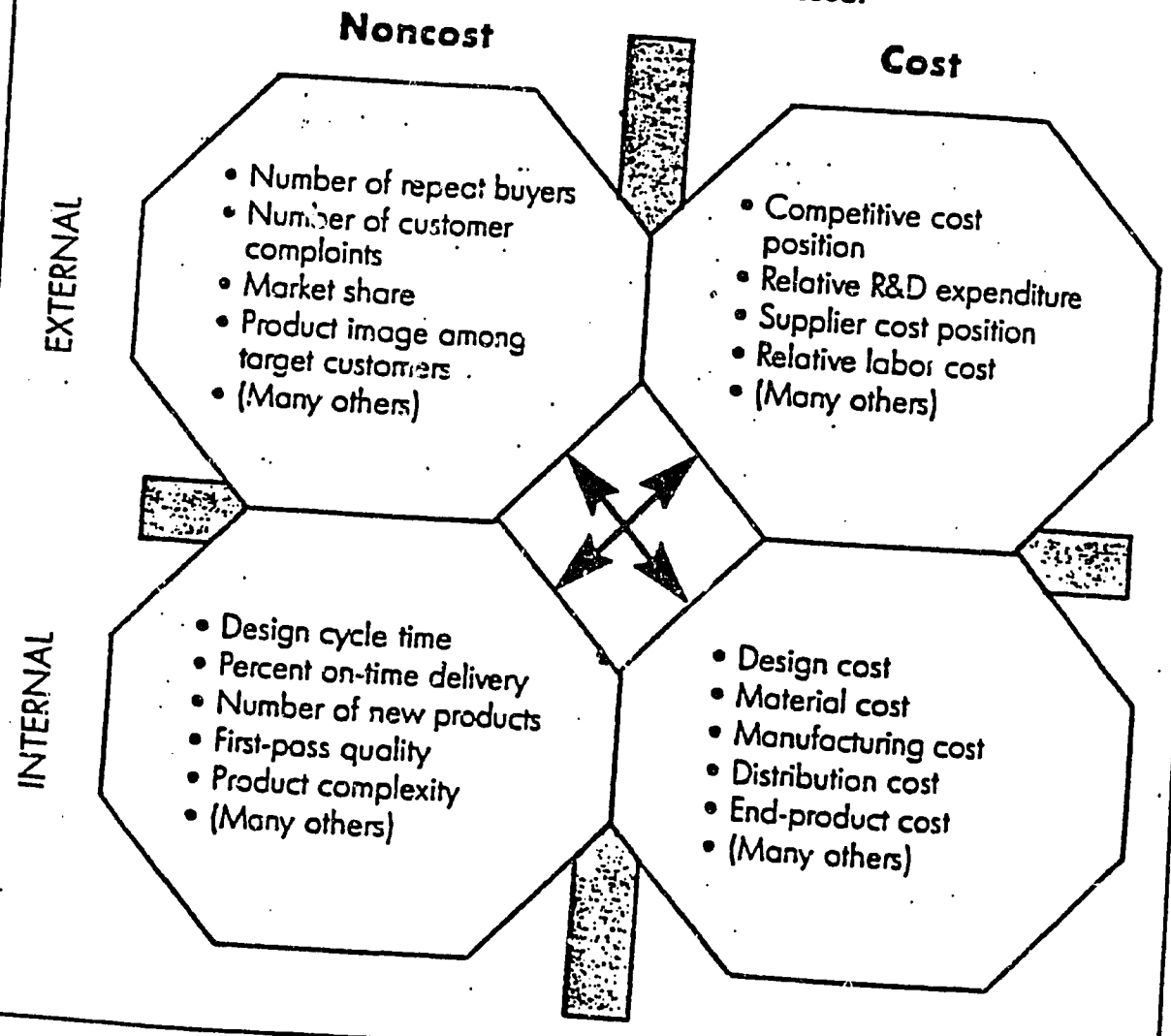


FIGURE 3 / SUPPORTIVE PERFORMANCE MEASURES

Performance Measures Must Support
A Company's Multidimensional Environment

Performance measures can be internal or external; cost-based or noncost-based.



Activity Costing Problem:

The following information is available for costing the four products produced in ARTWELL CO's factory. Assume also that the total conversion cost consist of direct labor and overhead.

Product No.	Number of units produced	Material cost per unit	Direct Labor Hours	Machine hours	Number of setups	Number of part orders
P1	10	$ 6	5	5	1	1
P2	100	$ 6	50	50	3	1
P3	10	$ 18	15	15	1	1
P4	100	$ 18	150	150	3	1
			220	220	8	4
Conversion during period			$ 2,500	$ 3,300	$ 2,200	$ 2,000 =
						= $ 10,000

required:

a. Calculate the unit cost of each product using a volume based overhead allocation.

b. Calculate unit costs using an activity costing appreach.

c. Briefly compare and explain the difference in these unit costs

COST DRIVERS AND PRODUCT-COST DISTORTION

Edgeworth Box Corporation manufactures a variety of special packaging boxes used in the pharmaceutical industry. The company's Dallas plant is semiautomated, but the special nature of the boxes requires some manual labor. The controller has chosen the following cost drivers and overhead rates for the Dallas plant's product-costing system.

Overhead Cost Pool	Overhead Cost	Cost Driver	Budgeted Level for Cost Driver	Predetermined Overhead Rate
Purchasing, storage, and material handling	$200,000	Raw-material costs	$1,000,000	20% of material cost
Engineering and product design	100,000	Hours in design department	5,000 hours	$20 per hour
Machine setup costs	70,000	Production runs	1,000 runs	$70 per run
Machine depreciation and maintenance	300,000	Machine hours	100,000 hours	$3 per hour
Factory depreciation, taxes, insurance, and utilities	200,000	Machine hours	100,000 hours	$2 per hour
Other manufacturing overhead costs	150,000	Machine hours	100,000 hours	$1.50 per hour
Total	$1,020,000			

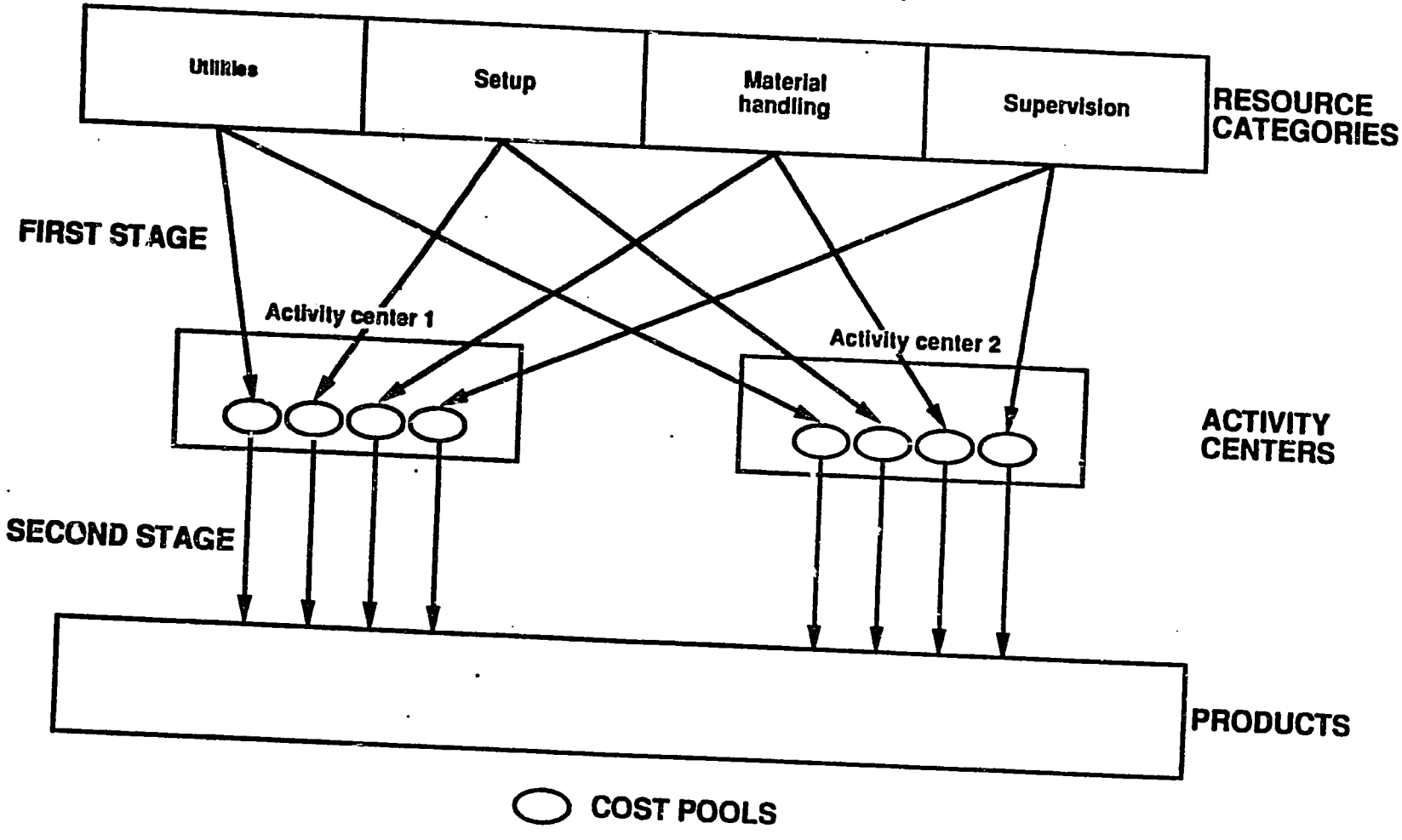
Two recent production orders had the following requirements.

	20,000 Units of Box C52	10,000 Units of Box W29
Direct-labor hours	42 hours	21 hours
Raw-material cost	$40,000	$35,000
Hours in design department	10	25
Production runs	2	4
Machine hours	24	20

REQUIRED:

1. Compute the total overhead that should be assigned to each of the two production orders, C52 and W29.
2. Compute the overhead cost per box in each order.
3. Suppose the Dallas plant were to use a single predetermined overhead rate based on direct-labor hours. The direct-labor budget calls for 4,000 hours.
   a. Compute the predetermined overhead rate per direct-labor hour.
   b. Compute the total overhead cost that would be assigned to the order for box C52 and the order for box W29.
   c. Compute the overhead cost per box in each order.
4. Why do the two product-costing systems yield such widely differing overhead costs per box?

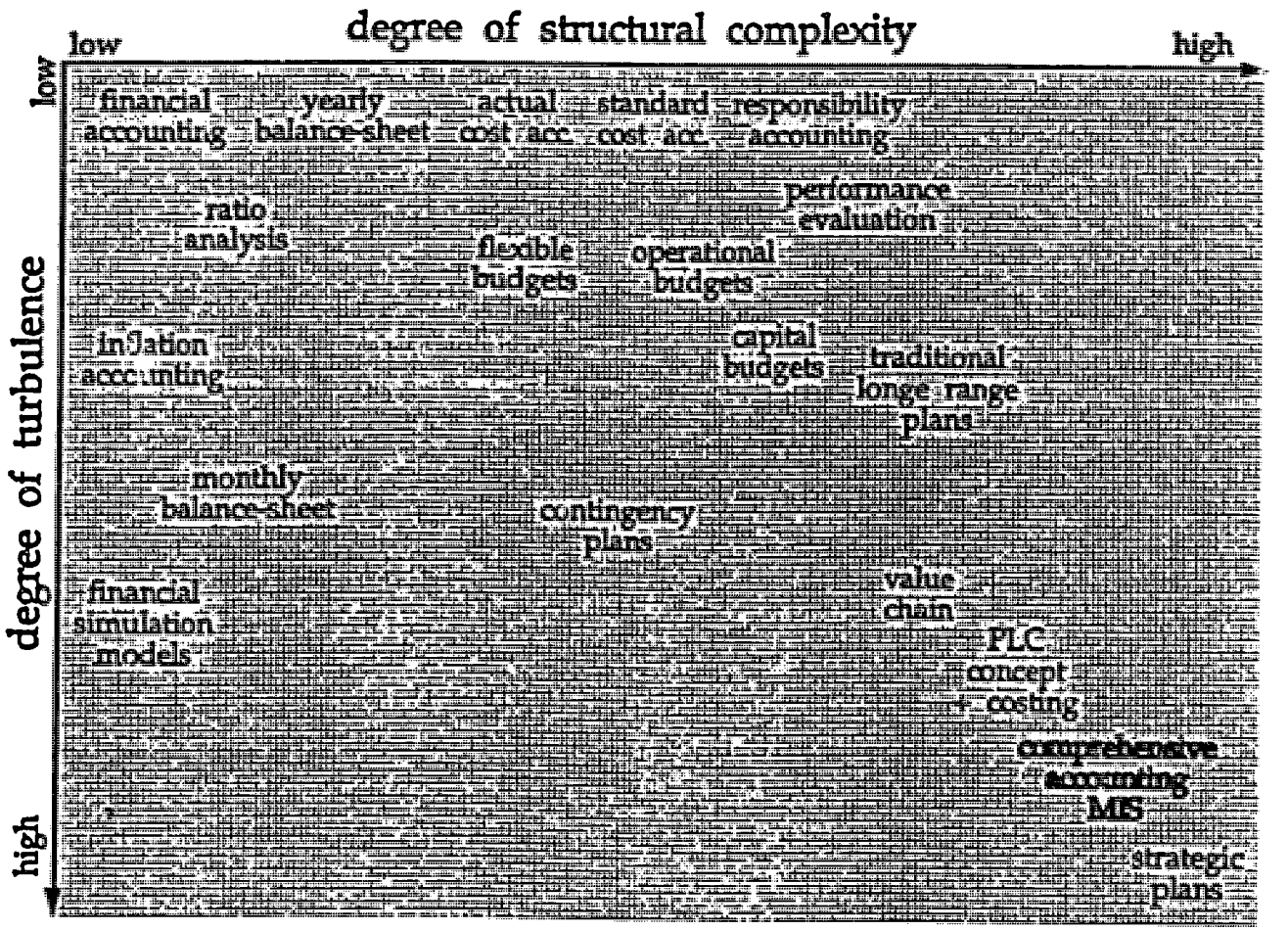
Exhibit 1. *Conceptual model of a typical ABC system*



Life-cycle costing.

Strategic costing.

The Connection among External Turbulence, Structural Complexity, and Control Tools[86.)]



GLOSSARY

A

Absorption costing. The concept that considers the cost of manufactured products to be composed of direct materials, direct labor, and factory overhead.

Accelerated depreciation method. A depreciation method that provides for a high depreciation charge in the first year of use of an asset and gradually declining periodic charges thereafter.

Account. The form used to record additions and deductions for each individual asset, liability, owner's equity, revenue, and expense.

Account form of balance sheet. A balance sheet with assets on the left-hand side and liabilities and owner's equity on the right-hand side.

Accounting. The process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information.

Accounting cycle. The sequence of principle accounting procedures employed to process transactions during a fiscal period.

Accounting equation. The expression of the relationship between assets, liabilities, and owner's equity; most commonly stated as Assets = Liabilities + Owner's Equity.

Accounting system. The system that provides the information for use in conducting the affairs of the business and reporting to owners, creditors, and other interested parties.

Account payable. A liability created by a purchase made on credit.

Account receivable. A claim against a customer for sales made on credit.

Accounts payable ledger. The subsidiary ledger containing the individual accounts with suppliers (creditors).

Accounts receivable ledger. The subsidiary ledger containing the individual accounts with customers (debtors).

Accounts receivable turnover. The relationship between credit sales and accounts receivable, computed by dividing net sales on account by the average net accounts receivable.

Accrual basis. Revenues are recognized in the period earned and expenses are recognized in the period incurred in the process of generating revenues.

Accrued asset (accrued revenue) or accrued liability (accrued expense). An asset (revenue) or a liability (expense) that gradually increases with the passage of time and that is recorded at the end of the accounting period by an adjusting entry.

Accumulated depreciation account. The contra asset account used to accumulate the depreciation recognized to date on plant assets.

Acid-test ratio. The ratio of the sum of cash, receivables, and marketable securities to current liabilities.

Activity-based costing. A cost allocation method that initially assigns costs to activities and then to products.

Adequate disclosure. The concept that financial statements and their accompanying footnotes should contain all of the pertinent data believed essential to the reader's understanding of an enterprise's financial status.

Adjusting entry. An entry required at the end of an accounting period to record an internal transaction and to bring the ledger up to date.

Administrative expense. An expense incurred in the administration or general operations of the business.

Aging the receivables. The process of analyzing the accounts receivable and classifying them according to various age groupings, with the due date being the base point for determining age.

Allowance method. The method of accounting for uncollectible receivables, by which advance provision for the uncollectibles is made.

American Institute of Certified Public Accountants (AICPA). The national professional organization of CPAs.

Amortization. The periodic expense attributed to the decline in usefulness of an intangible asset or the allocation of bond premium or discount over the life of a bond issue.

Annuity. A series of equal cash flows at fixed intervals.

Appropriation of retained earnings. The amount of a corporation's retained earnings that has been restricted and therefore is not available for distribution to shareholders as dividends.

Articles of partnership. The formal written contract creating a partnership.

Asset. Property owned by a business enterprise.

Average cost method. (a) The method of inventory costing for a merchandising enterprise that is based on the assumption that costs should be charged against revenue in accordance with the weighted average unit costs of the commodities sold. (b) A method of determining manufactured products costs in which all costs incurred in manufacturing the goods completed during a period are averaged, and this average is used in determining the unit product cost of the goods completed during the period and the work in process at the end of the period.

Average rate of return. A method of evaluating capital investment proposals that focuses on the expected profitability of the investment.

B

Balance of an account. The amount of difference between the debits and the credits that have been entered into an account

Balance sheet. A financial statement listing the assets, liabilities, and owner's equity of a business entity as of a specific date.

Bank reconciliation. The method of analysis that details the items that are responsible for the difference between the cash balance reported in the bank statement and the balance of the cash account in the ledger.

Betterments. Expenditures that increase operating efficiency or capacity for the remaining useful life of a plant asset.

Bond. A form of interest-bearing note employed by corporations to borrow on a long-term basis.

Bond indenture. The contract between a corporation issuing bonds and the bondholders.

Book value of an asset. The cost of an asset less the balance of any related contra asset account.

Boot. The balance owed the supplier when an old asset is traded for a new asset.

Break-even point. The level of operations of an enterprise at which revenues and expired costs are equal.

Budget. A formal written statement of management's plans for the future, expressed in financial terms.

Budget performance report. A report comparing actual results with budget figures. (

Budgeted cost. Carefully estimated costs which management plans to incur.

Business entity concept. The concept that assumes that accounting applies to individual economic units and that each unit is separate and distinct from the persons who supply its asset.

Business transaction. The occurrence of an event or of a condition that must be recorded in the accounting records.

By-product. A product resulting from a manufacturing process and having little value in relation to the principal product or joint products.

C

Capital. The rights (equity) of the owners in a business enterprise.

Capital expenditure. A cost that adds to the utility of an asset for more than one accounting period.

Capital expenditures budget. The budget summarizing future plans for acquisition of plant facilities and equipment.

Capital investment analysis. The process by which management plans, evaluates, and controls long-term capital investments involving property, plant, and equipment.

Capital lease. A lease which includes one or more of four provision that result in treating the leased asset as a purchased asset in the accounts.

Capital rationing. The process by which management allocates available investment funds among competing capital investment proposals.

Capital stock. Shares of ownership of a corporation.

Carrying amount. The amount at which a temporary or a long-term investment or a long-term liability is reported on the balance sheet; also called basis or book value.

Cash basis. Revenue is recognized in the period cash is received, and expenses are recognized in period cash is paid.

Cash discount. The deduction allowable if an invoice is paid by a specified date.

Cash dividend. A cash distribution of earnings by a corporation to its shareholders.

Cash flows from financing activities. The section of the statement of cash flows in which is reported the transactions involving cash receipts from the issuance of equity and debt securities; and cash payments for dividends, repurchase of equity securities, and redemption of debt securities.

Cash flows from investing activities. The section of the statement of cash flows in which is reported the activities involving cash receipts from the sale of investments, plant assets, and other noncurrent assets; and cash payments for the acquisition of investments, plant assets, and other noncurrent assets.

Cash flows from operating activities. The section of the statement of cash flows in which is reported the cash transactions that entered into the determination of net income.

Cash payback period. The expected period of time that will elapse between the date of a capital expenditure and the complete recovery in cash (or equivalent) of the amount invested.

Cash payments journal. The journal in which all cash payments are recorded.

Cash receipts journal. The journal in which all cash receipts are recorded.

Certified Public Accountant (CPA). An accountant who meets state licensing requirements for engaging in the practice of public accounting as a CPA.

Chart of accounts. A listing of all the accounts used by a business enterprise.

Closing entry. An entry necessary to eliminate the balance of a temporary account in preparation for the following accounting period.

Codes of professional conduct. Standards of conduct established by professional organizations of CPAs to guide CPAs in the conduct of their practices.

Common-size statement. A financial statement in which all items are expressed only in relative terms.

Common stock. The basic ownership class of corporate capital stock.

Completed-contract method. The method that recognizes revenue from long-term construction contracts when the project is completed.

Composite-rate depreciation method. A method of depreciation based on the use of a single rate that applies to entire groups of assets.

Consistency. The concept that assumes that the same generally accepted accounting principles have been applied in the preparation of successive financial statements.

Consolidated statement. A financial statement resulting from combining parent and subsidiary company statements.

Consolidation. The creation of a new corporation by the transfer of assets and liabilities from two or more existing corporations.

Constant dollar. Historical costs that have been converted into dollars of constant value through the use of a price-level index.

Contingent liability. A potential obligation that will materialize only if certain events occur in the future.

Continuous budgeting. A method of budgeting that provides for maintenance of a twelve-month projection into the future.

Contra account. An account that is offset against another account.

Contract rate of interest. The interest rate specified on a bond.

Contribution margin. Sales less variable cost of goods sold and variable selling and administrative expenses.

Contribution margin analysis. The systematic examination of the differences between planned and actual contribution margin.

Contribution margin ratio. The percentage of each sales dollar that is available to cover the fixed expenses and provide an operating income.

Controllable cost. For a specific level of management, a cost that can be directly controlled.

Controller. The chief managerial accountant of an organization.

Controlling. The process by which managers attempt to achieve the goals identified in an enterprise's strategic and operational plans.

Controlling account. The account in the general ledger that summarizes the balances of a subsidiary ledger.

Conversion costs. The combination of direct labor and factory overhead costs.

Corporation. A separate legal entity that is organized in accordance with state or federal statutes and in which ownership is divided into shares of stock.

Cost accounting system. An accounting system which uses the perpetual system of inventory accounting for the three manufacturing inventories: direct materials, work in process, and finished goods.

Cost allocation. The assignment of costs to a cost object.

Cost behavior. The manner in which a cost changes in relation to its activity base.

Cost center. A decentralized unit in which the department or division manager has responsibility for control of costs incurred and the authority to make decisions that affect these costs.

Cost driver. An activity measure overhead cost.

Cost estimation. The method or methods used to estimate costs for use in managerial decision making.

Cost ledger. A subsidiary ledger employed in a job order cost system and which contains an account for each job order.

Cost method. A method of accounting for an investment in stock, by which the investor recognizes as income its share of cash dividends of the investee.

Cost object. The object or segment of operations to which costs are related such as a product or department.

Cost of goods sold. The cost of the manufactured product sold.

Cost of merchandise sold. The cost of the merchandise purchased and sold.

Cost of production report. A report prepared periodically by a processing department, summarizing (1) the units for which the department is accountable and the disposition of these units and (2) the costs charged to the department and the allocation of these costs.

Cost price approach. An approach to transfer pricing that uses cost as the basis for setting the transfer price.

Cost principle. The principle that assumes that the monetary record for properties and services purchased by a business should be maintained in terms of cost.

Costs. The disbursement of cash (or the commitment to pay cash in the future) for the purpose of generating revenues.

Cost-volume-profit analysis. The systematic examination of the interrelationships between selling prices, volume of sales and production, costs, expenses, and profits.

Cost-volume-profit chart. A chart used to assist management in understanding the relationships between costs, expenses, sales, and operating profit or loss.

Credit. (1) The right side of an account; (2) the amount entered on the right side of an account; (3) to enter an amount on the right side of an account.

Credit memorandum. The form issued by a seller to inform a debtor that a credit has been posted to the debtor's account receivable.

Cumulative preferred stock. Preferred stock that is entitled to current and past dividends before dividends may be paid on common stock.

Current asset. Cash or another asset that may reasonably be expected to be realized in cash or sold or consumed, usually within a year or less, through the normal operations of a business.

Current cost. The amount of cash that would have to be paid currently to acquire assets of the same age and in the same condition as existing assets.

Current liability. A liability that will be due within a short time (usually one year or less) and that is to be paid out of current assets.

Current ratio. The ratio of current assets to current liabilities.

Currently attainable standards. Standards which represent levels of operation that can be attained with reasonable effort.

Cycle time. The time required to manufacture a product. Sometimes referred to as throughput time.

D

Data base. The entire amount of data needed by an enterprise.

Debit. (1) The left side of an account; (2) the amount entered on the left side of an account; (3) to enter an amount on the left side of an account.

Debit memorandum. The form issued by a buyer to inform a creditor that a debit has been posted to the creditor's account payable.

Debt security. A bond or a note payable.

Decentralization. The separation of a business into more manageable units.

Decision making. The process by which managers determine to follow one course of action as opposed to an alternative.

Declining-balance depreciation method. A method of depreciation that provides declining periodic depreciation charges to expense over the estimated life of an asset.

Deficit. A debit balance in the retained earnings account.

Departmental margin. Departmental gross profit less direct departmental expenses.

Depletion. The cost of metal ores and other minerals removed from the earth.

Depreciation. The decrease in usefulness of all plant assets except land.

Differential analysis. The area of accounting concerned with the effect of alternative courses of action on revenues and costs.

Differential cost. The amount of increase or decrease in cost that is expected from a particular course of action compared with an alternative.

Differential revenue. The amount of increase or decrease in revenue expected from a particular course of action as compared with an alternative.

Direct cost. A cost that can be traced directly to a cost object.

Direct expense. An expense directly traceable to or incurred for the sole benefit of a specific department and ordinarily subject to the control of the department manager.

Direct labor cost. Wages of factory workers who convert materials into a finished product.

Direct labor rate variance. The cost associated with the difference between the standard rate and the actual rate paid for direct labor used in producing a commodity.

Direct labor time variance. The cost associated with the difference between the standard hours and actual hours of direct labor spent producing a commodity.

Direct materials cost. The cost of materials that enter directly into the finished product.

Direct materials inventory. The cost of direct materials which have not yet entered into the manufacturing process.

Direct materials price variance. The cost associated with the difference between the standard price and the actual price of direct materials used in producing a commodity.

Direct materials quantity variance. The cost associated with the difference between the standard quantity and the actual quantity of direct materials used in producing a commodity.

Direct method. (a) A method of reporting the cash flows from operating activities as the difference between the operating cash receipts and the operating cash payments. (b) A method of allocating service department costs.

Direct write-off method. A method of accounting for uncollectible receivables, whereby an expense is recognized only when specific accounts are judged to be uncollectible.

Directing. The process by which managers, given their assigned level of responsibilities, run day-to-day operations.

Discontinued operations. The operations of a business segment that has been disposed of.

Discount. (a) The interest deducted from the maturity value of a note; (b) excess of par value of stock over its sales price; (c) excess of the face amount of bonds over their issue price.

Discount rate. The rate used in computing the interest to be deducted from the maturity value of a note.

Discretionary cost. A cost that is not essential to short-term operations.

Dishonored note receivable. A note which the maker fails to pay on the due date.

Dividend. A distribution of earnings of a corporation to its owners (stockholders).

Double-entry accounting. A system for recording transactions based on recording increases and decreases in accounts so that debits always equal credits.

E

Earnings per share (EPS) on common stock. The profitability ratio of net income available to common shareholders to the number of common shares outstanding.

Economic order quantity (EOQ). The optimum quantity of specified inventoriable materials to be ordered at one time.

Economies of scale. An economic concept that recognizes that over a wide range of production, costs vary in differing proportions to changes in an activity base. When production facilities are limited, costs tend to increase but at a decreasing rate as production increases from a relatively low level.

Effective rate of interest. The market rate of interest at the time bonds are issued.

Electronic funds transfer (EFT). A payment system that uses computerized electronic impulses rather than paper (money, checks, etc.) to effect a cash transaction.

Employee's earnings record. A detailed record of each employee's earnings.

Engineering method. A cost estimation method in which engineers estimate total cost, as well as variable and fixed components, based on studies of such factors as production methods, materials and labor requirements, equipment needs, and utility demands.

Equity. The right or claim to the properties of a business enterprise.

Equity method. A method of accounting for investments in common stock, by which the investment account is adjusted for the investor's share of periodic net income and property dividends of the investee.

Equity per share. The ratio of stockholders' equity to the related number of shares of stock outstanding.

Equity security. Preferred or common stock.

Equivalent units of production. The number of units that could have been manufactured from start to finish during a period.

Ethics. Moral principals that guide the conduct of individuals

Exchange rate. The rate at which one unit of currency can be converted into another currency.

Expected value. A concept useful for managers in decision making which involves identifying the possible outcomes from a decision and estimating the likelihood that each outcome will occur.

Expense. The amount of assets consumed or services used in the process of earning revenue.

Extraordinary item. An event or transaction that is unusual and infrequent.

Extraordinary repairs. Expenditures that increase the useful life of an asset beyond the original estimate.

F

Factory overhead cost. All of the costs of operating the factory except for direct materials and direct labor.

Factory overhead controllable variance. The difference between the actual amount of factory overhead cost incurred and the amount of factory overhead budgeted for the level of operations achieved.

Factory overhead volume variance. The cost or benefit associated with operating at a level above or below 100% of productive capacity.

FICA tax. Federal Insurance Contributions Act tax used to finance federal programs for old-age and disability benefits and health insurance for the aged.

Financial accounting. The branch of accounting that is concerned with the recording of transactions using generally accepted accounting principles (GAAP) for a business enterprise or other economic unit and with a periodic preparation of various statements from such records.

Financial Accounting Standards Board (FASB). The current authoritative body for the development of accounting principles for all entities except state and municipal governments.

Finished goods inventory. The cost of finished products on hand that have not been sold.

Finished goods ledger. The subsidiary ledger that contains the individual accounts for each kind of commodity produced.

First-in, first-out (fifo) method. (a) A method of inventory costing based on the assumption that the costs of merchandise sold should be charged against revenue in the order in which the costs were incurred. (b) A method of determining costs of goods manufactured in which the beginning work in process inventory costs are kept separate from the costs incurred during the period and these costs are assigned to the goods manufactured in the order incurred.

Fiscal year. The annual accounting period adopted by an enterprise.

Fixed expense (cost). An expense (cost) that tends to remain constant in amount regardless of variations in volume of activity

Flexible budget. A series of budgets for varying rates of activity.

FOB destination. Terms of agreement between buyer and seller, whereby ownership passes when merchandise is received by the buyer, and the seller absorbs the transportation costs.

FOB shipping point. Terms of agreement between buyer and seller, whereby ownership passes when merchandise is delivered to the shipper, and the buyer absorbs the transportation costs

Funded. An appropriation of retained earnings accompanied by a segregation of cash or marketable securities.

Future value. The amount that will accumulate at some future date as a result of an investment or a series of investments.

G-H

General accounting system. An accounting system which extends the periodic system of inventory accounting used by merchandising enterprises to the three manufacturing inventories: direct materials, work in process, and finished goods.

General journal. The two-column form used to record journal entries that do not "fit" in any special journals.

General ledger. The principal ledger, when used in conjunction with subsidiary ledgers, that contains all of the balance sheet and income statement accounts.

Generally accepted accounting principles (GAAP). Generally accepted guidelines for the preparation of financial statements.

Going concern concept. The concept that assumes that a business entity has a reasonable expectation of continuing in business at a profit for an indefinite period of time.

Goodwill. An intangible asset that attaches to a business as a result of such favorable factors as location, product superiority, reputation, and managerial skills.

Governmental Accounting Standards Board (GASB). The current authoritative body for the development of accounting principles for state and municipal governments.

Gross pay. The total earnings of an employee for a payroll period.

Gross profit. The excess of net revenue from sales over the cost of merchandise sold.

Gross profit method. A means of estimating inventory on hand without the need for a physical count.

High-low method. A technique that uses the highest and lowest total costs as a basis for estimating the variable cost per unit and fixed cost component of a mixed cost.

Horizontal analysis. The percentage of increases and decreases in corresponding items in comparative financial statements.

Income from operations. The excess of gross profit over total operating expenses.

Income statement. A summary of the revenues and expenses of a business entity for a specific period of time.

Income summary account. The account used in the closing process for summarizing the revenue and expense accounts.

Indirect cost. A cost that cannot be traced directly to a cost object.

Indirect expense. An expense that is incurred for an entire business enterprise as a unit and that is not subject to the control of individual department managers.

Indirect method. A method of reporting the cash flows from operating activities as the net income from operations adjusted for all deferrals of past cash receipts and payments and all accruals of expected future cash receipts and payments.

Inflation. A period when prices in general are rising and the purchasing power of money is declining.

Installment method. The method of recognizing revenue, whereby each receipt of cash from installment sales is considered to be composed of partial payment of cost of merchandise sold and gross profit.

Intangible asset. A long-lived asset that is useful in the operations of an enterprise, is not held for sale, and is without physical qualities.

Interim statements. A financial statement issued for a period covering less than a fiscal year.

Internal controls. The detailed procedures adopted by an enterprise to control its operations.

Internal rate of return method. A method of analysis of proposed capital investments that focuses on using present value concepts to compute the rate of return from the net cash flows expected from the investment.

Internal Revenue Service (IRS). The branch of the U.S. Treasury Department concerned with enforcement and collection of the income tax.

Inventory reorder point. The level to which inventory is allowed to fall before an order for additional inventory is placed.

Inventory turnover. The relationship between the volume of goods sold and inventory, computed by dividing the cost of goods sold by the average inventory.

Investment center. A decentralized unit in which the manager has the responsibility and authority to make decisions that affect not only costs and revenues, but also the plant assets available to the center.

Investment turnover. A component of the rate of return on investment, computed as the ratio of sales to invested assets.

Invoice. The bill provided by the seller (who refers to it as a sales invoice) to a buyer (who refers to its as a purchase invoice) for item purchased.

J

Job cost sheet. An account in the cost ledger in which the costs charged to a particular job order are recorded.

Job order cost system. A type of cost system that provides for a separate record of the cost of each particular quantity of product that passes through the factory.

Joint cost. The cost common to the manufacture of two or more products (joint products).

Joint products. Two or more commodities of significant value produced from a single principal direct material.

Journal. The initial record in which the effects of a transaction on accounts are recorded.

Journalizing. The process of recording a transaction in a journal.

Judgmental method. A cost estimation method in which managers estimate total cost, as well as variable and fixed components, using experience and past observations of cost-volume-relationships.

Just-in-time manufacturing system. A system of manufacturing in which a primary emphasis is on the manufacture of products only as they are needed by the next stage of production or by the marketplace.

L

Last-in, first-out (lifo) method. A method of inventory costing based on the assumption that the most recent merchandise costs incurred should be charged against revenue.

Lead time. The time, usually expressed in days, that it takes to receive an order for inventory.

Least squares method. A cost estimation method that uses statistics to estimate total cost and the fixed and variable cost components.

Ledger. The group of accounts used by an enterprise.

Leverage. The tendency of the rate earned on stockholders' equity to vary from the rate earned on total assets because the amount earned on assets acquired through the use of funds provided by creditors varies from the interest paid to these creditors.

Liability. A debt of a business enterprise.

Linear programming. A quantitative method that can be used in providing data for solving a variety of business problems in which management's objective is to minimize cost or maximize profits, subject to several limiting factors.

Liquidating dividend. A distribution out of paid-in capital when a corporation permanently reduces its operations or winds up its affairs completely.

Liquidation. The winding-up process when a partnership goes out of business.

Long-term investment. An investment that is not intended to be a ready source of cash in the normal operations of a business and that is listed in the "investments" section of the balance sheet.

Long-term liability. A liability that is not due for a comparatively long time (usually more than one year).

Lower of cost or market. A method of costing inventory or valuing temporary investments that carries those assets at the lower of their cost or current market prices.

M

Management. Individuals who are charged with the responsibility of directing the operations of enterprises.

Management by exception. The philosophy of managing which involves monitoring the operating results of implemented plans and comparing the expected results with the actual results. This feedback allows management to isolate significant variations for further investigation and possible remedial action.

Management process. The four basic functions of (1) planning, (2) organizing and directing, (3) controlling, and (4) decision making used in managing an organization.

Managerial accounting. The branch of accounting that uses both historical and estimated data in providing information which management uses in conducting daily operations and in planning future operations.

Manufacturing margin. Sales less variable cost of goods sold.

Marginal cost. The increase in total cost of producing and selling an additional unit of product.

Marginal revenue. The increase in total revenue realized from the sale of an additional unit of product.

Margin of safety. The difference between current sales revenue and the sales at the break-even point.

Market price approach. An approach to transfer pricing that uses the price at which the product or service transferred could be sold to outside buyers as the transfer price.

Marketable security. An investment in a security that can be readily sold when cash is needed.

Market (sales) value method. A method of allocating joint costs among products according to their relative sales values.

Markup. An amount which is added to a "cost" amount to determine product price.

Master budget. The comprehensive budget plan encompassing all the individual budgets related to sales, cost of goods sold, operating expenses, capital expenditures, and cash.

Matching. The principle of accounting that all revenues should be matched with the expenses incurred in earning those revenues during a period of time.

Materiality. The concept that recognizes the practicality of ignoring small or insignificant deviations from generally accepted accounting principles.

Materials. Goods in the state in which they were acquired for use in manufacturing operations.

Materials ledger. The subsidiary ledger containing the individual accounts for each type of material.

Materials requisition. The form used by the appropriate manufacturing department to authorize the issuance of materials from the storeroom.

Maturity value. The amount due at the maturity or due date of a note.

Merchandise inventory. Merchandise on hand and available for sale.

140

Merger. The fusion of two corporation by the acquisition of the properties of one corporation by another, with the dissolution of one of the corporations.

Minority interest. The portion of a subsidiary corporation's capital stock that is not owned by the parent corporation.

Mixed cost. A cost with both variable and fixed characteristics, sometimes referred to as semivariable or semifixed cost.

Modified Accelerated Cost Recovery System (MACRS). The system described in the Internal Revenue Code for determining depreciation (cost recovery) of plant asset acquisitions.

Multiple-step income statement. An income statement with numerous sections and subsections with several intermediate balances before net income.

N

Natural business year. A year that ends when a business's activities have reached the lowest point in its annual operating cycle.

Negotiated price approach. An approach to transfer pricing that allows the managers of decentralized units to agree (negotiate) among themselves as to the proper transfer price.

Net income. The final figure in the income statement when revenues exceed expenses.

Net loss. The final figure in the income statement when expenses exceed revenues.

Net pay. Gross pay less payroll deductions; the amount the employer is obligated to pay the employee.

Net present value method. A method of analysis of proposed capital investments that focuses on the present value of the cash flows expected from the investment.

Net realizable value. The amount at which merchandise that can be sold only at prices below cost should be valued, determined as the estimated selling price less any direct cost of disposition.

Nominal account. A revenue or expense account periodically closed to the income summary account; a temporary owner's equity account.

Noncontrollable cost. For a specific level of management, a cost that cannot be directly controlled.

Note payable. A written promise to pay, representing an amount owed by a business.

Note receivable. A written promise to pay, representing an amount to be received by a business.

Number of days' sales in inventory. The relationship between the volume of sales and inventory, computed by dividing the inventory at the end of the year by the average daily cost of goods sold.

Number of days' sales in receivables. The relationship between credit sales and accounts receivable, computed by dividing the net accounts receivable at the end of the year by the average daily sales on account.

O

Operational planning. The development of short-term plans to achieve goals identified in an enterprise's strategic plan. Sometimes referred to as tactical planning.

Operating lease. A lease which does not meet the criteria for a capital lease, and thus which is accounted for as an operating expense, so that neither future lease obligations nor future rights to use the leased asset as recognized in the accounts.

Operating leverage. The ratio determined by dividing contribution margin by operating income.

Operation costing. A hybrid system that combines features of job order and process cost systems.

Opportunity cost. The amount of income that would result from the best available alternative to a proposed use of cash or its equivalent.

Organizing. The process by which management assigns responsibility to individuals for achieving enterprise goals.

Other expense. An expense that cannot be associated definitely with operations.

Other income. Revenue from sources other than the principal activity of a business.

Overapplied factory overhead. The amount of factory overhead applied in excess of the actual factory overhead costs incurred for production during a period.

Owner's equity. The rights of the owners in a business enterprise.

P-Q

Paid-in capital. The capital acquired from stockholders.

Par. The arbitrary monetary figure printed on a stock certificate.

Parent company. The company owning all or a majority of the voting stock of another corporation.

Participating preferred stock. Preferred stock that could receive dividends in excess of the specified amount granted by its preferential rights.

Partnership. An unincorporated business owned by two or more individuals.

Payroll. The total amount paid to employees for a certain period.

Payroll register. A multi-column form used to assemble and summarize payroll data at the end of each payroll period.

Percentage-of-completion method. The method of recognizing revenue from long-term contracts over the entire life of the contract.

Period costs. Those costs that are used up in generating revenue during the current period and that are not involved in the manufacturing process. These costs are recognized as expenses on the current period's income statement.

Periodic inventory system. A system of inventory accounting in which only the revenue from sales is recorded each time a sale is made; the cost of merchandise on hand at the end of a period is determined by a detailed listing (physical inventory) of the merchandise on hand.

Perpetual inventory system. A system of inventory accounting that employs records that continually disclose the amount of the inventory on hand.

Petty cash fund. A special cash fund used to pay relatively small amounts.

Physical inventory. The detailed listing of merchandise on hand.

Planning. The process of setting goals for the use of an organization's resources and developing ways to achieve these goals.

Plant asset. A tangible asset of a relatively fixed or permanent nature owned by a business enterprise.

Point of sale method. The method of recognizing revenue, whereby the revenue is determined to be realized at the time that title passes to the buyer.

Pooling of interests method. A method of accounting for an affiliation of two corporations resulting from an exchange of voting stock of one corporation for substantially all of the voting stock of the other corporation.

Post-closing trial balance. A trial balance prepared after all of the temporary accounts have been closed.

Posting. The process of transferring debits and credits from a journal to the accounts.

Predetermined factory overhead rate. The rate used to apply factory overhead costs to the goods manufactured.

Preemptive right. The right of each shareholder to maintain the same fractional interest in the corporation by purchasing a proportionate number of shares of any additional issuances of stock.

Preferred stock. A class of stock with preferential rights over common stock.

Premium. (a) The excess of the sales price of stock over its par amount; (b) excess of the issue price of bonds over the face amount.

Prepaid expense. A purchased commodity or service that has not been consumed at the end of an accounting period.

Present value. The estimated present worth of an amount of cash to be received (or paid) in the future.

Present value index. An index computed by dividing the total present value of the net cash flow to be received from a proposed capital investment by the amount to be invested.

Present value of an annuity. The sum of the present values of a series of equal cash flows to be received at fixed intervals.

Price-earnings (P/E) ratio. The ratio of the market price per share of common stock, at a specific date, to the annual earnings per share.

Price-level index. The ratio of the total cost of a group of commodities prevailing at a particular time to the total cost of the same group of commodities at an earlier base time.

Price theory. A separate discipline in the area of microeconomics which studies the setting of product prices.

Prime costs. The combination of direct materials and direct labor costs.

Prior period adjustment. Correction of a material error related to a prior period or periods, excluded from the determination of net income.

Private accounting. The profession whose members are accountants employed by a business firm or nonprofit organization.

Proceeds. The net amount available from discounting a note.

Process cost system. A type of cost system that accumulates costs for each of the various departments or processes within a factory.

Product cost concept. A concept used in applying the cost-plus approach to product pricing in which only the costs of manufacturing the product, termed the

product cost, are included in the cost amount to which the markup is added.

Product costing. The allocation of costs to products.

Product costs. The three components of manufacturing cost: direct materials, direct labor, and factory overhead costs.

Product life cycle. A concept that assumes that a product passes through various stages from the time that it is introduced until the time it disappears from the market.

Product margin. A measure of the profitability of each product and its contribution to overall enterprise profits, determined by deducting the traceable fixed costs from the contribution margin of each product.

Profitability. The ability of a firm to earn income.

Profit center. A decentralized unit in which the manager has the responsibility and the authority to make decisions that affect both costs and revenues (and thus profits).

Profit margin. A component of the rate of return on investment, computed as the ratio of operating income to sales.

Profit-volume chart. A chart used to assist management in understanding the relationship between profit and volume.

Promissory note. A written promise to pay a sum in money on demand or at a definite time.

Public accounting. The profession whose members render accounting services on a fee basis.

Purchase method. The accounting method employed when a parent company acquires a controlling share of the voting stock of a subsidiary other than by the exchange of voting common stock.

Purchase order. The form issued by the purchasing department to suppliers, requesting the delivery of materials.

Purchase requisition. The form used to inform the purchasing department that items are needed by a business.

Purchasesdiscounts. An available discount taken by the purchaser for early payment of an invoice; a contra account to Purchases.

Purchases journal. The journal in which all items purchased on account are recorded.

Purchases returns and allowances. Reduction in purchases, resulting from merchandise returned to the vendor or from the vendors reduction in the original purchase price; a contra account to Purchases.

Quality control chart. A chart, often developed using statistical methods, which shows desired operating conditions and limits within which production may vary.

Quick assets. The sum of cash, receivables, and marketable securities.

R

Rate earned on common stockholders' equity. A measure of profitability computed by dividing net income, reduced by preferred dividends requirement, by common stockholders' equity.

Rate earned on stockholders' equity. A measure of profitability computed by dividing net income by total stockholders' equity.

Rate earned on total assets. A measure of the profitability of assets, without regard to the equity of creditors and stockholders in the assets.

Rate of return on investment (ROI). A measure of managerial efficiency in the use of investments in assets.

Real account. A balance sheet account.

Realization. The sale of assets when a partnership is being liquidated.

Realization principle. Recording sales when the title to the merchandise passes to the buyer in exchange for cash or claims to cash.

Receiving report. The form used by the receiving department to indicate that materials have been received and inspected.

Relevant range. The range of activity within which the enterprise is planning to operate.

Report form of balance sheet. The form of balance sheet with the liability and owner's equity sections presented below the asset section.

Residual income. The excess of divisional operating income over a "minimum" amount of desired operating income.

Residual value. The estimated recoverable cost of a depreciable asset as of the time of its removal from service.

Responsibility accounting. The process of measuring and reporting operating data by areas of responsibility.

Retail inventory method. A method of inventory costing based on the relationship of the cost and retail price of merchandise.

Retained earnings. Net income retained in a corporation.

Retained earnings statement. A statement for a corporate enterprise, summarizing the changes in retained earnings during a specific period of time.

Revenue. The gross increases in owner's equity as a result of business and professional activities entered into for the purpose of earning income.

Revenue expenditure. An expenditure that benefits only the current period.

Reversing entry. An entry that reverses a specific adjusting entry to facilitate the recording of routine transactions in the subsequent period.

S

Safety stock. The amount of inventory that serves as a reserve for unforeseen circumstances, and therefore is not normally used in regular operations.

Sales discounts. An available discount granted by the seller for early payment of an invoice; a contra account to Sales.

Sales journal. The journal in which all sales of merchandise on account are recorded.

Sales mix. The relative distribution of sales among the various products available for sale.

Sales returns and allowances. Reductions in sales, resulting from merchandise returned by customers or from the seller's reduction in the original sales price; a contra account to Sales.

Scattergraph method. A cost estimation method that uses a graph to estimate total cost and the fixed and variable cost components.

Securities and Exchange Commission (SEC). The federal agency that exercises a dominant influence over the development of accounting principles for most companies whose securities are traded in interstate commerce.

Selling expense. An expense incurred directly and entirely in connection with the sale of merchandise.

Semivariable cost. A cost with both variable and fixed characteristics, sometimes referred to as a mixed or semifixed cost.

Service department. A factory department that does not process materials directly but renders services for the benefit of production departments.

Simplex method. A mathematical equation approach to linear programming, which is often used more practically with a computer

Single-step income statement. An income statement with the total of all expenses deducted from the total of all revenues.

Sinking fund. Assets set side in a special fund to be used for a specific purpose.

Slide. The erroneous movement of all digits in a number, one or more spaces to the right or the left, such as writing $542 as $5,420.

Sole proprietorship. A business owned by one individual.

Solvency. The ability of a firm to pay its debts as they come due.

Special journal. A journal designed to record a single type of transaction.

Standard account form. A ledger account that contains debit and credit balance columns. Sometimes called a four-column account form.

Standard costs. Detailed estimates of what a product should cost.

Standard cost system. An accounting system that uses standards for each element of manufacturing costs entering into the finished product.

Stated value. An amount assigned by the board of directors to each share of no-par stock.

Statement of cash flows. A summary of the major cash receipts and cash payments for a period.

Statement of cost of goods manufactured. A separate statement for a manufacturer that reports the cost of goods manufactured during a period.

Statement of owner's equity. A summary of the changes in the owner's equity of a business entity that have occurred during a specific period of time.

Step method. A method of allocating service department costs.

Step-wise fixed cost. A cost which varies in a step-wise fashion with changes in an activity base. Because of the long width of the range or production (steps) over which the total cost changes, the cost is classified as a fixed cost for managerial decision making.

Step-wise variable cost. A cost which varies in a step-wise fashion with changes in an activity base. Because of the short width of the range or production (steps) over which the total cost changes, the cost is classified as a variable cost for managerial decision making.

Stock dividend. Distribution of a company's own stock to its shareholders.

Stockholders. The owners of a corporation.

Stockholders' equity. The equity of the shareholders in a corporation.

Stock options. Rights given by a corporation to its employees to purchase shares of the corporation's stock at a stated price.

Stock outstanding. The stock that has been issued to stockholders.

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DO NOT WRITE IN THIS AREA

THE PROFESSIONAL MANAGER PROGRAM
MANAGERIAL ACCOUNTING
Budapest, Hungary

PLEASE USE PENCIL

Strongly Agree 1 — Agree 2 — Undecided 3 — Disagree 4 — Strongly Disagree 5

	1	2	3	4	5
1. The objectives of this course were clear to me.	(1)	(2)	(3)	(4)	(5)
2. The course exceeded my expectations.	(1)	(2)	(3)	(4)	(5)
3. The instructor(s) communicated effectively.	(1)	(2)	(3)	(4)	(5)
4. The instructor(s) made the subject matter more meaningful through the use of examples.	(1)	(2)	(3)	(4)	(5)
5. The instructor(s) encouraged participants to be involved in discussions.	(1)	(2)	(3)	(4)	(5)
6. The instructor(s) presented up-to-date material and information.	(1)	(2)	(3)	(4)	(5)
7. The instructor(s) was(were) well prepared and organized.	(1)	(2)	(3)	(4)	(5)
8. The instructor(s) did a good job of relating this course with other parts of the program.	(1)	(2)	(3)	(4)	(5)
9. The quantity and depth of material covered were appropriate for the allotted time.	(1)	(2)	(3)	(4)	(5)
10. I feel that I have a good understanding of the topics covered in this course.	(1)	(2)	(3)	(4)	(5)
11. This course helped me gain useful knowledge and/or skills.	(1)	(2)	(3)	(4)	(5)
12. I was pleased with the amount of interaction I had with the faculty in the course.	(1)	(2)	(3)	(4)	(5)
13. The participants enriched the course by sharing their ideas and experiences.	(1)	(2)	(3)	(4)	(5)
14. Overall, I would rate this course as an outstanding educational experience.	(1)	(2)	(3)	(4)	(5)
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TOTAL QUALITY MANAGEMENT MODULE

April 15 - 17, 1993
Budapest, Hungary

Session	Day 1 - April 15	Day 2 - April 16	Day 3 - April 17
Morning		Presentation by Host Institution	Statistical Process Control
Break			
Morning		Quality Improvement Process	TQM Implementation: Making it Happen
Lunch			
Afternoon	Global Competition: Quality Imperative	Quality Improvement Process	Presentation by Host Institution
Break			
Afternoon	Why's, What's, Who's of Quality	Quality Improvement Process	TQM Implementation: Making it Happen

Total Quality Management
MUCIA Executive Development Program
Budapest, Hungary
April 15-17, 1993

Instructors: Ram Narasimhan, Professor of Management, Michigan State University
John Anderson, Associate Professor of Operations Management, University of Minnesota

Program Objectives: The Participants will be able to:

Gain an understanding of the Building Blocks of TQM
Understand Total Quality Management as a Strategic Opportunity
Understand the Quality Improvement Process: Concepts and Methods
Select from Alternative Approaches to TQM and recognize their usefulness to their organizations
Organize and carry out a Quality Improvement Project
Recognize and be able to deal with the Barriers for Implementation

Day One

1:00 - 1:15 PM

Welcome and Opening Remarks

Introductions

Review of Goals and Objectives, Planned Activities
Expectations, and Pedagogy

1:15 - 2:45 PM Session 1.

Global Competition: Quality Imperative

(The Why's of Quality, Strategic Notion of Quality, Quality Priority, Alternative Perspectives of Quality, Quality/TQM Connection)

Casette: Quality Priority within an Organization

2:45 - 3:00 PM Break

3:00 - 4:30 PM Session 2.

Why's, What's, Who's of Quality

(Comparative Perspective of Quality Leaders, Overview of Demings 14 Points, Overview of Crosby's 14 Steps, Overview of Juran's Breakthrough Process, Alternative Definitions of Quality)

Video Excerpts from: Deming, Crosby and Juran

Total Quality Management
MUCIA Executive Development Program
Budapest, Hungary
April 15-17, 1993

Day Two

8:15 - 9:45 AM Session 3.

Presentation by Host Institution

9:45 - 10:00 AM Break

10:00 - 11:45 AM Session 4.

Quality Improvement Process (Overview, Steps 1 and 2)

(Overview of the QIP Process, Example of Project, Step 1. Project Definition, How to choose Projects, How to define the Project, Organizing the Project Team, Guidelines for Team Process, Step 2. Process Understanding, Principles and Methods of Process Flow, examples)

11:45 - 1:00 PM Lunch

1:00 - 2:45 PM Session 5.

Quality Improvement Process (Step 3)

(The Diagnosis Step, The concept of Variance, Identifying Downstream and UpStream Variances, Cause and Effect Thinking and Diagrams, Data Collection Techniques and Analysis, Checksheets, Pareto Analysis)

Exercises: Cause and Effect Diagrams, Pareto Analysis, Data Analysis

2:45 - 3:00 PM Break

3:00 - 5:00 PM Session 6.

Quality Improvement Process (Step 4)

(Employing the Team to Generate Alternatives and Solutions, Brainstorming, Nominal Group Technique, QFD, Benchmarking, Partnering)

Example: QFD, Benchmarking at IBM Rochester

Total Quality Management
MUCIA Executive Development Program
Budapest, Hungary
April 15-17, 1993

Day Three

8:15 - 9:45 AM Session 7.

Statistical Process Control

(SPC Approach, Assignable and Common Cause Variation, Process Stability, Shewhart Rules, Control Charts: X Bar and R Bar Charts, p Charts, C Charts, Process Capability, Cpk, Cpl, Cpu, Evolving from Stability to Process Capability)

9:45 - 10:00 AM Break

10:00 - 11:45 AM Session 8.

TQM Implementation: Making it Happen

(Overview of Company Experiences: Dow, Chevron, Texas Instruments Supplier Developement Program

11:45 - 1:00 PM Lunch

1:00 PM - 2:45 PM Session 9.

Presentation by Host Institution

2:45 - 3:00 PM Break

3:00 - 4:30 PM Session 10.

TQM Implementation: Making it Happen

Video: The Harley Davidson Experience

Synthesis and Wrapup

WHY QUALITY?

1. Global Demands
2. Quality has been compromised
3. Quality: a fundamental value
4. Costs of Quality can be enormous
5. The changing face of quality
6. Quality is a strategic issue
7. Quality provides a competitive advantage
8. Quality: a driver of productivity
9. Growing customer intolerance of "inadequate quality"

CHANGING QUALITY ASSUMPTIONS

From:	To:
Reactive	Proactive
Inspection	Prevention
Product Oriented	Organization Oriented
Blame Placing	Problem Solving
Quality vs MFG	Quality & MFG
Cost or Quality	Cost & Quality
Hunches on COQ	Determination of COQ
Blue-Collar Caused	White Collar Caused
Defects Hidden	Defects Highlighted
Q. C. is Technical	Q. C. is Managerial
Schedule First	Quality First
Acceptable Quality (AQL)	Zero Defects Continual Improvement

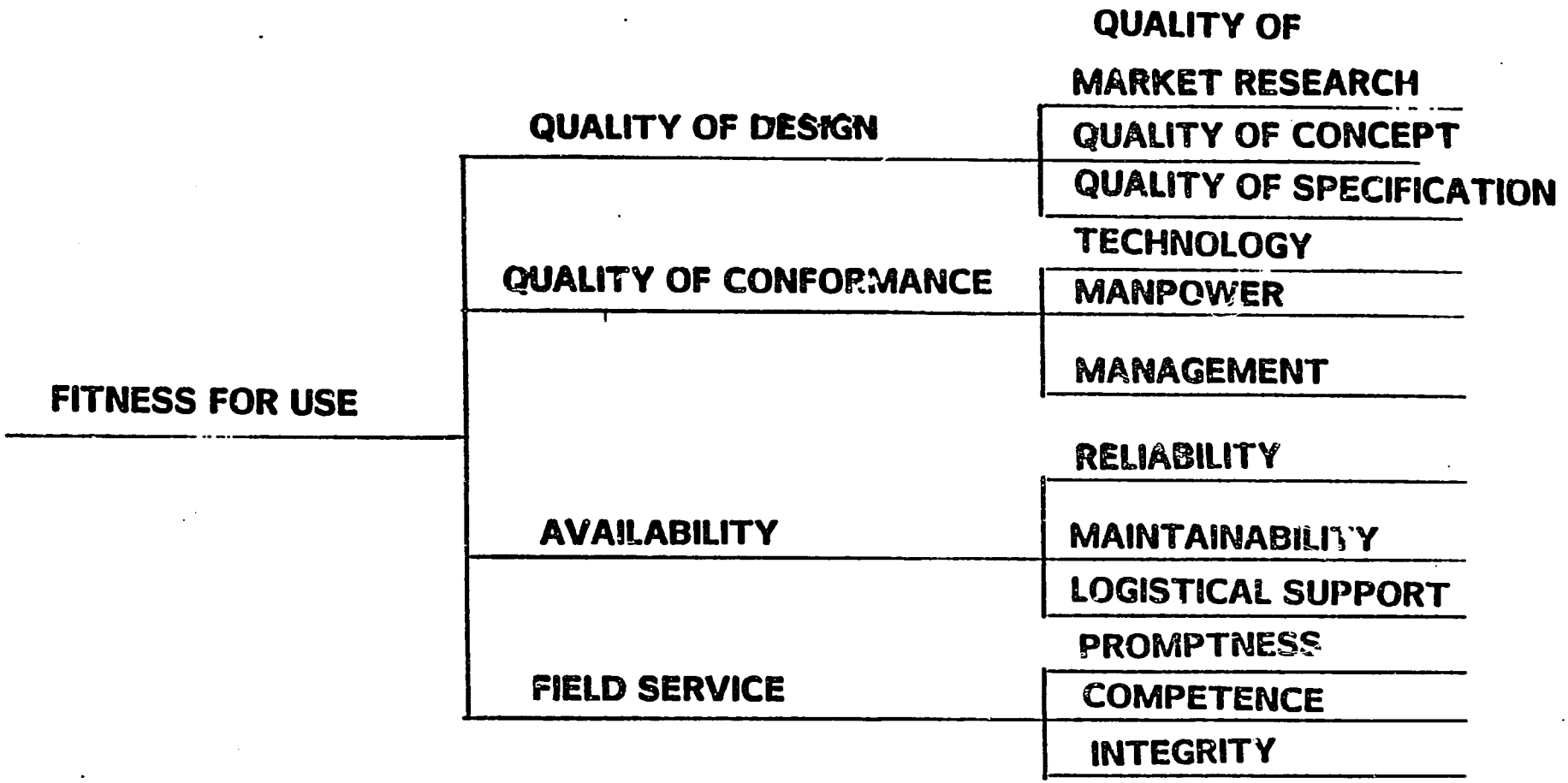
ESSENTIALS OF QUALITY

WHAT QUALITY MEANS

- DIFFICULT TO GIVE AN ALL-INCLUSIVE DEFINITION
- ENCOMPASSES
  - -- "CUSTOMER SATISFACTION"
  - -- "VALUE TO CUSTOMER"
  - -- "SPECIFICATIONS"

    . . . ETC.
- A DEFINITION (FITNESS FOR USE)

  "THE EXTENT TO WHICH A PRODUCT OR SERVICE CONFORMS TO ITS SPECIFICATIONS <u>AND</u> CUSTOMER SPECIFICATIONS."



DIFFERENT TYPES OF QUALITY

- FITNESS FOR USE (JURAN)

  IS BASED ON

  TECHNOLOGICAL (E.G., DESIGN, PERFORMANCE)

  PSYCHOLOGICAL (E.G., STATUS, AESTHETICS)

  CONTRACTUAL (E.G., GUARANTEE PROVISIONS)

  ETHICAL (E.G., HONESTY, TRUTH IN ADVERTISING)

  EVOLUTIONARY (E.G., RELIABILITY, AVAILABILITY)

  CHARACTERISTICS

QUALITY HAS BOTH <u>PERCEIVED</u> (QUALITATIVE) AND <u>SPECIFIC</u> (QUANTITATIVE) ATTRIBUTES

E.G., AIR CONDITIONING SYSTEM IN A CAR

SPECIFIC: SYSTEM MAINTAINS TEMPERATURE WITHIN $\pm 3^{\circ}$ F

PERCEIVED: AIR TEMPERATURE SEEMED "JUST RIGHT" AS OPPOSED TO "TOO COOL" OR "TOO WARM"

ERRONEOUS ASSUMPTIONS

- QUALITY IS "GOODNESS" OF A PRODUCT/SERVICE.
- QUALITY IS NOT MEASURABLE (INTANGIBLE).
- THERE IS AN "ECONOMICS" OF QUALITY.
- QUALITY PROBLEMS ORIGINATE IN THE SHOP FLOOR.
- QUALITY CONTROL DEPT. IS RESPONSIBLE FOR QUALITY.

NEED A DEFINITION THAT PERMITS MANAGEMENT ACTION AND COMMUNICATION.

MANAGING ATTITUDES TOWARD QUALITY

- DEFECTS ARE NOT THE CAUSE FOR BLAME BUT A CALL TO ELIMINATE CAUSES
- QUALITY WILL NOT BE SACRIFICED TO ACHIEVE COST OR DELIVERY GOALS
- IDENTIFY AND REPORT COST OF QUALITY (AS A PERCENTAGE OF SALES OR COST OF GOODS SOLD)
- EVALUATE MANAGEMENT ON COST-OF-QUALITY PERFORMANCE
- CHANGE ORGANIZATIONAL STRUCTURE - GIVE QUALITY ASSURANCE PROMINENCE

IMPROVING QUALITY

- JAPANESE MANUFACTURING COMPANIES VIEW QUALITY AS A HOLISTIC CONCEPT, A WAY OF THINKING THAT PERVADES THE ENTIRE ORGANIZATION

- STATISTICAL METHODS

- CHANGING ORGANIZATIONAL ATTITUDES; MAKE PERFECTION A STANDARD INSTEAD OF A GOAL

- "ZERO DEFECTS" DOES NOT MEAN "DO THE BEST YOU CAN!" EVERYONE IS EXPECTED TO PRODUCE WITH ZERO DEFECTS OR CHANGE THE PROCESS SO THAT ATTAINMENT OF ZERO DEFECTS IS POSSIBLE

- IDENTIFY AND REMOVE ALL CAUSES OF ERRORS → ZERO DEFECTS

- ZERO DEFECT APPROACH ORIGINATED IN AEROSPACE INDUSTRY IN THE 1960s

IMPROVING QUALITY (GENERAL COMMENTS)

- QUALITY SHOULD BE A LEADING PART OF THE OPERATION, EQUAL PART OF THE OPERATION, EQUAL IN IMPORTANCE TO EVERY OTHER PART.

- DEVELOP UNDERSTANDING
  INSTALL PREVENTION
  EXTRACT COMMITMENT

  YOU MUST BE PREPARED TO D.I.E. FOR QUALITY.

- MANAGEMENT PARTICIPATION
  NOT SUPPORT; THIS IS NOT JUST VITAL BUT EVERYTHING.

  E.G. ITT, CDC, XEROX

- QUALITY IS NOT A SINGLE GULP OF PHILOSOPHY

- CAN YIELD BIG PAYOFFS

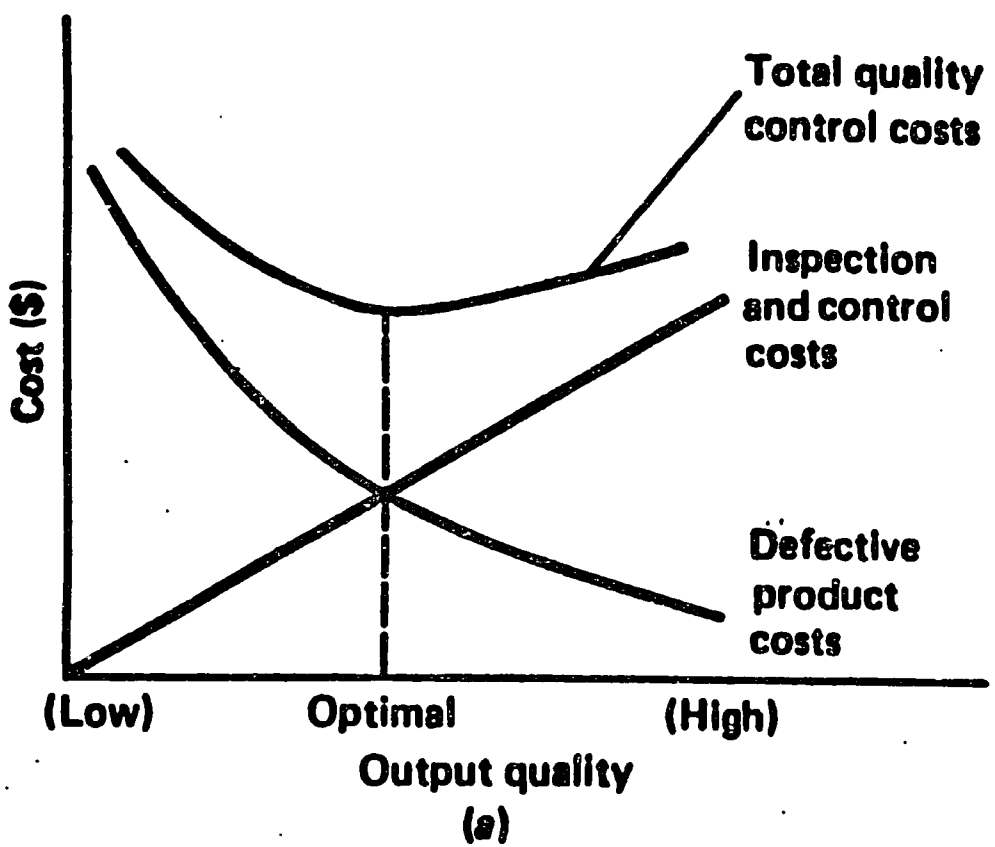
- FEWER THE DEFECTS, THE LESS ARE PROBLEMS OF NON CONFORMANCE.

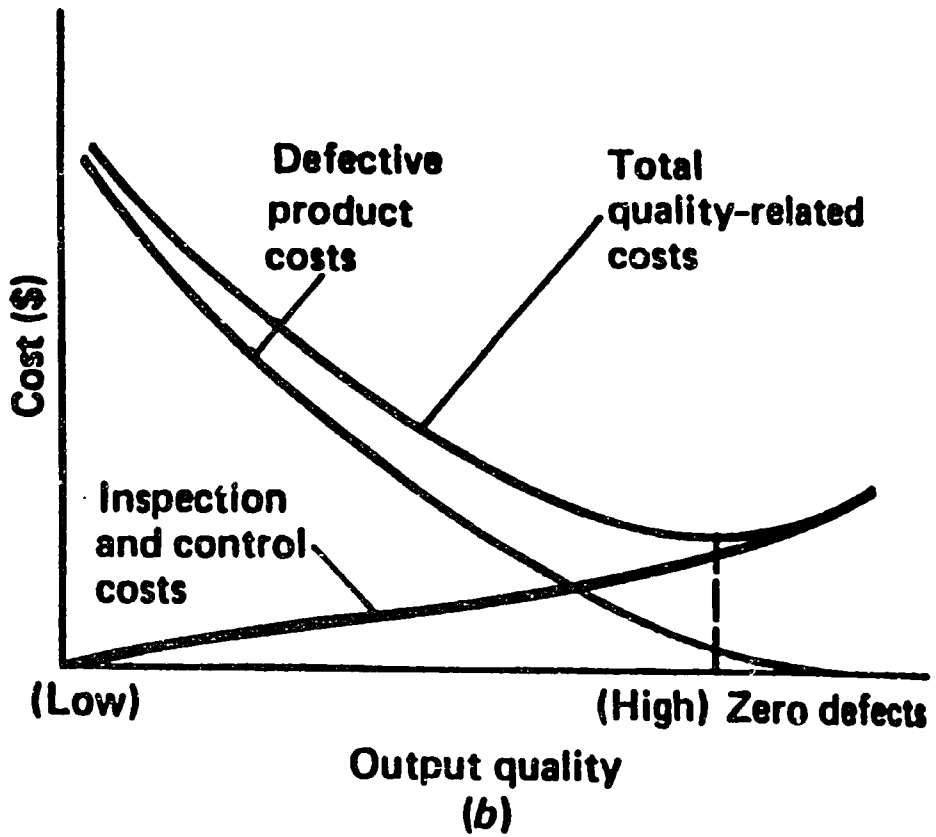
- "DEFECT PREVENTION" IS A KEY CONCEPT.

- TOOLS EXIST, BUT CONCEPT IS NOT WELL UNDERSTOOD.

- "COST OF QUALITY" IS THE EXPENSE OF DOING THINGS WRONG.

- PREVENTION IS NOT HARD TO DO, IT IS HARD TO SELL!





QUALITY COSTS UNDER (a) TRADITIONAL AND (b) ZERO-DEFECT PROGRAMS

ZERO DEFECTS

SEMICONDUCTOR INDUSTRY EXAMPLE

CHIP DEFECTS = f (STATIC ELECTRICITY, TEMPERATURE, DUST, ABRASION, ETC.)

THROUGH STRICT QUALITY CONTROL PROCEDURES THE JAPANESE ACHIEVED ZERO DEFECTS ENABLING THEM TO CAPTURE

40% OF MARKET FOR 16K CHIPS

70% OF MARKET FOR 64K CHIPS

90% OF MARKET FOR 256K CHIPS

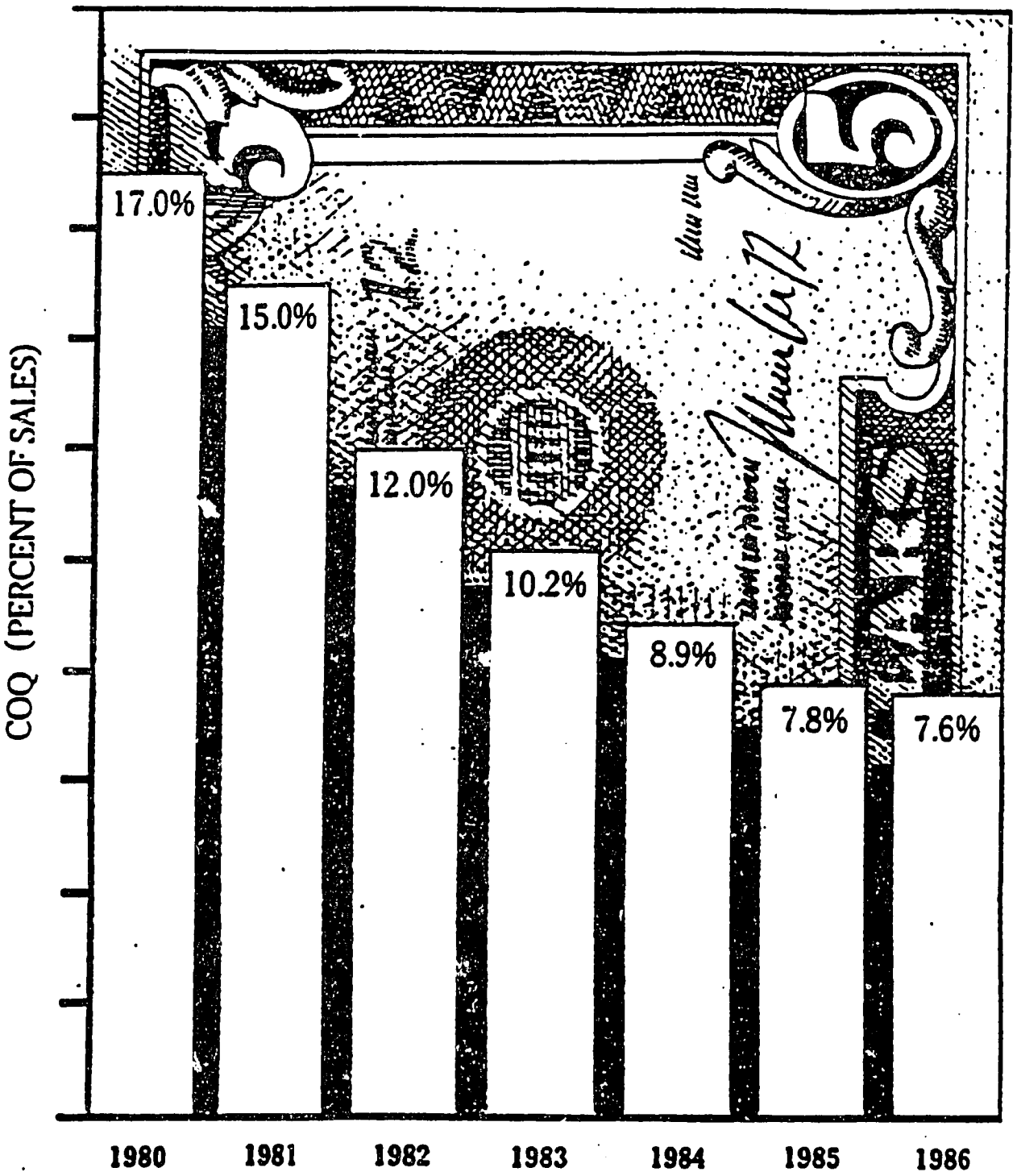
COST OF QUALITY

- FAILURE COSTS
- DETECTION COSTS
- PREVENTION COSTS

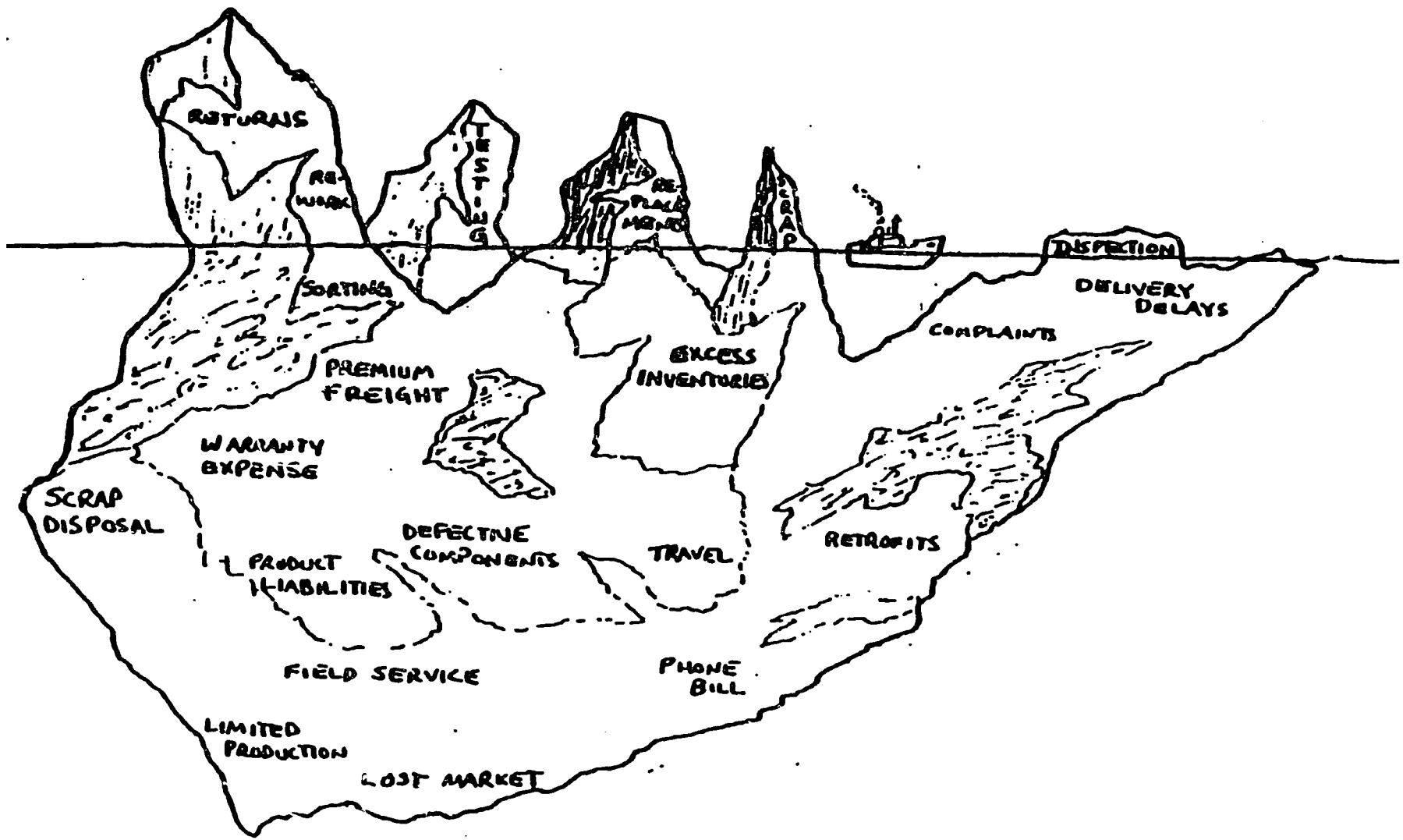
-- TO REDUCE (AVOID) THESE COSTS A FIRM MUST PRODUCE THE PRODUCT OR DELIVER THE SERVICE CORRECTLY THE FIRST TIME AND IN EVERY INSTANCE

-- MANAGEMENT IS RESPONSIBLE FOR 80% OF QUALITY PROBLEMS

COST OF QUALITY



THE HIDDEN COSTS OF QUALITY



TRADEOFFS IN QUALITY COSTS

Range of appraisal costs (dollars per unit)	Range of prevention costs (dollars per unit)								
	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20
0.60	20.05	20.29	20.18	19.40	15.90	12.22	10.09	9.82	10.22
0.80	20.40	20.64	20.54	19.78	16.34	11.72	10.62	10.36	10.77
1.00	20.52	20.77	20.69	19.96	16.63	12.16	11.11	10.87	11.28
1.20	20.20	20.46	20.42	19.77	16.66	12.47	11.51	11.31	11.73
1.40	18.08	18.40	18.47	18.03	15.58	12.25	11.56	11.50	11.95
1.60	15.17	15.56	15.77	15.62	14.02	11.79	11.46	11.53	12.06
1.80	14.62	15.03	15.29	15.23	13.91	12.03	11.81	11.99	12.48
2.00	14.63	15.06	15.34	15.32	14.14	12.44	12.28	12.48	12.98
2.20	15.09	15.52	15.80	15.80	14.64	12.98	12.83	13.04	13.54

Source: Whirlpool, *Total Quality Assurance: Total Cost of Quality*, May 1978, p. 2.

ELEMENTS IN THE COST OF QUALITY

FAILURE COSTS	DETECTION COSTS	PREVENTION COSTS
External failure costs:	Process capability measurement (e.g., control charts)	Design reviews
Consumer affairs (dealing primarily with customer complaints about quality)	Product acceptance	Engineering drawing checks
Field service (mostly repair of what should have worked)	Prototype inspection and tests	Engineering quality orientation program
Product liability (insurance and settlements)	Receiving inspection and tests	Engineering specifications reviews
Product returns, recalls, and corrective action costs	Supplier surveillance	Preventive maintenance
Warranty costs	Work-in-process and finished goods testing and inspection	Process capability studies
Internal failure costs:		Product qualification
Downtime due to defects		Quality audits
Engineering change orders		Quality orientation programs
Purchasing change orders		Supplier evaluations
Redesign		Supplier quality seminars
Retesting		Tool and machines control
Rework in factory or service operations		Worker training and cross-training
Scrap		

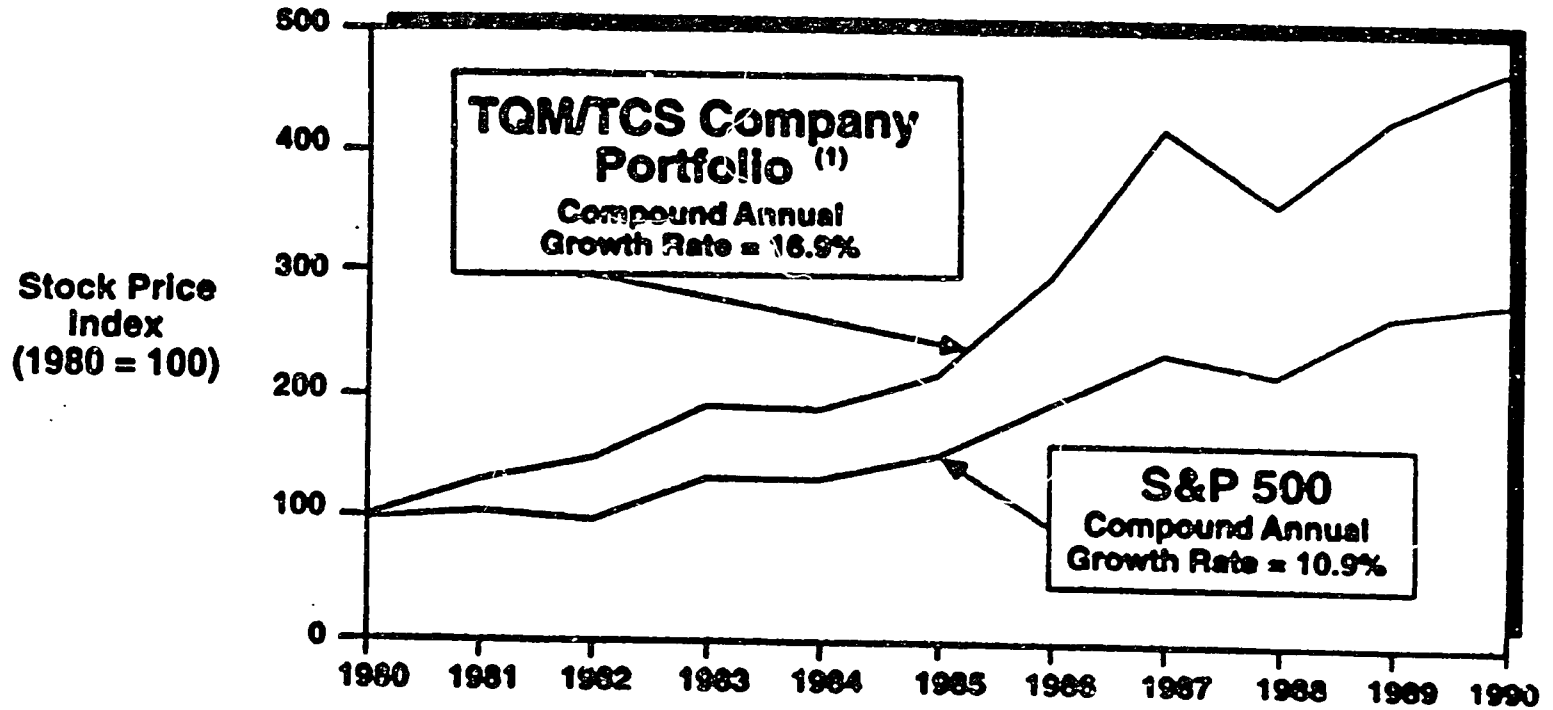
WHAT IS QUALITY PERFORMANCE?

Quality Performance means consistently meeting or exceeding your internal or external customers' expectations so THEY can be successful.

WHY QUALITY PERFORMANCE?

Quality Performance

TQM/TCS Companies Have Substantially Outperformed The S&P 500

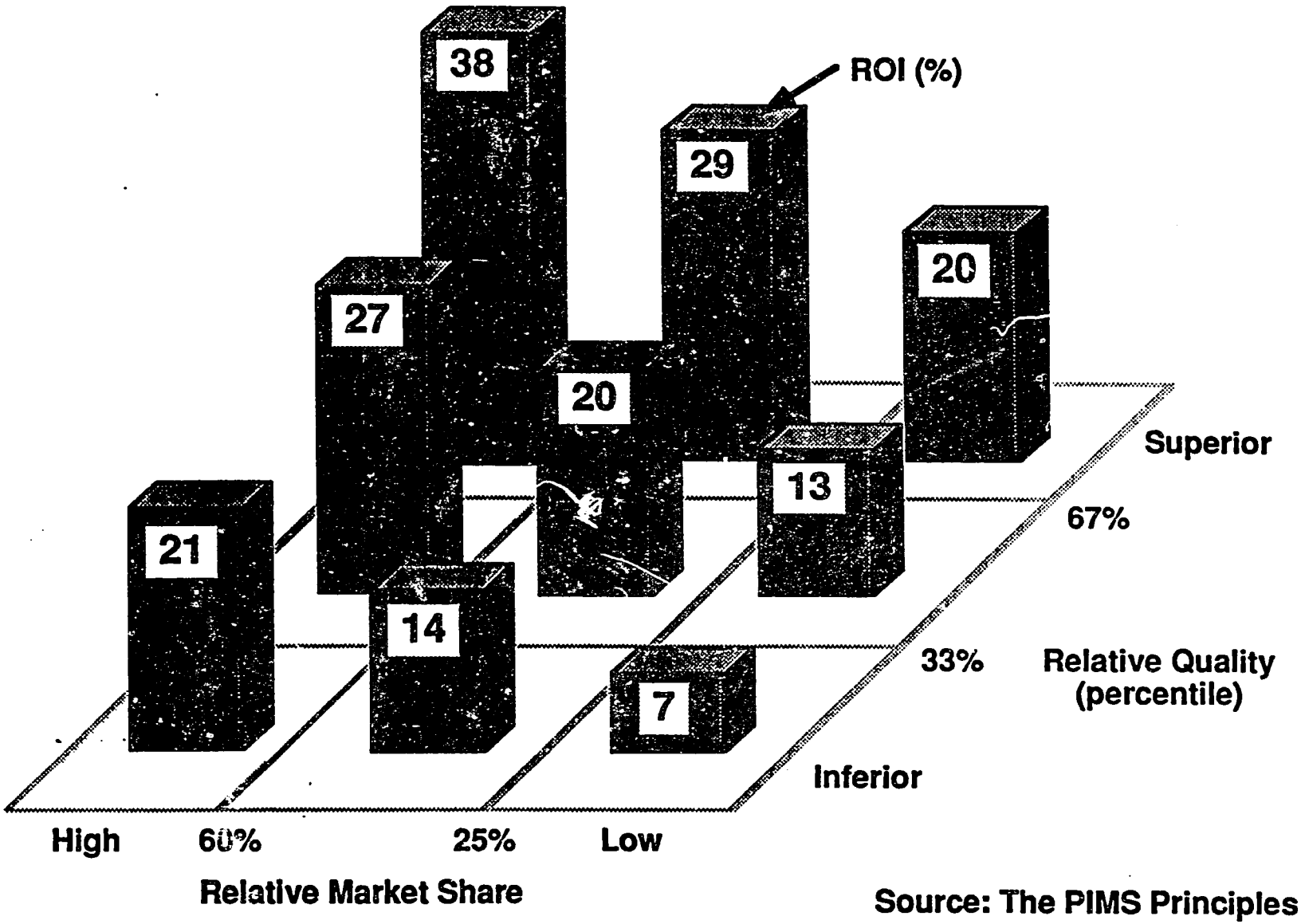


Note: (1) Portfolio is comprised of Bell Atlantic, Coca-Cola, Disney, Dow Chemical, Federal Express, Ford, General Electric, H.J. Heinz, Hewlett-Packard, Honda, Eli Lilly, McDonald's, 3M, Nordstrom, Procter & Gamble, Rubbermaid, Texas Instruments, Toyota, Unilever, Westinghouse, Xerox

Business Performance Implications Of TQM/TCS		
Performance Characteristic	**Non-TQM/TCS Companies**	**TQM/TCS Companies**
■ Relative price	98	107
■ Market share	2% Loss Per Year	6% Gain Per Year
■ Sales	8% Gain Per Year	17% Gain Per Year
■ Return on sales	1%	12%

Source: PIMS (Profit Impact of Market Strategy) Database, Cambridge, Massachusetts

QUALITY PERFORMANCE DRIVES PROFITABILITY



Source: The PIMS Principles

Quality Performance

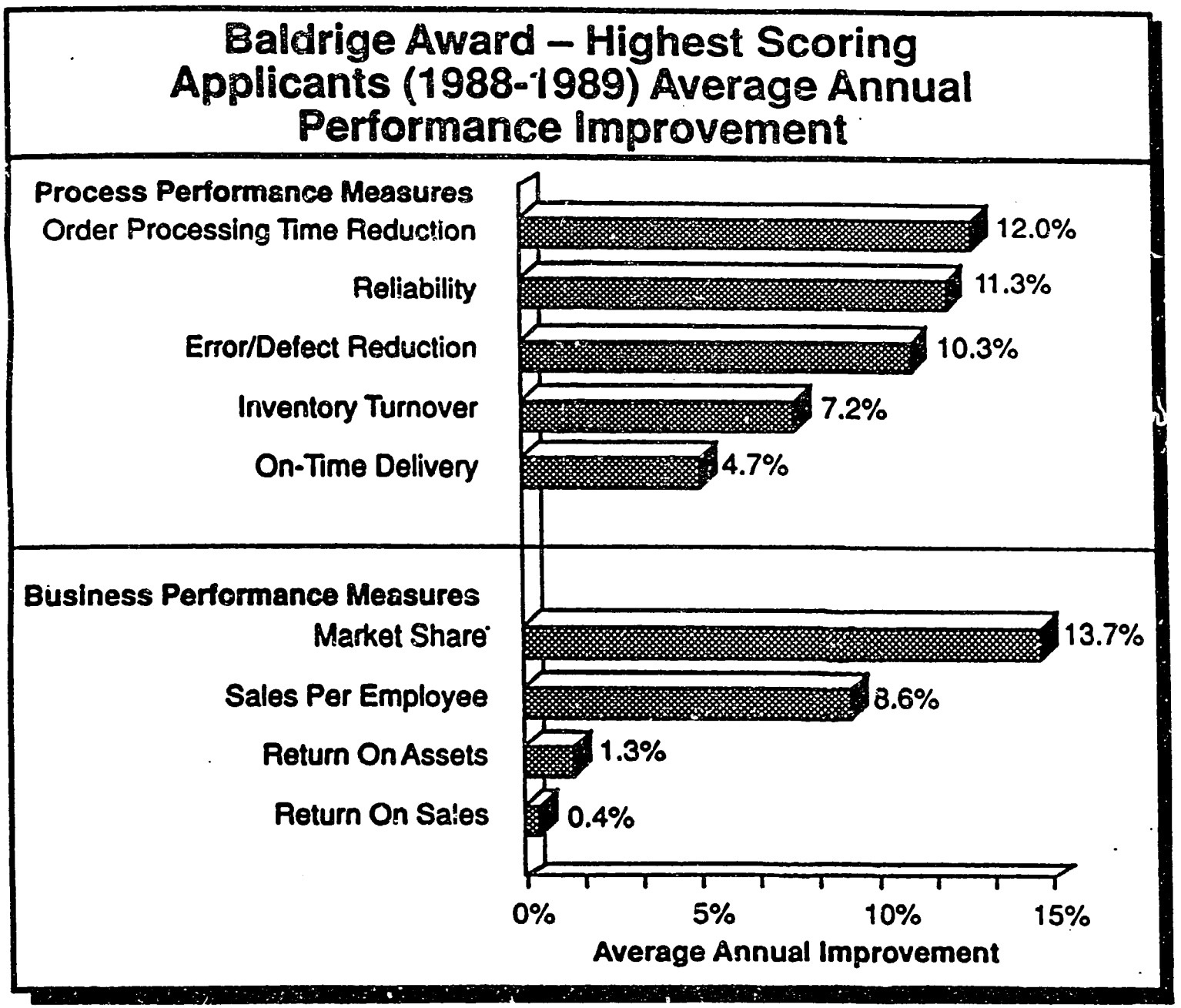
QUALITY PERFORMANCE AFFECTS PRICE

Relative Quality (percentile)	Low	25%	60%	High
Superior	107	107	108	
67%	103	104	104	
33%	101	101	102	
Inferior				

Relative Price (%)

Relative Market Share

Source: The PIMS Principles



Source: United States General Accounting Office

QUALITY PERFORMANCE AND PROFITABILITY

BENEFITS OF SUPERIOR QUALITY

- Stronger customer loyalty
- More repeat purchases
- Less vulnerability to price wars
- Ability to command higher relative price without affecting market share
- Lower costs
- Market share improvements

THE "WHO" OF QUALITY

CROSBY'S "14 STEP" QUALITY IMPROVEMENT PROGRAM

1. Management Commitment
2. Quality Improvement Team
3. Quality Measurement
4. Cost of Quality Evaluation
5. Quality Awareness
6. Corrective Action
7. Ad Hoc Zero Defects Group
8. Supervisor Training
9. Zero Defects Day
10. Goal Setting
11. Error Cause Removal
12. Recognition
13. Quality Councils
14. Do It Over Again

THE "WHO" OF QUALITY

DEMINGS "14 POINTS"

1. Create Constancy of Purpose
2. Adopt New Philosophy
3. Cease Mass Inspection
4. Don't Single Out Price
5. Continuous Improvement
6. Institute Training on the Job
7. Institute Leadership and Improved Supervision
8. Drive Out Fear
9. Break Departmental Barriers
10. Eliminate Numerical Goals Without Providing Methods
11. Eliminate Fixed Work Standards
12. Remove Barriers to Pride of Workmanship
13. Vigorous Education Program
14. Involvement

THE "WHO" OF QUALITY

JURAN'S "BREAKTHROUGH"

1. Policy Making
2. Setting Objectives
3. Breakthrough in Attitudes
4. Use of Pareto Principle
5. Organizing for Breakthrough
6. Creation of Steering Arm
7. Creation of a Diagnostic Arm
8. Diagnosis
9. Breakthrough in Cultural Pattern
10. Transition to the New Level

THE "WHAT" OF QUALITY

Quality

Those attributes of a product or service that meet the needs and expectations of the user, as perceived by the user.

Quality Control

The regulatory process through which we measure actual quality, performance, compare it with standards,and act on the difference.

Quality Assurance

The activity of providing to all concerned, the evidence needed to establish confidence that the quality function is being performed adequately.

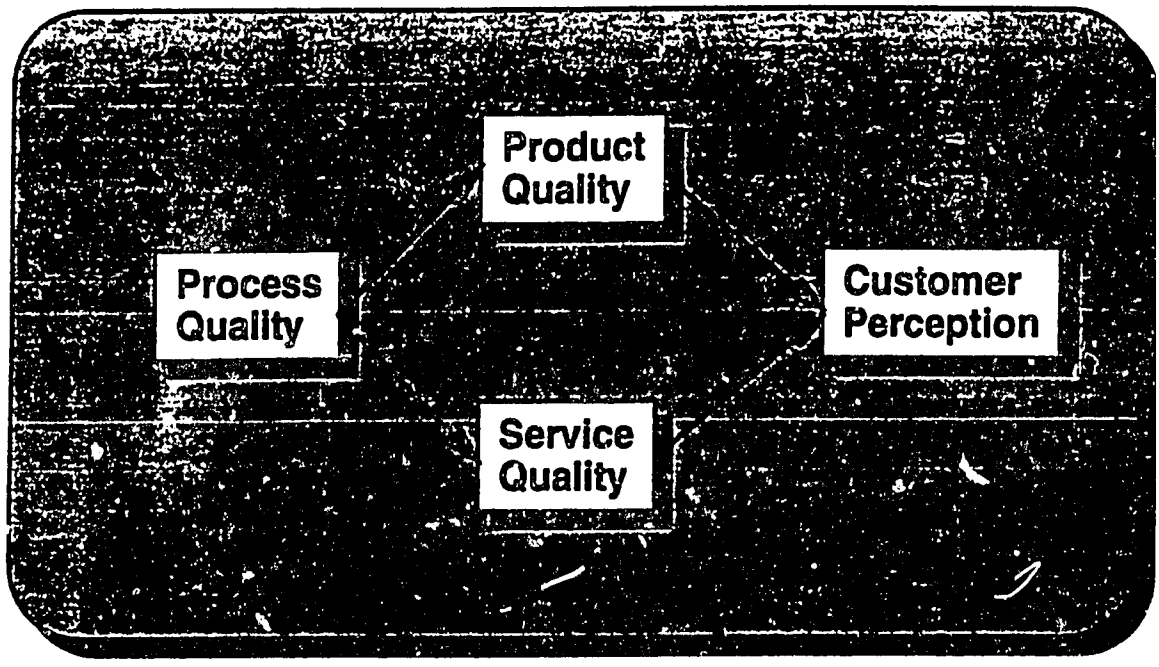
Quality Function

The Entire Collection of activities through which an organization achieves quality.

Quality System

The specifically designed plans, tasks, and programs within an organization to achieve quality.

Competing on Quality



Product Quality includes those dimensions of quality that can be attributed to the products themselves.

Service Quality includes those dimensions of quality that can be attributed to customer service and the way we interact with our customer.

Process Quality includes those dimensions of quality that relate to the processes that we use to produce our products.

THE DIMENSIONS OF PRODUCT QUALITY
Garvin 1989, Anderson, 1990

Product Quality includes those dimensions of quality that can be attributed to products themselves:

1. **INFORMATION CONTENT:**	Is adequate information provided for purchasing and use of the product.
2. **PERFORMANCE:**	The primary operating characteristic(s) of a product; i.e., does it do the job?
3. **FEATURES:**	The options that enhance and expand the product offering.
4. **CONFORMANCE:**	The degree to which a product's design and operating characteristics match a preestablished and promised standard.
5. **PERCEIVED QUALITY:**	The wider reputation the company has with regard to quality. (e.g. Are our customers likely to think our products are high quality given other experiences with our organization?)
6. **AESTHETICS:**	How the product appeals to senses (i.e., packaging, color, texture, etc.)
7. **DURABILITY:**	The amount of use one gets from a product before it deteriorates beyond repair or useability (i.e., how long the products last.)
8. **DELIVERY TIMELINESS:**	The ability to deliver the product to the customer on time.
9. **COST TO THE CUSTOMER:**	The price of the product paid by the customer.
10. **RELIABILITY:**	The frequency with which the product fails or breaks down.
11. **SERVICEABILITY:**	The access to and ease of repair or service of the

THE DIMENSIONS OF SERVICE QUALITY
Zeithaml, Parasuraman, and Berry; 1990

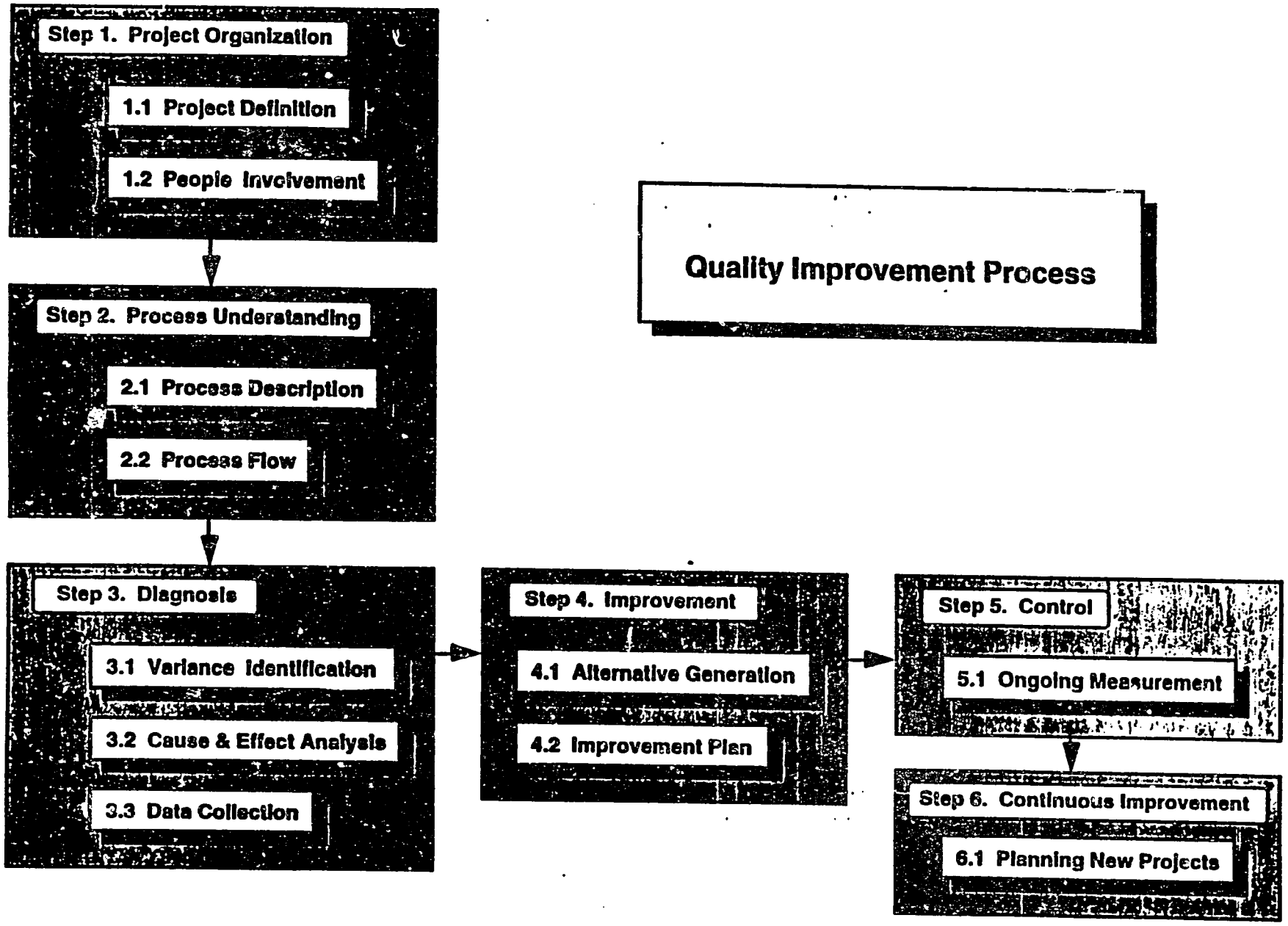
Service Quality includes those dimensions of quality that can be attributed to customer service and the way we interact with our customer:

1. **UNDERSTANDING THE CUSTOMER:**	Making an effort to know customers and their needs.
2. **RESPONSIVENESS:**	Willingness to help customers and provide prompt service.
3. **ACCESS:**	Approachability, ease of contact.
4. **COMMUNICATION:**	Keeping customers informed in language they can understand and listening to them.
5. **COMPETENCE:**	Possession of the required skills and knowledge to perform the service.
6. **CREDIBILITY:**	Trustworthiness, believability, honesty of the service provider.
7. **RELIABILITY:**	Ability to perform the promised service dependably and accurately.
8. **COURTESY:**	Politeness, respect, consideration, and friendliness of contact personnel.
9. **SECURITY:**	Freedom from danger, risk, or doubt.
10. **TANGIBLES:**	Appearance of physical facilities, equipment, personnel, and communication materials.

THE DIMENSIONS OF PROCESS QUALITY
Anderson, Dooley, Misterek; 1990

Process Quality includes those dimensions of quality that relate to the processes that we use to produce our products:

1. **EFFICIENCY:**	The degree to which the process adds value, as opposed to waste, to the product.
2. **CAPACITY:**	The ability to produce the amount of product necessary to meet customer demand.
3. **FLEXIBILITY:**	The ability to make timely and effective changes in meeting product type or product volume changes.
4. **SYNCHRONIZATION:**	How well aligned different parts of the process are.
5. **ROBUSTNESS:**	The ability of the process to meet changes in product or environment without major modification.
6. **CAPABILITY:**	The ability to keep variation of critical product characteristics within promised limits.
7. **SIMPLICITY:**	How complicated the process is.
8. **UNDERSTANDABILITY:**	How well understood the process is throughout the organization by those who would benefit from this knowledge.
9. **CLEANLINESS:**	The cleanliness of the process.
10. **SAFETY:**	How safe the process is to employees and customers involved.


Quality Improvement Process
Step 1. Project Organization
1.1 Project Definition
1.2 People Involvement
Step 2. Process Understanding
2.1 Process Description
2.2 Process Flow
Step 3. Diagnosis
3.1 Variance Identification
3.2 Cause & Effect Analysis
3.3 Data Collection
Step 4. Improvement
4.1 Alternative Generation
4.2 Improvement Plan
Step 5. Control
5.1 Ongoing Measurement
Step 6. Continuous Improvement
6.1 Planning New Projects

The Quality Improvement Pocess is intended to provide us with a logical, orderly way of identifying areas of improvement, understanding what needs to be done, taking action to realize results toward continuous improvement.

The process involves six basic steps as shown in the figure on the next page, starting with Project Organization and ending with Continuous Improvement. The following provides a brief summary of the kinds of activities and issues explored in each step.

Step 1. Project Organization

The Project Organization step is a very important start of a quality improvement project. It involves identifying opportunities for improvement. Further it involves defining the particular project opportunity in terms of scope and specific objectives to be accomplished. Finally it involves exploring and defining the membership of the project team. Beyond the structure itself these steps provide ways of thinking about project definition and organization which can aid these efforts.

Step 2. Process Understanding

The Process Understanding step helps to clarify the scope of the project by placing the problem in the context of the processes that appear to produce the problem. During this step we seek a common understanding of what is really happening, and how far we should reach out in the improvement project. The primary goal here is to get everyone in the group on the same footing, and to understand the broader context of the problem. During this step we search for the organization of activities that come together to produce or reduce the problem. Tools are provided to help identify and describe this process understanding.

Step 3. Diagnosis

The diagnosis step, as its name implies involves diagnosing the problem situation and concluding with a statement of causes of the problem that are verified by data. It consists of three sub steps which may require repeat visits. The first sub step involves choosing an area of the problem situation to work on. This problem may be the problem as originally stated, or more likely a more specific statement of a problem that has emerged in Process Understanding step or simply from project group discussions. The second sub step involves defining possible causes of the chosen problem. The third sub step involves collecting and analyzing data to confirm the causes involved. This may involve the use of past data that may be available, or may require additional data collection. Tools are provided to help your group accomplish these activities.

Step 4. Improvement

The improvement step involves generating possible solutions to the problem identified during the diagnosis step, and most importantly choosing and organizing a solution plan that your group believes provides the best assurance of improvement. During this step you will explore a variety of different avenues of improvement; carefully plan the changes required, and structure the kinds of controls that you feel are important to realize success of the project effort. A number of concepts and questions are provided to help your group identify and develop improvements.

Step 5. Control

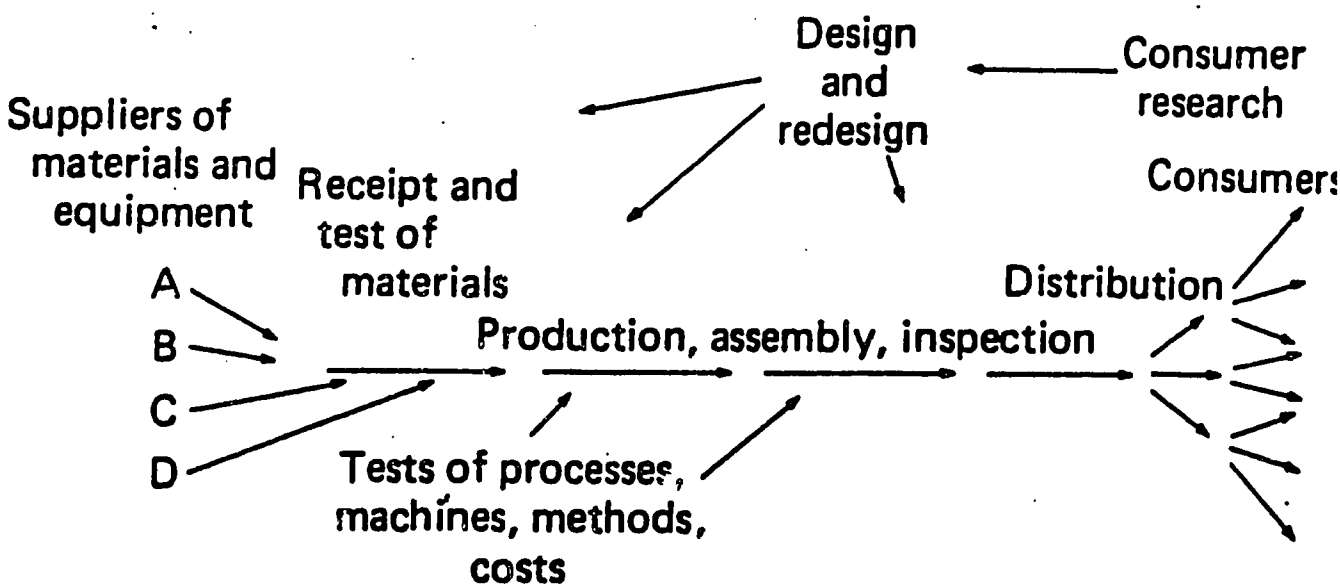
The control step involves defining and putting into place controls to assure 1) that the change is working, 2) that we are on the path toward continuous improvement with regard to this process, and 3) that we can stay on that path. In large part it builds off the improvement plan developed in the previous step. What is different here is that we are taking action to put in place and monitor the progress of improvement. Various concepts and methods for control are provided in this step.

Step 6. Continuous Improvement

Your project is intended to be a beginning. It is hoped that it helps to lead us on a path of continuous improvement. Your knowledge about the process involved in this project, and your understanding of our quality improvement process, needs to be shared so that others can build upon your experience. This step involves your planning of what you will do next toward furthering continuous improvement. It may mean pursuing a problem or improvement plan discussed in this project effort, or it may involve an entirely new problem and improvement area. It may mean being a part of taking leadership in a new project team effort.

Quality Improvement:
A Special Kind of Problem Solving

"Process Problem Solving"



Begin the Process of Identifying Quality Improvement Project Opportunities

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Think about Projects that can
Impact the Customer

Think about Projects that can
Simplify what we do?

Think about Projects that can
Shorten the time Involved in what we do?

Think about Projects that
Relate to what you do for and with Others

Gather Input Regarding
Project Opportunities with Others

Think about Project Opportunities
That Involve Waste of Some Kind

Think about Project Opportunities
That involve Reducing Variation

Think about Project Opportunities
That Involve a Large Amount of Setup

Think about Projects in terms of
Opportunities, Problems, and Crises

PROJECT DEFINITION
THREE VIEWS OF PROBLEM SOLVING..

IT IS TOO NAIVE...

to always accept the problem as given

IT IS TOO IDEAL...

to believe study will always reveal the true problem

IT IS PRACTICAL...

to realize that problem definitions are chosen, and that this choice makes a fundamental difference in the success of what we do!

PROJECT DEFINITION
Avoiding Type III Error

Personally Persevere When you feel Constructive Discontent..

Take an Excursion into Creativity...

Use a Combination of Convergent and Divergent Thinking..

Recognize and See Beyond the Barriers to Effective Problem Solving..

Think "More Broadly" about the Problem..

Understand the Context of the Problem

Seek Underlying Causes

Effectively Employ the Team in Defining the Problem Situation...

AVOIDING TYPE III ERROR

Develop a Preliminary Statement of the Quality Improvement Project including:

A short definition of the Problem.

Some examples of the problem which highlight more specific circumstances involved in, or simply instances of the problem

A statement of issues to consider including such things as timing, constraints, requirements, etc.

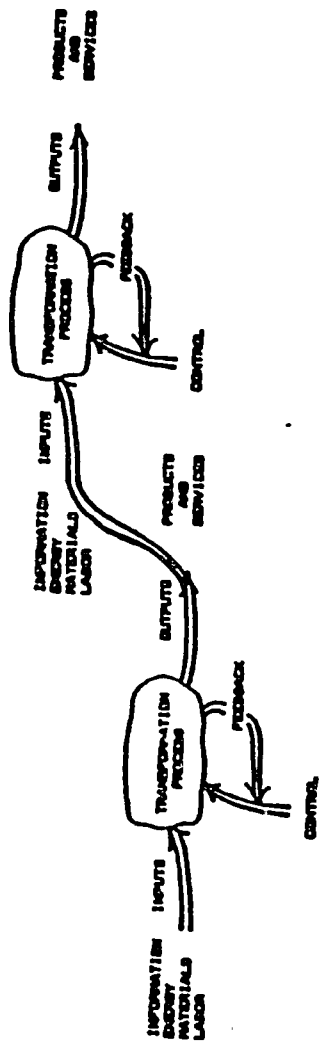
A tentative statement about expectations or requirements for improvement as a result of the project effort.

PROCESS SYSTEM FLOW DIAGRAMS
THE CONCEPT OF THE SYSTEMS PERSPECTIVE

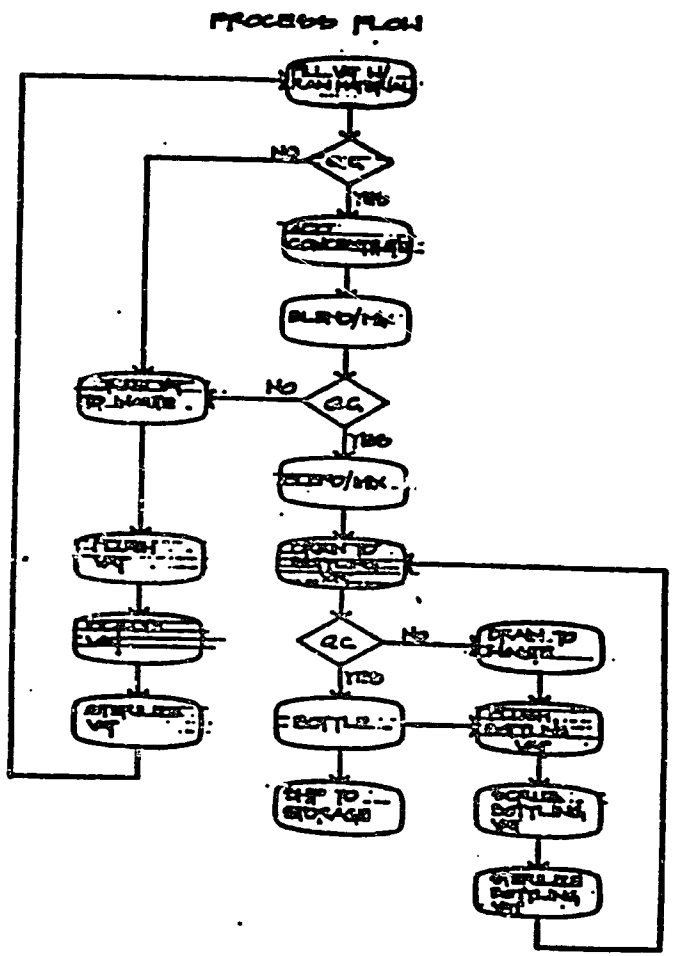
WHAT IS THE SYSTEMS PERSPECTIVE?

It is not "systems analysis"

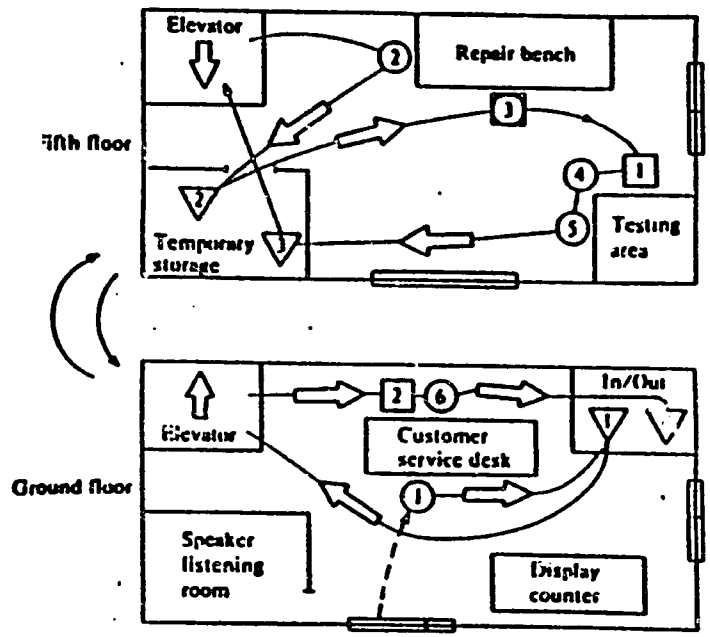
Rather it is a unique way of looking at processes as systems

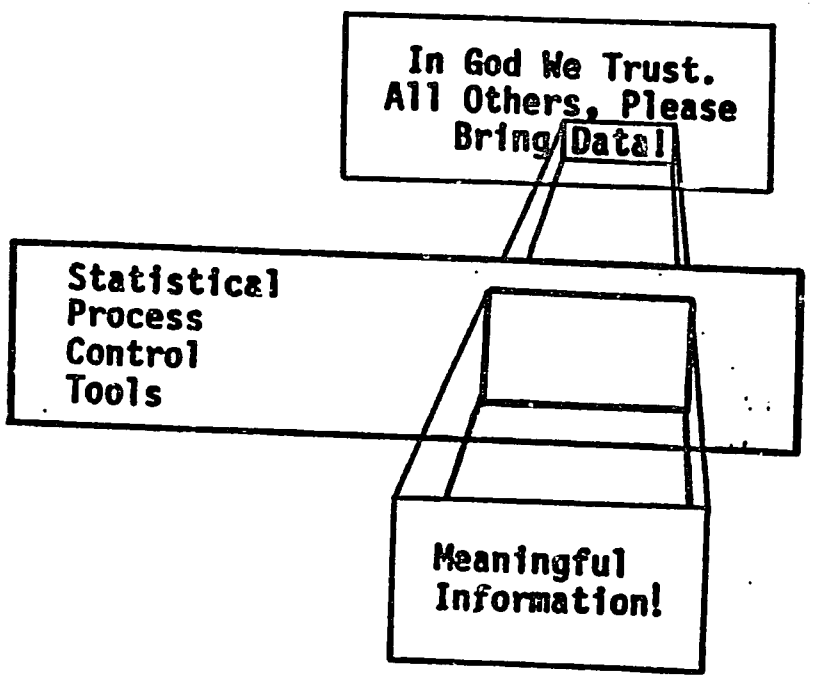


SYSTEM PROCESS FLOW DIAGRAM
ILLUSTRATION



SYSTEM PROCESS FLOW DIAGRAM
ILLUSTRATION





CHECKSHEETS...
TRANSFORMING DATA TO INFORMATION

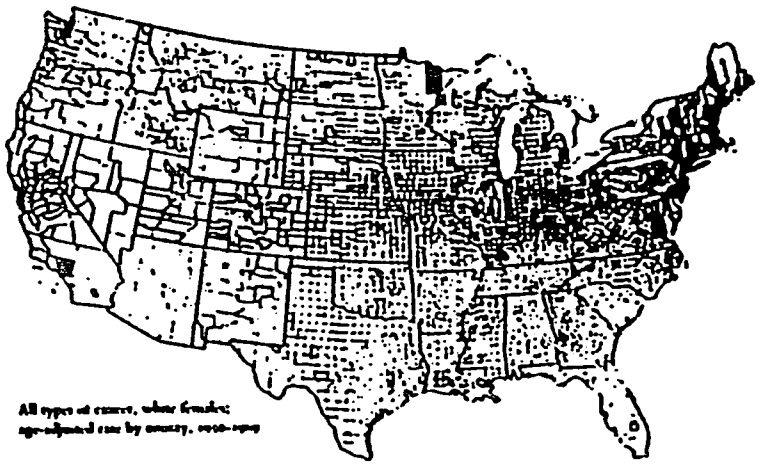
Data without a clear purpose or unreliable data are worth nothing.

Checksheets provide a Simple, Efficient, Organized way to Structure and Represent data in a meaningful way to provide Information in the Problem Identification and Problem Solving process

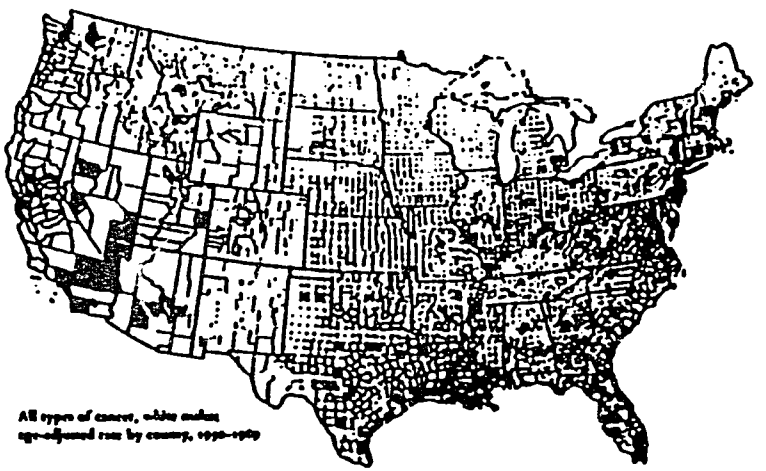
CHECKLIST
ILLUSTRATION

Dr. John Snow's classic study in epidemiology during the London Cholera epiemic of 1854 employed the use of checklist which mapped the incidence of deseese to a map of the city. The analysis revealed that the primary cause was a contaminated water pump.

CHECKLISTS
ILLUSTRATION



All types of cancer, white females: age-adjusted rate by county, 1950-1969



All types of cancer, white males: age-adjusted rate by county, 1950-1969

(Source: Tufte)

PARETO ANALYSIS
DEVELOPING USEFUL CLASSIFICATIONS

WHAT KINDS OF ITEM CLASSIFICATIONS SHOULD BE USED?

1. Various kinds of defectives
2. Product Classifications
3. Subassembly Categories
4. Parts and Components
5. Organizational Departments
6. Work Groups
7. Supervisors
8. Employees
9. Geographic Locations
10. Size
11. Inputs to the System
12. Materials
13. Supplier Categories
14. Suppliers
15. Stages in a Process

BE INNOVATIVE WITH THE CLASSIFICATIONS THAT YOU USE. NEW ITEM CLASSIFICATIONS IN PARETO ANALYSIS REVEAL A NEW LEVEL OF UNDERSTANDING ABOUT THE PROBLEM SITUATION, AND HOPEFULLY A NEW LEVEL OF QUALITY

PARETO ANALYSIS

Vilfredo Pareto (1849-1923), an Italian economist, while studying the distribution of wealth discovered, "80% of the wealth lies with 20% of the people".

The "Pareto principle" as coined by Juran has become deeply rooted in our industrial literature. It generally recognizes the phenomenon that in any population which contributes to a common effect, a relative few of the contributors account for the bulk of the effect.

It is the principle of the "VITAL FEW AND TRIVIAL MANY"

A Pareto Chart helps you provide a clear, concise, picture of the relative seriousness of causes, or categories of causes, that you have identified. Most times the causes are shown according to their frequency of occurrence but by translating the causes in to monetary amounts you can see the economical impact each has.

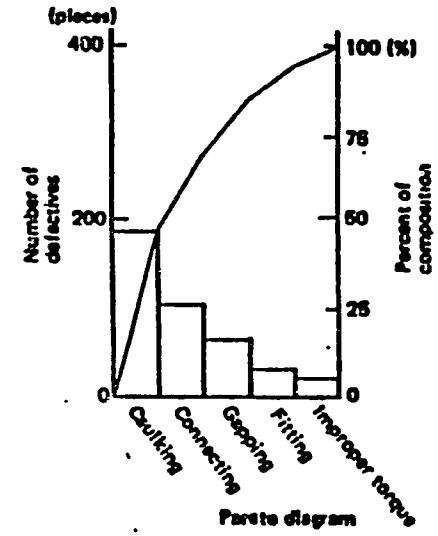
PARETO ANALYSIS
ILLUSTRATION OF GENERAL FORM

Record of Defectives

Date: Number Inspected: *N = 2166*

Defective Items	Number of defectives	Per cent Defective	Per cent defective
Caulking	198	9.1%	47.6
Fitting	25	1.2%	6.0
Connecting	103	4.8%	24.7
Torque	18	0.8%	4.3
Gapping	72	3.3%	17.3
Total	416	19.2%	99.9

PARETO ANALYSIS
ILLUSTRATION OF GENERAL FORM



Pareto diagram

(Adapted from Ishikawa)

STEPS IN THE CONSTRUCTION OF A PARETO DIAGRAM

1. First decide upon the definition of the problem or opportunity to be examined. You may wish to examine what contributes to defective product, or what contributes extraordinarily high quality product, or what contributes to resource utilization.

2. Define the classification items you will use in the graph. For example, graphs could list items according to kinds of defectives, defects, work groups, product, size, damage, etc. Be sure that your check sheets are organized so that this information is available.

3. Decide on the period of time to be illustrated on your graph. This will vary according to your particular situation. However, it is preferable that the period be set conveniently such as one week, two weeks, one month, quarterly, etc, but for some processes it could also be one day, two days or four hours. Try to keep the period consistent if you can so you will be able to compare a Pareto Chart from one period to another.

4. Total the frequency of occurrence for each item for the period decided upon above. The total for each item will be shown bey the length of the bar.

5. Draw horizontal and vertical axes on graph paper and demarcate the vertical axis in the proper units (such as the number of defectives). Try to make the graph easy to read. Do not number every line on the vertical axis, use units demarcations of tens, hundreds, etc as appropriate. Clearly label the vertical and horizontal axes.

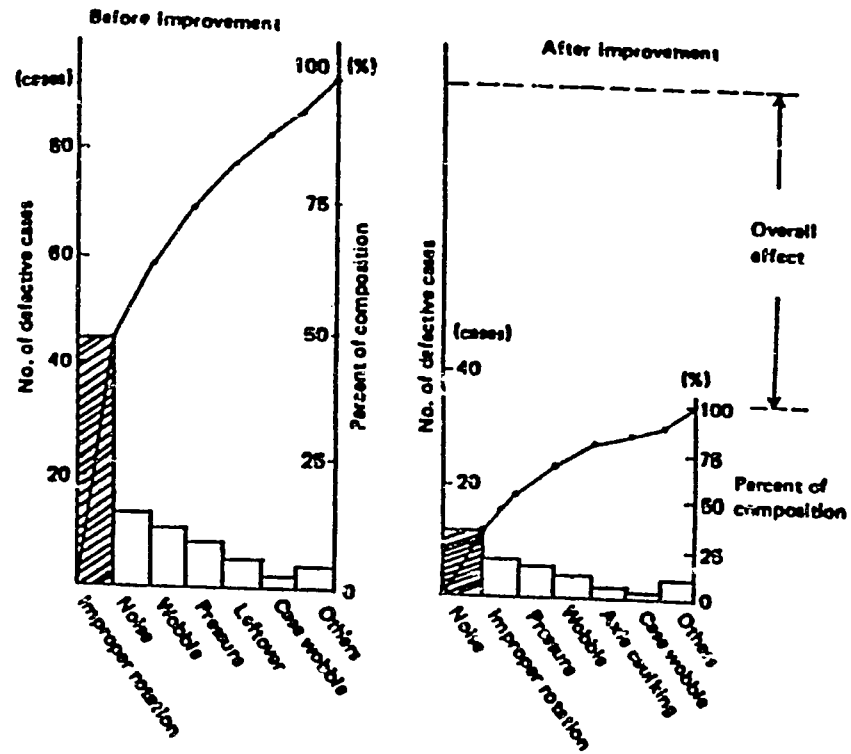
6. Under the horizontal axis, write in the most important item first, then the next most important, and so on. In this way the most frequent item will be shown on the far left. Group the many items with little frequency under a category labeled "Other" which should be shown on the far right.

7. Draw in the bars. The height of the bar will correspond to the value on the vertical axis. Keep the width of the bar the same, and position the bars in contact with each other.

8. Plot a line graph of the cumulative total for each item.

9. Title the graph and write briefly the source of the data on which the graph is based.

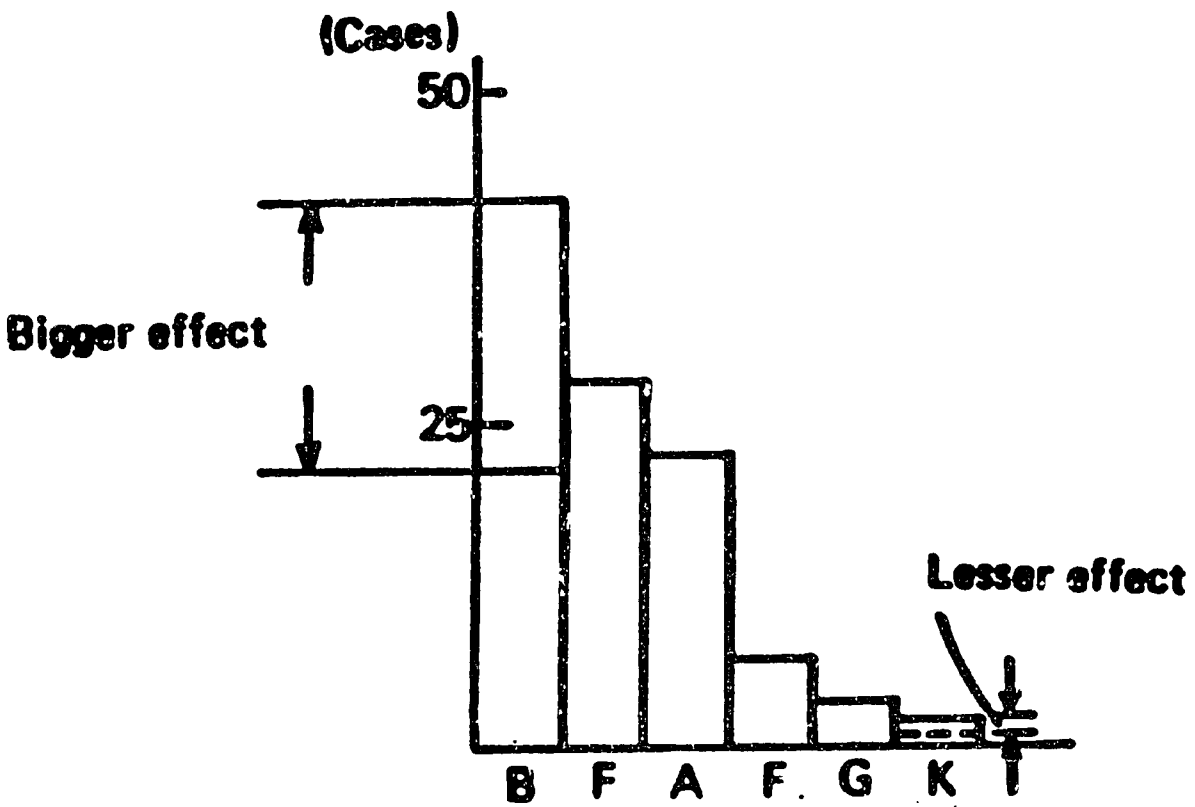
PARETO ANALYSIS
ILLUSTRATION WITH IMPROVEMENT



(Adapted from Ishikawa)

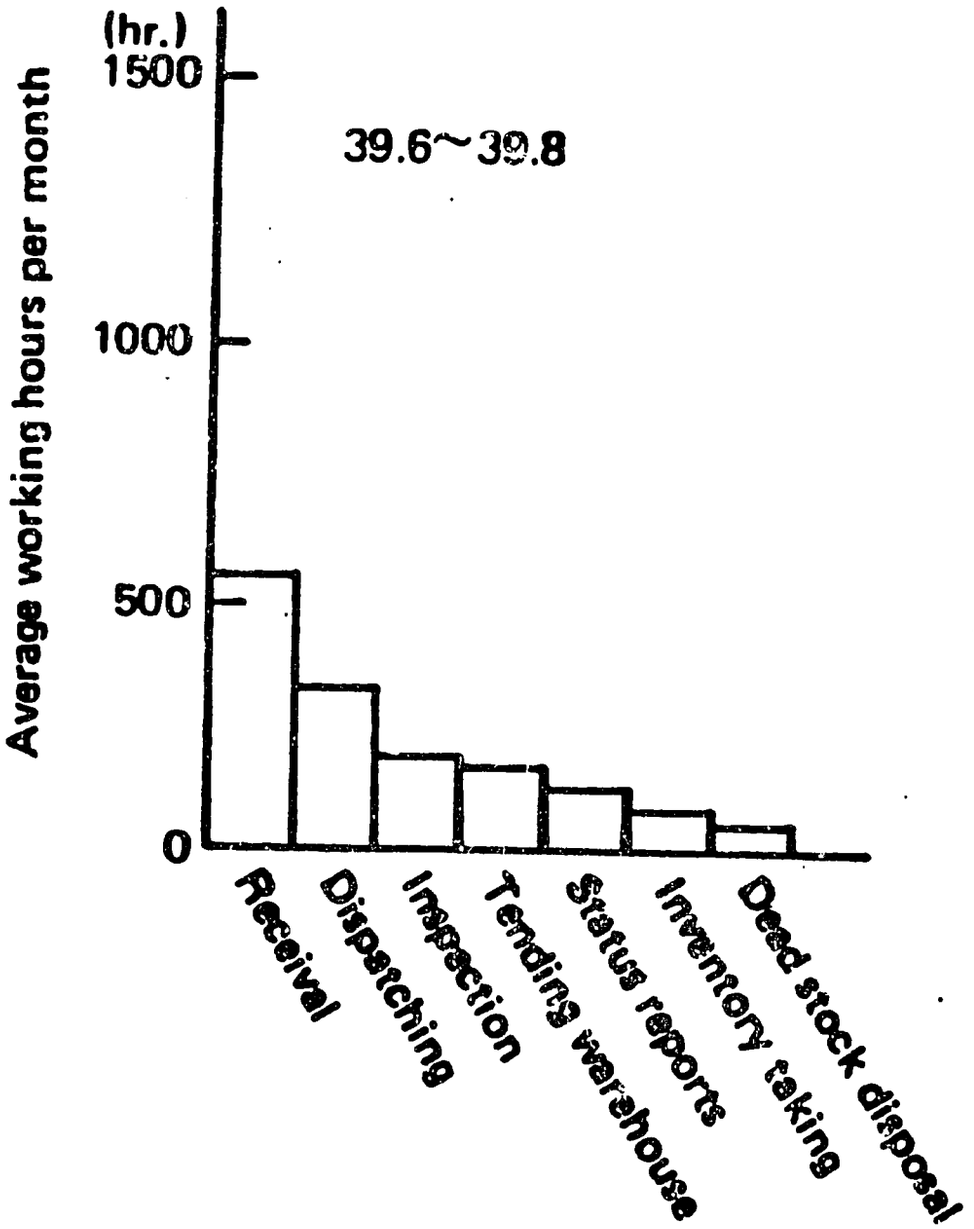
USING PARETO DIAGRAMS

- FIRST STEP IN MAKING IMPROVEMENTS
- ESTABLISH A CONCRETE GOAL (ONE LOOK AT THE DIAGRAM TELLS WHERE EFFORT SHOULD BE CONCENTRATED)

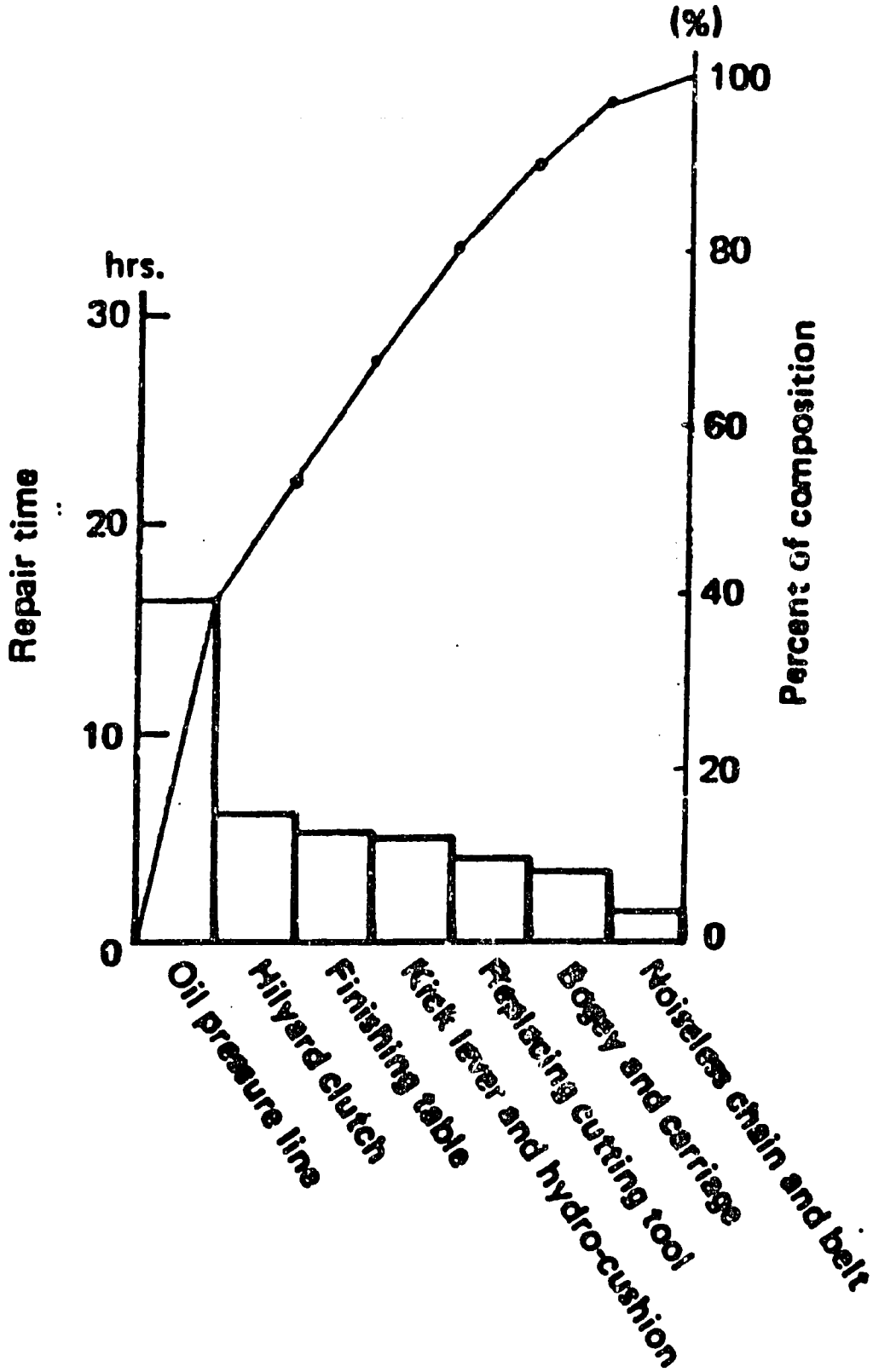


EFFORT FOR AND EFFECT OF IMPROVEMENT

- PARETO DIAGRAMS CAN BE USED FOR IMPROVING ALL ASPECTS OF OPERATIONS



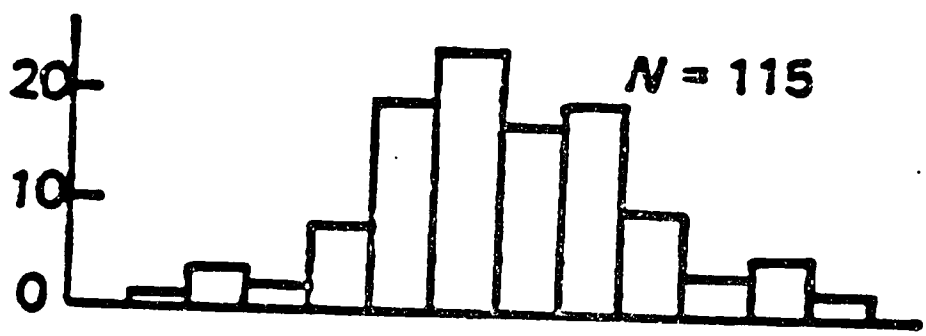
PARETO DIAGRAM OF CUMULATIVE HOURS SPENT BY WAREHOUSE WORKERS ON DIFFERENT JOBS



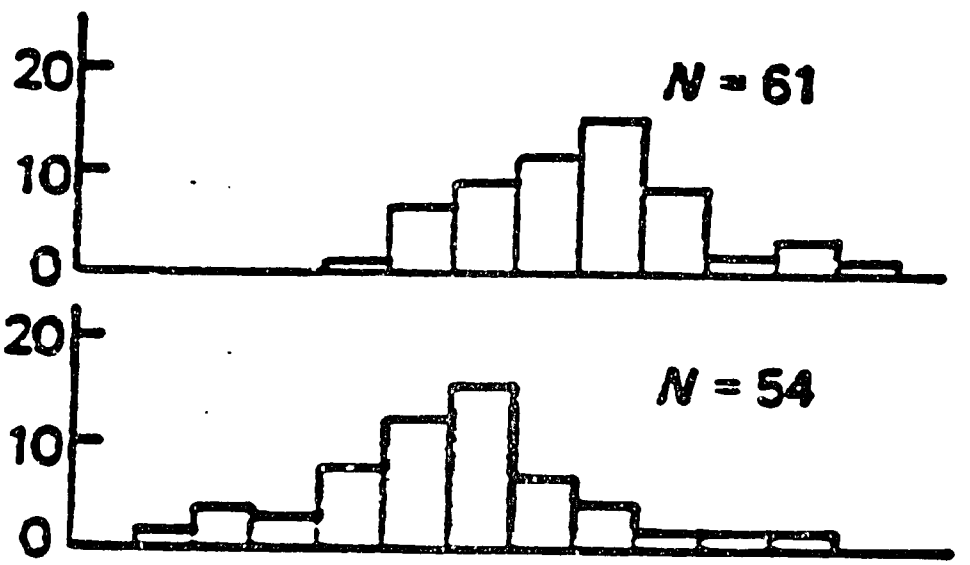
PARETO DIAGRAM FOR CUTTER MACHINE BREAKDOWNS

HISTOGRAM

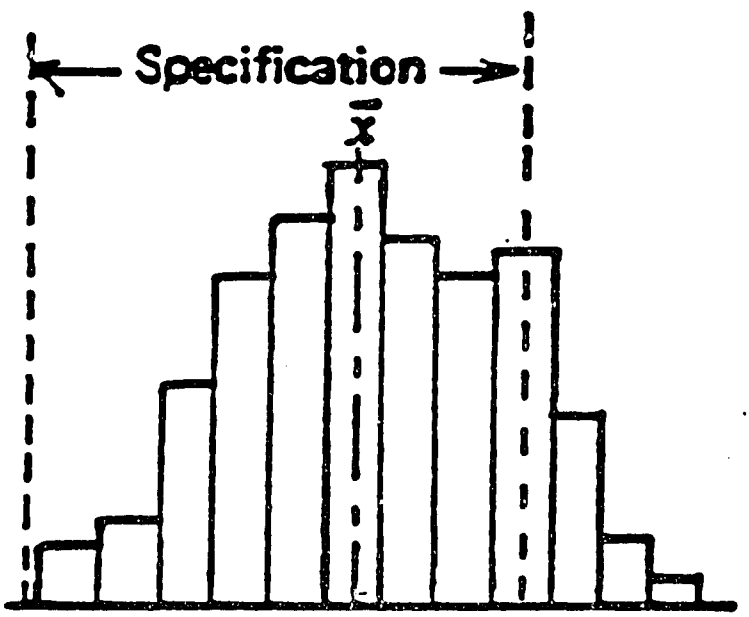
- SIMPLE DIAGNOSTIC TOOLS
- EASY TO CONSTRUCT
- CONSTRUCT A FREQUENCY TABLE
- CONVERT TO HISTOGRAM
- SPREAD SHEETS
- EXAMPLES



Sheet metal hardness histogram



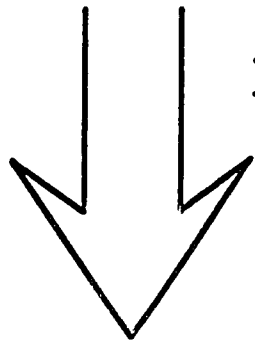
Hardness histograms by companies A and B



Histogram of load characteristics

A MANUFACTURING COMPANY'S OBJECTIVE:

To bring new (and carryover) products to market sooner than the competition with lower cost and improved quality



MECHANISM

QUALITY FUNCTION DEPLOYMENT (Q.F.D.)

A system to assure that customer needs drive the product design and production process

* Focuses effort on designing quality at the vision and product development stage
  -- More product development quality control
  -- Less manufacturing process quality control

* Company operations driven by the "voice of the customer"

* Assigns responsibilities to deploy the "voice of the customer" and to translate these requirements into design and manufacturing parameters.

Q.F.D. DEFINITIONS:

Q.F.D. is an overall concept that provides a means of translating customer requirements into the appropriate technical requirements for each stage of product development and production (i.e., marketing strategies planning, product design and engineering, prototype evaluation, production process development, production, sales). (Sullivan)

Q.F.D. is a systematic approach for:

- identifying and prioritizing customer needs
- translating ~~there~~ their needs into product and/or service specifications, and
- tracking those needs throughout the product/service realization process. (AT & T)

Q.F.D. is a systematic means of ensuring that customer or market place demands (requirements, needs, wants) are accurately translated into relevant technical requirements and actions throughout each stage of product development (Fortuna)

Q.F.D. is a way to induce quality control into product development (Steudel)

QUALITY FUNCTION DEPLOYMENT

(Linked Definitions)

Customer Requirements

⇓

System Requirements

⇓

Part Requirements

⇓

Part Characteristics

⇓

Manufacturing Operations

⇓

Production Requirements

QUALITY FUNCTION DEPLOYMENT
Structure and Tools

AT & T's 5-Step Structure

1. Identify Market Needs

2. Prioritize Needs
   - Customer importance ratings
   - Competition ratings
   - Company strategy/direction

3. Identify Technical Characteristics and Features

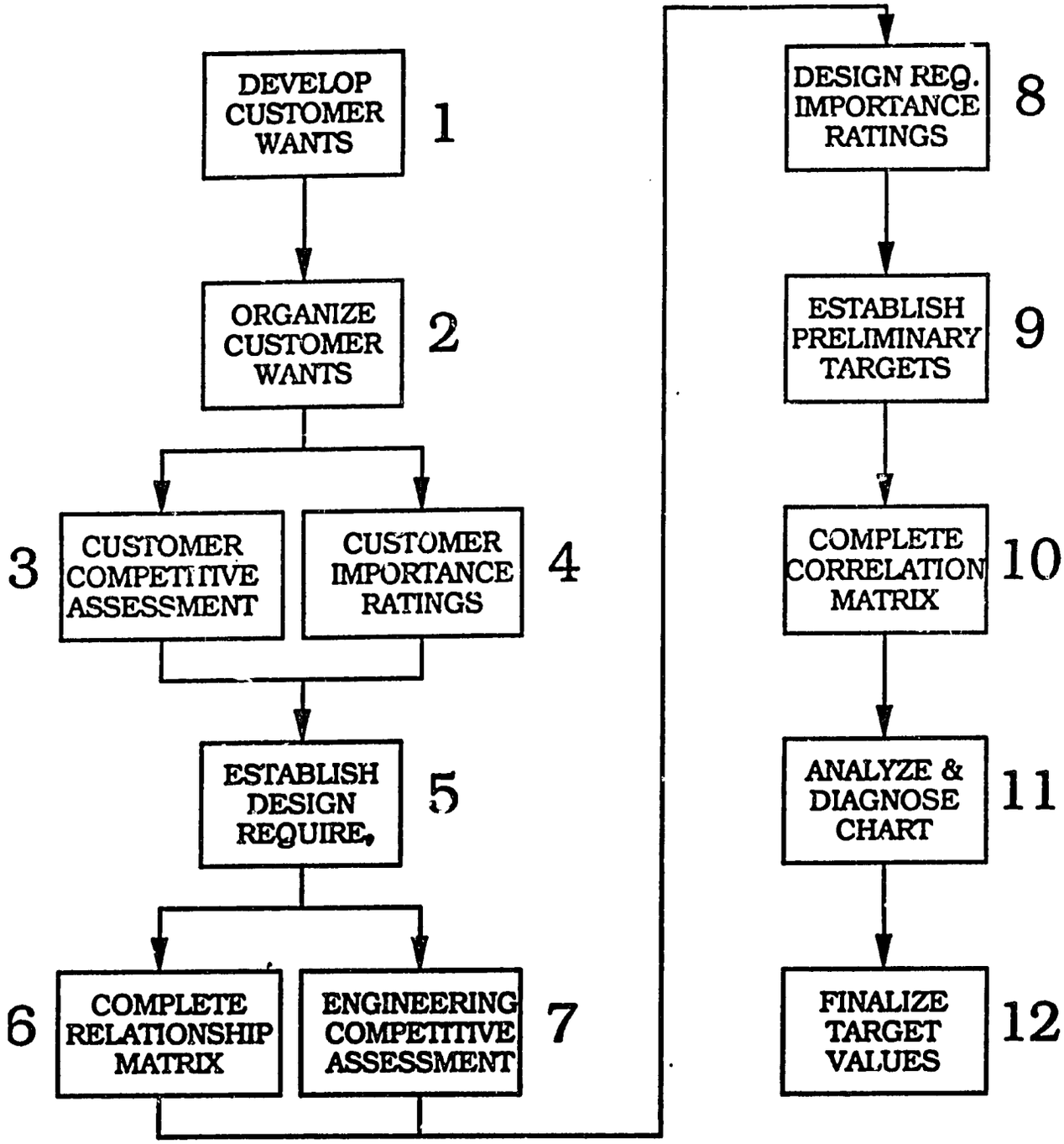
4. Map Technical Characteristics and Features to Needs

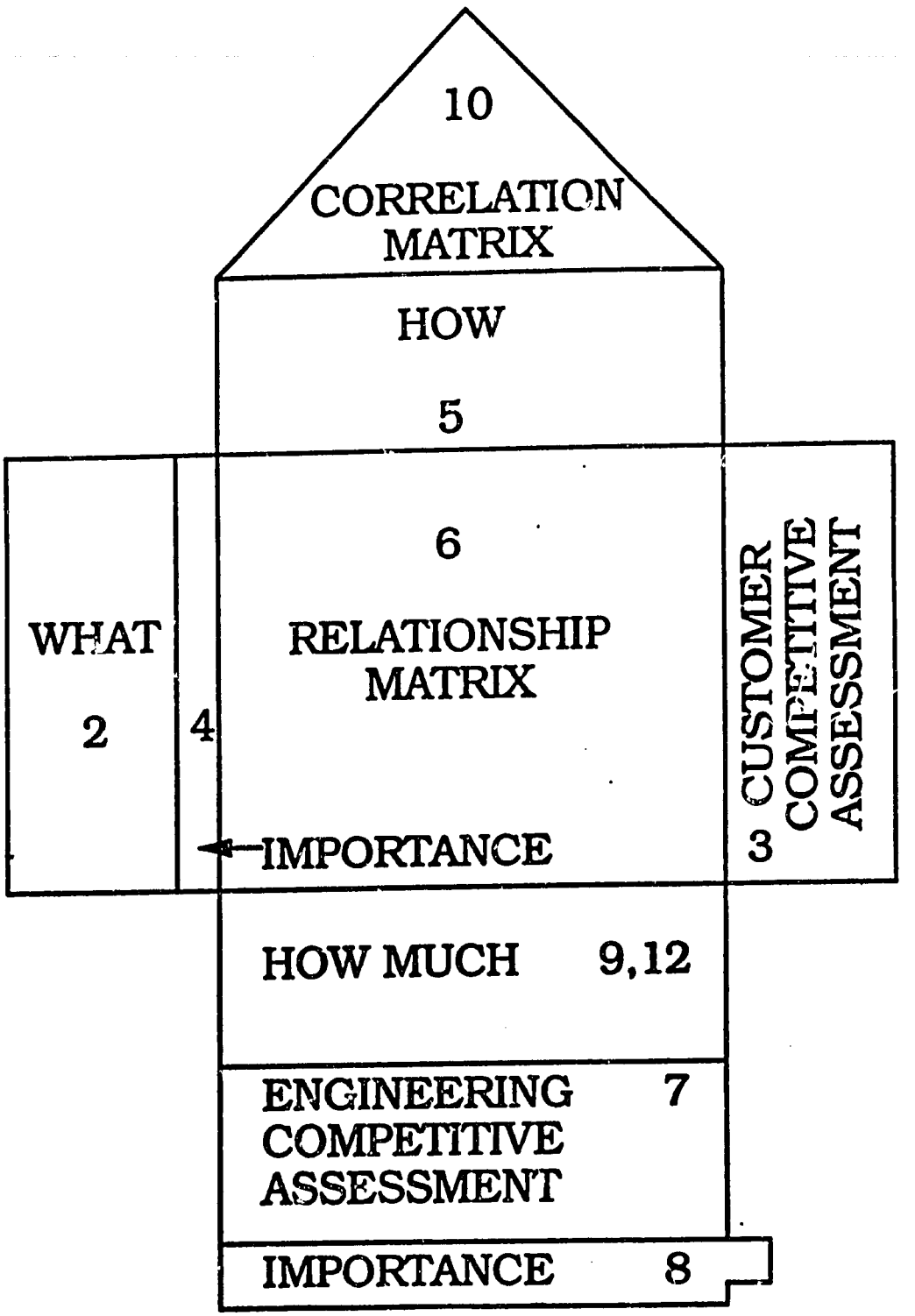
5. Prioritize Technical Characteristics and Features

⇓

HOUSE OF QUALITY APPROACH

More Structured/Matrix Oriented


DEVELOP CUSTOMER WANTS
1
ORGANIZE CUSTOMER WANTS
2
3
CUSTOMER COMPETITIVE ASSESSMENT
CUSTOMER IMPORTANCE RATINGS
4
ESTABLISH DESIGN REQUIRE.
5
6
COMPLETE RELATIONSHIP MATRIX
ENGINEERING COMPETITIVE ASSESSMENT
7
DESIGN REQ. IMPORTANCE RATINGS
8
ESTABLISH PRELIMINARY TARGETS
9
COMPLETE CORRELATION MATRIX
10
ANALYZE & DIAGNOSE CHART
11
FINALIZE TARGET VALUES
12


10
CORRELATION MATRIX
HOW
5
WHAT
2
4
6
RELATIONSHIP MATRIX
IMPORTANCE
CUSTOMER COMPETITIVE ASSESSMENT
3
HOW MUCH
9,12
ENGINEERING COMPETITIVE ASSESSMENT
7
IMPORTANCE
8

Q.F.D. POTENTIAL BENEFITS**

* QFD provides a customer driven system for evaluating the relationships between:
  1. Customer requirements and the characteristics to be used to develop and control the product.
  2. Customer (market) and company evaluations of competitive products. (Benchmarking)

* Product objectives based on customer requirements are not misinterpreted at subsequent stages.

* Particular marketing strategies or "sales points" do not become lost or blurred during the translation process from marketing through planning and on to execution.

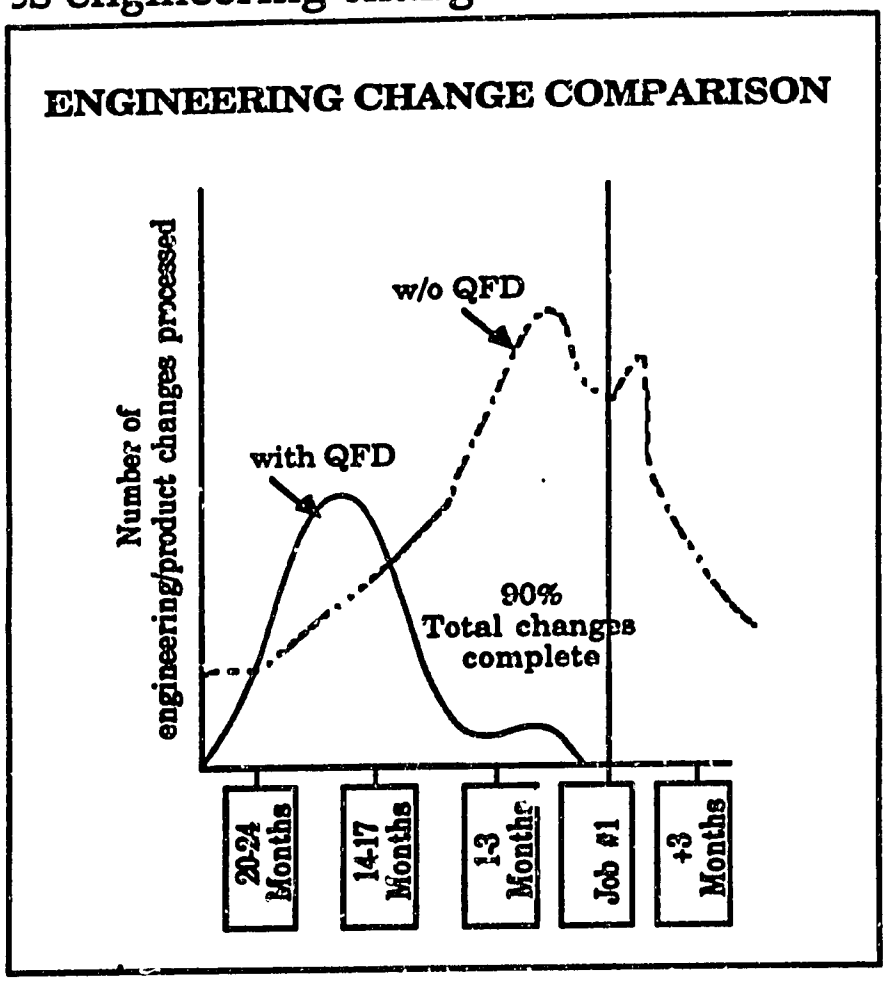
* Important production control points are not overlooked--everything necessary to achieve the desired outcome is understood and in place.

* QFD often reduces product development cycles 30% - 50%, improves quality, and lowers startup costs†

†Using 1977 as a base, Toyota reported a 20% reduction in start-up costs on the launch of the new van in October 1979; a 38% reduction at November 1982; and a cumulative 61% reduction at April 1984. During this period, the product development cycle (time to market) was reduced by one third with a corresponding improvement in quality because of a reduction in the number of engineering changes.

Q.F.D. POTENTIAL BENEFITS cont.

QFD reduces engineering changes 30% - 50%



* QFD promotes a team approach by fostering a better understanding of requirements and what is needed to meet those requirements.

* QFD reduces warranty claims (as much as 50%)

* QFD leads to better quality designs, improved product performance, and increases in customer satisfaction and market share

** Ford, DEC, P&G, AT&T, H-P, Toyota, NKG, Komatsu MEC, Omark, Mitsubishi-Kobé

DISADVANTAGES OF Q.F.D.

* Requires Substantial Training and Preparation

* Requires More Work in the Early Planning Stages of Product Development

* Makes it More Difficult to Change Direction Once a Project is Underway Because all of the Interrelated Elements of the System must be Revised.

* The System can be Complicated to Administer. (How do you communicate the concept to all affected activities? Who maintains the documents through the entire development cycle?)

* Requires Top Management's Involvement and Commitment to Total Quality and Its Up-Front Investment Costs.

HOUSE OF QUALITY APPROACH

FIVE KEY TERMS

1. **The Voice of the Customer** -- the customers' requirements expressed in their own terms.

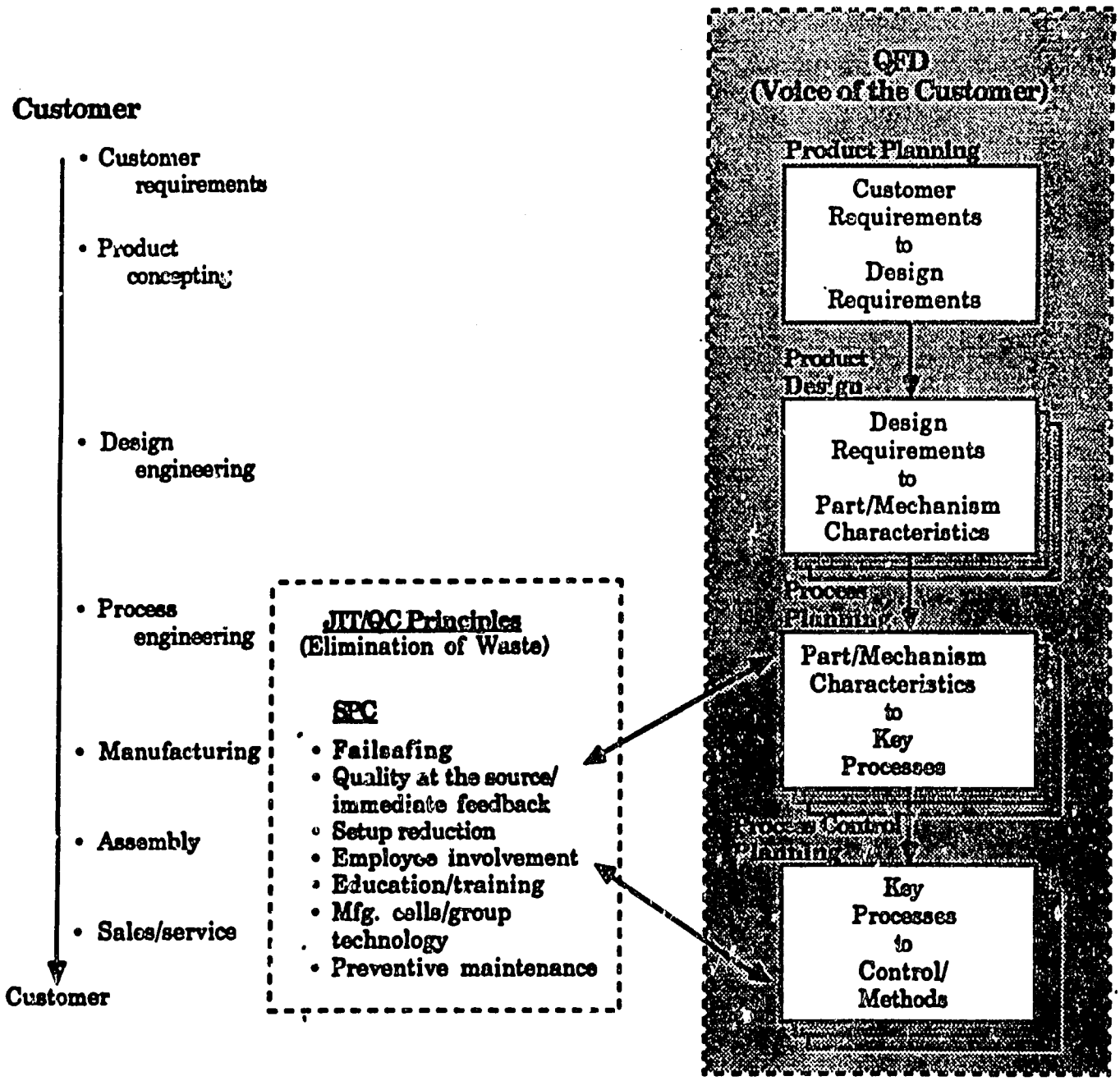
2. **Counterpart Characteristics** -- an expression of the voice of the customer in technical language that specifies customer-required quality; counterpart characteristics are critical final product control characteristics.

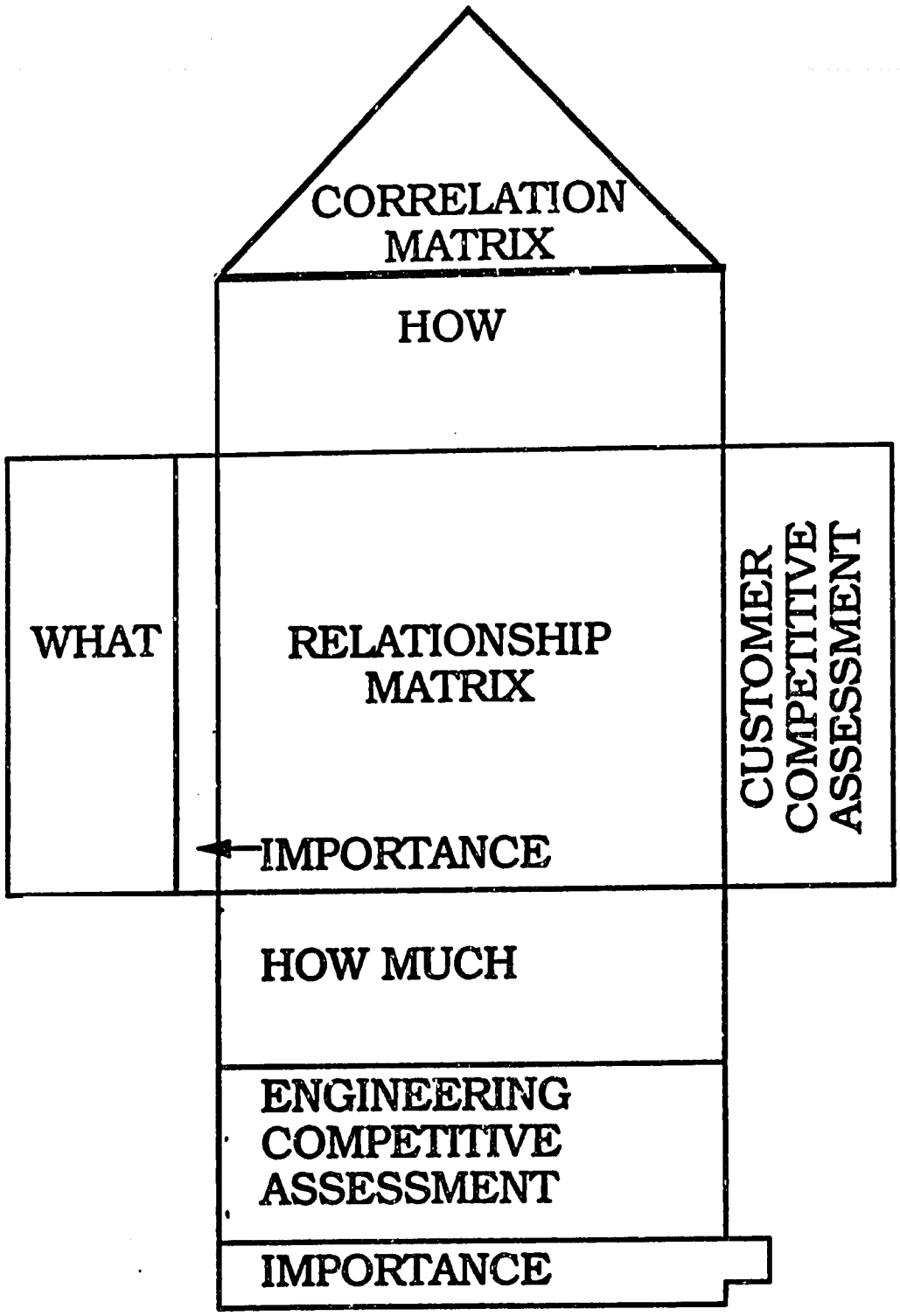
3. **Product Quality Deployment** -- activities needed to translate the voice of the customer into counterpart characteristics.

4. **Deployment of the Quality Function** -- activities needed to assure that customer-required quality is achieved; the assignment of specific quality responsibilities to specific departments.

5. **Quality Tables** -- a series of matrices used to translate the voice of the customer into final product control characteristics.

RELATIONSHIPS AMONG QFD AND JIT/QC OPERATING PRINCIPLES




CORRELATION MATRIX
HOW
WHAT
RELATIONSHIP MATRIX
IMPORTANCE
CUSTOMER COMPETITIVE ASSESSMENT
HOW MUCH
ENGINEERING COMPETITIVE ASSESSMENT
IMPORTANCE

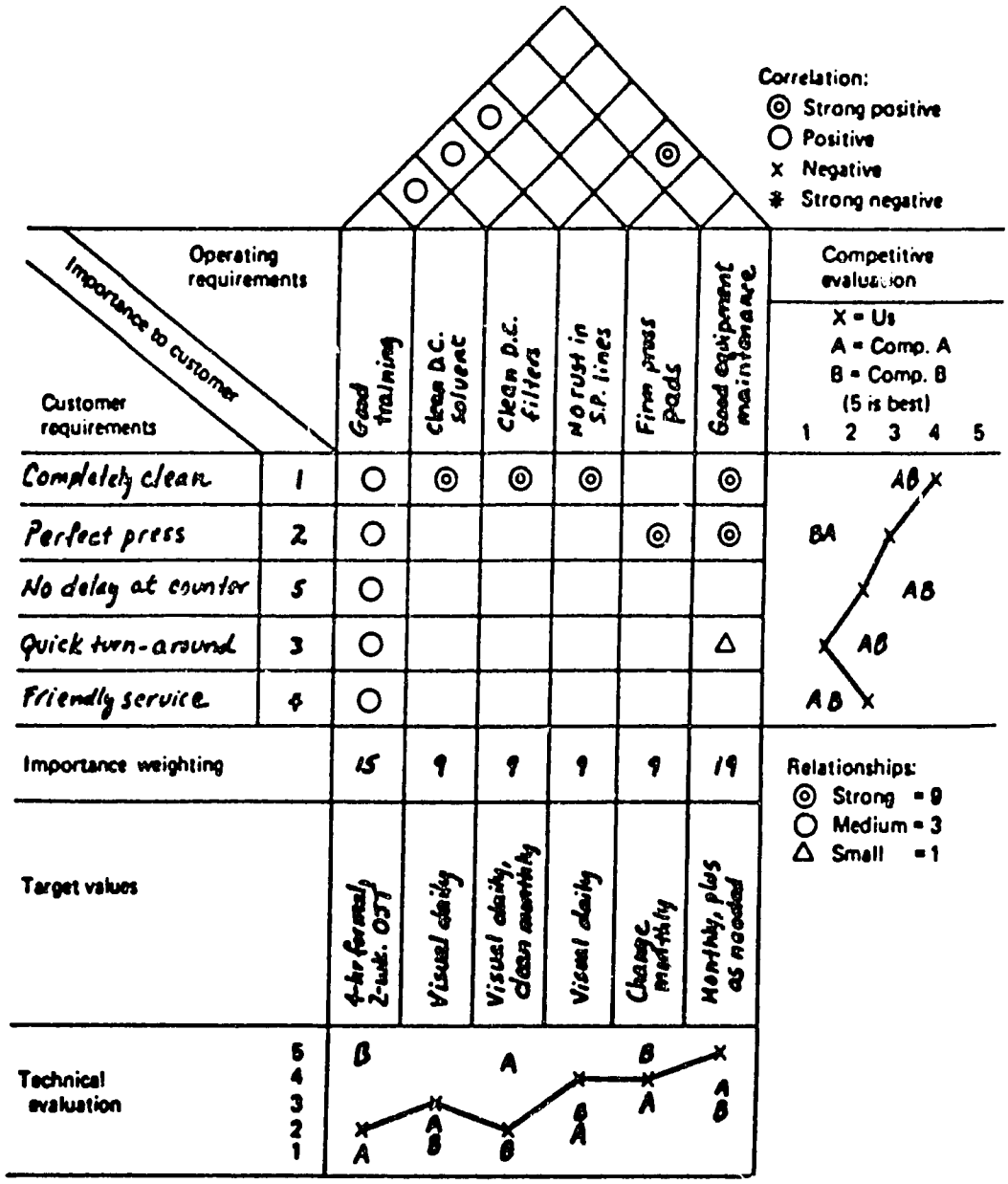
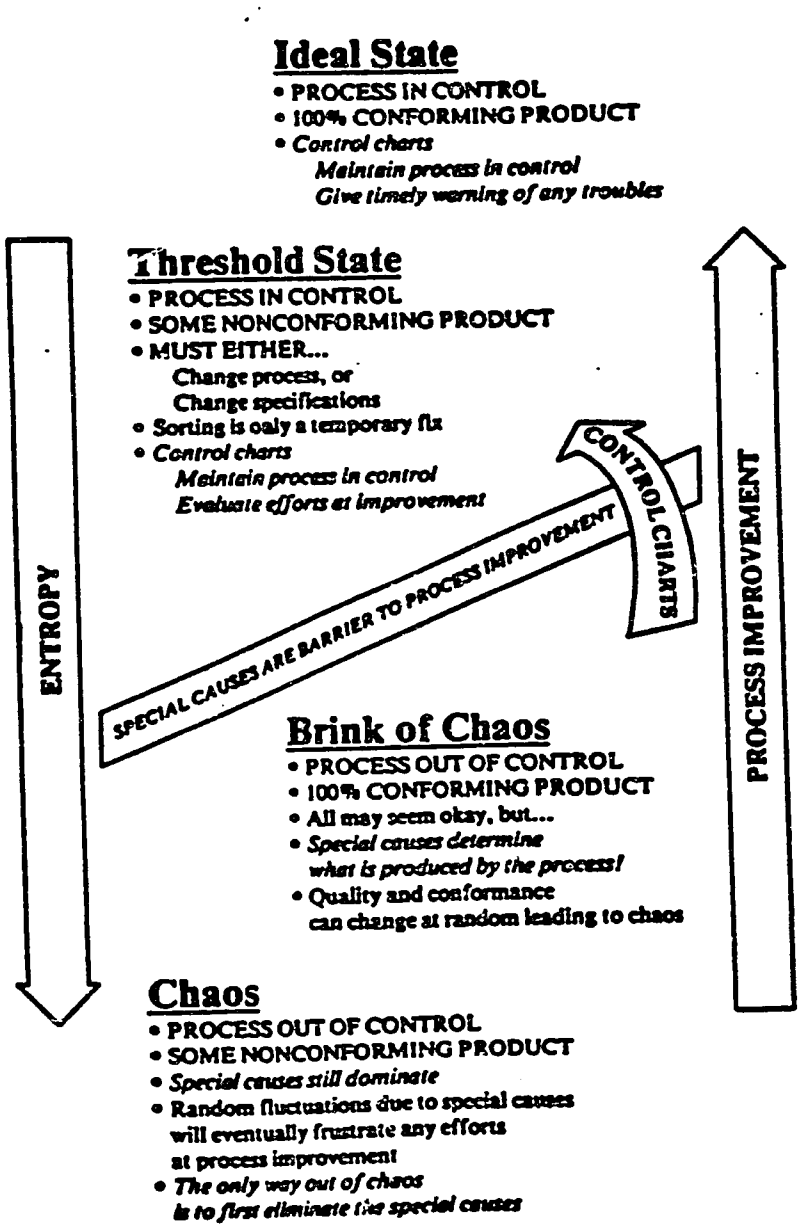


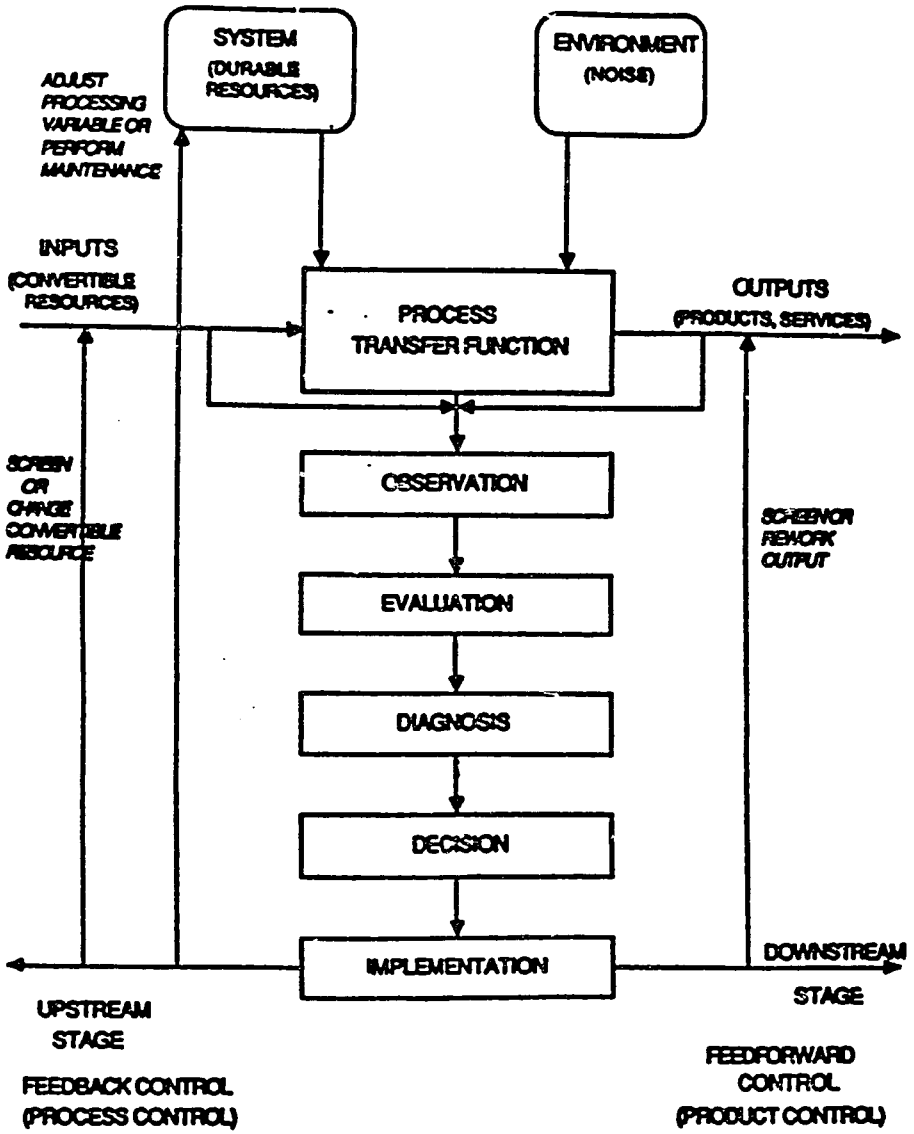
Figure 10–1. QFD in Dry Cleaning



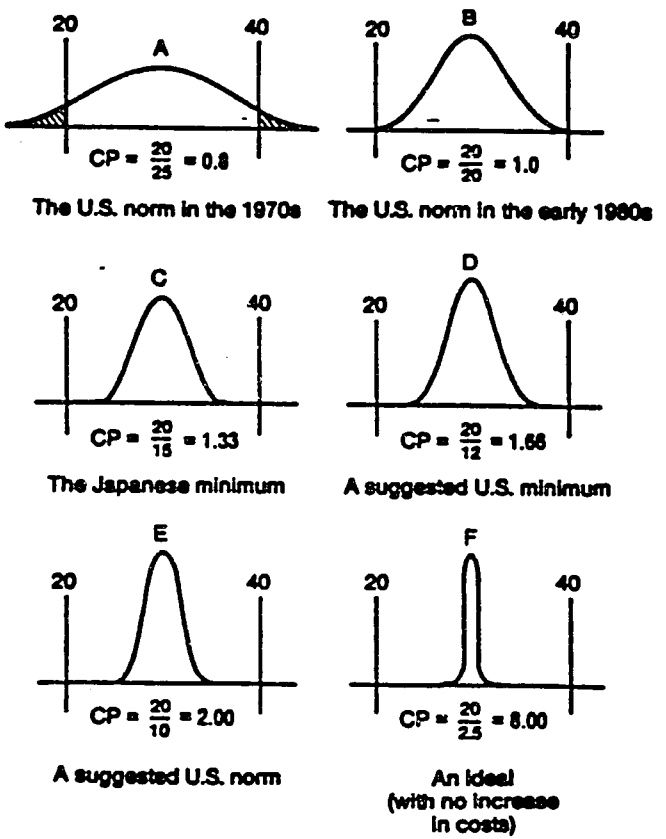
SPC HELPS US ANSWER THESE QUESTIONS

- IS THE PROCESS IN STATISTICAL CONTROL?
- WHAT IS THE CAPABILITY OF OUR PROCESS?
- WHEN SHOULD WE INVESTIGATE THE CAUSES OF PROCESS VARIATION?
- IS THE PROCESS VARIATION DUE TO COMMON CAUSES AND SPECIAL CAUSES OR BOTH?
- SHOULD THE PROCESS BE ADJUSTED?
- WHEN SHOULD THE PROCESS BE ADJUSTED?
- WHO SHOULD MAKE THE ADJUSTMENT?
- WHEN IS "BENIGN NEGLECT" OF THE PROCESS THE APPROPRIATE STRATEGY?

IN ADDITION, SPC PROVIDES A COMMON LANGUAGE FOR DISCUSSING PROCESS PERFORMANCE.



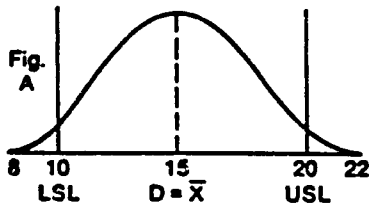
$$Cp = \frac{\text{Spec. width}}{\text{Process width}}$$



$$C_P = \frac{\text{Spec. width (w)}}{\text{Process width}} \; ; \; C_{P_K} = (1-K)C_P \; ; \; K = \frac{\text{Design center (D)} - \bar{X}^*}{w/2}$$

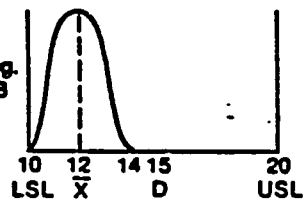
*Ignore a minus figure in the numerator

Fig. A



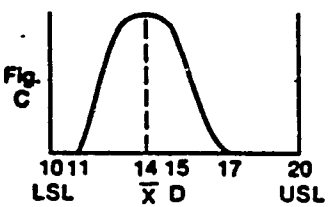
$C_P = C_{P_K} = 0.71$
Typical Process capability till early 1980s

Fig. B



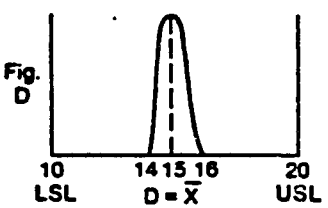
$C_P = 2.5$; $C_{P_K} = 1.0$
Despite narrow distribution, poor C_{P_K} because $\bar{X}$ far from design center

Fig. C



$C_P = 1.67$; $C_{P_K} = 1.33$
Wider distribution than Fig. B, but closer to design center, so acceptable C_{P_K}

Fig. D



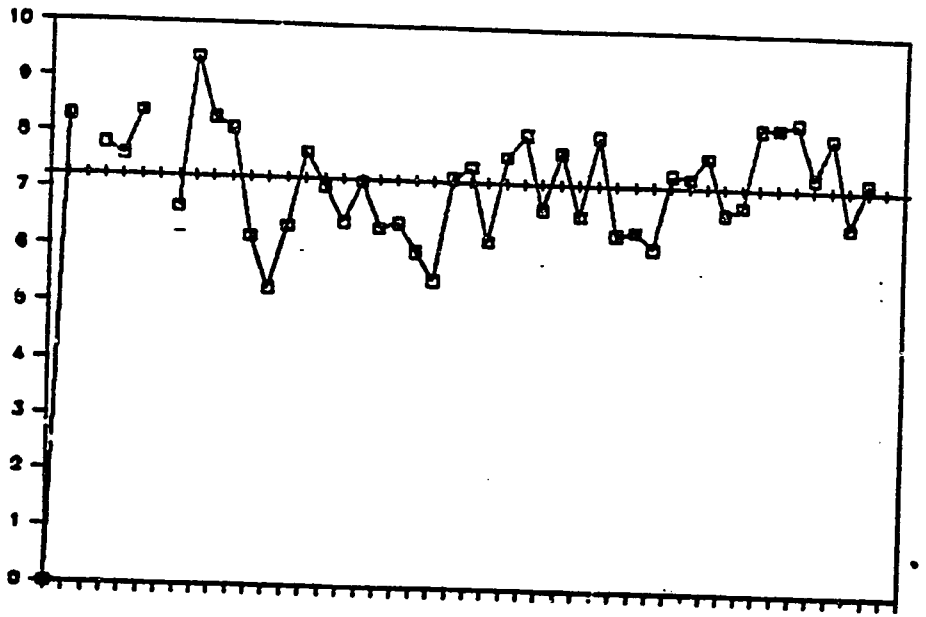
$C_P = C_{P_K} = 5$
Ideal distribution

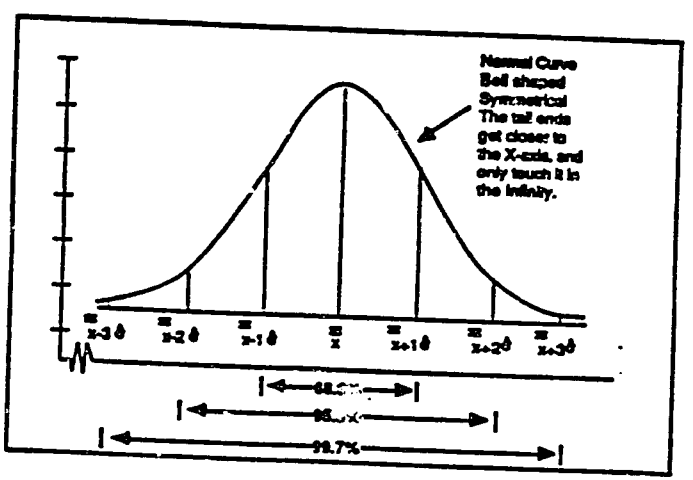
For critical parameters: Minimum $C_{P_K} = 1.33$
Desirable $C_{P_K} = 2.00$
Ideal $C_{P_K} = 5.00$

Code

LSL = Lower spec. limit
USL = Uper spec. limit
W = Spec. width
D = Design center (or target)
$\bar{x}$ = Process average
K = Correction factor for noncentered distribution

MONTH	YEAR 1984	YEAR 1985	YEAR 1986	YEAR 1987
1	0	5.3	6.2	7.78
2	8.3	6.4	7.7	6.8
3		7.7	8.1	6.93
4	7.8	7.:	6.8	8.3
5	7.6	6.5	7.8	8.32
6	8.4	7.2	6.7	8.41
7		6.4	8.1	7.45
8	6.7	6.5	6.37	8.15
9	9.4	6	6.44	6.59
10	8.3	5.5	6.15	7.38
11	8.1	7.3	7.45	
12	6.2	7.5	7.4	





No special causes. No changes in process average or process variation. Ability to predict is enhanced.

THE RELATIONSHIPS AMONG NATURAL TOLERENCE LIMITS, CONTROL LIMITS, AND SPECIFICATION LIMITS

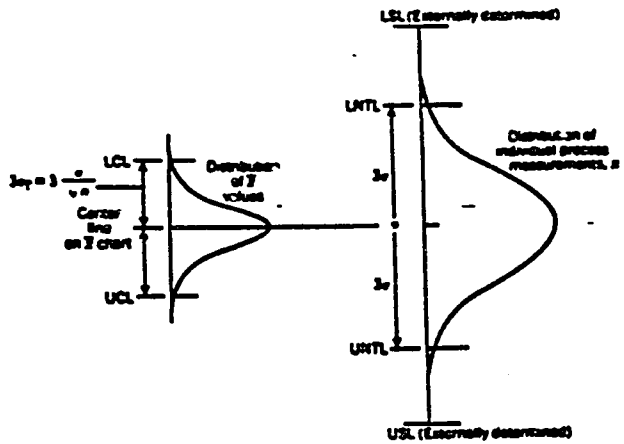
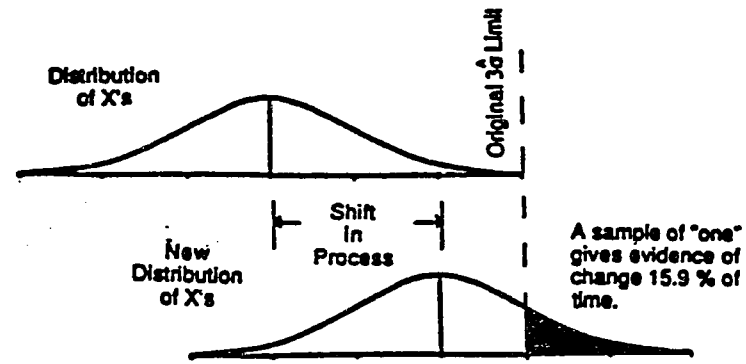


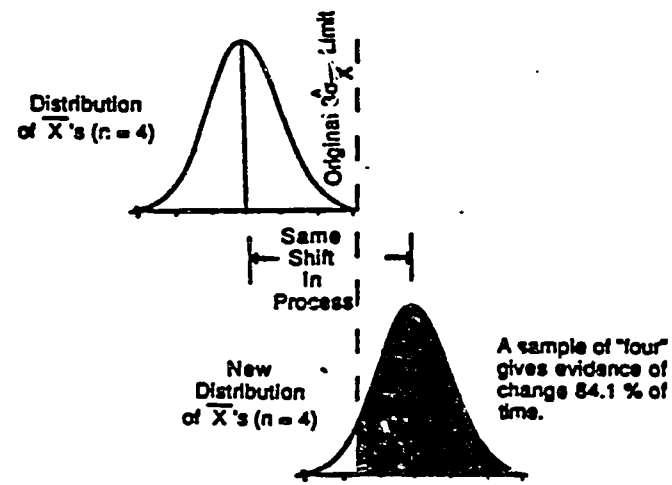
Figure 6-7. Relationship of natural tolerance limits, control limits, and specification limits.

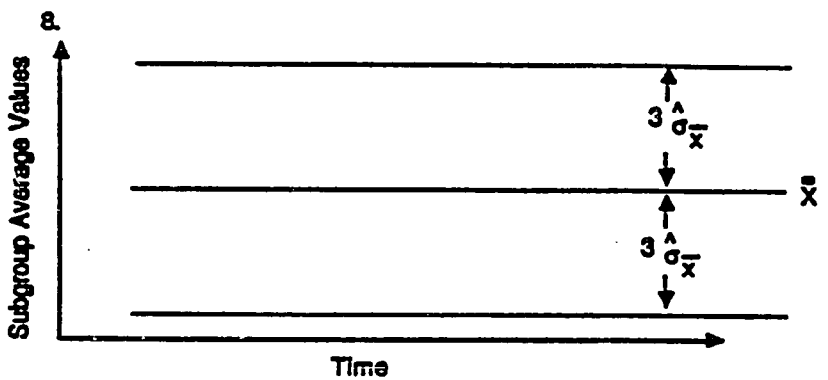
THERE IS NO RELATIONSHIP BETWEEN CONTROL LIMITS AND SPECIFICATION LIMITS.

- **CONTROL LIMITS ARE A FUNCTION OF THE NATURAL VARIABILITY OF THE PROCESS.**
- **SPECIFICATION LIMITS ARE DETERMINED EXTERNALLY BY MANAGEMENT, CUSTOMERS, ENGINEERS, AND/OR PRODUCT DESIGNERS.**

Why Subgroup ?







Subgroup averages process:

99% - 100% of future subgroup averages will fall inside the limits according to the empirical rule.

CONTROL CHARTS FOR ATTRIBUTES

P-CHART (CONTROL CHART FOR PERCENT DEFECTIVE)

- FINITE SAMPLE SIZE (n)
- % OF DEFECTIVE ITEMS IS NOT EXTREMELY SMALL (LET'S SAY ≥ 1%)
- BINOMIAL DISTRIBUTION

$$\text{MEAN} = \bar{p} = \frac{\text{TOTAL \# DEFECTIVE}}{\text{TOTAL \# SAMPLED}}$$

$$\text{STANDARD DEVIATION} = \sigma_p = \sqrt{\frac{\bar{p}\,(1 - \bar{p})}{n}}$$

$$\text{UPPER CONTROL LIMIT (UCL)} = \bar{p} + 3\sigma_p$$

$$\text{CENTRAL LIMIT (CL)} = \bar{p}$$

$$\text{LOWER CONTROL LIMIT (LCL)} = \bar{p} - 3\sigma_p$$

CONTROL CHARTS FOR ATTRIBUTES (Cont.)

c-CHART (CONTROL CHART FOR NUMBER OF DEFECTS

- ESSENTIALLY INFINITE SAMPLE SIZE (n)
- EXTREMELY SMALL PERCENTAGE OF DEFECTS (LET'S SAY THAT THE % IS SO SMALL THAT IT ISN'T EVEN CALCULABLE)
- POISSON DISTRIBUTION

$$\text{MEAN} = \bar{c} = \frac{\text{TOTAL \# DEFECTS}}{\text{\# ITEMS SAMPLED}}$$

$$\text{STANDARD DEVIATION} = \sqrt{c}$$

$$\text{UPPER CONTROL LIMIT (UCL)} = \bar{c} + 3\sigma_{\bar{c}}$$

$$\text{CENTRAL LIMIT (CL)} = \bar{c}$$

$$\text{LOWER CONTROL LIMIT (LCL)} = \bar{c} - 3\sigma_{\bar{c}}$$

CONTROL CHARTS FOR VARIABLES

$\bar{X}$ - CHART

USED TO CONTROL THE MEAN VALUE OF A PARTICULAR CHARACTERISTIC OF THE OUTPUT

$\bar{x}$ = SAMPLE MEAN

$\bar{\bar{x}}$ = MEAN OF THE SAMPLE MEANS

$$UCL_x = \bar{\bar{x}} + 3\sigma'_{\bar{x}}$$

$$CL_x = \bar{\bar{x}} \qquad 3\sigma'_{\bar{x}} = A_2 \cdot \bar{R}$$

$$LCL_x = \bar{\bar{x}} - 3\sigma'_{\bar{x}}$$

R-CHART

USED TO CONTROL THE VARIABLILITY OF A PARTICLUAR CHARACTERISTIC OF THE OUTPUT

R = RANGE = LARGEST - SMALLEST MEASUREMENT (WITHIN A SAMPLE)

$$UCL_R = D_4 \cdot \bar{R}$$

$$CL_R = \bar{R}$$

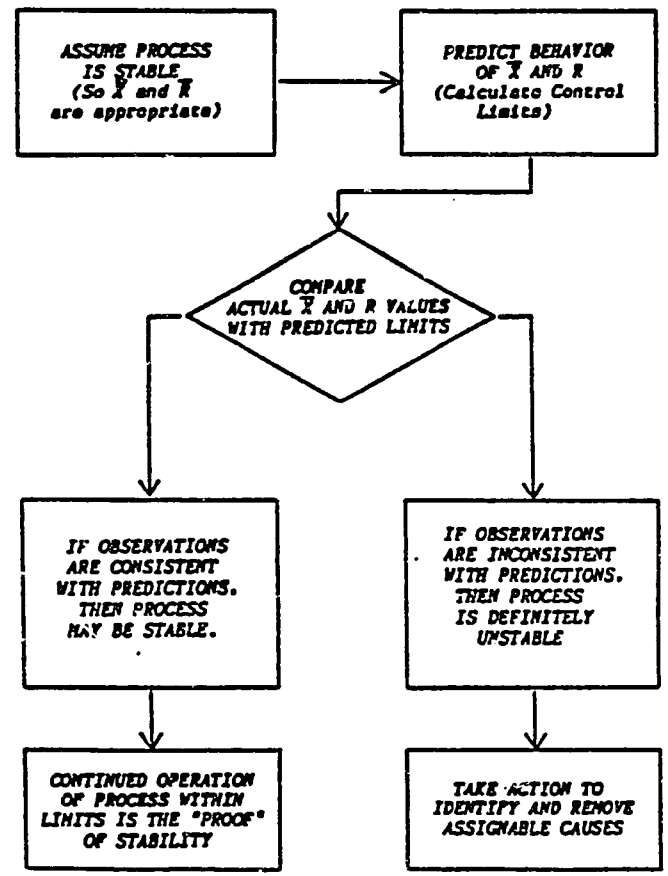
$$LCL_R = D_3 \cdot \bar{R}$$

FACTORS FOR CONSTRUCTING $\overline{X}$ AND R CHARTS

SUBGROUP SIZE	A_2	D_3	D_4
2	1.08	*	3.27
3	1.02	*	2.57
4	.73	*	2.28
5	.58	*	2.11
6	.48	*	2.00
7	.42	.08	1.92
8	.37	.14	1.86
9	.34	.18	1.82
10	.31	.22	1.78

FOR SAMPLE SIZES BELOW 7, THE LOWER CONTROL LIMIT (LCL) FOR THE R CHART WOULD BE NEGATIVE. IN THOSE CASES NO LCL IS PLOTTED.

IMPLICATION: FOR A SUBGROUP OF SIZE 6, SIX "IDENTICAL" MEASUREMENTS WOULD NOT BE UNREASONABLE.



24.

$\bar{X}$ AND R CHARTS

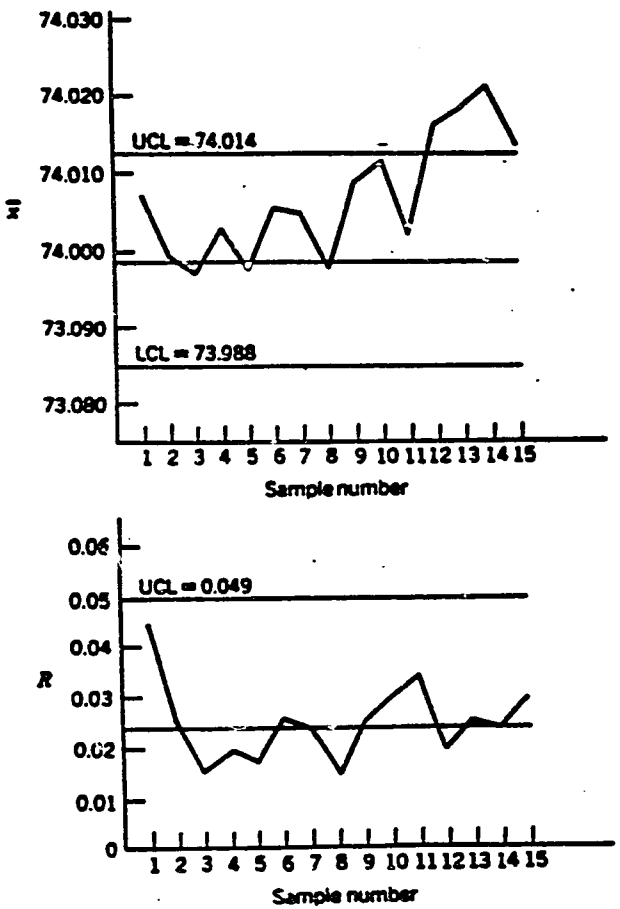
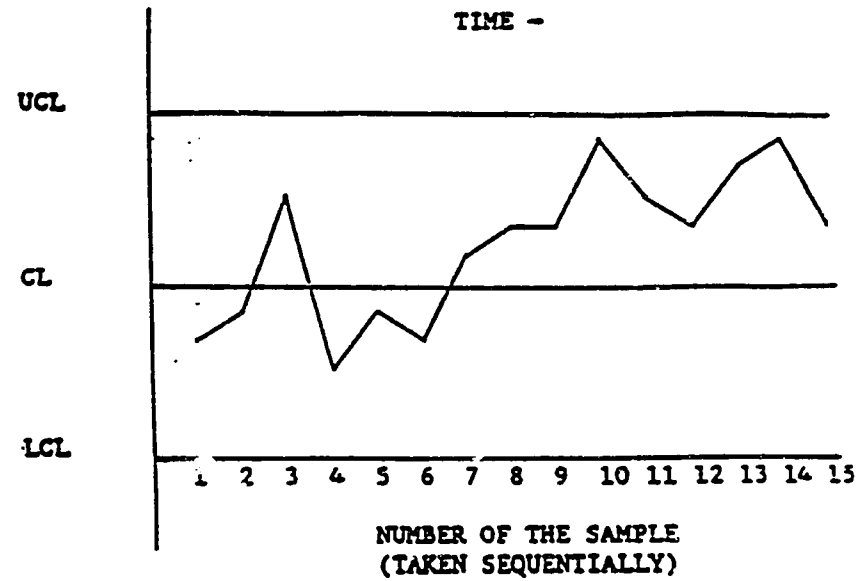


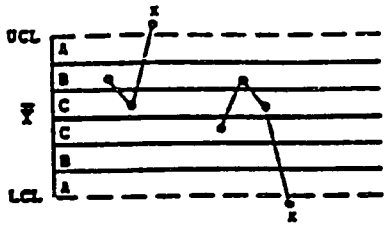
Figure 6-5. Continuation of the $\bar{X}$ and R charts, Example 6-1.

HOW A CONTROL CHART IS USED

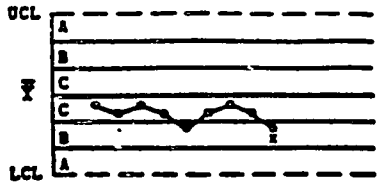


- OUTSIDE CONTROL LIMITS?
- "RUNS" ABOVE OR BELOW CENTRAL LINE (CL)?

Test 1. One point beyond Zone A

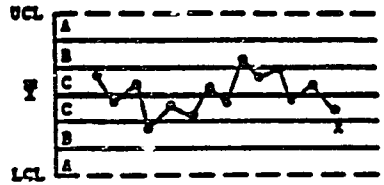


Test 2. Nine points in a row in Zone C or beyond

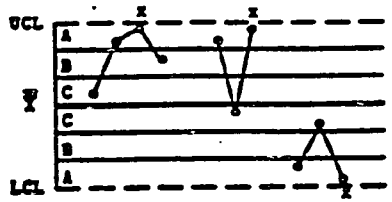


Test 3. Six points in a row steadily increasing or decreasing

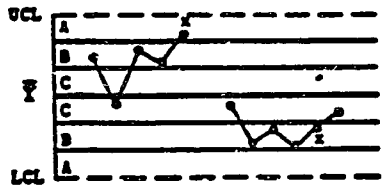
Test 4. Fourteen points in a row alternating up and down



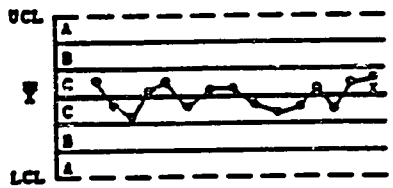
Test 5. Two out of three points in a row in Zone A or beyond



Test 6. Four out of five points in a row in Zone B or beyond

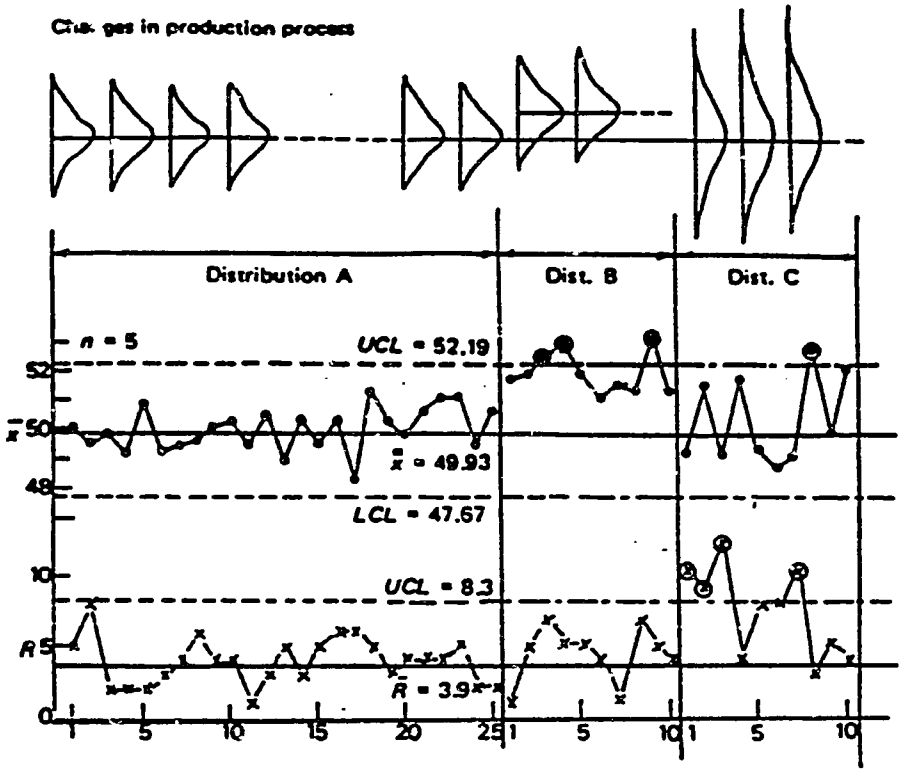


Test 7. Fifteen points in a row in Zone C (above and below centerline)



Test 8. Eight points in a row on both sides of centerline with none in Zones C

FIGURE 1. Illustrations of Tests for Special Causes Applied to Shewhart Control Charts



226

Table 14-4 Comparison of some control charts

Statistical measure plotted	Average $\bar{X}$ and range R	Percent defective (p)	Number of defects (c)
Type of data required	Variable data (measured values of a characteristic)	Attribute data (number of defective units of product)	Attribute data (number of defects per unit of product)
General field of application	Control of individual characteristics	Control of overall fraction defective of a process	Control of overall number of defects per unit
Significant advantages	1. Provides maximum utilization of information available from data 2. Provides detailed information on process average and variation for control of individual dimensions	1. Data required are often already available from inspection records 2. Easily understood by all personnel 3. Provides an overall picture of quality	Same advantages as p chart but also provides a measure of defectiveness
Significant disadvantages	1. Not understood unless training is provided: can cause confusion between control limits and tolerance limits 2. Cannot be used with go/no go type of data	1. Does not provide detailed information for control of individual characteristics 2. Does not recognize different degrees of defectiveness in units of product	Does not provide detailed information for control of individual characteristics
Sample size	Usually 4 or 5	Use given inspection results or samples of 25, 50, or 100	Any convenient unit of product such as 100 ft of wire or one television set

227

THE "HOW'S" OF QUALITY

The quality side of excellence...
Learning from experience and the masters...

1. **Create Constancy of Purpose.. quality improvement requires a vision for change.**

2. **Consider Quality as a strategic priority.**

3. **Establish Quality as meeting customer requirements: Real, Perceived, and unknown.. Customer Driven Quality**

4. **Quality improvement requires management leadership and commitment.. Management and the system are the cause of poor quality**

5. **Quality is everyone's business: Quality improvement initiatives must provide for uncensored input from individuals at all levels**

6. **Quality improvement requires teamwork: carefully enabled organizational involvement**

7. **Quality improvement must be the driver for productivity improvements, not the other way around**

THE "HOW'S" OF QUALITY

The quality side of excellence...
Learning from experience and the masters...

8. **Quality improvement must be based upon prevention as opposed to inspection**

9. **Strive for continuous quality improvement.. performance to a fixed standard will lead to failure**

10. **Vendor relationships must be based on expectations and reality of continuous quality improvement**

11. **Quality improvement involves: "process problem solving"**

12. **Establish Quality Improvement through progressive measurement and use of data.**

13. **Establish a quality improvement process to guide and support quality improvement efforts.**

14. **Quality improvement is a learning process, training and education are key.**

Hank Kolb, Director, Quality Assurance

Hank Kolb was whistling as he walked toward his office, still feeling a bit like a stranger since he had been hired four weeks ago as director, quality assurance.[1] All last week he had been away from the plant at an interesting seminar entitled "Quality in the 90s" given for quality managers of manufacturing plants by the corporate training department. He was not looking forward to really digging into the quality problems at this industrial products plant employing 1,200 people.

Hank poked his head into Mark Hamler's office, his immediate subordinate, the quality control manager, and asked him how things had gone last week. Mark's muted smile and an "Oh, fine" stopped Hank in his tracks. He didn't know Mark very well and was unsure about pursuing this reply any further. Hank was still uncertain of how to start building his relationship with him since Mark had been passed over for the promotion to Hank's job—Mark's evaluation form had stated "superb technical knowledge; managerial skills lacking." Hank decided to inquire a little further and asked Mark what had happened. Mark replied:

> Oh, just another typical quality snafu. We had a little problem on the Greasex line last week (a specialized degreasing solvent packed in a spray can for the high-technology sector). A little high pressure was found in some cans on the second shift, but a supervisor vented them so that we could ship them out. We met our delivery schedule!

Since Hank was still relatively unfamiliar with the plant and the products he asked Mark to elaborate. Painfully, Mark continued:

> We've been having some trouble with the new filling equipment, and some of the cans were pressurized beyond our acceptable standard on a psi (pounds per square inch) rating scale. The production rate is still 50 percent of standard, about 14 cases per shift, and we caught it halfway into the shift. Mac Evans (the inspector for that line) picked it up, tagged the cases "Hold" and went on about his duties. When he returned at the end of the shift to write up the rejects, Wayne Simmons, first-line supervisor, was by a pallet of finished goods finishing sealing up a ca. on of the rejected Greasex: the reject "Hold" tags had been removed. He told Mac that he had heard about the high pressure from another inspector at coffee break, had come back, taken off the tags, individually turned the cans upside down and vented every one of them in the rejected eight cartons. He told Mac that production planning was really pushing for the stuff, and they couldn't delay by having it sent through the rework area. He told Mac that he would get on the operator to run the equipment right next time. Mac didn't write it up but came in about three days ago to tell me about it. Oh, it happens every once in a while, and I told him to make sure to check with maintenance to make sure the filling machine was adjusted; and I saw Wayne in the hall and told him that he ought to send the stuff through rework next time.

Hank was a bit dumbfounded at this and didn't say much—he didn't know if this was a "big deal" or not. When he got to his office he thought again what Mr. Morganthal, general manager, had said when he had hired Hank. He warned Hank about the "lack of quality attitude" in the plant and said that Hank "should try to do something about this."

[1]Reprinted with permission of the Harvard Business School.

730

He had further emphasized the quality problems in the plant. "We have to improve our quality, it's costing us a lot of money, I'm sure of it, but I can't prove it! Hank, you have my full support in this matter; you're in charge of these quality problems. This downward quality-productivity-turnover spiral has to end!"

The incident had happened a week ago; the goods were probably out in the customer's hands by now; everyone had forgotten about it (or wanted to!); and there seemed to be more pressing problems than this for Hank to spend his time on; but this continued to nag at him. He felt like the quality department was being treated as a joke, and it also felt to him like a personal slap from manufacturing. He didn't want to start a war with the production people but what could he do? He was troubled enough to cancel his appointments and spend the morning talking to a few people. After a long and very tactful morning, he learned the following:

A. From personnel—the operator for the filling equipment had just been transferred from shipping two weeks ago. He had had no formal training in this job but was being trained by Wayne, on the job, to run the equipment. When Mac had tested the high-pressure cans, the operator was nowhere to be found and had only learned of the rejected material from Wayne after the shift was over.

B. From plant maintenance—this particular piece of automated filling equipment had been purchased two years ago for use on another product. It had been switched to the Greasex line six months ago, and maintenance had had 12 work orders during the last month for repairs or adjustments on it. The equipment had been adapted by plant maintenance for handling the lower viscosity Greasex, which it had not originally been designed for. This included designing a special filling head. There was no scheduled preventive maintenance for this equipment, and the parts for the sensitive filling head, replaced three times in the last six months, had to be made at a nearby machine shop. Non-standard downtime was running at 15 percent of actual running times.

C. From purchasing—the plastic nozzle heads for the Greasex can, recently designed by a vendor for this new product on a rush order, were often found with slight burrs on the inside rim, and this caused some trouble in fitting the top to the can. An increase in application pressure at the filling head by maintenance adjustment had solved the burr application problem or had at least "forced" the nozzle heads on despite burrs. Purchasing said that they were going to talk to the sales representative of the nozzle head supplier about this the next time he came in.

D. From product design and packaging—the can, designed especially for Greasex, had been contoured to allow better gripping by the user. This change, instigated by marketing research, set Greasex apart from the appearance of its competitors and was seen by the designers to be "significant." There had been no test of the effects of the contoured can on filling speed or filling hydrodynamics from a high-pressured filling head. Hank had a hunch that the new design was acting as a venturi when being filled, but the packaging designer thought that "unlikely."

E. From manufacturing manager—he had heard about the problem; in fact, Wayne had made a joke about it, bragging about how he beat his production quota to the other foremen and shift supervisors. Wayne was thought by the manufacturing manager to be one of the "best foremen we have . . . he always gets his production out." His promotion papers were actually on the manufacturing manager's desk when Hank dropped by. Wayne was being "strongly considered" for promotion to shift supervisor. The manufacturing manager, under pressure from Mr. Morganthal for cost improvements and reduced delivery times, sympathized with Hank but said that the rework area would have just vented with their pressure gauges that Wayne did by hand. "But, I'll speak with Wayne about the incident."

F. From marketing—the introduction of Greasex had been rushed to beat competitors to market and a major promotional/advertising campaign was now underway to increase consumer awareness. A deluge of orders was swamping the order-taking department right now and put-

231

ting Greasex high on the back-order list. Production "had to turn the stuff out"; even a little off spec was tolerable because "it would be better to have it on the shelf than not there at all. Who cares if the label is a little crooked or the stuff comes out with a little too much pressure? We need market share now in that high-tech segment."

What bothered Hank the most was the safety issue of the high pressure in the cans. He had no way of knowing how much of a hazard the high pressure was or if Wayne had vented them enough to effectively reduce the hazard. The data from the can manufacturer which Mark had showed him indicated that the high pressure which the inspector had found was not in the danger area; but then again the inspector had only used a sample testing procedure to reject the eight cases. Even if he could morally accept that there was no product safety hazard, could he make sure that this never happened again?

Hank, skipping lunch, sat in his office and thought about the morning's events. Last week's seminar had talked about "the role of quality," "productivity and quality," "creating a new attitude," and the "quality challenge" but where had they told him what to do when this happens? He had left a very good job to come here because he thought the company was serious about the importance of quality, and he wanted a challenge. Hank had demanded and received a salary equal to the manufacturing, marketing, and R&D directors' and was one of the direct reports to the general manager. Yet he still didn't know exactly what he should or shouldn't do or even what he could or couldn't do.

DISCUSSION QUESTIONS

1. What is wrong with the way quality is managed in this company?
2. What should be done to improve quality management?
3. What should Hank Kolb do?

232

Tapes

→ Excerpts from Quality gurus — Session #2

→ Harley Davidson — Session #10

→ Tom Peters · World class quality — Session #6

Cases / Exercises

→ Hank · kolb — Session #9

CE Diagramming (specific to individuals)

Integrative assignment on data analysis

SPC charts (Gitlow)

References

→ Bibliography

Garvin Paper

Aaker, D., Managing Brand Equity, The Free Press, New York, New York, 1991.

Abernathy, W.J., Clark, K. & Kantrow, A M. "The new industrial competition," Harvard Business Review, June, 1981.

Acar, W., Booth, D., "Easier Quality Control: Combining Problem Classification with Time Series Analysis," Production & Inventory Mgmt Vol: 28, No. 3, 3rd Quarter 1987, pp 53-58.

Acar, W., DuMont, P., Khouja, M., "Standard-Maintaining and Continuous Improvement Systems: Experiences and Comparisons", Interfaces, Vol. 20, No. 3, May-June 1990, pp 24-40.

Ackoff, Russel L., "The Second Industrial Revolution", unpublished paper.

Adair, C., The Human Side of Just in Time, American Management Association, New York, 1991.

Adam, Jr., E.E., "Quality Circle Performance," Journal of Management, Vol. 17, No. 1, 1991, pp 25-39.

Adam, E., Hershauer, J., and Ruch, W., Productivity and Quality, Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1981.

Adams, R., and Browning, J., "Purchasing and Product Liability", Journal of Purchasing and Materials Management, Summer, 1989, pp 2-9.

Agogino, A., "Use of Probabilistic Inference in Diagnostic Expert Systems", in Proceedings of the International Computers and Engineering Conference, 1985, the American Society for Mechanical Engineers

Aguayo, R., Dr. Deming: The American Who Taught the Japanese About Quality, Simon and Shuster, New York, 1991.

Albin, S., "The Lognormal Distribution for Modeling Quality Data When the Mean Is Near Zero," Journal of Quality Technology Vol: 22, No. 2, Apr 1990 pp 105-110.

Albin, S.; Friedman, David J., "The Impact of Clustered Defect Distributions in IC Fabrication," Management Science Vol: 35, No. 9, Sep 1989 pp: 1066-1078.

Albrecht, K., The Service Advantage, Dow Jones-Irwin, Homewood Illinois, 1990.

Albrecht, K., Service Within, Dow Jones-Irwin, Homewood Illinois, 1990.

Albrecht, K., At America's Service, Dow Jones-Irwin, Homewood Illinois, 1988.

Albrecht, K., The Creative Corporation, Dow Jones-Irwin, Homewood Illinois, 1987.

Albrecht, K., and Zemke, R., Service America, Dow Jones-Irwin, Homewood Illinois, 1985.

Alston, J., The American Samurai, Walter de Gruter, New York, New York, 1985.

Alwan, L., Roberts, H., "Time-Series Modeling for Statistical Process Control," Journal of Business & Economic Statistics Vol: 6, No. 1, January, 1988 pp: 87-95.

Ames, C., Hlavacek, J., Market Driven Management, Dow Jones-Irwin, Homewood, Illinois, 1989.

Amsden, D., & Amsden, QC Circles: Applications, Tools and Theory, Milwaukee, American Society for Quality Control (ASQC), 1976

Anderson, K., Zemke, R., Delivering Knock Your Socks Off Service, American Management Association, New York, 1991.

Anderson, J., Dooley, K., and M. Rungtusanatham, "Requisite Knowledge for Continuous Improvement: Toward Improved Training and Education," Proceedings of the North American Deming Conference, Minneapolis, June, 1992

Anderson, J., Dooley, K., and Liu, X., "Knowledge for Process Improvement," Proceedings of the North American Deming Conference, Minneapolis, June, 1991

Anderson, J., Rungtusanatham, M. and R. Schroeder, "The Deming Management Method: an Emerging Theory of Quality Management," Proceedings of the National Decision Sciences Institute Conference, San Francisco, November, 1992

Anderson, J., Dooley, K., and Misterek, S., "The Role of Profound Knowledge in the Continual Improvement of Quality," The Journal of Human Systems Management, Vol. 10, No. 4, 1991, pp: 243-260.

Anderson, J., "Total Quality Management: The Case for and of Business Schools," Proceedings of the Quality in Higher Education Conference, University of Southern California, Los Angeles, California, July, 1991

Ansari, A., An Empirical Examination of the Implementation of Japanese Just-in-Time Purchasing Practices and its Impact on Product Quality and Productivity in U.S. Army. Unpublished doctoral dissertation, University of Nebraska-Lincoln, 1984.

Ansoff, H., The New Corporate Strategy, John Wiley & Sons, New York, 1988.

Archibald, R.B., Haulman, C.A., & Moody, Jr., C.E., "Quality, Price, Advertising, and Published Quality Ratings," Journal of Consumer Research, Vol. 9, March 1983, pp 347-356.

Argyris, C. and Schon, D., Organizational Learning: A Theory of Action Perspective, Addison-Wesley Publishing Co., 1978.

Argyris, C., Reasoning, Learning, and Action, Jossey-Bass, Inc., San Francisco, 1982.

Argyris, C. and Schon, D., Theory in Practice: Increasing Professional Effectiveness, Jossey-Bass Publishers, San Francisco, 1974.

Arinc, Reliability Engineering, Prentice Hall, New Jersey, 1964.

Armistead, Colin G., "Customer Service and Operations Management in Service Businesses," Service Industries Journal (UK) Vol: 9, No. 2, Apr 1989 pp: 247-260.

Armstrong, D., Managing By Storying Around: A New Method Of Leadership, Doubleday Currency, New York, 1992.

ASQC, 45th Annual Quality Congress Transactions, American Society for Quality Control, May, 1991, Milwaukee, Wisconsin.

Ayres, Robert U., "Complexity, Reliability, and Design: Manufacturing Implications", Manufacturing Review, Volume 1, No. 1, March, 1988

Babbar, S.,"A Dynamic Model for Continuous Improvement in the Management of Service Quality," International Journal of Operations & Production Management, Vol. 12, No. 2, 1992, pp. 38-48.

Bagwell, Timothy C., "Quality Circles: Two Keys To Success", Quality Progress, September, 1987, pp 57-59.

Baille, Allan S., "Subcontracting Based on Integrated Standards: The Japanese Approach", National Association of Purchasing Management, Inc., May, 1986, pp 17-21.

Baker, M., & Artinian, H., "The Deming Philosophy of Continuing Improvement in a Service Organization: The Case of Windsor Export Study", Quality Progress, June, 1985.

Ballou, D., Pazer, H., "Designing Inspection Strategies for Uncertain Environments," Decision Sciences Vol: 18, No. 2, Spring 1987 pp: 217-233.

Band, W., Creating Value for Customers, John Wiley & Sons, New York, 1991.

Banker, R., Datar, S., Kekre, S., and Mukhopadhyay, T., "Costs of Product and Process Complexity" Measures for Manufacturing Performance, special volume edited by Robert Kaplan, Harvard Business Press, 1989.

Banks, J., Principles of Quality Control, John Wiley & Sons, New York, 1989.

Bardwick, J., Danger In The Comfort Zone, American Management Association, New York, 1991.

Barker, J., Future Edge, Bill Morrow, New York, New York, 1992.

Barker, Eugene M., "Counting Costs: Another Approach to Supplier Ratings", Quality Progress, November, 1984, pp 67-69.

Barker, Thomas B., "Quality Engineering By Design: Taguchi's Philosophy", Quality Progress, December, 1986, pp 32-42.

Barnett, N., "Process Control and Product Quality: The Cp and Cpk Revisited," International Journal of Quality & Reliability Mgmt (UK) Vol: 7, No. 5, 1990 pp: 34-43.

Barrick, M., and Alexander, R.,"Estimating the Benefits of a Quality Circle Intervention," Journal of Organizational Behavior, Vol. 13, pp. 73-80, 1992.

Bauer, R., et. al., The Silverlake Project, The Oxford Press, New York, New York, 1992.

Baxter, L.F., Ferguson, N., Macbeth, D.K., & Neil, G.C., "Getting the Message Across? Supplier Quality Improvement Programmes: Some Issues in Practice," International Journal of Production Management, Vol. 9, No. 5, 1989, pp 69-76.

Bazeman, M., Neale, M., Negotiating Rationally, The Free Press, New York, 1992.

Beer, S., Diagnosing the System for Organizations, John Wiley & Sons, New York, 1985.

Beer, S., Brain of the Firm, John Wiley & Sons, New York, 1981.

Belasco, J., Teaching the Elephant to Dance, Crown Publishers, New York, 1990.

Belcher, J., Productivity Plus, Gulf Publishing Co., Houston, Texas, 1987.

Bell, C., Zemke, R., Managing Knock Your Socks Off Service, American Management Association, New York, 1992.

Benson, P., & Ohta, H., "Classifying Sensory Inspectors with Heterogeneous Inspection-Error Probabilities", Journal of Quality Technology, Vol. 18, No. 2, April 1986, p. 79-90

Benson, P.G., Saraph, J.V., & Schroeder, R.G., "The Effects of Organizational Context on Quality Management: An Empirical Investigation," Management Science, Vol. 37, No. 9, September 1991, pp 1107-1125.

Berg, I., Freedman, M., and Freedman, M., Managers and Work Reform, The Free Press, New York, 1978.

Berry, T., Managing the Total Quality Transformation, McGraw-Hill, New York, 1991.

Berry, L., and Parasuraman, A., Marketing Services: Competing Through Quality, The Free Press, New York, 1991.

Berry, L., Bennett, D., and Brown, C., Service Quality: A Profit Strategy for Financial Institutions, Dow Jones Irwin, 1989.

Best, A., When Consumers Complain, Columbia University Press, New York, 1981.

Besterfield, D., Quality Control, Englewood Cliffs, New Jersey, Prentice Hall, Inc., 1979

Bhote, K., World Class Quality, AMA Membership Publications Div., New York, 1988.

Bhote, K., Next Operation As Customer (NOAC), AMA Membership Publications Div., New York, 1991.

Bhote, K., Supply Management, American Management Briefing, 1987, AMA, New York

Bhote, K., "DOE The High Road to Quality" Management Review, January, 1988, pp 27-33.

Bitner, M.J., Booms, B.H., & Stanfield Tetreault, M., "The Service Encounter: Diagnosing Favorable and Unfavorable Incidents," Journal of Marketing, Vol. 54, January, 1990, pp 71-84.

Blair, John D. and Ramsing, Kenneth D., "Quality Circles and Production/Operations Management: Concerns and Caveats", Journal of Operations Management, November, 1983, pp 1-10.

Block, P., The Empowered Manager, Jossey-Bass Publishers, San Francisco, 1987.

Boiz, R., Manufacturing Automation Management, Chapman and Hall, New York, New York, 1985.

Booz, Allen and Hamilton, New Product Management for the 1980's, Booz Allen Hamilton, New York, 1982

Bowen, D.E., Chase, R.B., Cummings, T.G. & Associates, Service Management Effectiveness, Jossey-Bass Inc., San Francisco California, 1990.

Bowles, J. and Hammond, J., Beyond Quality, G. P. Putnam's Sons, New York, 1991.

Bez, G., etal, "Quality Practices in Japan", Quality Progress, March, 1988, p 37-41.

Bez, G., and Bisgaard, S., "The Scientific Context of Quality Improvement", Quality Progress, June, 1987, pp 54-61.

Box, G., "Quality Improvement: an Expanding Domain for the Application of the Scientific Method", a Working paper of the Center for Quality and Productivity Improvement, University of Wisconsin, 1987

Boyett, J., Conn, H., Workplace 2000, A Plume Book, New York, 1991.

Boyles, R.A., "The Taguchi Capability Index," Journal of Quality Technology, Vol. 23, No. 1, January 1991, pp 17-26.

Brack, A. & Gieskes, J.F.B., "European Legal Developments in Product Liability and Product Safety and the Total Quality Management Approach," International Journal of Materials and Product Technology, Vol. 5, No. 4, 1990, pp 311-326.

Breitenberg, M.,"ISO 9000," U.S. Department of Commerce, 1992.

Bremer, Michael S., "Linking Strategic Management and Ongoing Quality Improvement," National Productivity Review Vol: 8, No. 1, Winter 1988/1989, pp: 11-22.

Brennan, L.; Cullinane, H.; O'Connor, C.; Punch, D.; Sheil, J., "Quality Costs Determination on a Production Line," International Journal of Quality & Reliability Mgmt (UK) Vol: 7, No. 3, 1990 pp: 43-58.

Brennan, M.C.B., Management and quality circles: case studies in direct participation. Unpublished doctoral dissertation, University of Edinburgh, 1988.

Brocka, B., and Brocka, S., Quality Management, Business One Irwin, Illinois, 1992.

Broh, R., Managing Quality for Higher Profits, New York, McGraw-Hill Book Company, 1982.

Brooks, G., and Linklater, J. R., "Statistical Thinking and W. Edwards Deming's Teaching in the Administrative Environment", National Productivity Review, Summer, 1986, pp. 271-280.

Brown, F. etal, "Quality Cost and Profit Performance" Quality Costs: Ideas and Applications, ASQC Press, 1982

Brown, S., Gummesson, E., Edvardsson, B., and Gustavsson, B., Service Quality, Lexington Books, Lexington, Massachusetts, 1991.

Brown, P., "Quality Improvement Through Activity Analysis," Journal of Organizational Behavior Management Vol: 10, No. 1, 1989 pp: 169-179.

Brown, J.S. & Duguid, P., "Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation," Organization Science, Vol. 2, No. 1, February 1991, pp 40-57.

Brown, S., and Swartz, T., "A Gap Analysis of Professional Service Quality", Journal of Marketing, April, 1989, pp 92-98.

Buchholz, S., et. al., Creating the High-Performance Team, John Wiley and Sons, New York, New York, 1987.

Budde, J., Measuring Performance in Human Service Systems, AMACOM, New York, 1979.

Burrill, C. and Ellsworth, L., Quality Data Processing, Burrill-Ellsworth Assoc., Inc., 1982.

Burstein, D., Euroquake, Simon & Schuster, New York, 1991.

Bush, D.H. & Dooley, K.J., "A Learning Process for Transformation to Continuous Improvement Management," Human Systems Management, 1992.

Bushe, G., "Cultural Contradictions of Statistical Process Control in American Manufacturing Organizations," Journal of Mgmt Vol: 14, No. 1, Mar 1988 pp: 19-31.

Business Week Special Report, "The Push For Quality" Business Week June 8, 1987, p. 130-144.

Business Week Special Issue, "The Quality Imperative: Manufacturing, Government, Services, Research & Development" Business Week, October 25, 1991.

Butler, C. and Bryce, G., "Implementing SPC with Signetics Production Personnel", Quality Progress, April, 1986, pp 42-50.

Buzzell, R., and Gale B., The PIMS Principles - Linking Strategy to Performance' The Free Press, New York, New York.

Camp, R., Benchmarking, Quality Press, Milwaukee, Wisconsin, 1989.

Campanella, J., "Principles of Quality Costs", Quality Costs: Ideas and Applications, ASQC Press, 1982

Cannie, J., and Caplin, D., Keeping Customers for Life, American Management Association, New York, 1991.

Caplan, F., The Quality System, Chilton Book Company, Radnor, Pennsylvania, 1980.

Carlzon, J., Moments of Truth, Harper and Row Publishers, New York, 1987.

Carr, C., Front-Line Customer Service, John Wiley & Sons, New York, 1990.

Carr, W., "Modified Control Limits," Quality Progress Vol: 22, No. 1, Jan 1989 pp: 44-48.

Carrubba, E., and Gordon, R., Product Assurance Principles, McGraw Hill, New York, 1988.

Carson, K., Cardy, R., and Dobbins, G., "Performance Appraisal as Effective Management or Deadly Management Disease," Group and Organization Studies, Vol. 16, No. 2, June 1991, pp 143-159.

Carter, J.R. & Miller, J.G., "The Impact of Alternative Vendor/Buyer Communications Structures on the Quality of Purchased Materials," Decision Sciences, Vol. 20, 1989, pp 759-776.

Celente, G., Trend Tracking, Warner Books, New York, 1991.

Cetron, M., and Davies, O., American Renaissance, St. Martin's Press, New York, 1989.

Chambers, J., Cleveland, W., Kleiner, B., and Tukey P., Graphical Methods for Data Analysis, Wadsworth and Brooks Cole Publishing, Pacific Grove, California, 1983.

Chandler, A., The Visible Hand the Managerial Revolution in American Business, The Belknap Press, Cambridge, England, 1977.

Chase, R.B. & Hayes, R.H., "Beefing Up Operations in Service Firms," Sloan Management Review, Fall, 1991, pp 15-26.

Checkland, P., System Thinking: Systems Practice, John Wiley and Sons, New York, 1981.

Chester, D., etal, "An Expert System Approach to On-Line Alarm Analysis in Power and Process Plants", in the Proceedings of the International Computers and Engineering Conference, 1985, the American Society for Mechanical Engineers.

Choong, P.S. & Kukalis, S., "How Does American Top Management View Quality?", Omega, 1991, pp 506-510.

Christopher, R., Second to None: American Companies in Japan, Crown Publishers Inc., New York, 1986.

Churchill, G., Surprenant, C., "An Investigction Into the Determinants of Customer Dissatisfaction" Journal of Marketing Research, Volume 19, November, 1982, pp 491 - 504

Clark, K., and Fujimoto, T., "The Power of Product Integrity," Harvard Business Review, November-December, 1990, pp 107-118.

Cleveland, H., The Knowledge Executive, Truman Talley Books, New York, New York, 1985.

Cloer, W. C., "Objective: Zero Defects Suppliers", Quality Progress, November, 1984, pp 20-22.

Cohen, A., Influence Without Authority, John Wiley and Sons, New York, 1991.

Cohen, S., and Zysman, J., Manufacturing Matters: The Myth of the Post-Industrial Economy, Basic Books Inc., New York, 1987.

Cohen, H.M. & Kerwin, R.E., "New Tools for Quality Design," AT&T Technology, Vol. 2, No. 2, pp 8-15.

Cohen, S., Cowboys and Samurai, Harper Collins Publishers, New York, 1991.

Cole, R. E., Tachiki, D. S., "Forging Institutional Links: Making Quality Circles Work in the U. S., National Productivity Review, Autumn, 1984, pp. 417-429.

Cole, R. "Learning from the Japanese", Management Review" September 1980, p. 22-42.

Cole, Robert E. and Byosiere, Philippe, "Managerial Objectives for Introducing Quality Circles: A U.S.-Japan Comparison", Quality Progress, March, 1986, pp 25-30.

Collier, D., Service Management: Operating Decisions, Prentice Hall Inc., Reston, Virginia, 1987.

Collier, D., Service Management: The Automation of Services, Prentice Hall Inc., Reston, Virginia, 1985.

Collier, P., Horowitz, D., The Fords An American Epic, Summit Books, New York, 1987.

Connell, Gale W., "Quality at the Source: The First Step in Just-in-Time Production", Quality Progress, November, 1984, pp 44-45.

Cooper, R.G. & Kleinschmidt, E.J., "New Products: What Separates Winners from Losers?", Journal of Product Innovation Management, No. 4, 1987, pp 169-184.

Cooper, R. & Kaplan, R.S., "Measuring Costs Right: Make the Right Decisions," Harvard Business Review, September-October 1988, pp 96-103.

Cooper, R., and Kleinschmidt, E., "An Investigation into the New Product Process: Steps, Deficiencies and Impact," The Journal of Product Innovation Management, June 3, 1986, pp. 71-85.

Cooper, S.D., "A Total System for Measuring Delivery Performance," Journal of Purchasing and Materials Management, Fall, 1977, pp 22-26.

Cooper, R., The Performance Edge, Houghton Mifflin Inc., Boston, 1991.

Cound, Dana M., "A Call for Leadership", Quality Progress, March, 1987, pp 11-15.

Covey, S., Principle-Centered Leadership, Simon and Schuster, New York, 1990.

Covey, S., The 7 Habits Of Highly Effective People, A Fireside Book, New York, 1989.

Cranny, C., Smith, P., and Stone, E., Job Satisfaction, Lexington Books, New York, 1992.

Crawford, R., In the Era of Human Capital, Harper Collins Publishers, New York, 1991.

Crosby, P., Quality Without Tears, McGraw-Hill, New York, 1984.

Crosby, P., Quality is Free, Mentor Publishing, New York, 1979.

Crosby, P., Completeness, Dutton Book, New York, 1992.

Crosby, P., Running Things: The Art of Making Things Happen, McGraw-Hill, New York, 1986.

Crosby, P., Let's Talk Quality, Penquin Books, New York, 1990.

Crosby, P., Leading: The Art of Becoming an Executive, McGraw-Hill, New York, 1990.

Crosby, P., The Eternally Successful Organization: The Art of Corporate Wellness, McGraw-Hill, New York, 1986.

Crossfield, R.T., & Dale, B.G., "Mapping Quality Assurance Systems: A Methodology," Quality and Reliability Engineering International, Vol. 6, 1990, pp 167-178.

Curry D., and Riesz P., "Prices and Quality Relationships: A Longitudinal Analysis", Journal of Marketing, Vol. 52, January 1988, pp 36-51.

Curry, D., "Measuring Price and Quality Competition", Journal of Marketing, Vol. 49, Spring, 1985, p 106-117

Curry, D.J. & Faulds, D.J., "Indexing Product Quality: Issues Theory, and Results," Journal of Consumer Research, Vol. 13, No. 6, 1986, pp 134-145.

Curtis, D., Management Rediscovered, Dow-Jones Irwin, Homewood, Illinois, 1990.

Czepiel, J., Solomon, M., and Surprenant, C., The Service Encounter: Managing Employee/Customer Interaction in Service Businesses, Lexington Books, Lexington, Mass., 1985.

Daetz, D., "The Effect of Product Design on Product Quality and Product Cost," Quality Progress, June, 1987, pp 63-67.

Dale G., and Duncalf, A., "Quality- Related Decision Making: A Study in Six British Companies", International Journal of Operations and Production Management, Volume 5, No. 1, 1985, pp 15-26.

Dale B., and Duncalf, A., "Quality - The Linchpin to British Manufacturing Success", MD, Vol. 22, No. 1, 1984.

Davidow, W., and Uttal, B., Total Customer Service, The Ultimate Weapon, Harper & Row Publishers, New York, 1989.

Davis, S., Future Perfect, Addison-Wesley, Massachusetts, Menlo Park, California, New York, Don Mills, 1987.

Davis, S., Managing Corporate Culture, Ballinger Publishing Company, Cambridge, 1984.

Day, G., and Wensley, R., "Assessing Advantage: A Framework for Diagnosing Competitive Superiority" Journal of Marketing, Volume 52, April 1988, pp 1 -20.

Deal, T., and Kennedy, A., Corporate Cultures: The Rites and Rituals of Corporate Life, Addison Wesley Publishing Company, Reading Mass., 1982.

Dean, J.W., Jr., An investigation of quality circles. Unpublished doctoral dissertation, Carnegie-Mellon University, 1983.

Dehnad, K., Quality Control, Robust Design, and the Taguchi Method, Wadsworth and Brooks Cole Publishing, Pacific Grove, California, 1989.

Dehnad, K., Quality Control and the Taguchi Method, Wadsworth and Brooks/Cole, Pacific Grove, California, 1989.

Delmar, D., and Sheldon, G., Introduction to Quality Control, West Publishing, St. Paul, 1988.

Deming, W., Statistical Adjustment of Data, Dover Books, New York, 1938.

Deming, W.E. "Improvement of quality and productivity through action by management," National productivity Review, Winter, 1981, pp 12-22.

Deming, W., "On Some Statistical Aids Toward Economic Production", Interfaces, August, 1975, pp 1-15.

Deming, W., Out of the Crisis, Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, Massachusetts, 1982.

Deming, W., Quality, Productivity, and Competitive Position, Massachusetts Institute of Technology, Center for Advanced Engineering Study, 1982.

Denton, D., Horizonta' Management: Beyond Total Customer Satisfaction, Lexington Books, New York, 1991.

Derrick, F.W., Desai, H.B., & O'Brien, W.R., "Survey Shows Employees at Different Organizational Levels Define Quality Differently," Industrial Engineering, April, 1989, pp 22-27.

Dertouzos, M., Lester, R., and Solow, R., Made in America: Regaining the Productiv Edge, MIT Press, Cambridge, 1989.

DeSanctis, G., Poole, M.S., Desharnais, G., & Lewis, H., "Using Computing to Facilitate the Quality Improvement Process: The IRS-Minnesota Project," working paper, University of Minnesota, 1991.

Desatnick, R., Managing to Keep the Customer, Josey Bass Publishers, San Fransisco, 1987.

Devor, R., Chang, R., and Sutherland, J., Statistical Quality Design and Control, Macmillan Publishing Company, New York, New York, 1992.

Dewar, D., The Quality Circle Handbook, Quality Circle Institute, California, 1980.

Dibacco, T., Made in the U.S.A, Harper and Row Publishers, New York, 1987.

Dietrich, W., In The Shadow of the Rising Sun, The Pennsylvania Press, Pennsylvania, 1991.

Dimancescu, D., The Seamless Enterprize, Harper Business, New York, New York, 1992.

Dingus, V., and Golomski, W., A Quality Revolution in Manufacturing, Industrial Engineering and Management Press, Norcross, Georgia, 1988.

Dixon, J., Nanni, A., The New Performance Challenge, New York, 1990.

Dobyns, L, Crawford-Mason, C., Quality or Else: The Revolution in World Business, Houghton Mifflin Co., Boston, 1991.

Donovan, J.M., "The Role of the Steering Committee," The Quality Circles Journal, Vol. 10, March 1 1987, pp 6-10.

Dooley, K., and Anderson, J., "On Special Causes Which Only Affect a Portion of the Subgroup", forthcoming Journal of Computers and Industrial Engineering

Dooley, K., Bush, D., Anderson, J., and Rungtusanatham M., "The United States' Baldrige Award and Japan's Deming Prize: Two Guidelines for Total Quality Control," , The Journal of Engineering Management, Vol. 2, No. 3, September, 1990, pp 9 - 16.

Dooley, K., "Chaos and the Deming Management Method," unpublished notes, University of Minnesota.

Dooley, K., and Kapoor, S., "An Enhanced Quality Evaluation System for Quality Improvement in Continuous Processes - Part I Design", Journal of Engineering for Industry, Feb. 1990, Vol. 112, Nol 1., pp: 57-62.

Dovich, R., Quality Engineering Statistics, ASQC Quality Press, Milwaukee, Wisconsin, 1992.

Drucker, P., "The New Productivity Challenge," Harvard Business Review, November - December 1991, pp 69 - 79.

Drucker, P., Managing for the Future, Truman Talley Books/Dutton, New York, 1992.

Duncalf, A., and Dale B., Quality Management Effectiveness - An Analytical Approach", International Journal of Operations and Production Management, Volume 8, Number 5, pp 4 - 45.

Duncan, A., Quality Control and Industrial Statistics, Fifth Edition, Homewood, Illinois, Richard D. Irwin, 1974.

Dutta, R.N., Relationship between participation in quality circles and employee attitudes in aerospace industries. Unpublished doctoral dissertation, United States International University, 1988.

Early, J.F., "Strategies for the Measurement of Service Quality," Quality Forum, Vol. 17, No. 1, March 1991, pp 10-14.

Easterling, R.G., Johnson, M.E., Bement, T.R., & Nachtsheim, C.J., "Statistical Tolerancing Based on Consumer's Risk Considerations," Journal of Quality Technology, Vol. 23, No. 1, January 1991, 1-11.

Eastman Kodak Company, Keeping the Customer Satisfied, ASQC Quality Press, New York, 1989.

Ebrahimpour, M., An empirical study of the implementation of the Japanese approach to quality management and its impact on product quality in U.S. manufacturing firms. Unpublished doctoral dissertation, University of Nebraska-Lincoln, 1986.

Ebrahimpour, M. & Mangiameli, P.M., "Vendor Evaluation Criteria and Perceived Organizational Performance: A Comparison of American and Japanese Firms," International Journal of Quality & Reliability Management, Vol. 7, No. 6, 1990, pp 14-28.

Ebrahimpour, M., "An Examination of Quality Management in Japan: Implications for Management in the United States", Journal of Operations Management, August, 1985, pp 419-430.

Ebrahimpour, M. & Ansari, A., "Measuring the Effectiveness of Quality Control Circles: A Goal Programming Approach," International Journal of Production Management, Vol. 8, No. 2, 1988, pp 59-68.

Ebrahimpour, M., and Lee, S.M., "Quality management practices of American and Japanese electronic firms in the United States," Production and Inventory Management Journal, Vol. 29, No 4, 1988, pp 28-31.

Edwards, M.G., "Supplier Management Evaluation," Journal of Purchasing, Vol. 3, No. 1, February 1967, pp 28-41.

English, J.R. & Case, K.E., "Improved Quality of Continuous Flow Manufacturing Through the Combination of Statistical Process Control and Conventional Computer Process Control," Computers Industrial Engineering (UK), Vol. 15, Nos 1-4, 1988, pp 344-348.

Ernst and Young, American Competitive Study: Characteristics of Success, 1991.

Ernst and Young, Best Practices Report, An Analysis of Management Practices the Impact Performance, American Quality Foundation, 1992.

Ernst and Young, Total Quality: An Executive's Guide for the 1990's, Dow Jones-Irwin, Homewood, Illinois, 1990.

Ernst and Young, International Quality Study, American Quality Foundation and Ernst & Young, 1991.

Eureka, W., and Ryan, N., The Customer Driven Company: Managerial Perspectives on QFD, American Supplier Institute, Dearborn, 1988.

Evans, J.R. & Lindsay, W.M., "A Framework for Expert System Development in Statistical Quality Control," Computers Industrial Engineering (UK), Vol. 14, No. 3, 1988, pp 335-343.

Evans, J., Lindsay, W., The Management And Control of Quality, West Publishing Company, St. Paul, Minneapolis, 1993.

Evans, J., Statistical Process Control for Quality Improvement, Prentice Hall, New Jersey, 1991.

Everett, R.J. & Sohal, A.S., "Individual Involvement and Interventior in Quality Improvement Programmes: Using the *Andon* System," International Journal of Quality & Reliability Management, Vol. 8, No. 2, 1991, pp 21-34.

Feenstra, R., "Quality Change Under Trade Restraints in Japanese Autos", Quarterly Journal of Economics, February, 1988, p. 131-146

Feigenbaum, E., McCorduck, P., Nii, P., The Rise Of the Expert Company, Times Books, New York, 1988.

Feigenbaum, A., Total Quality Control, McGraw-Hill, New York, 1983

Feigenbaum, A.V., "Total Quality Control," Harvard Business Review, November-December 1956, pp 93-101.

Feigenbaum, A., "Quality: The Strategic Business Imperative", Quality Progress, February, 1986, p. 26-30.

Feigenbaum, D., "Return to Quality Control", Quality Progress, May 1976, pp. 18-21.

Fellers, G., Deming Vision, ASQC Quality Press, Milwaukee, Wisconsin, 1992.

Ferris, G.R. & Wagner III, J.A., "Quality Circles in the United States: A Conceptual Reevaluation," The Journal of Applied Behavioral Science, Vol. 21, No. 2, 1985, pp 155-167.

Fine, C., "A Quality Control Model with Learning Effects," Operations Research, Vol. 36, No. 3, May-June 1988, pp 437-444.

Fine, C., "Quality Improvement and Learning in Productive Systems", Management Science, Vol. 32, No. 10, October 1986, pp 1301-1315.

Fine, C.H. & Porteus, E.L., "Dynamic Process Improvement," Operations Research, Vol. 37, No. 4, July-August 1989, pp 580-591.

Fink, P.K. & Lusth, J.C., "Expert Systems and Diagnostic Expertise in the Mechanical and Electrical Domains," IEEE Transactions on Systems, Man, and Cybernetics, Vol. SMC-17, No. 3, May/June 1987, pp 340-349.

Florida, R., and Kenney, M., The Breakthrough Illusion, Basic Books, New York, 1990.

Ford, H., Today and Tomorrow, Productivity Press, New York, 1988.

Forker, L.B., "Quality: American, Japanese, and Soviet Perspectives," Academy of Management Executive, Vol. 5, No. 4, 1991, pp 63-74.

Fornell, C., "A National Customer Satisfaction Barometer: The Swedish Experience," Journal of Marketing, Vol. 56, January 1992, pp 6-21.

Fornell, C. & Wernerfelt, B., "Defensive Marketing Strategy by Customer Complaint Management: A Theoretical Analysis," Journal of Marketing Research, Vol. 24, November 1987, pp 337-346.

Fornell, C., and Wernerfelt, B., "A Model for Customer Complaint Management", Marketing Science, Volume 7, Summer, 1988, pp 63-78.

Fornell, C. & Westbrook, R.A., "The Vicious Circle of Consumer Complaints," Journal of Marketing, Vol. 48, Summer 1984, pp 68-78.

Foster, R., Innovation, Summit Books, New York, 1986.

Fraser Hite, C., Hite, R., and Minor, T., "Quality Uncertainty, Brand Reliance, and Dissipative Advertising," Journal of the Academy of Marketing Science, Volume 19, Number 2, Spring, 1991, pp 115-121.

Fuller, F. T., "Eliminating Complexity from Work: Improving Productivity by Enhancing Quality", National Productivity Review, Autumn 1985, pp. 327-344.

Gabor, A., The Man Who Discovered Quality, Random House, New York, 1990.

Gale, B., Buzzell, R., "Market Perceived Quality: Key Strategic Concept," Planning Review Vol: 17, No. 2, Mar/Apr 1989 pp: 6-15.

Ganter, W.A., "Quality in Design," Quality and Reliability Engineering International, Vol. 4, 1988, pp 4-6.

Garvin, D., "Quality on the Line", Harvard Business Review, September-October 1983, p. 64-75.

Garvin, D., "Japanese Quality Management", Columbia Journal of Word Business, Fall, 1984, New York, AMACOM, American Management Association, 1978

Garvin, David A., "Competing on the Eight Dimensions of Quality", Harvard Business Review, November-December, 1987, pp 101-109.

Garvin, D., "A Note on Quality: the Views of Deming, Juran, and Crosby," 1-687-011, Rev. October 86, Harvard Business School, Boston, Mass.

Garvin, D., "What Does Product Quality Really Mean?", Sloan Management Review, Fall, 1984, p. 25-43.

Garvin, D., Managing Quality, The Free Press (MacMillan), New York, 1988

Garvin, D., "Product Quality: An Important Strategic Weapon", Business Horizons, Vol. 27, No. 3, March-April 1984, p. 40-43.

Garvin, D., Various Authors, comment on "Does the Baldrige Award Really Work?," Harvard Business Review, January - February 1992, pp 126 - 147.

Garvin, D., "Quality Problems, Policies and Attitudes and Japan: An Exploratory Study", Academy of Management Journal, Volume 29, No. 4, December 1986, p. 653-673.

Garvin, D.A., "How the Baldrige Award Really Works," Harvard Business Review, November-December 1991, pp 80-93.

Geber, B., "Benchmarking: Measuring Yourself Against the Best," Training Vol: 27, No. 11, Nov 1990 pp: 36-44.

Geistfeld, L.V., "The Price-Quality Relationship - Revisited," The Journal of Consumer Affairs, Winter 1982, pp 334-346.

General Accounting Office, U.S. Companies Improve Performance Through Quality Efforts, NSIAD-91-190, United States General Accounting Office, Washington, D. C., 205-48, May, 1991.

George, S., Baldrige Quality System, John Wiley and Sons Inc., New York, 1992.

Gerber, M., Power Point, Harper Business, New York, 1991.

Gershman, M., Getting it Right The Second Time, Addison-Wesley, Massachusetts, Menlo Park, California, 1991.

Gerstner, E., "Do Higher Prices Signal Higher Quality?", Journal of Marketing Research, Vol. 22, May 1985, pp 209-215.

Gettel-Riehl, K., Kleiner, B., "Lessons from the Japanese Automotive Industry," Industrial Mgmt & Data Systems (UK), May/Jun 1987 pp: 3-6.

Gitlow, H., Planning for Quality Productivity and Competitive Position, Dow Jones-Irwin, Homewood, Illinois, 1990.

Gitlow, H. & Hertz, P., "Product Defects and Productivity", Harvard Business Review, Sept-Oct 1983, pp. 131-141.

Gitlow, H., Gitlow, S., The Deming Guide to Quality and Competitive Position, Prentice Hall, New Jersey, 1987.

Gitlow, H., "A Comparison of the Japanese School of Quality (TQC) and the Deming School of Quality (WED)", a working paper of the University of Miami Institute for the Study of Quality in Manufacturing and Service, June, 1989.

Gitlow, H., Gitlow S., Oppenheim, A., Oppenheim, R., Tools and Methods for the Improvement of Quality, Irwin, Homewood Illinois, 1989.

Gleick, J., Chaos: Making a New Science, Viking Penguin Inc., New York, 1988.

Goetz, Victor J., Quality Assurance: A Program for the Whole Organization, New York, AMACOM, American Management Association, 1978

Goh, T.N., "An Efficient Empirical Approach to Process Improvement," International Journal of Quality & Reliability Management, Vol. 6, No. 1, 1989, pp 7-26.

Gold, B., "Improving Industrial Performance Through Integrating Quality and Productivity Advances," Technovation (Netherlands) Vol: 10, No. 8, Dec 1990 pp: 521-529.

Goldratt, E., The Haystack Syndrome, North River Press, New York, 1990.

Goldratt, E., The Goal: A Process of Ongoing Improvement, North River Press, New Haven, 1984.

Goodman, J., Malech, A., and Adamson, C., "Don't Fix the Product, Fix the Customer," The Quality Review, Fall, 1988, pp 6-11.

Goodman, P.S., Devadas, R., & Griffith Hughson, T.L., "Groups and Productivity: Analyzing the Effectiveness of Self-Managing Teams," Productivity in Organizations, pp 295-327.

Goyal, S.K. & Gunasekaran, A., "Effect of Dynamic Process Quality Control on the Economics of Production," International Journal of Production Management, Vol. 10, No. 7, 1990, pp 69-77.

Grant, E., and Leavenworth, R., Statistical Quality Control, McGraw Hill, New York, 1988.

Grayson, J., and O'Dell, C., A Two Minute Warning, The Free Press, New York, 1988.

Gregory, P.E., "Source Selection: A Matrix Approach," Journal of Purchasing and Materials Management, Summer 1986, pp 24-29.

Griffen, R., "Consequences of Quality Circles in an Industrial Setting: A Longitudinal Assessment", Academy of Management Journal, Volume 31 Number 2, 1988, pp 238 - 258.

Grimaldi, J., and Simmons, R., Safety Management, Richard D. Irwin, Homewood, Illinois, 1989.

Gronroos, C., Service Management And Marketing, Lexington Books, Massachusetts, 1990.

Groocock, J., The Chain of Quality: Market Dominance Through Product Superiority, John Wiley and Sons, New York, 1986.

Gryna, F., Quality Circles - A Team Approach to Problem Solving, New York, AMACOM, American Management Association, 1981

Gunn, T., Manufacturing for Competitive Advantage: Becoming a World Class Manufacturer, Ballinger Publishing Company, Cambridge, 1987.

Gunter, Berton, "A Perspective on the Taguchi Methods", Quality Progress, June, 1987, pp 44-52.

Hahn, C.K., Kim, K.H., & Kim, J.S., "Costs of Competition: Implications for Purchasing Strategy," Journal of Purchasing and Materials Management, Fall 1986, pp 2-7.

Hakansson, H. & Wootz, B., "Supplier Selection in an International Environment - An Experimental Study," Journal of Marketing Research, Vol. 12, February 1975, pp 46-51.

Halberstam, D., The Reckoning, Avon Books, New York, 1986.

Hale, R., Kowal, R., Carlton, D., and Schaert, T., Made in the USA How One Company Helps Satisfy Customer Needs Through Strategic Supplier Quality Management, Tennant Company, Minneapolis, 1991.

Hale, R., Koelscher, D., and Kowal, R., Quest for Quality, How One Company Put Theory to Work, Tennant Company, Minneapolis, 1987.

Hall R., Attaining Manufacturing Excellence, Dow Jones Irwin, Homewood, Illinois, 1987.

Halpin, J., Zero Defects, McGraw-Hill, New York, 1966.

Hamper, B., Rivethead, Warner Books, New York, New York, 1991.

Hanan, M., Customer Satisfaction, Amacom, New York, 1989.

Hanan, M., Profits Without Products, Amacom, New York, 1992.

Hanan, M., and Karp, P., Competing on Value, American Management Association, New York, 1991.

Handfield, R., "Quality Management in Japan Versus the United States: An Overview," Production and Inventory Management Journal, Second Quarter, 1989, pp 79-85.

Handy, C., The Age of Unreason, Harvard Business School Press, Boston, 1989.

Harmen, W., Hormann, J., Creative Work, Knowledge Systems, Munich, 1990.

Harmon, R., Reinventing the Factory II, Free Press, New York, 1992.

Harmon, R., Peterson, L., Reinventing the Factory, The Free Press, New York, 1990.

Hartley, R., Bullseyes and Blunders, John Wiley and Sons, New York, 1987.

Harvard Business Review., Survival Strategies for American Industry, John Wiley and Sons, New York, New York, 1983.

Hatvany, N., Pucik, V., "Japanese Management Practices and Productivity", in Organizational Dynamics, Spring, 1981, American Management Association

Hauser, J. R., and Clausing, D., "The House of Quality", Harvard Business Review, May-June 1988, pp. 63 - 73.

Hax, A., Planning Strategies That Work, Oxford University Press, New York, 1987.

Hayes, R., Wheelwright, S., and Clark, K., Dynamic Manufacturing, Free Press, New York, 1988.

Hayes, R., and Wheelwright, S., Restoring Our Competitive Edge: Competing Through Manufacturing, John Wiley and Sons, New York, 1984.

Hayes, G., Quality and Productivity: The New Challenge, Hitchcock Publishing Co., Wheaton, Illinois, 1985.

Hayes, R., Measuring Customer Satisfaction: Development and Use of Questionnaires, ASQC Quality Press, 1992.

Haywood-Farmer, John, "A Conceptual Model of Service Quality", International Journal of Operations and Production Management, Volume 8, Number 6., pp 18 - 29.

Heath, P.M., "The Path to Quality Achievement Through Teamwork Plus Commitment," International Journal of Quality & Reliability Management, Vol. 6, No. 2, 1989, pp 51-58.

Hedberg, B. "How Organizations Learn and Unlearn," in Handbook of Organizational Design, P.C. Nystrom & W.H. Starbuck, editors, Oxford University Press, 1981, pp 3-27.

Heirs, B., the Professional Decision Thinker, Dodd Mead and Company, New York, 1987.

Heirs, B., Pehrson, G., The Mind of the Organization, Harper and Row Publishers, New York, 1977, 1982.

Henry, G., Redmon, W., "The Effects of Performance Feedback on the Implementation of a Statistical Process Control (SPC) Program," Journal of Organizational Behavior Management, Vol: 11, No. 2, 1990 pp: 23-46.

Hesket, J., Sasser, W., and Hart, C., Service Breakthroughs: Changing Rules of the Game, Free Press, New York, 1990.

Hiam, A., Closing The Quality Gap, Prentice Hall, New Jersey, 1992.

Hickman, C., and Silva, M., Creating Excellence, New American Library, 1984

Hickman, C., Mind of a Manager Soul of a Leader, John Wiley and Sons, New York, 1990.

Hickok, Susan, A., "The Competitiveness of U.S. Manufactured Goods: Recent Changes and Prospects", Federal Reserve Bank of New York Quarterly Review, Spring 1988, Volume 7 .

Hill, F.M., "What British Management can Reasonably Expect from a Quality Circle Programme," International Journal of Quality & Reliability Management, Vol. 6, No. 3, 1989, pp 59-73.

Hilton, C., Be My Guest, Prentice Hall, New York, 1957.

Hite, C.F., Hite, R.E., & Minor, T., "Quality Uncertainty, Brand Reliance, and Dissipative Advertising," Journal of the Academy of Marketing Science, Vol. 19, No. 2, 1991, pp 115-121.

Hjorth-Andersen, C., "The Concept of Quality and the Efficiency of Markets for Consumer Products," Journal of Consumer Research, Vol. 11, September, 1984, pp 708-718.

Hjorth-Andersen, C., "More on Multidimensional Quality: A Reply, "Journal of Consumer Research, Vol. 13, June, 1986, pp 149-154.

Hockman, K., & Lucas, J., "Variability Reduction Through Subvessel CUSUM Control", Journal of Quality Technology, Vol. 19, No. 3, July 1987, p. 113-121.

Horowitz, M., Stonehenge to Star Wars, Dow-Jones Irwin, Homewood, Illinois, 1990.

Hostage, G., "Quality Control in Service Business", Harvard Business Review, July-Aug 1975, p. 98-106.

Howard, W., Profiting From Innovation, The Free Press, New York, 1992.

Hradesky, J., Productivity & Quality Improvement, McGraw-Hill, Inc., New York, 1988.

Hsu, L. & Tapiero, C.S., "An Economic Model for Determining the Optimal Quality and Process Control Policy in a Queue-Like Production System," International Journal of Production Research, Vol. 28, No. 8, 1990, pp 1447-1457.

Huang Y., etal, "Fault Diagnosis of Hazardous Waste Incineration Facilities Using A Fuzzy Expert System", in the Proceedings of the 1st Symposium on Expert Systems in Civil Engineering, 1986, the American Society of Civil Engineering

Huber, G.P., "Organizational Learning: The Contributing Processes and the Literatures," Organization Science, Vol. 2, No. 1, February 1991, pp 88-115.

Hudiburg, J., Winning with Quality, Quality Resources, White Plains, New York, 1991.

Hughes, T., American Genesis, Viking Penguin, Middlesex, England, 1989.

Hutchins, G., Purchasing Strategies for Total Quality, Richard D. Irwin, Homewood, Illinois, 1992.

Hutchins, G., Purchasing Strategies for Total Quality, Business One Irwin, Homewood, Illinois, 1992.

Iacocca, L., Talking Straight, Bantam Books, Toronto, 1988.

Imai, M., Kaizen, The Key to Japan's Competitive Success, Random House, New York, 1986

Ingle, S, Quality Circle Master Guide, Prentice Hall, Englewood Cliffs, New Jersey, 1982.

Instone, F.J., & Dale, B.G. "A case study of the typical issues involved in quality improvement," International Journal of Operations and Production Management, Vol. 9, No. 1, 1989, pp 15-26.

Ishikawa, K., "The Quality Control Audit", Quality Progress, January, 1987, p. 39-43.

Ishikawa, K., Guide to Quality Control, Asian Productivity Organization, Tokyo, Japan, 1982.

Ishikawa, K., What is Total Quality Control?, Prentice Hall, London, 1985.

Jacobson, G., & Hillkirk J., Xerox American Samurai, Collier Books, New York, 1986.

Jacobson, R. etal, "The Strategic Role of Product Quality", Journal of Marketing, Vol, 51, Oct. 1987, p. 31-44

Jacoby, J., Olson, J., Percieved Quality, Lexington Books, Massachusetts, 1985.

Johnson, T., Relevance Regained, The Free Press, New York, 1992.

Johnston, R., "A Framework for Developing a Quality Strategy in a Customer Processing Operation," International Journal of Quality & Reliability Mgmt (UK) Vol: 4, No. 4, 1987 pp: 37-46.

Jones, T.E., An assessment of the effectiveness of quality circle training of public service employees. Unpublished doctoral dissertation, University of San Francisco, 1988.

Jorissen, H., "Product Liability and Its Insurance in Consideration of Quality Assurance," Forensic Engineering, Vol. 2, Nos. 1/2, 1990, pp 85-87.

Juran, J., Juran on Planning for Quality, New York: The Free Press, 1988.

Juran, J., and Gryna, F., Quality Planning and Analysis, McGraw Hill, New York, 1993.

Juran, J., Juran on Quality By Design, The Free Press, New York, 1992.

Juran, J., "Product Quality - A Prescription for the West Part I", Management Review, June 1981, p. 8-14

Juran, J., Quality Control Handbook, McGraw-Hill, New York.

Juran, J., Juran on Leadership for Quality, Free Press, New York, 1989.

Juran, J., "Product Quality - A Prescription for the West Part II", Management Review, June 1981, p. 8-14

Juran, J., "The Quality Trilogy", Quality Progress, August, 1986

Juran, J., Managerial Breakthrough, McGraw Hill, New York, 1964

Juran, J., "Japanese and Western Quality: A Contrast in Methods and Results", Management Review, November 1978, p 27-45.

Kackar, Raghu N., "Taguchi's Quality Philosophy: Analysis and Commentary", Quality Progress, December, 1986, pp 21-29.

Kackar, R., "Off-Line Quality Control, Parameter Design, and the Taguchi Method", Journal of Quality Technology, Vol. 17, No. 4, October, 1985, p. 176-188.

Kane, V., "Process Capability Indices", Journal of Quality Technology, Vol. 18, No. 1, January, 1986, p. 41-52.

Kanter, R., et. al., The Challenge of Organizational Change, The Free Press, New York, New York, 1992.

Kanter, R., "Quality Leadership and Change", Quality Progress, February, 1987, p. 45-53.

Kanter, R., When Giants Learn to Dance, Touchstone-Simon & Schuster, New York, 1989.

Kaplan, R., Measuring for Manufactering Excellence, Harvard Business School Press, Boston, Massachusetts, 1990.

Kapur, K.C., Raman, S., & Pulat, P.S., "Methodology for Tolerance Design Using Quality Loss Function," Computers Industrial Engineering (UK), Vol. 19, Nos. 1-4, 1990, pp 254-257.

Kathawala, Y., and Nanda, V., "Quality in a Global Context: A Framework for Analysis," International Journal of Quality and Reliability Management, Volume 6, Number 2, 1989, pp 31 - 39.

Kathawala, Y., "A Comparative Analysis of Selected Approaches to Quality," International Journal of Quality & Reliability Management, Vol. 6, No. 5, 1989, pp 7-17.

Kaynak, H.,"New Criteria for Organizational Effectiveness: Towards a Total Quality Management Approach," Southern Management Association Proceeding, 1992, pp. 339-343.

Kearns, R., Zaibatsu America, The Free Press, New York, 1992.

King, C., "Service Quality Assurance is Different," Quality Progress, June, 1985, pp 14-18.

King, C., "A Framework for a Service Quality Assurance System", Quality Progress, September, 1987, p. 27-37.

Kinlaw, D., Developing Superior Work Teams: Building Quality and the Competitive Edge, Lexington Books, Lexington, Mass., 1991.

Klein, J., Revitalizing Manufacturing, Irwin, Homewood, Illinois, Massachusetts, 1990.

Kobu, B. & Greenwood, F., "Continuous Improvement in a Competitive Global Economy," Production and Inventory Management Journal, Fourth Quarter 1991, pp 58-63.

Konz, Stephen, "Quality Circle: An Annotated Bibliography," Quality Progress, April 1981, p. 30-35

Kotter, J., A Force For Change, The Free Press, New York, 1990.

Kotter, J., The Leadership Factor, The Free Press, New York, 1988.

Kotter, J., Heskett, J., Corporate Culture and Performance, The Free Press, New York, 1992.

Kriegel, R., and Patler, L., If It Ain't Broke... Break It!, Warner Books, New York, 1991.

Kroeger, R., "Quality Costs: A New Perspective", Quality Costs: Ideas and Applications, ASQC Press, 1982

Kuhn, T., The Structure of Scientific Revolutions, The University of Chicago Press, Chicago, 1962, 1970.

Kume, H., Statistical Methods for Quality Improvement, The Association for Overseas Technical Scholarship, Tokyo, Japan, 1985

Langenberg, P., & Iglewicz, B., "Trimmed Mean X and R Charts", Journal of Quality Technology, Vol. 18, No. 3, July 1986, p. 152-161.

Langevin, R., "Service Performance Measurement", National Operations and Automation Research Conference, Washington DC., American Bankers Association, June 1976

Langevin, R., Quality Control in Service Industries, New York, AMACOM, American Management Association, 1977

Larean, W., American Samurai, Warner Books, New York, 1991.

Lascelles, D., and Dale, B., "The Buyer-Supplier Relationship in Total Quality Management", Journal of Purchasing and Materials Management, Summer, 1989, pp 10-18.

Lascelles, D., Dale, B., "Examining the Barriers to Supplier Development," International Journal of Quality & Reliability Mgmt (UK) Vol: 7, No. 2, 1990 pp: 46-56.

Latzko, W., Quality and Productivity for Bankers and Financial Managers, Mercel Dekker, Inc., New York, 1986.

Lawler, E., Ledford, G., and Mohrman, S.,"Employee Involvement in America: A Study of Contemporary Practice," Center for Effective Organization.

Lawler, E., and Mohrman, S., "Quality Circles after the Fad", Harvard Business Review", Jan - Feb 1985, pp 65-71.

Lawler, E., High Involvement Management, Jossey-Bass Publishers, San Fransisco, Oxford, 1990.

Lawler III, E.E. & Mohrman, S.A., "Quality Circles: After the Honeymoon," Organizational Dynamics, pp 42-54.

Leavitt, H., Corporate Pathfinders, Penguin Group, New York, 1986.

Ledford, G., Lawler, E., Mohrman, "The Quality Circle and Its Variations", in Productivity in Organizations,

Lee, S.M. & Ebrahimpour, M. "An analysis of Japanese quality control systems: implications for American manufacturing firms." SAM Advanced Management Journal, Spring, 1985, pp 24-31.

Leenders, M., and Blenkhorn, D., Reverse Marketing: The New Buyer-Supplier Relationship, The Free Press, New York, 1988.

Leibfried, K., McNair, C.j., Benchmarking, Harper Business, New York, 1992.

Lele, M., The Customer is Key, John Wiley & Sons, Inc., New York, 1987.

Leonard, F.S. & Sasser, W.E., "The Incline of Quality," Harvard Business Review, Vol 60, 1982, pp 163-171.

Lester, R., Enrick, N., & Motley, H., Quality Control for Profit, New York, Industrial Press, 1977

Levitt, B., and March, J.,"Organizational Learning," Annual Review Sociology, Vol. 14, 1988, pp. 319-339.

Levitt, T.,"Marketing Myopia," Harvard Business Review, No. 75507, pp. 1-12.

Lieberman, M., Lau, L, and Williams, M., "Firm-Level Productivity and Management Influence: A Comparison of U. S. and Japanese Automobile Producers", a research monograph of Stanford University, Dec. 1989.

Lin, P.K.H., Sullivan, L.P., & Taguchi, G., "Using Taguchi Methods in Quality Engineering," Quality Progress, September 1990, pp 55-59.

Linkow, P., "Is Your Culture Ready for Total Quality?", Quality Progress, November 1989, pp 69-71.

Locke, E., The Essence of Leadership, Lexington Books, New York, New York, 1991.

Lockyer, K., Oakland, J., & Duprey, C., "Quality Control in the U. K. Chemical Manufacturing Industry - A Study," International Journal of Production Research, Vol. 191, 1981, p 317-325

Love, P., etal, "An Assistant Program for the Interpretation of Manufacturing Process Signals", in Proceedings of the Winter Conference on Knowledge Based Systems in Manufacturing, 1986, American Society of Mechanical Engineers

Lynch, D., and Kordis, P., Strategy of the Dolphin, Fawcett Columbine, New York, 1988.

Maani, K., and Siuti, D., "A Conformance - Performance Model: Linking Quality Strategies to Business Unit's Performance", in the Proceedings of the Manufacturing Strategy Conference, U. of Michigan, Jan. 1990.

Maani, K., "Productivity and Profitability through Quality - Myth and Reality," International Journal of Quality and Reliability Management, Volume 6, Number 3, 1989, pp 11 - 23.

Manoochehri, G.H., "Suppliers and the Just-in-Time Concept", Journal of Purchasing and Materials Management, Winter, 1984, pp 16-21.

Manz, C., Sims, H., Super Leadership, Berkley Books, New York, 1989.

Marcellus, R.L. & Dada, M., "Interactive Process Quality Improvement," Management Science, Vol. 37, No. 11, November 1991, pp 1365-1376.

Martin, R., "On Judging Quality by Price: Price Dependent Expectations, Not Price Dependent Preferences", Southern Economics Journal, Jan, 1986

Maskell, B., Performance Measurement for World Class Manufacturing, Productivity Press, New York, 1991.

Mawhinney, T.C., "OBM, SPC, and Theory D: A Brief Introduction," Journal of Organizational Behavior Management, Vol. 8, No. 1, Spring/Summer 1986, pp 89-105.

McCosh, A.M. & Walsh, M., "The Financial Management of Quality as a Strategy," Marketing Intelligence & Planning, Vol. 6, No. 1, 1988, pp 10-20.

McCullough, P., "Development and Validation of an Instrument to Measure Adherence to Deming's Philosophy of Quality Improvement," PhD Thesis, Univeristy of Tennessee, 1988.

McGuire, J., Schneeweis, T., Branch, B., "Perceptions of Firm Quality: A Cause or Result of Firm Performance," Journal of Mgmt Vol: 16, No. 1, Mar 1990 pp: 167-180.

McKeever, B., Blundell, J., "Faults - An Expert Systems Environment for Fault Detection and Diagnosis", in Proceedings of the Winter Conference on Knowledge Based Systems in Manufacturing, 1986, American Society of Mechanical Engineers

McMillan, C., The Japanese Industrial System, Walter de Gruyter Publishing, New York, 1985.

Mead, P., Rasmussen, E., and Seal, J., "Quality Assurance in the Equal Employment Opportunity Commission", National Productivity Review, Autumn 1986, pp. 363-375.

Melan, E.H., "Process Management in Service and Administrative Operations", Quality Progress, June, 1985, pp 52-59.

Metz, E. J., "Managing Change: Implementing Productivity and Quality Improvements", National Productivity Review, Summer, 1984, pp. 303-314.

Miller, D., The Icarus Paradox, Harper Business, New York, 1990.

Miller, W., The Creative Edge, Addison-Wesley, Massachusetts, Menlo Park, California, 1987.

Miller, W. C., and Pearce, N. T., "Synergizing Total Quality and Innovation", National Productivity Review, Winter 1987-1988, pp. 34-44.

Miller, T., "The Quality Circle Phenomenon: A Review and Appraisal," SAM Advanded Management Journal, Winter, 1989, pp 4 - 12.

Mills, D., The IBM Lesson, Times Books-Random House, New York, 1988.

Milne, Robert, "Strategies for Diagnosis", IEEE Transactions on Systems, Man and Cybernetics, Volume SMC-17, No. 3, May/June 1987.

Mize, D.K. & Ryan, B., An Ounce of Prevention, Advanced Quality Engineering, 1991.

Mizuno, S., Company-Wide Total Quality Control, Asian Productivity Organization, Tokyo, 1988.

Mizuno, S., Management for Quality Improvement: The Seven New QC Tools, Cambridge: Productivity Press, 1988.

Modarress, B. & Ansari, A., "Quality control techniques in U.S. firms: a survey," Production and Inventory Management Journal, Vol. 30, No. 2, 1989, pp 58-62.

Modarress, B. & Ansari, A., "Two Strategies for Regaining US Manufacturing Dominance," International Journal of Quality & Reliability Management, Vol. 7, No. 6, 1990, pp 68-77.

Moen, R. D. and Nolan, T. W.; "Process Improvement: A Step-by-Step Approach to Analyzing and improving a Process", Quality Progress, September, 1987, p. 62-68.

Monden Y., Toyota Production System, New York, American Institute of Industrial Engineers (AIIE), 1982.

Montgomery, C., "Guest Editor's Introduction to the Special Issue on Research in the Content of Strategy", Strategic Management Journal, Volume 9, 1988, pp 3 - 8.

Montgomery, D., Design and Analysis of Experiments, John Wiley and Sons, New York, New York, 1991.

Montgomery, D., Statistical Quality Control, John Wiley and Sons, United States, 1985, 1991.

Mormon, A., Jr.,"Deming Versus Performance Appraisal: Is There a Resolution?," Center for Effective Organization, pp. 1-23.

Morris B., and Johnston R., "Dealing with Inherent Variability: The Difference Between Manufacturing and Service", International Journal of Operations and Production Management, Volume 7, Number 4., pp 12 - 22.

Naisbitt, J., and Aburdene, P., Re-Inventing the Corporation, Warner Books, New York, 1985.

Naisbitt, J., Aburdene, P., Megatrends 2000, Avon books, New York, 1990.

Narus, J.A. & Anderson, J.C., "Turn Your Industrial Distributors Into Partners," Harvard Business Review, March-April 1986, pp 66-71.

National Center for Manufacturing Sciences., Competing in World Class Manufacturing, Business One Irwin, Homewood Illinois, 1990.

Nau, H., The Myth of America's Decline, Oxford University Press, New York, 1990.

Newman, R.G., "Insuring Quality: Purchasing's Role," Journal of Purchasing and Materials Management, Fall, 1988, pp 14-21.

Nolan, V., The Innovator's Handbook, Penguin Books, London, 1987.

Nolan, R., and Provost, L., "Understanding Variation", Quality Progress, May, 1990, 70-78.

Nonaka, I., "The Knowledge-Creating Company," Harvard Business Review, November-December 1991, pp 96-104.

Nosow, S., "A Lesson for American Managers: Learning from Japanese Experiences in the U.S.", National Productivity Review, Autumn, 1984, p 407 - 416.

Odiorne, G., The Human Side Of Management, Lexington Books, Massachusetts, 1987.

Oech, R., A Whack On The Side Of The Head, Warner Communications Company, New York, 1983.

Ohmae, K., The Borderless World: Power and Strategy in the Interlinked Economy, Harper Collins Publishing Co. New York, 1990.

Ohmae, K., The Mind of the Strategist, Penguin Books Ltd., Middlesex, England, 1990.

Oliver, N., "Employee Commitment and Total Quality Control," International Journal of Quality & Reliability Management, Vol. 7, No. 1, 1990, pp 21-29.

Olshavsky, R. and Miller, J., "Consumer Expectations, Product Performance, and Perceived Product Quality", Journal of Marketing Research, Volume 9, February, 1972, pp. 19-21.

Orsburn, J., Moran, L., Musselwhite, E., and Zenger, J., Self Directed Work Teams, Richard D. Irwin, Homewood, Illinois, 1990.

Ott, E., Process Quality Control, New York, McGraw-Hill, 1975

Ouchi, W., "Organizational Paradigms: A Commentary on Japanese Management and Theory Z Organizations", in Organizational Dynamics, Spring, 1981, American Management Association

Pall, G., Quality Process Management, Prentice Hall, Englewood Cliffs, New Jersey, 1987

Papadakis, E., "The Deming Inspection Criterion for Choosing Zero or 100 Percent Inspection", Journal of Quality Technology, Vol. 17, No. 3, July 1985, p. 121-127

Parasuraman, A., Zeithaml, V., and Berry L., "SERVQUAL: A Multiple-Item Scale for Measuring Customer Perceptions of Service Quality", Marketing Science Institute Research Report No. 86-108, August 1986.

Parkhideh, B. & Case, K.E., "The Economic Design of a Dynamic X(bar)-Control Chart,"IIE Transactions, Vol. 21, No. 4, December 1989, pp 313-323.

Perrow, C., Normal Accidents, Basic Books, New York, 1984.

Perry, J.H. & Perkins, C.A., "Operationalizing Quality Considerations in the Purchasing Process," International Journal of Purchasing and Materials Management, Winter 1992, pp 10-14.

Peters, T., Thriving on Chaos, Alfred A. Knopf, New York, 1987.

Peters, T., "Leadership Alliance," Video Publishing House, 1989.

Peters, T., "Beyond Close to the Customer," Video Publishing House, 1991.

Peters, T., A Passion for Excellence, Warner Books, New York, 1985.

Peters, T., In Search of Excellence, Warner Books, New York, 1983.

Peters, T., Liberation Management, Alfred A. Knopf, New York, 1992.

Petersen, D., A Better Idea, Houghton Mifflin, Boston, 1991.

Phillips, L, Chang D., and Buzzell R., "Product Quality, Cost Position and Business Performance: A Test of Some Key Hypotheses", Journal of Marketing, Vol. 47, Spring 1983, p. 26-43

Phillips, S., Dunkin, A., Treece, J.B., & Hammonds K.H., "King Customer," Business Week, March 12, 1990, pp 88-94.

Phillips, D., Lincoln On Leadership, Warner Books, New York, 1992.

Pine, J., Mass Customization, Harvard Business School Press, Massachusetts, 1993.

Pirsig, R., Zen and the Art of Motorcycle Maintenance, Bantam Books, New York, 1974.

Pirsig, R., Lila, Bantam Books, New York, 1991.

Plunkett, J. J., and Dale, B. G., "Quality costs: a critique of some economic cost of quality models" International Journal of Production Research, Volume 26, number 11, November 1988, pp 1713-1726.

Poirier, C., Houser, W., Business Partnering For Continuous Improvement, Pfeiffer, Amsterdam, 1993.

Porter, M., The Competitive Advantage of Nations, Free Press, New York, 1990.

Posco, P., and Brown D., "The Analysis of Complex Manufacturing Data Using Expert Diagnostic Browsing", in Proceedings of the Winter Conference on Knowledge Based Systems in Manufacturing, 1986, American Society of Mechanical Engineers

Potter, D., "From Experience: The Customer's Eye View of Innovation," Journal of Product Innovation Management, Number 6, 1989, pp 35 - 42.

Prokopenko, J., Productivity Management, International Labour Office, Geneva, 1987.

Quinn, J., Intelligent Enterprise, The Free Press, New York, 1992.

Quinn, J., Mintzberg, H., James, R., The Strategy Process, Prentice Hall, New Jersey, 1988.

Ramsay, J., "The Myth of the Cooperative Source," Journal of Purchasing and Materials Management, Winter 1990, pp. 2-5.

Raz, T., "A Survey of Models for Allocating Inspection Effort in Multistage Production Systems", Journal of Quality Technology, Vol. 18, No. 4, October 1986, p. 239-247.

Reddy, J., & Berger, A., "Three Essentials of Product Quality", Harvard Business Review, July-Aug 1983, p 153-159

Reddy, J., "Incorporating Quality in Competitive Strategies", Sloan Management Review, Spring, 1980, pp 53-60.

Redmon, W., and Dickinson, A., "A Comparative Analysis of Statistical Process Control, Theory D, and Behavior Analytic Apoproaches to Quality Control," a working paper of the Department of Psychology, Western Michigan University, 1977.

Reich, R., Tales of a New America, First Vintage Books, New York, New York, 1987.

Reitsperger, W., and Daniel, S., "A Comparison of Quality Attitudes in the USA and Japan: Empirical Evidence," Journal of Management Studies, Volume 28, Number 6, November, 1991, pp 585 - 599.

Reitsperger, W., Daniel, S.,"Japan vs. Silicon Valley: Quality-Cost Trade-Off Philosophies," University of Hawaii, pp. 289-299.

Riesz, P. (1978), Price versus Quality in the Marketplace 1961-1975, Journal of Retailing, Volume 54, Number 4, Winter, 1978, pp. 15-28.

Robson, G., Continuous Process Improvement, The Free Press, New York, 1991.

Roche, J.G., "Design Implications of Product Liability," International Journal of Quality Management, Vol. 5, No. 2, pp. 7-13.

Rosenbluth, H., The Customer Comes Second, William Morrow and Company, New York, 1992.

Rouse, W., Design for Success, John Wiley and Sons, Inc., New York, New York, 1991.

Russell, D.J., The viability of quality assurance in hotels. Unpublished doctoral dissertation, United States International University, 1988.

Rutledge, J., et. al., Rust to Riches, Harper and Roe, New York, New York, 1989.

Sakaiya, T., The Knowledge-Value Revolution, Kodansha International, Tokyo, 1991.

Saraph, J., Benson, P., and Schroeder, R., "An Instrument Measuring the Critical Factors of Quality Management", Decision Sciences, Vol. 20, No. 4, 1989, pp 810-829.

Sauerhaft, S., Atkins, C., Image Wars, John Wiley and Sons, Canada, 1989.

Scherkenbach, W., The Deming Route to Quality and Productivity, Cee Press Books, Washington, D.C., 1986.

Schneiderman, Arthur M. "Optimum Quality Costs and Zero Defects: Are They Contradictory Concepts?" Quality Progress, November, 1986, 28-31.

Schoenberger, R., Japanese Manufacturing Techniques, New York, The Free Press (McMillian Publishing Company), 1982.

Scholtes, P., The Team Handbook, Joiner and Associates, Madison, 1988.

Seymour, D., Causing Quality In Higher Education, Macmillan Publisher, New York, 1992.

Schonberger, R., World Class Manufacturing, The Free Press, New York, 1986.

Schonberger, R., Building a Chain of Customers, The Free Press, New York, 1990.

Schor, J., The Overworked American-The Unexpected Decline of Leisure, Basic Books, New York, New York, 1991.

Schroeder, D., and Robinson, A., "America's Most Successful Export to Japan: Continuous Improvement Programs," Sloan Mgmt Review Vol: 32, No. 3, Spring 1991 pp: 67-81.

Schuster, J., and Zingheim, P., The New Pay: Linking Employee and Organizational Performance, Lexington Books, New York, 1992.

Schwartz, M.H.,"A Question of Semantics," Quality Progress, November 1991, pp. 59-63.

Schwartz, P., Long View, Doubleday Currency, New York, 1992.

Scott, W., "Participative Management at Motorola - The Results", Management Review, June 1981, p 26-29

Seidman, W., Skancke, S., Productivity The proven path to excellence in U.S companies, Touchstone Books, New York, 1989, 1990.

Senge, P., The Fifth Discipline, Doubleday, New York, 1990.

Sewell, C., and Brown, P., Customers for Life: How to Turn that One-Time Buyer into a Lifetime Customer, ASQC Quality Press, 1990.

Seymour, D., On Q: Causing Quality in Higher Education, American Council of Education, Macmillan Company, New York, 1992.

Shanklin, W., Ryans, J., Thinking Strategically, Random House, New York, Toronto, 1985.

Shanklin, W., Six Timeless Marketing Blunders, Lexington Books, Lexington, Mass., 1990

Shaw, J., The Service Focus, Dow Jones-Irwin, Homewood, Ill., 1990.

Shaw, J., The Quality-Productivity Connection, Van Nostrand Reinhold Co., New York, 1978.

Shea, Gregory, "Quality Circles: The Danger of Bottled Change", Sloan Management review, Spring, 1986, pp. 33-46.

Shenkar, O., "Uncovering Some Paths in the Japanese Management Theory Jungle", Human Systems Management, Vol. 7, No. 3, 1988, p. 221 - 232.

Sher, B., Gottlieb, A., Teamworks, Warner Books, New York, 1989.

Shetty, Y., "Quality, Productivity, and Profit Performance: Learning from Research and Practice", National Productivity Review, Spring, 1986, pp. 166-173.

Shetty, Y., "Product Quality and Competitive Strategy", Business Horizons, May-June 1987, p. 46-52

Shetty, Y., Buehler, V., Quality Productivity and Innovation, Elsevier, New York, Amsterdam, London, 1987.

Shewhart, W.A., Economic Control of Quality of Manufactured Product, D.Van Nostrand Company: New York, 1931.

Shewhart, W. A., Statistical Method from the Viewpoint of Quality Control, Washington D.C.: The Graduate School of the Department of Agriculture, 1939.

Shingo, S., A Revolution in Manufacturing: The SMED System, Productivity Press, Stamford, Connecticut, 1985

Shook, R., Honda, An American Success Story, Prentice Hall Press, New York, 1988.

Silva, M. and Sjogren, B., Europe 1992 & The New World Power Game, John Wiley & Sons, New York, 1990.

Sims, H. and Gioia, D., The Thinking Organization, Jossey-Bass Publishers, San Francisco, 1986.

Sirkin, H., Stalk, G., "Fix the Process, Not the Problem," Harvard Business Review Vol: 68, No. 4, Jul/Aug 1990 pp: 26-33.

Skinner, W., Manufacturing: The Formidable Competitive Weapon, John Wiley & Sons, New York, 1985.

Skrabec, Q.,"Ancient Process Control and its Modern Implications," Quality Progress, November 1990, pp. 49-52.

Smith, P., and Reinertsen, D., Developing Products in Half the Time, Van Nostrand Reinhold, New York, 1991.

Smith, G., Statistical Process Control and Quality Improvement, Macmillan Publishing, New York, 1991.

Sohal, A., Tay, G., and Wirth, A., "Total Quality Control in an Asian Division of a Multinational Corporation," International Journal of Quality and Reliability Management, Volume 6, Number 6, 1989, pp 60 - 74.

Son, Y., and Park, C., "Economic Measure of Productivity, Quality and Flexibility in Advanced Manufacturing Systems", Journal of Manufacturing Systems, Volume 6, Number 3, 1987, pp 193 - 206.

Sower, V., "The Consequences of Implementing Statistical Process Control," PhD Thesis, University of North Texas, 1990.

Spechler, J., When America Does It Right, Institute of Industrial Engineers, Norcross, Georgia, 1988.

Squires, Frank H., "Human Fallibility and Process Variability", Quality Progress, July, 1987, pp 31-34.

Spendolini, M., The Benchmarking Book, American Management Association, New York, 1992.

Stacey, R., Managing the Unknowable, Jossey-Bass Publishers, San Francisco, 1992.

Stalk, G. and Hout, T., Competing Against Time, The Free Press, New York, 1990.

Steenkamp, J., Product Quality, Van Gorcum, Assen/Maastricht, the Netherlands, 1992.

Stephanou, S., and Spiegl, F., The Manufacturing Challenge: From Concept to Production, Van Nostrand Reinhold, New York, 1992

Steudel, H., and Desruelle, P., Manufacturing in the Nineties, Van Nostrand Reinhold, New York, 1992.

Strasser, S., Satisfaction Guarantee, Pantheon Books, New York, 1989.

Stratton, B., "Quality Progress Special Report: Quality in Education", Quality Progress, October, 1991, pp 36-42.

Stuedel, H., et. al., Manufacturing in the Nineties, Van Nostrand Reinhold, New York, New York, 1992.

Sullivan, Lawrence P., "The Power of Taguchi Methods", Quality Progress, June, 1987, pp 76-79.

Sullivan, Lawrence P., "The Seven Stages in Company-Wide Quality Control", Quality Progress, May, 1986, pp 77-83.

Sullivan, Lawrence P., "Quality Function Deployment", Quality Progress, June, 1986, pp 39-50.

Suzaki, K., The New Manufacturing Challenge, The Free Press, New York, 1987.

Taguchi, G., On Line Quality Control, Japanese Standards Association, Tokyo, Japan, 1981

Taguchi, G., and Clausing, D., "Robust Quality", Harvard Business Review, Jan - Feb 1990, pp 65-75.

Taguchi, G., Elsayed, E. and Hsiang, T., Quality Engineering in Production Systems, McGraw-Hill, New York, 1989.

Taguchi, G., Introduction to Off Line Quality Control, Japanese Standards Association, Tokyo, Japan, 1979

Takeuchi, H., & Quelch J., "Quality is More Than Making a Good Product", Harvard Business Review, July-Aug 1983, p 139-145

Tang, T., Tollison, P., and Whiteside, H., "Quality Circle Productivity as Related to Upper-Management Attendance, Circle, Initiation, and Collar Color", Journal of Management, Vol. 15, No. 1, 1989, pp 101-113.

Tatsuno, S., Created in Japan, Harper Business, Japan, 1990.

Temple, A., and Dale, B., "A Study of Quality Circles in White Collar Areas", International Journal of Operations and Production Management, Vol 7., No. 6, 1987, p. 17 - 31

Thurow, L., Head to Head, Bill Morrow, New York, New York, 1992.

Thurow, L., Zero Sum Solution, Simon And Schuster, New York, 1985.

Time Special Report, "Why is Service So Bad", Time, February 2, 1987, p. 48-57.

Tomas, S.,"Six Sigma: Motorola's Quest for Zero Defects," APICS, 1991, pp. 36-41.

Tomas, S., "Six Sigma: Motorola's Quest for Zero Defects", APICS: The Performance Advantage, July, 1991., pp 36-41.

Townsend, R., Further up the Organization, Alfred A. Knopf, New York, 1984.

Townsend, P., Gebhardt, J., Quality in Action, John Wiley And Sons, New York, 1992.

Tregoe, B., Zimmerman, J., Smith, R., Vision in Action, Simon and Schuster, New York, London, Toronto, Sydney, Tokyo, 1989.

Treleven, Mark, "Single Sourcing: A Management Tool for the Quality Supplier", Journal of Purchasing and Materials Management, Spring, 1987, pp 19-24.

Tsuda, Y., and Tribus, M., "Managing for Quality: Does Culture Make a Difference?," Quality Progress, November 1985, pp. 23-29.

Tucker, R., Managing the Future, G. P. Putnam's Sons, New York, 1991.

Turney, P., Common Cents, Cost Technology, 1991.

Tzu, S., The Art of War, Oxford University Press, Oxford, 1963.

Van Gigch, J., Applied General Systems Theory, Harper & Row, New York, 1974.

Vardeman, Stephen and Cornell John A., "A Partial Inventory of Statistical Literature on Quality and Productivity Through 1985", Journal of Quality Technology, April, 1987, pp 90-97.

Wacker, John G., "An Integrative Theory of Strategic Quality Management: A Cost-Benefit Framework for Evaluating Quality Improvement Programmes" International Journal of Production Research, Volume 27, Number 1, 1989, pp 53 - 71.

Walton, M., Deming Management at Work, G. P. Putnam's Sons, New York, 1990

Walton, M., The Deming Management Method, Dodd Mead Co., New York, 1986

Ware, Paul A., "A Cooperative Approach to Vendor Certification", Quality Progress, November, 1984, pp 36-39.

Waterman, R., The Renewal Factor, Bantam Books, Toronto, 1987.

Watzlawick, P., Weakland, J. and Fisch, R., Change, Principles of Problem Formation and Problem Resolution, W. W. Norton & Co., New York, 1974.

Wellins, R., Byham, W., and Wilson, J., Empowered Teams: Creating Self-Directed Work Groups that Improve Quality, Productivity, and Participation, Jossey Bass Publishers, San Francisco, 1991.

Wheatley, J., Chiu, J., Goldman, A., "Physical Quality, Price, and Perceptions of Product Quality: Implications for Retailers", Journal of Retailing, 57, Summer, 1981, pp 110-116.

Wheatley, J., Chiu, J., "The Effects of Price, Store Image, and PRoduct and Respondent Characteristcs on Perceptions of Quality" Journal of Marketing Research, Vol. 14, May, 1977, pp. 181-186.

Wheeler, D. and Chambers, D., Understanding Statistical Process Control, Statistical Process Controls, Inc., Knoxville, Tenn., 1986.

Wheelwright, S., and Clark, K., Revolutionizing Product Development, The Free Press, New York, 1991.

White, E. and Schroeder, R., "A Simultaneous Control Chart", Journal of Quality Technology, January, 1987, pp 1-10.

White, D. D., and Bednar, D. A., " Locating Problems with Quality Circles", National Productivity Review, Winter 1985, pp. 45-52.

Williams, R. and Zigli, R. M., "Ambiguity Impedes Quality in the Service Industries", Quality Progress, July, 1987, pp 14-17.

Williamson, J., The Leader Manager, John Wiley and Sons, New York, 1986.

Wills, J., Samli, A., Jacobs, L., "Developing Global Products and Marketing Strategies: A Construct and a Research Agenda," Journal of the Academy of Marketing Science, Volume 19, Number 1, Winter 1991, pp 1 - 10.

Womack, J., Roos, D., The Machine That Changed the World, Harper Perennial, New York, 1991.

Wood, R., "The Prophets of Quality," The Quality Review, Fall, 1988

Wood, R., Hull, F. Azumi, K.,"Evaluating Quality Circles: The American Application", California Management Review, Vol. 26, No. 1, Fall, 1983, pp 37 -53

Woodal, W., "The Design of CUSUM Quality Control Charts", Journal of Quality Technology, Vol. 18, No. 2, April 1986, p. 99-102

Woods, P.F., A comparative analysis of supervisory leadership styles in quality circle and non-quality circle groups. Unpublished doctoral dissertation, University of Pittsburgh, 1984.

Wrege, C. and Greenwood, R., Frederick W. Taylor, The Father of Scientific Management, Business One Irwin, Homewood, Ill., 1991.

Yukul, G., Leadership in Organizations, Simon and Schuster, Englewood Cliffs, New Jersey, 1989.

Zangwill, W., Lighting Strategies For Innovation, Lexington Books, New York, 1993.

Zangwill, W., and Kantor, P., "Toward a Quantized Theory of Continuous Improvement,", a working paper of the University of Chicago, 1992.

Zeithaml, V., Parasuraman A., and Berry L., Delivering Quality Service, Balancing Customer Perceptions and Expectations, Free Press, New York, 1990.

Zeithaml, V., "Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence", Journal of Marketing, Vol. 52, July, 1988, pp 2 - 22.

Zeithaml, V., Berry L., and Parasuraman A., "Communication and Control Processes in the Delivery of Service Quality", Journal of Marketing, Volume 52, April, 1988, pp 35 - 48.

Zeleny M., "Knowledge as a New Form of Capital: Part 1. Division and Reintegration of Knowledge", and "Part 2. Knowledge-Based Management Systems", Human Systems Management, Volume 8, 1989, pp 45 - 73.

Zeleny, M., "Quality Management Systems: Subject to Continuous Improvement?", Human Systems Management, 1989, Volume 8, pp 1 - 3.

Zemke, R and Schaaf, D., The Service Edge, The Penguin Group, New York, 1990.

Zimmerman, F., The Turnaround Experience, McGraw-Hill, New York, 1991.

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A Note on Quality: The Views of Deming, Juran, and Crosby

Associate for Case Development Artemis March prepared this note under the supervision of Professor David A. Garvin as the basis for class discussion.

During the 1980s concerns about American competitiveness steered many U.S. companies to a new interest in quality. The three leading "quality gurus" were W. Edwards Deming, Joseph Juran, and Philip Crosby. Each was an active consultant, lecturer, and author, with years of experience. Deming and Juran were in their eighties and had been enormously influential in Japan; Crosby was in his sixties and had worked previously at ITT as vice president of quality. Each had developed his own distinctive approach to quality management.

Deming

W. Edwards Deming was widely credited with leading the Japanese quality revolution. The Japanese began to heed his advice on statistical process control (SPC) and problem-solving techniques in 1950, but 30 years passed before American businesses began to respond. By then, Deming's message to managers was blunt: "The basic cause of sickness in American industry and resulting unemployment is failure of top management to manage."[1]

1. W. Edwards Deming, *Quality, Productivity, and Competitive Position* (Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study, 1982), p. i.

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Known to dismiss client companies that did not change, he stated, "I give 'em three years. I've got to see a lot happen."[2] Best efforts were not enough; a program was needed, and it had to be adopted wholeheartedly:

> Everyone doing his best is not the answer. It is necessary that people know what to do. Drastic changes are required. The responsibility for change rests on management. The first step is to learn how to change.[3]

What Deming then expected from his clients was summarized in a 14-point program (see *Exhibit 1*).

To begin, managers had to put aside their preoccupation with today to make sure there was a tomorrow. They had to orient themselves to continuous improvement of products and services to meet customers' needs and stay ahead of the competition. They had to innovate constantly and commit resources to support innovation and continuous quality improvement. They had to build quality in. They had to break down department and worker-supervisor barriers. They had to rid themselves of numerical targets and quotas and instead had to concentrate on improving processes, giving workers clear standards for acceptable work, as well as the tools needed to achieve it. Finally, they had to create a climate free of finger pointing and fear, which block cooperative identification and solution of problems.

If management committed itself to this new order, Deming argued, productivity as well as quality would improve. Contrary to conventional wisdom in the United States, quality and productivity were not to be traded off against each other. Rather, productivity was a by-product of quality and of doing the job right the first time:

> Improvement of the process increases uniformity of product, reduces rework and mistakes, reduces waste of manpower, machine-time, and materials, and thus increases output with less effort. Other benefits of improved quality are lower costs, . . . happier people on the job, and more jobs, through better competitive position of the company.[4]

Because management was responsible, in Deming's view, for 85% of all quality problems, management had to take the lead in changing the systems and processes that created those problems. For example, consistent quality of incoming materials and components could not be expected when buyers were told to shop for price or were not given the tools for assessing a supplier's quality. Management had to develop long-term relationships with vendors, work with vendors to improve and maintain quality, train its own purchasing department in statistical quality control, require statistical evidence of quality from vendors, and insist that specifications be complete, including an understanding of how the material actually worked in manufacturing. Once management had changed purchasing systems and procedures, buyers could then not only be expected but also able to do their job in a new way. When top management had seriously committed to quality, lower-level personnel would be more likely to take action on problems that were within their control.

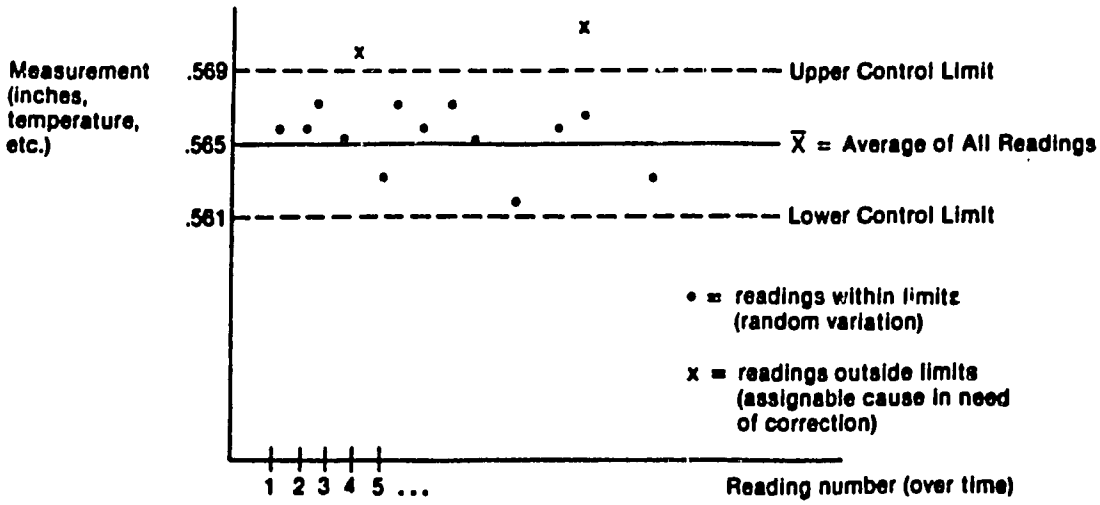
Accordingly, Deming delineated two means of process improvement: changing the "common causes" that were systemic (and were thus shared by numerous operators, machines, or products) and removing the "special causes" that produced nonrandom variation within systems (and were usually confined to individual employees or activities). Common causes included poor product design, incoming materials unsuited to their use, machines out of order, improper bills of materials, machinery that would not hold tolerances, poor physical conditions, and so on. Special causes included lack of knowledge or skill, worker inattention, or a poor lot of incoming materials. Management was responsible for common causes, and operators were responsible for special causes:

> The discovery of a special cause of variation and its removal are usually the responsibility of someone who is connected directly with some operation. . . . In contrast, there are common causes of defectives, of errors, of low rates of production, of low sales, of accidents. These are the responsibility of management. . . . The worker at a machine can

2. Jeremy Main, "The Curmudgeon Who Talks Tough on Quality," *Fortune*, June 25, 1984, p. 122.
3. Deming, *Quality*, p. ii.
4. Ibid., p. 1.

249

Figure A A Typical Control Chart



> do nothing about causes common to all machines. . . . He cannot do anything about the light; he does not purchase raw materials; the training, supervision, and the company's policies are not his.[5]

The key tool that Deming advocated to distinguish between systemic and special causes—and indeed, the key to quality management in general—was statistical process control (SPC). Developed by Walter Shewart while at Bell Labs in the 1930s and later refined by Deming in a well-known paper, "On the Statistical Theory of Errors," SPC was required because variation was an inevitable fact of industrial life. It was unlikely that two parts, even when produced by the same operator at the same machine, would ever be identical. The issue, therefore, was distinguishing acceptable variation from variation that could indicate problems. The rules of statistical probability provided a method for making this distinction.

Probability rules could determine whether variation was random or not, that is, whether it was due to chance. Random variation occurred within statistically determined limits. If variation remained within those limits, the process was a stable one and in control. As long as nothing changed the process, future variation could be predicted easily, for it would remain indefinitely within the same statistical limits.

Data of this sort were normally collected and plotted on control charts kept by the operators themselves. Such charts graphically plotted actual performance readings (e.g., the outside diameters of pistons) on graphs that also depicted the upper and lower control limits for that characteristic, which were statistically determined (see *Figure A*).

As long as the readings, taken on a small sample of units at predetermined intervals (such as every half hour), fell between limits or did not show a trend or "run," the process was in control and no intervention was required, despite the obvious variation in readings. Readings that either fell outside the limits or produced a run indicated a problem to be investigated.

The practical value of distinguishing random from nonrandom variation was enormous. Operators now knew when to intervene in a process and when to leave it alone. Further, because readings were taken during the production process itself, unacceptable variation showed up early enough for corrective action, rather than after the fact.

Once a process was in control, readings that fell outside the limits indicated a special cause. When the cause of such nonrandom variation

5. Deming, *Quality*, p. 116.

250

was found and removed, the system returned to its stable state. For example, if a particular lot of goods showed yields that were below control limits, further analysis might determine that raw materials peculiar to that lot were the cause. The removal of such special causes, however, did not improve the system (i.e., raise yield levels), but simply brought it back under control at the preexisting yield.

To improve the system itself, common causes had to be removed. Simply because a system was in statistical control did not mean it was as good as it could be. Indeed, a process in control could produce a high proportion of defects. Control limits indicated what the process was, not what it should or could be. To move the average (yield, sales, defects, returns, etc.) up or down—and thus also move the control limits up or down—typically required the concerted efforts of engineering, research, sales, manufacturing, and other departments. To narrow the range of variation around the target point could consume even more effort. In both instances, control charts would readily document the improvements in the process.

Deming viewed training in the use of control charts as essential if workers were to know what constituted acceptable work. He was adamant that quotas, piecework, and numerical goals be eliminated. Instead, workers had to be shown good work and given the tools to do it. Such tools would also allow them to monitor their own work and correct it in real time, rather than find out about problems days or weeks later.

Control charts were but one part of the statistical approach to quality. Because 100% testing was inefficient, sampling techniques had been developed to provide a scientific basis on which to accept or reject production lots based on a limited number of units. Although sampling and control charts could indicate problems, they could not by themselves identify their causes. For that purpose, other statistical techniques were needed, such as Pareto analysis, Ishikawa or "fishbone" cause-and-effect diagrams, histograms, flow charts, and scatter diagrams.

By 1986 Deming's lectures concentrated more on management than SPC, but SPC remained at the core of his approach. Many U.S. firms sought him out, and some, such as the Ford Motor Company, adopted his approach throughout the company with great success. Deming, who still worked out of the basement of his home with his secretary of 30 years, was hardly sanguine about the prospects for American business. He believed that it would take 30 years for Americans to match the progress of the Japanese and that the United States was still falling behind. With the specter of a lower U.S. standard of living, he concluded, "We should be pretty scared."[6]

Juran

Joseph M. Juran's impact on Japanese quality was usually considered second only to Deming's. At 82, he had enjoyed a varied and distinguished career that included stints as a business executive, government administrator, lecturer, writer, and consultant. After years of independent activity, he established the Juran Institute in 1979 to serve as a base for the seminars, consulting, conferences, and videotapes long associated with his name. His clientele included Texas Instruments, Du Pont, Monsanto, and Xerox.

Juran defined quality as "fitness for use," meaning that the users of a product or service should be able to count on it for what they needed or wanted to do with it. For example, a manufacturer should be able to process a purchased material or component to meet the demands of its customers while achieving high yields and minimal downtime in production; a wholesaler should receive a correctly labeled product, free from damage during shipment and easy to handle and display; and a consumer should receive a product that performed as claimed and did not break down—or, if it did, receive prompt and courteous adjustment of the claim.

Fitness for use had five major dimensions: quality of design, quality of conformance, availability, safety, and field use.[7] Quality of design was what distinguished a Rolls Royce from a Chevrolet and involved the design con-

6. Main, "The Curmudgeon Who Talks Tough on Quality," p. 122.

7. The key parameters of fitness for use, as well as their dimensions, vary somewhat in Juran's writings over a 35-year period. Their comprehensiveness and their spanning the entire product life cycle, however, are constants. The present discussion draws most heavily on Joseph M. Juran and Frank M. Gryna, Jr., *Quality Planning and Analysis* (New York: McGraw-Hill, 1980).

251

cept and its specification. Quality of conformance reflected the match between actual product and design intent and was affected by process choices, ability to hold tolerances, workforce training and supervision, and adherence to test programs. Availability referred to a product's freedom from disruptive problems and reflected both reliability (the frequency or probability of failure) and maintainability (the speed or ease of repair). Safety could be assessed by calculating the risk of injury due to product hazards. Field use referred to a product's conformance and condition after it reached customers' hands and was affected by packaging, transportation, storage, and field-service competence and promptness.

To achieve fitness for use, Juran developed a comprehensive approach to quality that spanned a product's entire life—from design through vendor relations, process development, manufacturing control, inspection and test, distribution, customer relations, and field service. Each area was carefully dissected, and approaches were proposed to specify and quantify its impact on the various elements of fitness for use. A broad range of statistical techniques was included to assist in the analysis.

Juran's approach to reliability provides a representative example. His reliability program began by establishing reliability goals. It then apportioned these among product components; identified critical components; identified possible modes, effects, and causes of failures; and developed solutions for those most critical to successful product operation and safety. Juran also discussed the setting of realistic tolerances, design reviews, vendor selection, and testing of designs. Statistical methods for improving reliability included analysis of various types of failure rates, analysis of relationships between component and system reliability, and setting of tolerance limits for interacting dimensions. The aims of these activities were quantified reliability goals, a systematic guide for achieving them, and a measurement and monitoring system for knowing when they had been achieved.

Although Juran's analytical methods could identify areas needing improvement and could help make and track changes, they were in the language of the shop floor: defect rates, failure modes, not within specification, and the like. Juran recognized that such measures were not likely to attract top management attention; for this reason, he advocated a cost-of-quality (COQ) accounting system. Such a system spoke top management's language—money. Quality costs were costs "associated solely with defective product—the costs of making, finding, repairing, or avoiding defects."[8] They were of four types: internal failure costs (from defects discovered before shipment); external failure costs (from defects discovered after shipment); appraisal costs (for assessing the condition of materials and product); and prevention costs (for keeping defects from occurring in the first place). (See *Exhibit 2*.) In most companies, external and internal failure costs together accounted for 50% to 80% of COQ. When these were converted to dollars or presented as a percentage of sales or profits, top management usually took notice.

COQ not only provided management with a dollar cost for defective products, it also established the goal of quality programs: to keep improving quality until there was no longer a positive economic return. This occurred when the total costs of quality were minimized (see *Exhibit 3*). Two assumptions were built into this analysis: that failure costs approached zero as defects became fewer and fewer, and that prevention and appraisal costs together approached infinity as defects were reduced to lower and lower levels. COQ minimization therefore occurred at the point where additional spending on prevention and appraisal was no longer justified because it produced smaller savings in failure costs.

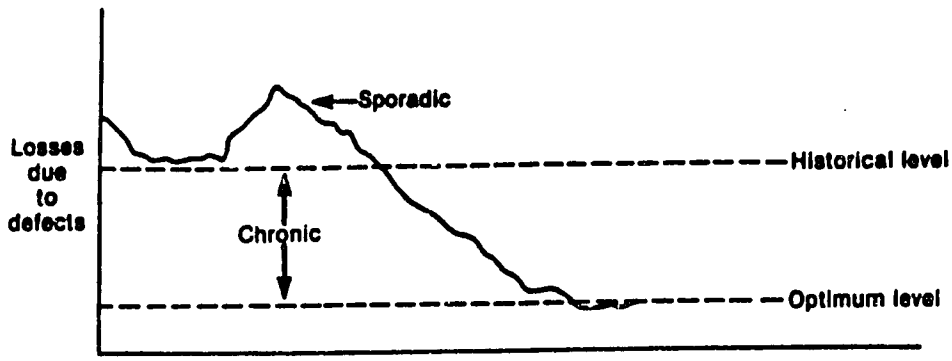
This approach had important practical implications. It implied that zero defects was not a practical goal, for to reach that level prevention and appraisal costs would have to rise so substantially that total costs of quality would not be minimized. As long as prevention and appraisal costs were cheaper (on a per-unit basis) than failure costs, Juran argued, resources should continue to go to prevention and testing. When prevention activities started to pull COQ unit costs up rather than down, however, it was time to maintain quality rather than attempt to reduce it further.

To reach and maintain this minimum cost of quality, Juran proposed a three-pronged ap-

8. Juran and Gryna, *Quality Planning*, p. 13.

292

Figure B Juran's Sporadic and Chronic Problems



Note: This figure is adapted from Juran and Gryna, *Quality Planning*, p. 100.

proach: breakthrough projects, the control sequence, and annual quality programs. In the early stages, when a firm's failure costs greatly exceeded its prevention and appraisal costs, there were significant opportunities for breakthrough projects, aimed at chronic problems. Problems, such as the need to revise tolerances, were ignored because they were neither dramatic nor thought to be solvable. The "breakthrough sequence" involved identifying the "vital few" projects, selling them to management, organizing to analyze the issues and to involve the key people who were needed for implementation, and overcoming resistance to change (see *Exhibit 4*). Juran claimed that most breakthrough analyses found that over 80% of the problems (e.g., defect rates, scrap rates) were under management control and fewer than 20% were caused by operators.

After successive breakthrough projects, a firm reached the point of optimal quality—in Juran's formulation, the bottom of the COQ curve. The organization then needed to employ the control sequence to preserve its gains. This sequence was actually a large feedback loop. The first step was to choose an objective to control, then to define a unit of measure, set a numerical standard or goal, create a means of measuring performance, and mobilize the organization to report the measurements. After these preparatory steps, an action cycle was repeated over and over: actual performance was compared with standard, and action was taken (if needed) to close the gap.[9]

The control sequence was also used to attack sporadic problems—sudden, usually dramatic changes in the status quo, such as a worn cutting tool. Eliminating sporadic problems only returned processes to their historical levels; to improve them to optimum levels, breakthrough teams were needed because chronic problems were involved. Juran's contrast between these two types of problems is illustrated in *Figure B*.

Both the control and breakthrough processes demanded sophisticated analysis and statistics. The comprehensiveness of Juran's program (it ran from vendor relations through customer service and covered all the functions in between) required high-level planning and coordination as well. For this reason, Juran argued that a new group of professionals—quality control engineers—was needed. This department would be involved in high-level quality planning, coordinating the activities of other departments, setting quality standards, and providing quality measurements. Juran also believed that top management had to give overall leadership and support to quality improvement for it to succeed.

Juran's major vehicle for top management involvement was the annual quality program. Akin to long-range financial planning and the annual budget process, this program gave top management quality objectives and was especially important for internalizing the habit of

9. This description of the control sequence is based on Joseph M. Juran, *Managerial Breakthrough* (New York: McGraw-Hill, 1964), pp. 183–187.

253

quality improvement to ensure that complacency did not set in.

Crosby

Philip B. Crosby started in industry as an inspector. He eventually rose through the ranks at several companies to become vice president of quality at ITT. In 1979 he left ITT to found Philip Crosby Associates, Inc., along with the Crosby Quality College, which by 1986 approximately 35,000 executives and managers had attended. General Motors owned over 10% of Crosby stock and had set up its own Crosby school, as had IBM, Johnson & Johnson, and Chrysler.

Crosby directed his message to top managers. He sought to change their perceptions and attitudes about quality. Typically, top managers viewed quality as intangible or else to be found only in high-end products. Crosby, however, spoke of quality as "conformance to requirements" and believed that any product that consistently reproduced its design specifications was of high quality. In this sense, a Pinto that met Pinto requirements was as much a quality product as a Cadillac that conformed to Cadillac requirements.

American managers must pursue quality to help them compete, Crosby argued. In fact, he believed that if quality were improved, total costs would inevitably fall, allowing companies to increase profitability. This reasoning led to Crosby's most famous claim—that quality was "free."[10]

Ultimately, the goal of quality improvement was zero defects, to be achieved through prevention rather than after-the-fact inspection. Crosby had popularized the zero defects movement, but it had actually originated in the United States at the Martin Company in the 1960s, where Crosby was employed. The company had promised and delivered a perfect missile, with limited inspection and rework, and its managers had concluded that perfection was possible if, in fact, it was expected. The company then developed a philosophy and program to support that goal.

Crosby elaborated on this approach. He believed that the key to quality improvement was changing top management's thinking. If management expected imperfection and defects, it would get them, for workers would bring similar expectations to their jobs. But if management established a higher standard of performance and communicated it thoroughly to all levels of the company, zero defects was possible. Thus, according to Crosby, zero defects was a management standard and not simply a motivational program for employees.

To help managers understand the seriousness of their quality problems, Crosby provided two primary tools: cost of quality measures and the management maturity grid (see *Exhibit 5*). Costs of quality, which Crosby estimated to be between 15% and 20% of sales at most companies, were useful for showing top management the size of its quality problem and the opportunities for profitable improvement. The management maturity grid was used for self-assessment. It identified five states of quality awareness: uncertainty (the company failed to recognize quality as a management tool); awakening (quality was recognized as important, but management put off taking action); enlightenment (management openly faced and addressed quality problems by establishing a formal quality program); wisdom (prevention was working well, problems were identified early, and corrective action was routinely pursued); and certainty (quality management was an essential part of the company, and problems occurred only infrequently). For each of these five stages, Crosby also examined the status of the quality organization, problem-handling procedures, reported and actual costs of quality as percentages of sales, and quality improvement actions.

Once companies had positioned themselves on the management maturity grid, Crosby offered a 14-point program for quality improvement (see *Exhibit 6*). It emphasized prevention over detection, and focused on changing corporate culture rather than on analytical or statistical tools. The program was designed as a guide for securing management commitment and gaining employees' involvement through actions such as Zero Defects Day. Crosby believed every company should tailor its own defect-prevention program; nevertheless, the goal should always be zero defects. In this process top management played a leadership role; quality professionals played a modest but important role as facilitators, coordinators, trainers, and technical assistants, and hourly workers were secondary.

10. Philip B. Crosby, *Quality Is Free* (New York: McGraw-Hill, 1979).

254

Exhibit 1 Deming's 14 Points

1. **Create constancy of purpose for improvement of product and service.**[a] Management must change from a preoccupation with the short run to building for the long run. This requires dedication to innovation in all areas to best meet the needs of customers.
2. **Adopt the new philosophy.** Shoddy materials, poor workmanship, defective products, and lax service must become unacceptable.
3. **Cease dependence on mass inspection.** Inspection is equivalent to planning for defects; it comes too late and is ineffective and costly. Instead, processes must be improved.
4. **End the practice of awarding business on price tag alone.** Price has no meaning without a measure of the quality being purchased. Therefore, the job of purchasing will change only after management establishes new guidelines. Companies must develop long-term relationships and work with fewer suppliers. Purchasing must be given statistical tools to judge the quality of vendors and purchased parts. Both purchasing and vendors must understand specifications, but they must also know how the material is to be used in production and by the final customer.
5. **Constantly and forever improve the system of production and service.** Waste must be reduced and quality improved in every activity: procurement, transportation, engineering, methods, maintenance, sales, distribution, accounting, payroll, customer service, and manufacturing. Improvement, however, does not come from studying the defects produced by a process that is in control but from studying the process itself. Most of the responsibility for process improvement rests with management.
6. **Institute modern methods of training on the job.** Training must be restructured and centered on clearly defined concepts of acceptable work. Statistical methods must be used for deciding when training has been completed successfully.
7. **Institute modern methods of supervising.** Supervisors must be empowered to inform upper management about conditions that need correction; once informed, management must take action. Barriers that prevent hourly workers from doing their jobs with pride must be removed.
8. **Drive out fear.** Because of the tremendous economic losses caused by fear on the job, people must not be afraid to ask questions, to report problems, or to express ideas.
9. **Break down barriers between departments.** Members of the research, design, procurement, sales, and receiving departments must learn about problems with raw materials and specifications in production and assembly. Each discipline must stop optimizing its own work and instead work together as a team for the company as a whole. Multidisciplinary quality-control circles can help improve design, service, quality, and costs.
10. **Eliminate numerical goals for the work force.** Targets, slogans, pictures, and posters urging people to increase productivity must be eliminated. Most of the necessary changes are out of workers' control, so such exhortations merely cause resentment. Although workers should not be given numerical goals, the company itself must have a goal: never-ending improvement.
11. **Eliminate work standards and numerical quotas.** Quotas focus on quantity, not quality. Therefore, work standards practically guarantee poor quality and high costs. Work standards that state percentage-defective or scrap goals normally reach those targets but never exceed them. Piecework is even worse, for it pays people for building defective units. But if someone's pay is docked for defective units, that is unfair, for the worker did not create the defects.
12. **Remove barriers that hinder the hourly workers.** Any barrier that hinders pride in work must be removed, including not knowing what good work is, supervisors motivated by quotas, off-gauge parts and material, and no response to reports of out-of-order machines.
13. **Institute a vigorous program of education and training.** Because quality and productivity improvements change the number of people needed in some areas and the jobs required, people must be continually trained and retrained. All training must include basic statistical techniques.
14. **Create a structure in top management that will push every day on the above 13 points.**

a. Deming's words are in bold headings. The remainder of each paragraph paraphrases his discussions.

Exhibit 2 Juran's Categories of Quality Costs

Internal failure costs = costs from product defects before shipment to the customer. They include the following:

- *Scrap* – net losses in labor and material resulting from defective goods that cannot economically be repaired or used.
- *Rework* – costs of correcting defective products to make them usable.
- *Retest* – costs of reinspection and retesting of products that have been reworked.
- *Downtime* – costs of idle facilities, equipment, and labor due to defective products.
- *Yield losses* – costs of process yields lower than could be attained through improved process control.
- *Disposition* – the time of those involved in determining whether nonconforming products are usable and what should be done with them.

External failure costs = costs associated with defects found after shipment to customer. They include the following:

- *Complaint adjustment* – costs of investigating and responding to complaints due to defective products, faulty installation, or improper instructions to users.
- *Returned material* – costs associated with receiving and replacing defective products returned from the field.
- *Warranty charges* – costs of services and repairs performed under warranty contracts.
- *Allowances* – income losses due to downgrading products for sale as seconds and to concessions made to customers who accept substandard products as is.

Appraisal costs = costs associated with discovering the condition of products and raw materials. They include the following:

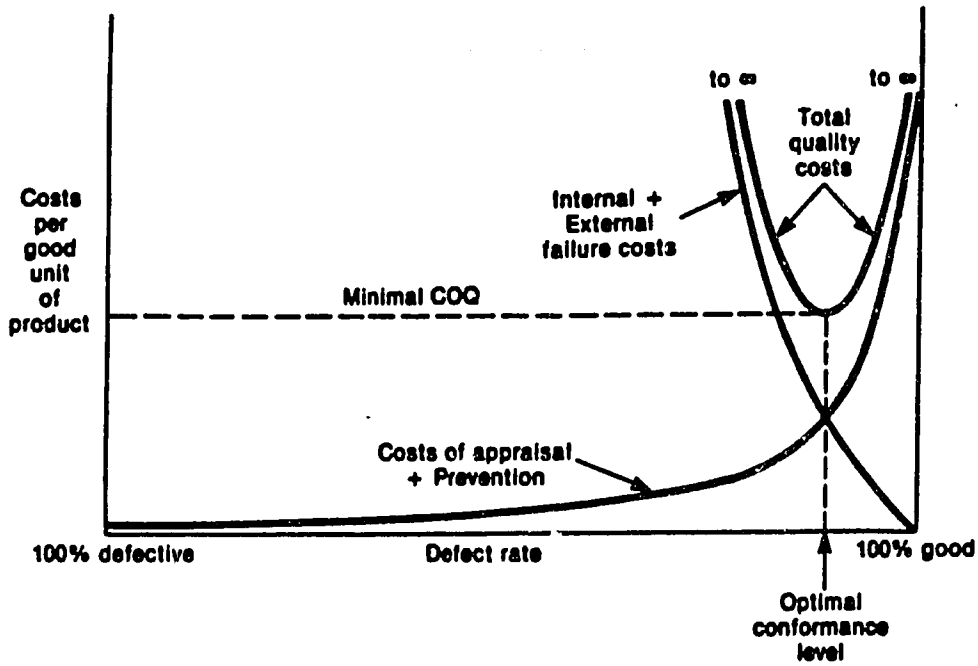
- *Incoming materials inspection* – costs associated with determining the quality of vendors' products.
- *Inspection and test* – costs of checking product conformance throughout design and manufacture, including tests done on customers' premises.
- *Maintaining accuracy of test equipment* – costs of operating and maintaining measuring instruments.
- *Materials and services consumed* – costs of products consumed in destructive tests; also materials and services (e.g., electric power) consumed in testing.
- *Evaluation of stocks* – costs of testing products in storage to assess their condition.

Prevention costs = costs associated with preventing defects and limiting failure and appraisal costs. They include the following:

- *Quality planning* – costs of creating and communicating plans and data systems for quality, inspection, reliability, and related activities—includes the costs of preparing all necessary manuals and procedures.
- *New products review* – costs of preparing bid proposals, evaluating new designs, preparing test and experimentation programs, and related quality activities associated with launching new products.
- *Training* – costs of developing and conducting training programs aimed at improving quality performance.
- *Process control* – costs of process control aimed at achieving fitness for use, as distinguished from productivity (a difficult distinction to make in practice).
- *Quality data acquisition and analysis* – costs of operating the quality data system to get continuing data on quality performance.
- *Quality reporting* – costs of bringing together and presenting quality data to upper management.
- *Improvement projects* – costs of building and implementing breakthrough projects.

Note: This is a summary and rewording of Juran and Gryna, *Quality Planning*, pp. 14–16.

Exhibit 3 Minimizing the Costs of Quality



Note: This figure is adapted from Juran and Gryna, *Quality Planning*, p. 27.

Exhibit 4 Juran's Breakthrough Sequence

1. **Breakthrough in attitudes.** Managers must first prove that a breakthrough is needed and then create a climate conducive to change. To demonstrate need, data must be collected to show the extent of the problem; the data most convincing to top management are usually cost-of-quality figures. To get the resources required for improvement, expected benefits can be monetized and presented in terms of return on investment.
2. **Identify the vital few projects.** Pareto analysis is used to distinguish the vital few projects from the trivial many and to set priorities based on problem frequency.
3. **Organize for breakthrough in knowledge.** Two organizational entities should be established—a steering group and a diagnostic group. The steering group, composed of people from several departments, defines the program, suggests possible problem causes, gives the authority to experiment, helps overcome resistance to change, and implements the solution. The diagnostic group, composed of quality professionals and sometimes line managers, is responsible for analyzing the problem.
4. **Conduct the analysis.** The diagnostic group studies symptoms, develops hypotheses, and experiments to find the problem's true causes. It also tries to determine whether defects are primarily operator controllable or management controllable. (A defect is operator controllable only if it meets three criteria: operators know what they are supposed to do, have the data to understand what they are actually doing, and are able to regulate their own performance.) Theories can be tested by using past data and current production data and by conducting experiments. With this information, the diagnostic group then proposes solutions to the problem.
5. **Determine how to overcome resistance to change.** The need for change must be established in terms that are important to the key people involved. Logical arguments alone are insufficient. Participation is therefore required in both the technical and social aspects of change.
6. **Institute the change.** Departments that must take corrective action must be convinced to cooperate. Presentations to these departments should include the size of the problem, alternative solutions, the cost of recommended changes, expected benefits, and efforts taken to anticipate the change's impact on employees. Time for reflection may be needed, and adequate training is essential.
7. **Institute controls.** Controls must be set up to monitor the solution and see that it works and to keep abreast of unforeseen developments. Formal follow-up is provided by the control sequence used to monitor and correct sporadic problems.

Note: This summary is adapted from Juran and Gryna, *Quality Planning*, pp. 100–129, and Juran, *Managerial Breakthrough*, pp. 15–17.

Exhibit 5 Crosby's Quality Management Maturity Grid

Measurement Categories	*Stage I: Uncertainty*	*Stage II: Awakening*	*Stage III: Enlightenment*	*Stage IV: Wisdom*	*Stage V: Certainty*
Management understanding and attitude	Fails to see quality as a management tool.	Supports quality management in theory but is unwilling to provide the necessary money or time.	Learns about quality management and becomes supportive.	Participates personally in quality activities.	Regards quality management as essential to the company's success.
Quality organization status	Quality activities are limited to the manufacturing or engineering department and are largely appraisal and sorting.	A strong quality leader has been appointed, but quality activities remain focused on appraisal and sorting and are still limited to manufacturing and engineering.	Quality department reports to top management, and its leader is active in company management.	Quality manager is an officer of the company. Prevention activities have become important.	Quality manager is on the board of directors. Prevention is the main quality activity.
Problem handling	Problems are fought as they occur and are seldom fully resolved; "fire-fighting" dominates.	Teams are established to attack major problems, but the approach remains short term.	Problems are resolved in an orderly fashion, and corrective action is a regular event.	Problems are identified early in their development.	Except in the most unusual cases, problems are prevented.
Cost of quality as percentage of sales	Reported: unknown Actual: 20%	Reported: 5% Actual: 18%	Reported: 8% Actual: 12%	Reported: 6.5% Actual: 8%	Reported: 2.5% Actual: 2.5%
Quality improvement actions	No organized activities.	Activities are motivational and short term.	Implements the 14-step program with full understanding.	Continues the 14-step program and starts Make Certain.	Quality improvement is a regular and continuing activity.
Summation of company quality posture	"We don't know why we have quality problems."	"Must we always have quality problems?"	"Because of management commitment and quality improvement programs, we are identifying and resolving our quality problems."	"We routinely prevent defects from occurring."	"We know why we don't have quality problems."

Note: This chart is adapted from Crosby, *Quality Is Free*, pp. 32–33.

259

Exhibit 6 Crosby's 14-Point Program

1. **Management commitment.** Top management must become convinced of the need for quality improvement and must make its commitment clear to the entire company. This should be accompanied by a written quality policy, stating that each person is expected to "perform exactly like the requirement, or cause the requirement to be officially changed to what we and the customers really need."

2. **Quality improvement team.** Management must form a team of department heads (or those who can speak for their departments) to oversee quality improvement. The team's role is to see that needed actions take place in its departments and in the company as a whole.

3. **Quality measurement.** Quality measures that are appropriate to every activity must be established to identify areas needing improvement. In accounting, for example, one measure might be the percentage of late reports; in engineering, the accuracy of drawings; in purchasing, rejections due to incomplete descriptions; and in plant engineering, time lost because of equipment failures.

4. **Cost of quality evaluation.** The controller's office should make an estimate of the costs of quality to identify areas where quality improvements would be profitable.

5. **Quality awareness.** Quality awareness must be raised among employees. They must understand the importance of product conformance and the costs of nonconformance. These messages should be carried by supervisors (after they have been trained) and through such media as films, booklets, and posters.

6. **Corrective action.** Opportunities for correction are generated by Steps 3 and 4, as well as by discussions among employees. These ideas should be brought to the supervisory level and resolved there, if possible. They should be pushed up further if that is necessary to get action.

7. **Zero defects planning.** An ad hoc zero defects committee should be formed from members of the quality improvement team. This committee should start planning a zero defects program appropriate to the company and its culture.

8. **Supervisor training.** Early in the process, all levels of management must be trained to implement their part of the quality improvement program.

9. **Zero Defects Day.** A Zero Defects Day should be scheduled to signal to employees that the company has a new performance standard.

10. **Goal setting.** To turn commitments into action, individuals must establish improvement goals for themselves and their groups. Supervisors should meet with their people and ask them to set goals that are specific and measurable. Goal lines should be posted in each area and meetings held to discuss progress.

11. **Error cause removal.** Employees should be encouraged to inform management of any problems that prevent them from performing error-free work. Employees need not do anything about these problems themselves; they should simply report them. Reported problems must then be acknowledged by management within 24 hours.

12. **Recognition.** Public, nonfinancial appreciation must be given to those who meet their quality goals or perform outstandingly.

13. **Quality councils.** Quality professionals and team chairpersons should meet regularly to share experiences, problems, and ideas.

14. **Do it all over again.** To emphasize the never-ending process of quality improvement, the program (Steps 1–13) must be repeated. This renews the commitment of old employees and brings new ones into the process.

Note: This summary is adapted from Crosby, *Quality Is Free*, pp. 132–139, 175–259.

260

					①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯
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DO NOT WRITE IN THIS AREA

THE PROFESSIONAL MANAGER PROGRAM
TOTAL QUALITY MANAGEMENT
Budapest, Hungary

PLEASE USE PENCIL

	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly Disagree 5
1. The objectives of this course were clear to me.	1	2	3	4	5
2. The course exceeded my expectations.	1	2	3	4	5
3. The instructor(s) communicated effectively.	1	2	3	4	5
4. The instructor(s) made the subject matter more meaningful through the use of examples.	1	2	3	4	5
5. The instructor(s) encouraged participants to be involved in discussions.	1	2	3	4	5
6. The instructor(s) presented up-to-date material and information.	1	2	3	4	5
7. The instructor(s) was(were) well prepared and organized.	1	2	3	4	5
8. The instructor(s) did a good job of relating this course with other parts of the program.	1	2	3	4	5
9. The quantity and depth of material covered were appropriate for the allotted time.	1	2	3	4	5
10. I feel that I have a good understanding of the topics covered in this course.	1	2	3	4	5
11. This course helped me gain useful knowledge and/or skills.	1	2	3	4	5
12. I was pleased with the amount of interaction I had with the faculty in the course.	1	2	3	4	5
13. The participants enriched the course by sharing their ideas and experiences.	1	2	3	4	5
14. Overall, I would rate this course as an outstanding educational experience.	1	2	3	4	5
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192

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MARKETING

Materials will be handed out in class

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

THE PROFESSIONAL MANAGER PROGRAM
MARKETING
Budapest, Hungary

PLEASE USE PENCIL

Strongly Agree 1 — Agree 2 — Undecided 3 — Disagree 4 — Strongly Disagree 5

	1	2	3	4	5
1. The objectives of this course were clear to me.	1	2	3	4	5
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MANAGERIAL ECONOMICS & INDUSTRIAL ORGANIZATION MODULE

May 10 - 12, 1993
Budapest, Hungary

Session	Day 1 - May 10	Day 2 - May 11	Day 3 - May 12
8:30-10:00	Introductory case studies and Basic elements of a market economy	Group case presentations and discussions	Further group case presentations and discussions
Break			
10:15-11:45	Fundamentals of engineering economics and Determining least cost strategies	Alternative forms of business organization	Business conditions analysis and the outlook for the economy.
Lunch			
1:30-3:00	Analysis of alternative cost allocation procedures	Incentive and motivation schemes within the firm and between the firm and suppliers and customers	
Break			
3:15-4:45	Alternative pricing strategies in competitive markets	Role(s) of government in economies in transition	

Managerial Economics and Industrial Organization

Day 1: Introductory case studies
Basic elements of a market economy and their importance for business decision making
Fundamentals of engineering economics
Determining least cost strategies
Analysis of alternative cost allocation procedures
Alternative pricing strategies in competitive markets

Overnight: Group case assignments

Day 2: Group case presentations and discussions
Alternative forms of business organization
Incentive and motivation schemes within the firm, between the firm and its suppliers, and between the firm and its customers
Role(s) of government in economies in transition

Day 3: Further group case presentations and discussions
Business conditions analysis and the outlook for the economy

TOPICS AND CASES

I) COST CONCEPTS AND THEIR USE

Concepts:

(a) Opportunity vs. Historical Costs

Existing factory space is charged at an average of $4.00/ft^2/year based on accounting figures for depreciation and out-of-pocket disbursements. However, the total annual cost for new space, including depreciation, interest, and out-of-pocket disbursements would be $7.00/ft^2/yr. Both figures are fixed regardless of use of space. What should be the cost of space charged in an economic analysis for a certain new product X under each of the following conditions:

(i) Project X will cause another project to be moved from existing space to leased space costing $9.00/ft^2/yr.

(ii) Project X will cause new space to be built (regardless of whether X occupies the new space or existing space).

(iii) Project X will use existing space which is thought to have a normal value to the firm approximating the accounting charge.

(iv) Project X will use existing space which is empty and there is no alternative use of that space expected for the entire period in which project X would exist.

(b) Public vs. Private Costs

A city is trying to decide between coal, fuel oil 3, low-sulfur fuel oil, and natural gas to power their electrical generators. Fuel forecasts indicate the following needs for the upcoming year, and the gradient increase during each subsequent year.

Fuel	First Year	Gradient Each Subsequent Year
Coal	460,000 tons	23,000 tons
Fuel oil 3	1,760,000 barrels	88,000 barrels
Low-sulfur fuel oil	1,820,000 barrels	91,000 barrels
Natural gas	11,000 10^6 cubic feet	550 10^6 cubic feet

The cost of the fuel, transportation, and various pollution effects affecting city residents have been estimated as follows:

Fuel	Cost	Transportation & Storage	Health	Crops	Uncleanliness
Coal	$5.80/ton	$2.25/ton	$0.70/ton	$1.75/ton	$1.05/ton
Fuel oil 3	2.15/barrel	0.20/barrel	0.10/barrel	0.25/barrel	0.15/barrel
Low-sulfur fuel oil	2.75/barrel	0.20/barrel	0.03/barrel	0.075/barrel	0.045/barrel
Natural gas	0.00058/cubic foot	0.00002/cubic foot	Negligible	Negligible	Negligible

(i) Calculate the annual equivalent benefits and costs of these fuels considering a life of 30 years and (a) i = 5% and (b) i = 10%. Use an incremental B/C analysis to determine the best fuel to use.

(ii) Now suppose outside experts said that the combustion of each ton of coal produced CO_2 which leads to general global warming. Cost estimates for the worldwide impact of global warming vary, but it is known that it costs roughly $5.00/ton of coal burned to remove an equivalent amount of CO_2 from the air. Now, what fuel would you recommend the city utilize?

(c) Sunk Versus Variable Costs

A manufacturer can produce a product in two plants. One is old, has high operating expenses of $4.00/unit, and is fully depreciated. The other plant is brand new, has operating costs of $2.00/unit, and, being new, a depreciation charge of $3.00/unit is still assessed each part by the accounting department.

If you were the company manager, where would you suggest the part be produced -- in the old plant, or in the new one?

(d) Direct vs. Overhead Costs

Two products require welding time, machining time, and raw materials according to the following schedule.

	Weld hours/part	Machine hours/part	Raw Material/part
Product A	2	1	$5
Product B	1	1	$4

Hourly costs in the weld shop are $6.66/hour, and the machine shop at $10.00/hour. This year, it is expected that 3000 units of product A and 3000 units of product B will be sold. The overhead cost of products A and B together have been estimated at $50,000/year which is allocated by developing an overhead cost per part. Markup over cost is 20% for the business.

(i) What price would you charge for the two products, if you were to price them at direct plus overhead cost plus markup?

270

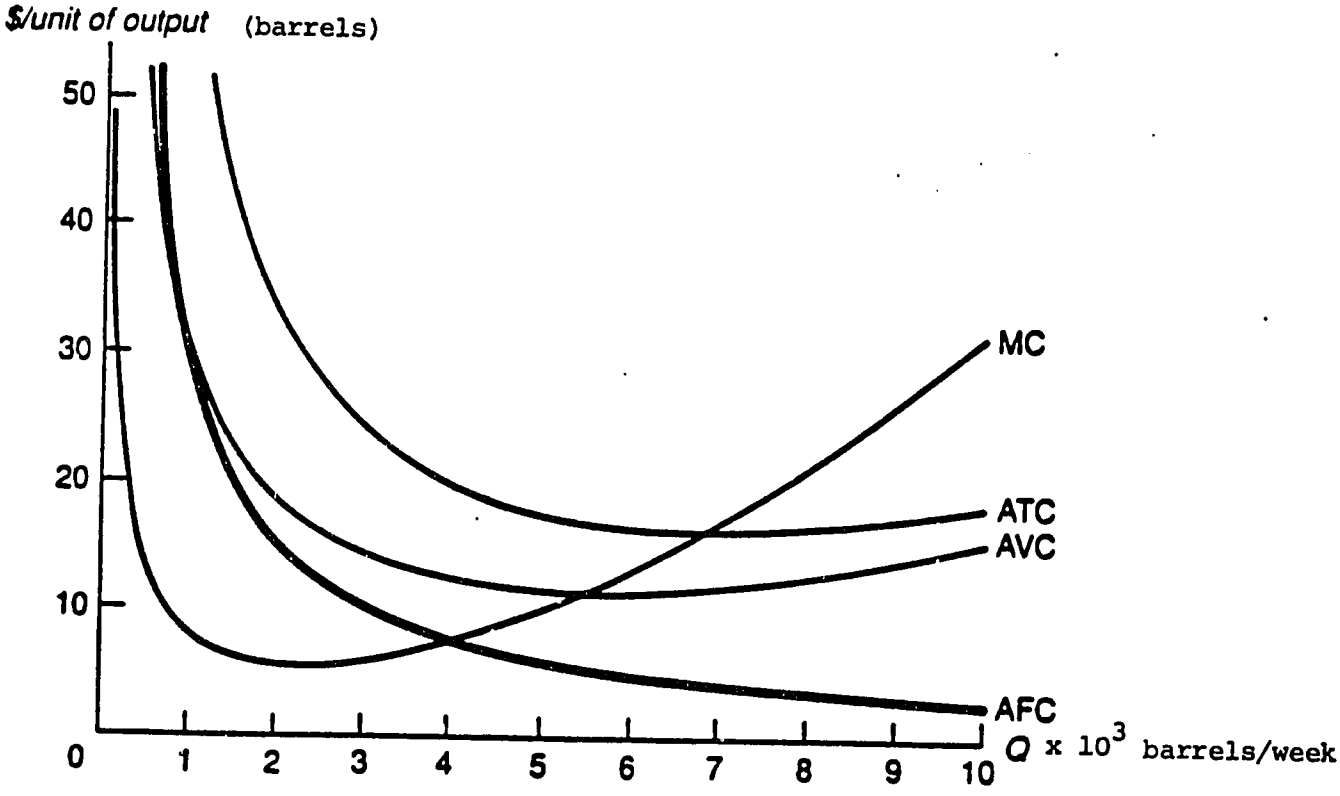
(ii) What if you were told that a 50% increase in the markup would only reduce sales for each product by 20%; what advice would you give your management? How would you have obtained such data?

(iii) Suppose it is known that the $50,000 overhead is split $40,000 for welding, and $10,000 for machining. If you were the product manager for part A, would you resist or support a suggestion to burden parts A and B on the basis of separate overhead charges per hour of use of each process, rather than continue with the present system? Why?

(e) Fixed Costs, Variable Costs, and Output Decisions

An oil refinery produces one type of gasoline for the automobile market. The costs/barrel/week are given in the following figure.

The Marginal, Average Total, Average Variable, and Average Fixed Cost Curves



(i) What (approximate) level of output would you choose if the market price per barrel were:

(a) $30?

(b) $15? (How long could you sustain this output?)

(c) $5?

112

II) CAPITAL BUDGETING AND INVESTMENT DECISIONS

(a) Suppose you were trying to decide which of 3 cars to lease on a monthly basis, given the following facts:

Car	A	B	C
Lease Cost/month	$350	275	600
MPG	30	25	35
Maint ¢/mile	12¢	17	10

Assuming $\left\{\begin{array}{l}\text{1. every month is identical}\\ \text{2. 2000 miles/month}\\ \text{3. fuel \$1.00/gallon}\end{array}\right\}$, which should be chosen?

(b) Now you are considering buying, rather than leasing the cars. Each car will last 10 years, with no scrap value. Gas prices are expected to escalate 10¢/gallon/year, and maintenance at 2¢/mile/year. If you could earn 10% per year on your money, which car would you purchase? Would the fact that you might earn considerably more on your money influence your decision?

(c) A firm purchases an analog computer for $15,000; the computer is used for 4 years and is then sold for $2000. Annual disbursement for operating and maintenance costs equals $3000/year over the 4-year period. The computer replaced an older manual system that cost $8000/year. If you could earn 15% on your money, determine if the decision to buy the analog computer was economically sound. Use the following measures of investment worth.

(i) Present worth.
(ii) Internal rate of return.
(iii) External rate of return.
(iv) Payback period.

III) LEAST COST METHODS OF PRODUCTION

Corn output per acre is given by the following relation:

(Y = output/acre, N = lbs nitrogen fertilizer/acre, P = lbs phosphate/acre)

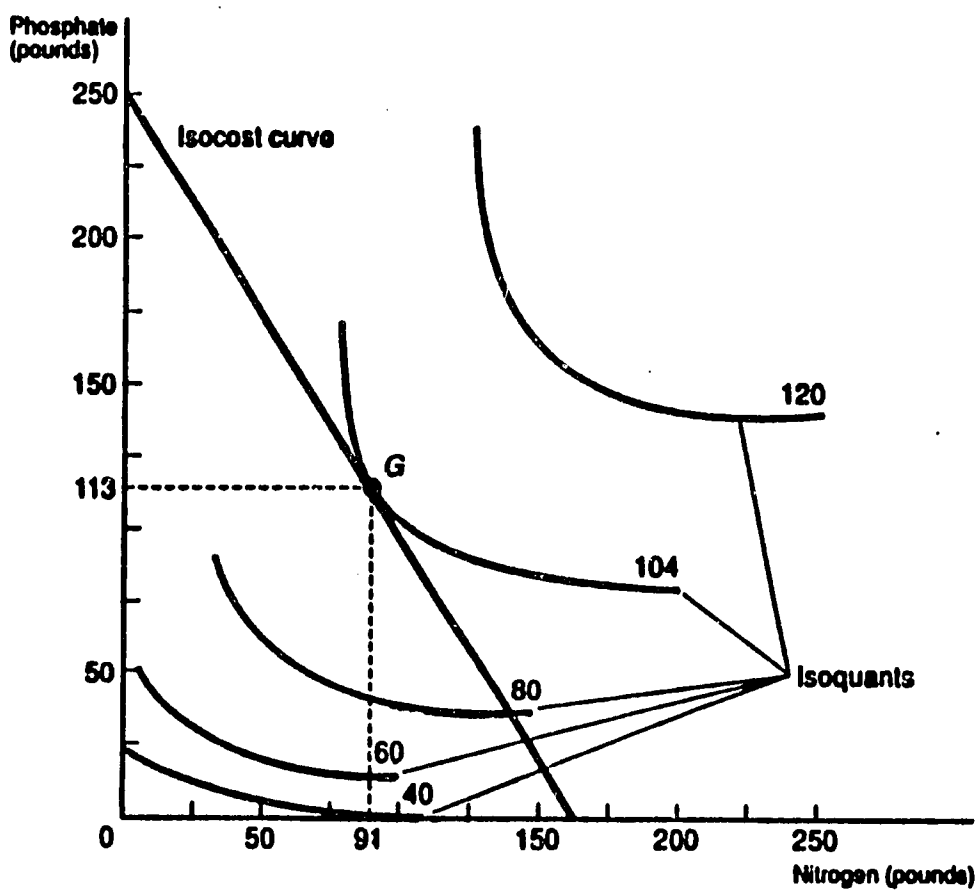
$$Y = 0.3N - 0.4P + 6.4\sqrt{N} + 8.5\sqrt{P}$$

Phosphate costs 12¢/pound, nitrogen costs 18¢/pound

Q: What mix of fertilizer maximizes the yield per acre, given the farmer spends no more than $30/acre in total on fertilizer?

Optimal Combination of Nitrogen and Phosphate Fertilizers

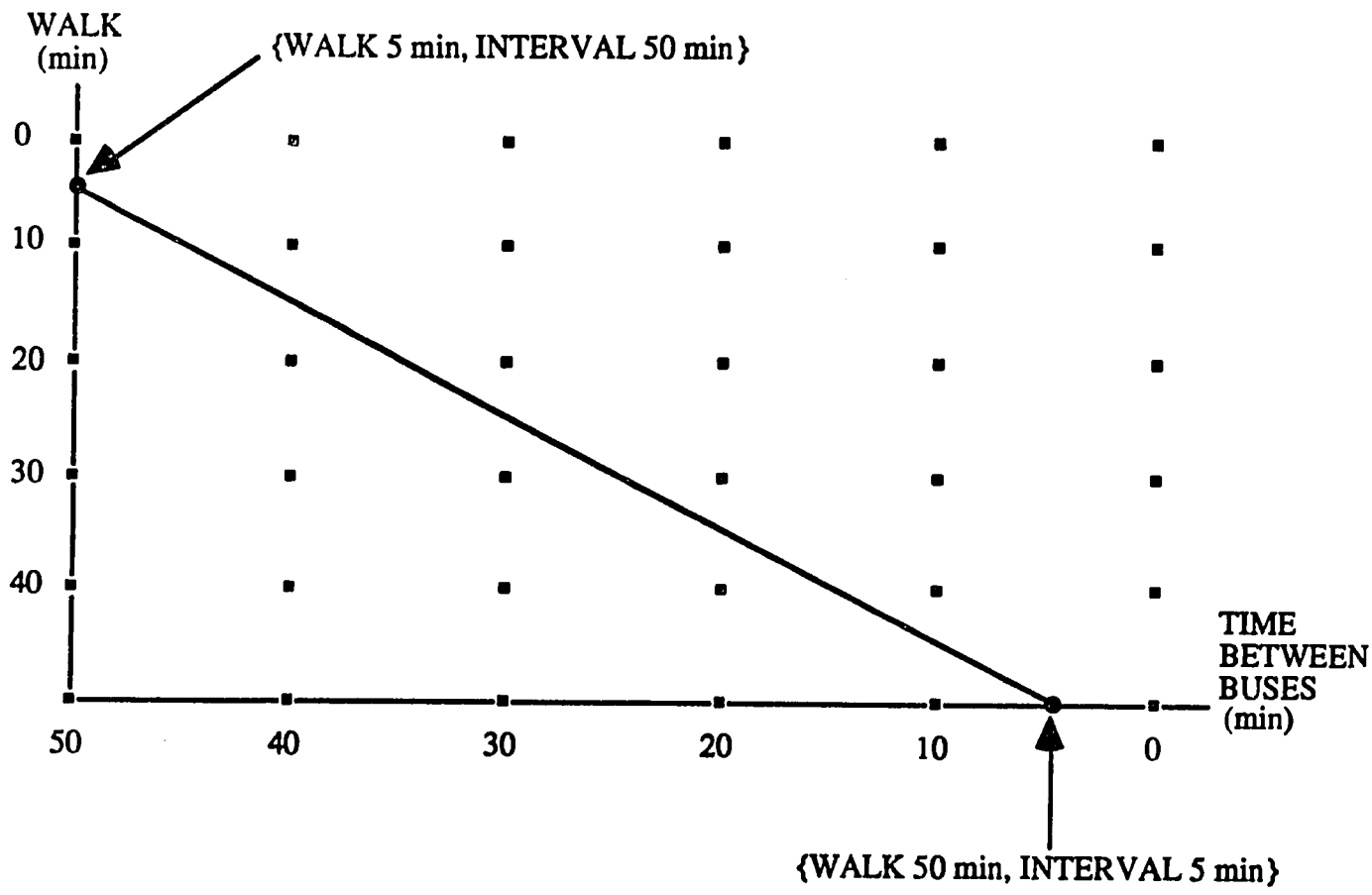
Based on these actual isoquants for Iowa corn, the optimal point is G, where about 91 pounds of nitrogen and about 113 pounds of phosphate are used per acre.



IV) CONSUMER CHOICE/ATTRIBUTE ANALYSIS

You are in charge of designing a bus route for people living in your city. Two attributes of interest to the riders are the time between buses, and the distance they would have to walk to the bus stop. Unfortunately, you have only one bus at your disposal, which means you may choose a rapid circular route which is designed to satisfy the first criteria at the expense of the second, or a circuitous, infrequently traversed route that comes close to the majority of the homes of the riders, but in so doing dramatically reduces the passage frequency of the bus, or some mix of the two.

Q: How would you decide on which route to choose, if the achievable combinations of average walk and average wait were as in the following figure?



V) Cost Concepts For Decision Making

1. Incremental costs and revenues
2. Selection among limited alternatives
3. Make or buy?
4. Take it or leave it?

1. The Muscle-Man Company manufactures forklift tractors, and it supplies some parts to other manufacturers of forklifts. If fabricates most of the component parts but buys the engines, hydraulic systems, wheels, and tires from suppliers. Demand estimates indicate that Muscle-Man should increase its production level from 60 forklift units monthly to 70 units monthly. Sufficient slack exists in most departments to allow this increase, except that production of 10 extra chassis assemblies could be attained only be reallocating labor and equipment form fork-assembly manufacture to chassis-assembly manufacture. The fork-assembly department currently produces 90 units monthly, and it supplies the 30 surplus units to other manufacturers at $188 each. With the expanded production level, 70 forks would be required, but the labor and equipment responsible for the remaining 20 units is thought to be just sufficient to produce the 10 extra chassis assemblies. Alternatively, the extra chassis assemblies could be purchased from a supplier, and the lowest quote is from Fenton Fabricators, for $365 per unit. The costs of the chassis and fork departments for a representative month were as follows:

	DEPARTMENT	
Costs	Chassis	Fork
Direct materials	$ 4,650	$ 2,070
Direct labor	6,300	4,050
Depreciation	750	500
Allocated burden of fuel, electricity, office, and other overheads	12,600	8,100
(200% of direct labor)	$23,300	$14,720
Total	60	90
Production level		

(a) Should Muscle-Man make or buy the ten extra chassis assemblies?
(b) What qualifications would you add to your decision?

2. The Crombie Castings Company produces two products, A and B, for which pertinent data are as follows for the past month:

	A	B
Sales (units)	840,000	220,000
Price per unit ($)	2.50	4.25
Materials cost ($)	386,400	105,600
Direct labor ($)	529,200	277,200
Overheads ($)	567,893	297,467

CCC's plant and labor are operating at full capacity, but the company is unable to meet the demand for product A, which is thought to be 1 million units per month. One way to meet the demand for A would be to reduce the output of product B and to shift resources to the production of A. For each unit reduction in the output of B, the firm could produce two units of A with the labor that is released. Note that average variable costs are constant in both production processes. Alternatively, CCC could contract out to have product A manufactured by another firm in the same industry and sold as if this product were from the CCC plant. Donald, Dodge, and Draper, a firm that holds a minor share of the same markets and has considerable excess capacity, was approached on this issue. DDD is willing to sign a contract to supply the extra 160,000 units of A at a price of $2.25 per unit.

How should CCC resolve this problem? Support your answer with discussion of the various issues involved.

3. A large department store has called for bids for the following contract: A truck plus its driver must be available, given one day's notice, whenever the store's own trucks are fully utilized, to deliver goods to suburban households. The number of days for which a truck will be required is twenty, and the number of miles is expected to be 4,000 for the coming year.

You are the manger of the Clark Rent-a-Truck Company and have a number of trucks that you rent out on a day-to-day basis. One truck is a little older than the others, and it is always the last to be rented out because it does less for public relations that the new trucks. In the absence of a contract with the department store, you expect this older truck to be rented out two thirds of the 300 rental days this coming year. Your normal rental charge is $25.00 per day plus $0.35 per mile

You estimate the costs of operating the truck to be as follows, assuming 10,000 miles of rental over the coming year:

Depreciation	$ 800
Interest on investment in truck	360
License fees and taxes	125
Insurance	440
Parking fees (permanently rented space)	300
Gasoline	1,367
Oil, grease, and preventive maintenance	600
Repairs	1,450
Allocated overheads	1,650

You can hire a driver on one day's notice for $50 per day. A one-time cost of $400 will be involved in fitting the truck with a special loading ramp required by the contract. This ramp will not interfere with the normal use of the truck.

On the basis of this information, and making whatever assumptions you fee are necessary and reasonable, calculate your incremental costs of undertaking this contract.

VI) Break-Even Analysis

1. The Franklin Razor Company is considering the introduction of a new product that will facilitate shaving in the shower. It is considering three alternative quality levels for the product. Produced in plastic without any detailing, the product would cost $0.125 per unit over a wide range of outputs. Produced in a more expensive clear plastic material that allows intricate design work, the product would cost $0.1875 per unit over a wide range of outputs. Produced in an aluminum alloy, the product would cost $0.2225 per unit over a wide range of outputs. Fixed and setup cost would be $120,000, $180,000, and $250,000, respectively, for each of the three alternative quality treatments.

Market research has indicated that consumers would perceive the products to contain good value when priced at $1.25, $1.49, and $1.98, respectively.

(a) Calculate the breakeven volumes for each of the three quality treatments.

(b) What other information would you prefer to have before making your recommendation?

VII) Pricing Strategies

1. The Napper Bag and Canvas Company, Ltd., is a specialist manufacturer of down-filled sleeping bags for sale in the camping equipment market. In this market there are several large companies with annual sales between $25 million and $30 million and many smaller companies with sales between $1 million and $5 million. Most of these companies have diversified product lines of

camping equipment, including tents, cooking equipment, camping furniture, and sleeping bags with various types of filling. Napper's sales of $1.6 million last year came entirely from down-filled sleeping bags, however. Although more expensive than other materials, down has substantially more insulating value by weight and volume and commands the attention of a loyal segment of serious outdoorspeople. Only a few firms produce quality down-filled bays, but these firms face peripheral competition from other firms producing bags filled with other natural and artificial materials.

Last year Napper sold 21,000 bags directly to large department stores, catalog sales companies, and specialty sporting equipment stores. These clients typically require contracts guaranteeing prices for one year. The cost of manufacturing sleeping bags depends on the size of the bag, the materials used, and the amount of fill. A breakdown of Napper's latest manufacturing costs for a typical style is as follows:

Item	Cost
Down filling	$30.00
Other raw materials	14.40
Direct labor	8.12
Manufacturing overhead	6.09
Total unit cost	$58.61

A markup of 30% is added to total unit cost to provide for selling, administration, financial expenses, and profit.

During the past year the cost of down increased by between 80% and 95%, depending on the grade and blend. Napper was able to pass this on to its customers without any apparent loss of sales or share of the market. The suppliers of down are forecasting a minimum increase of 80% over the next year. For Napper the average price of down will increase from the current $12 per pound to $22 per pound. It is anticipated that the cost of other raw materials will rise by 8% and labor by 5% over the next year.

George Napper, the marketing manager, is concerned about the prospects for the coming year, and you are called on to advise him.

(a) What price level do you advise for Napper's typical style bag?

(b) Do you have any other advice for Mr. Napper concerning future marketing strategy?

2. The refrigerator market is characterized by a wide diversity of product offerings and a price range from less than $400 to more than $1,200, depending on the features of the specific refrigerator. Within this range, each manufacturer has a product line extending from the basic no-frills smaller refrigerators to the top-of-the-line luxury units.

A large chain of department stores buys various refrigerators from various manufacturers and sells them under its own brand name "Valhalla." Given the stores' reputation for quality products and after-sales service, this refrigerator line has achieved a substantial market share in the areas where it is sold. The marketing vice-president of the chain has been considering an addition to the Valhalla

line. The new refrigerator, designated the Valhalla GE12456A, is made by General Electric and is similar to several sold by other major manufacturers, but it would fill a gap in the product line offered by the chain stores. The details of the Valhalla GE12456A are as follows: It is a 12-cubic feet upright refrigerator/freezer, with two doors, a freezer at the top, and freezer capacity of 3.2 cubic feet, and it has four large aluminum trays for fresh meat and vegetables (taking up the lower two shelves), fully compartmentalized inner doors, butter and cheese compartments with individual temperature controls, and "easy-glide" wheels underneath. It comes in four colors and with door hinges on either side.

The refrigerators available that would seem most competitive with the Valhalla GE12456A are as follows (apart from the details shown, they are similar in all other respects to the Valhalla GE12456A):

Make/Model	Price ($)	Total Size (cu ft)	Freezer Size	Trays	Wheels
General Electric	525	12.0	3.2	4	Yes
Westinghouse	515	11.5	2.3	3	No
Store A house brand	485	12.0	3.0	3	No
Store B house brand	505	12.5	3.5	4	No
RCA RC-6821	515	11.8	2.8	4	Yes
Kelvinator	535	12.5	3.5	4	No

You are asked to assist in pricing the new addition to the Valhalla line.

(a) What price level would you recommend?

(b) Explain the basis for your recommendation in detail.

(c) Outline all qualifications you feel should be made to this recommendation.

VIII) Competitive Bidding

1. Bids have been called for the fabrication of a steel watergate, and Stenson Steel is in the process of preparing to bid on this contract. The practice in your company has been to charge each contract with bid preparation costs of $2,000, which is actually about three times the actual value of time and office supplies spent on each bid but is costed this way because the company is the successful bidder only once in every three times it bids, on average. The bidding policy in the past has been to add a 15% margin to the incremental and allocated costs, and hence your colleague, a recent M.B.A. graduate from a rival university, insists that the appropriate bid price is $138,230, calculated as follows:

Bid preparation costs	$ 2,000
Direct materials	18,600
Direct labor	33,200
Variable overhead	14,400
Fixed overhead	52,000
Profit margin	18,030
Suggested bid price	$138,230

You are a little worried that conditions in the industry have deteriorated recently. You are aware that some of your competitors have been operating below capacity, and you suspect that demand for steel-fabricated products is likely to be depressed for the coming twelve months.

(a) What is the absolute minimum price you would bid on this contract? Explain and defend your answer.

(b) On the basis of the information given, what bid price would you recommend?

(c) What factors would you wish to investigate and evaluate before choosing the actual bid price?

IX) Product Quality and Competitive Strategies

1. Fisher Tools has developed a new product and has asked your advice as to the appropriate competitive strategy they should follow in order to earn a high and sustained profit from this product. The product is a paint applicator that continuously feeds paint under pressure to the roller, allowing painting to be done much more quickly and with less mess. The container could be pressurized either by an inexpensive hand pump that would need pumping regularly to maintain the desired pressure, or by a small bottle of compressed air that would maintain the correct pressure continuously through a (rather expensive) valve. At present the competition for the new product consists of the conventional brushes and rollers, spray guns, and a few other continuous-feed roller systems that are not well developed and are messy to use.

(a) Discuss the type of product and its implications for competitive strategy.

(b) Outline the competitive strategies that are potentially usable here.

(c) What competitive strategy do you recommend that Fisher follow, and why?

(d) What do you recommend that they do?

Ford Reaches Fork in Road in Its European Operations

WSJ 10/6/92

With Japanese Threat Looming, 'Lean Production' Looks Like the Future

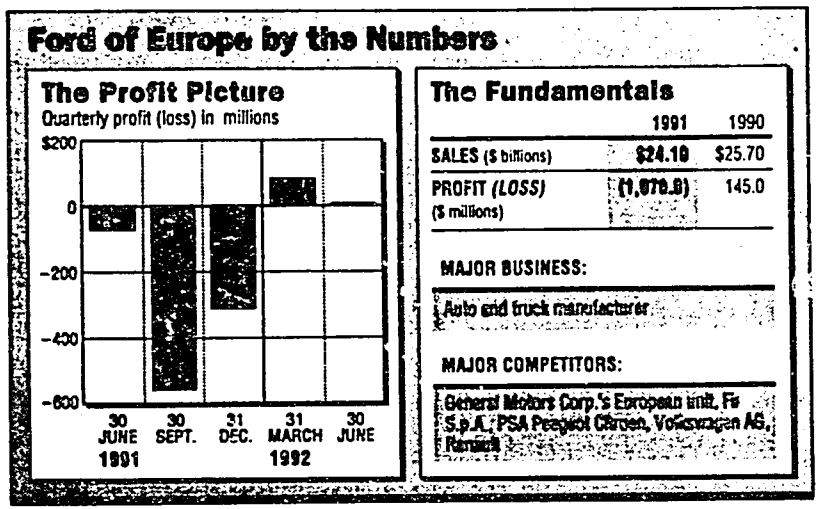
By TIMOTHY AEPPEL
Staff Reporter of THE WALL STREET JOURNAL

SAARLOUIS, Germany — Alfred Gross strides down the corridor separating two parallel assembly lines in Ford Motor Co.'s plant here, positioning himself between what he considers a vision of the future and Ford's past.

On one side, the line has been radically reorganized, with workers grouped in teams and parts and tools positioned close to where they are needed.

"On the old line, we have people who spend 40% of their time just walking" to get parts, says Mr. Gross, who manages the final assembly operation. "But with the new structure," he says, pointing to the other line, "we've eliminated most of that."

The reorganized line also requires 20% fewer workers to produce the same number of cars, while churning out vehicles with half the defects.



Bracing for Competition

The two assembly lines are a crucial test for Ford's struggling European operations. As Europe's auto makers brace for the blast of competition from ultra-efficient Japanese car factories now under construction or already operating in Britain, many are trying to borrow Japanese techniques, such as just-in-time parts deliveries and teamwork structures, often referred to under the catch phrase "lean production."

Ford was once considered one of Europe's most efficient car makers, and its U.S. operations are still strong. But the European plants have lagged behind the competition in adapting new ideas, and Ford is scrambling to catch up.

Saarlouis is a key to this. The plant, nestled next to a highway just 10 kilometers from Germany's border with France, was ranked one of the most efficient non-Japanese factories in the world by a group of experts from the Massachusetts Institute of Technology, who studied the plant in the late 1980s as part of a global survey. Even now, the plant is surprisingly efficient. Workers here build a new car in just under 19 hours, compared with about 15 hours required to produce a car of similar size at a Toyota factory in Japan.

"This has always been a very good plant," says John Hardiman, chairman of Ford Werke AG, the car maker's German subsidiary, "so it was a logical place for us to test the ideas of lean production."

Mr. Hardiman says there's a danger in rushing to adopt such ideas without first studying how to adapt them to European conditions. At Saarlouis, for instance, the test was limited to a small group, about 100 workers, who were viewed for more than a year on a line running exactly parallel to other workers doing the same tasks on a traditional assembly line. The workers were given special training and encouraged to help reorganize tasks and work areas. "We're now confident that this can be taken to a larger scale," says Mr. Hardiman.

But that will take time. Factory managers estimate it will take more than four years just to spread the new methods to the 2,500 workers in the plant's final assembly hall. Saarlouis's total work force is about 7,500. Some sections of the factory, such as the body shop, where 95% of the welding is automated, are less suited to the new methods.

This underscores one of Ford's problems. Some companies, such as General Motors Corp., which opened a new assembly plant in eastern Germany last week, are integrating lean production into new factories as well as existing plants. So-called "green field" factories are widely viewed as much easier to transform than older facilities. But Ford has no plans to build new capacity.

Moreover, the company's main base of operations, Britain, is caught in a deep slump and Germany's once-booming car market is softening as well. Since the new techniques save labor, Ford may find it increasingly difficult to persuade entrenched unions to accept the changes. The company has already cut its British work force by 7% this year to 48,400.

Mr. Hardiman admits it is much easier to make new factories lean. Firms investing in new plants, he says, often extract agreements from unions that would be unthinkable in existing operations. "But whether lean production can be done in an older plant or not depends on the factory itself," he says, adding that he is confident Saarlouis can make the switch.

Not that Saarlouis is typical. Compared with Ford's main German factory in Cologne, which employs 25,000 people, Saarlouis is relatively small, with a highly trained and homogenous work force. Only 22% of workers in Saarlouis are non-Germans, most of them German-speaking French who travel over the border every day. And nearly 70% of the workers involved in final assembly in Saarlouis are considered skilled workers. In Cologne, by contrast, the work force is 40% foreign, mostly Turkish, and the percentage of skilled workers is under 50%.

Such factors are crucial in lean production. Bringfried Ringe, head of the Saarlouis factory, says workers who make the switch to the new methods have to communicate openly, both among themselves and with their managers. "The demand for workers to be skilled is also growing," he says.

Ford managers admit Turkish workers often are hesitant to speak openly to their German bosses. There is also the problem of hostility within the ranks of foreigners, such as between Kurds and Turks, which can hamper cooperation.

Plant Faces Problems

But even Saarlouis faces serious problems. The plant was built in the late 1960s and will take years to restructure to fit the ideals of lean production. For example, only 10 of the 250 parts suppliers to the plant are located in the surrounding state of Saarland. One of the trends under lean production, however, is to have suppliers close to the factory, sometimes just outside the gate, so shipments of components can be sent much more frequently, in smaller batches. "We're moving in that direction, but it's a slow process," admits Peter Knorst, who organizes materials logistics for the factory.

Meanwhile, Ford has special reason to focus on sprucing up Saarlouis. The factory is the top contender to become the base for a new cooperative venture between Ford and Mazda Motor Corp. The Japanese car maker is looking for a beachhead in Europe and is already deeply involved in cooperation with Ford in other parts of the world. Ford officials have been predicting the deal to be almost clinched since 1989, and still say a final accord is just over the horizon.

"There's a strong desire on both sides for this cooperation," says Mr. Hardiman, "but we need to find a solution that benefits both sides." Mr. Hardiman says no agreement is likely before the end of this year. The main sticking points, he adds, are disagreements over marketing and finance.

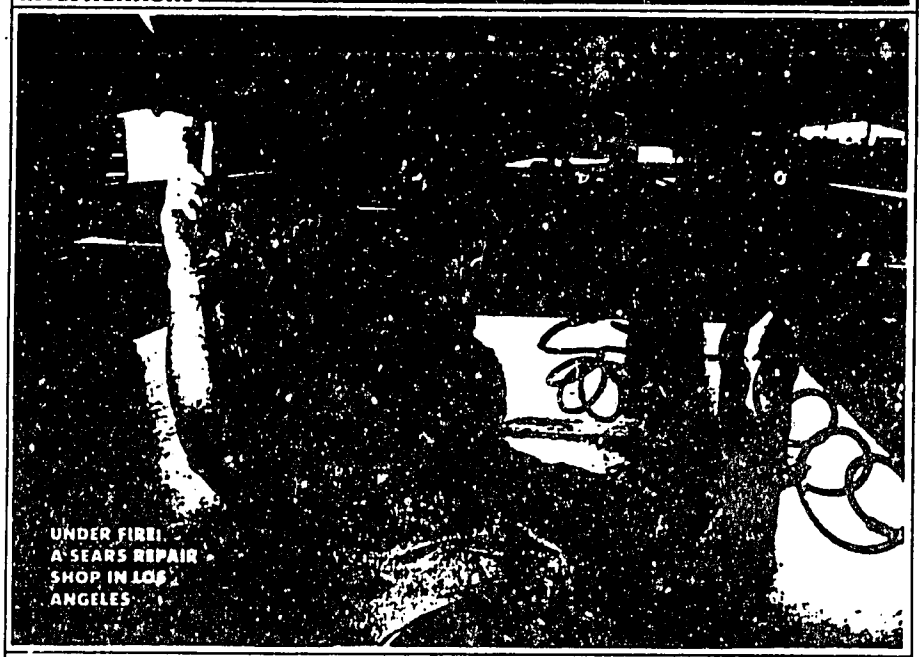
22

"Ford Reaches Fork in Road in its European Operation"

Discussion Questions:

1. Why did Ford choose to have "two parallel assembly lines" rather than converting completely to the new technology?
2. Why are "Green Field" factories easier to adapt to lean production methods than existing plants?
3. What should be the company's responsibility for the laid off workers?
4. How might Ford solve the problem of having a work force that is mixed in terms of language, nationality, and residence status within the country?
5. Can an automobile company in Eastern Europe effectively compete in the European car market? Explain.

INVESTIGATIONS



UNDER FIRE: A SEARS REPAIR SHOP IN LOS ANGELES

HOW DID SEARS BLOW THIS GASKET?

Some say the retailer's push for profits sparked its auto-repair woes

Two years ago, with his job apparently on the line, Sears Roebuck Chairman Edward A. Brennan scrambled to shake up the retail giant. He slashed costs by $600 million in 1991, began renovating the company's 868 lackluster stores, and pushed new low prices. The overall thrust: make every employee, from the sales floor to the chairman's suite, focus on profits.

That may have been the germ of trouble. The downside of Brennan's big shakeup became all too clear on June 11, when California charged that the state's 72 Sears Tire & Auto Centers had systematically ripped off customers. The Consumer Affairs Dept., which conducted a yearlong undercover investigation, alleges that Sears made unnecessary auto repairs. Now, the department wants to shut down all of Sears' auto operations in the state. Says Consumer Affairs' Bureau of Auto Repair Program Manager Allen D. Wood: "People trusted Sears, and the company took advantage of them."

The trouble is likely to spread. Several states, including Florida, Illinois, and New York are studying California's action. And on June 15, New Jersey, after a four-month undercover operation, accused six Sears auto centers, along with five unrelated repair shops, of doing unneeded work.

The controversy raises concerns that Sears' drive to boost profit and revenue may have run amok. Wall Street analysts and some shareholders worry that the boardroom pressure on Brennan trickled down to the shop floor. Indeed, the California agency says that complaints about Sears Tire & Auto Centers jumped by 29% in 1990 and an additional 27% in 1991—just as Brennan's new programs took hold. "Absent a coherent growth strategy, these sorts of things can happen," says dissident shareholder Robert Monks, who has unsuccessfully sought a Sears, Roebuck & Co. board seat.

Sears strenuously denies any wrongdoing. "There's lots of room to dispute these charges," says San Francisco attorney Dirk Schenkkan, who represents Sears in the California case. Schenkkan accuses the Consumer Affairs Dept., whose funding is threatened by California budget cuts, of beating up on Sears to boost its own standing. And Sears claims Consumer Affairs confused preventive-maintenance suggestions with attempts to defraud consumers.

INCENTIVES. But Ruth Hernandez of Stockton, Calif., doesn't buy that. Last October, she went to Sears to buy new tires for her 1986 Honda Accord. The mechanic who worked on the car insisted she also needed new struts, at a cost of $419.95. Hernandez, 53, sought a second opinion, and another auto-repair store told her the struts were fine. A livid Hernandez returned to Sears, where she says a sheepish mechanic admitted his diagnosis was wrong. "I kept thinking," she adds, "how many other people has this happened to?"

Too many, claims Consumer Affairs. In its undercover investigation begun in late 1990, the agency found that on 34 of 38 undercover runs, Sears charged an average $235 for unnecessary repairs.

What was the problem? Consumer Affairs officials say Sears pressured employees to sell, setting high quotas. Sales commissions and incentives, such as free trips for top sellers, may have contributed to the high-pressure atmosphere, suggests Bureau of Auto Repair chief James Schoning. Sears says its compensation system conforms to industry standards, that sales goals are reasonable, and that it emphasizes "outstanding service," not revenues.

At stake is Sears' license to operate its auto centers in California. If they close, Sears would lose up to $200 million in annual revenue, says Prudential Securities Inc. But with over 3,000 jobs on the line, and with the state in recession, a settlement could be in the offing.

The news couldn't have come at a worse time for Brennan. On June 15, Sears' board agreed to adopt four reforms supported by dissidents, including confidential voting for shareholders and a requirement that directors own 1,000 Sears shares. But with the auto controversy heating up, those minor repairs don't figure to keep Brennan out of hot water.

By Kevin Kelly in Chicago, with Eric Schine in Los Angeles

SEARS TIRE & AUTO CENTERS

ESTIMATED ANNUAL SALES	$2 billion
TOTAL OUTLETS	850
MAJOR REVENUE SOURCES	Batteries, tires, service
MAJOR BRANDS	Goodyear, Delco, Motorcraft

DATA: COMPANY REPORTS, PRUDENTIAL SECURITIES INC. ESTIMATE

BRENNAN: DID THE TROUBLE BEGIN WITH HIS SHAKEUP?

TOP TO BOTTOM: PHOTOGRAPHS BY JEFF JACOBSON; JONATHAN KUHN/GAMMA LIAISON

284

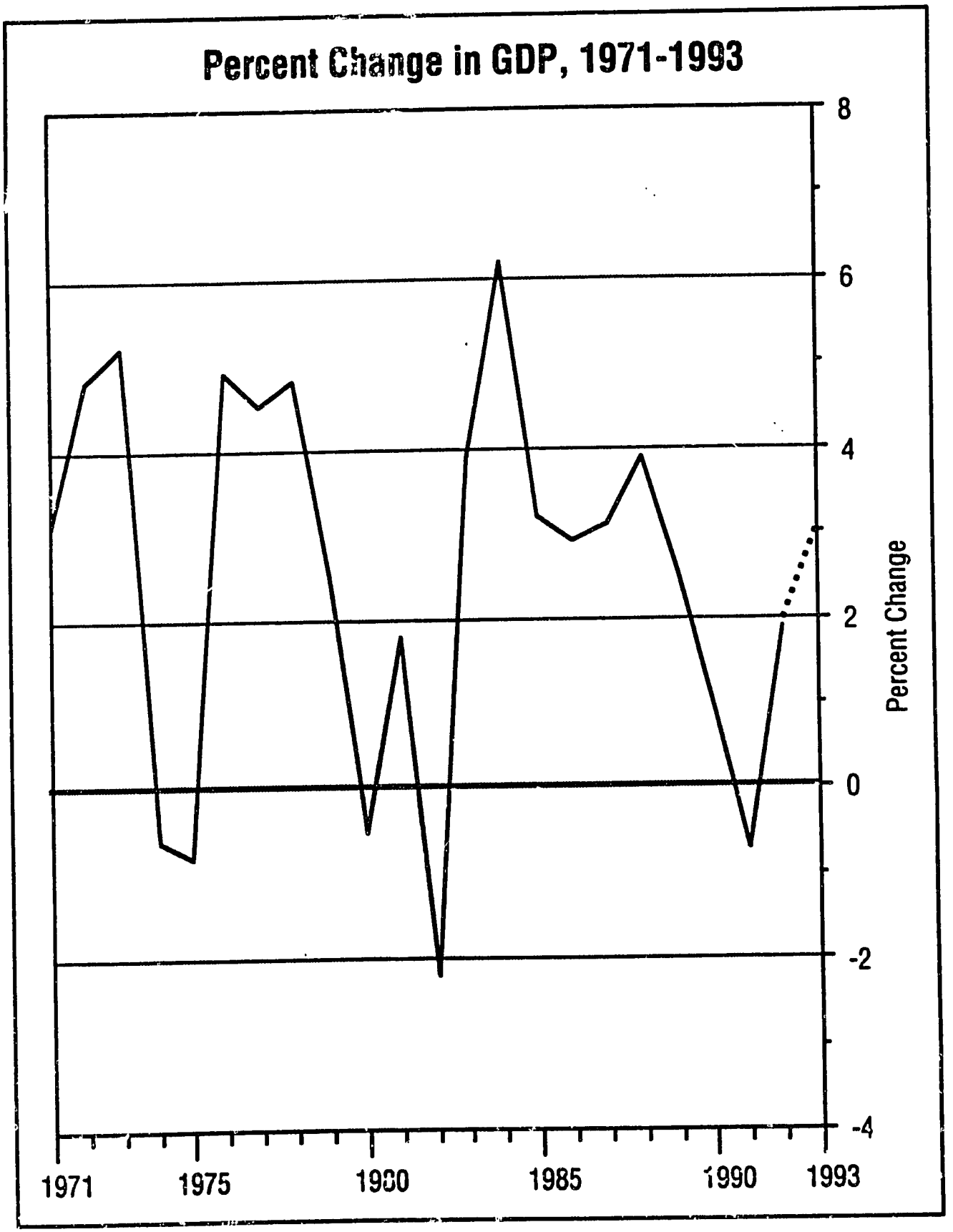
As the attached article from Business Week (6/29/92) indicates, Sears was charged by the California Consumers Affairs Department for making unnecessary automobile repairs. Part of the problem was alleged to be the compensation system for people working in the automobile repair area at Sears: at least a portion of their pay was tied to the amount of products or services they sold to customers. [Shortly after these charges were levied, Sears reduced, and in some cases, eliminated incentive compensation systems in their automobile repair departments.]

1. What was wrong with the Sears system? Don't we want to reward productive workers with higher salaries? Sears - or any firm - would like greater sales, everything else equal. Didn't the discarded scheme have employees matching their personal goals with the objectives of the corporation?

2. Do you see any significant difference between the discarded compensation system for Sears auto center employees and

   a) tips for waiters or waitresses
   b) insurance salespersons paid by percentage commissions
   c) real estate workers whose fee is a percentage of the selling price
   d) physicians whose income is related to the advice and procedures they recommend

3. Design a compensation scheme for automobile repair persons at Sears that would reduce fraud, increase customer satisfaction, be profitable for the company, and motivate workers.



AVG: -2.4% 1971 to 1992

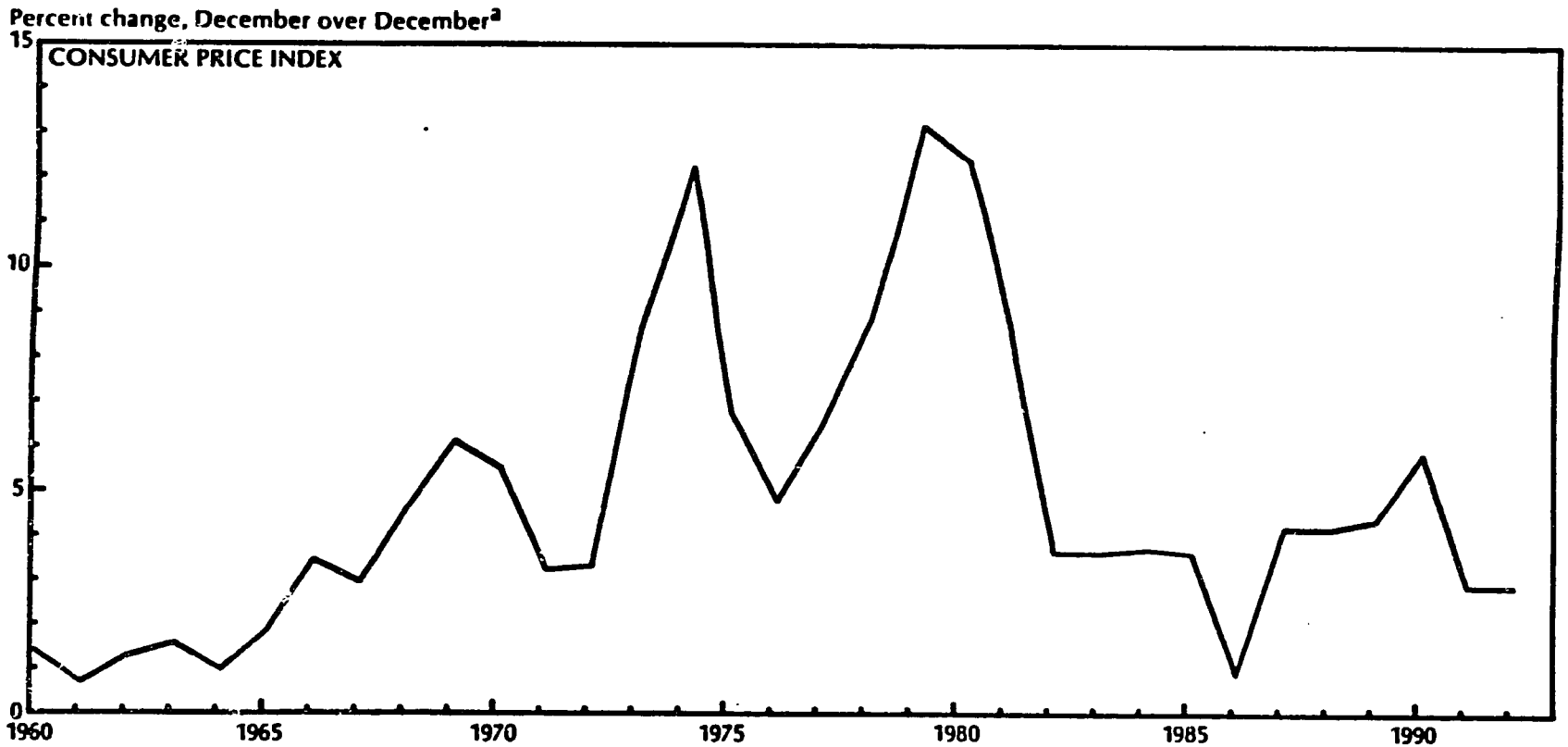
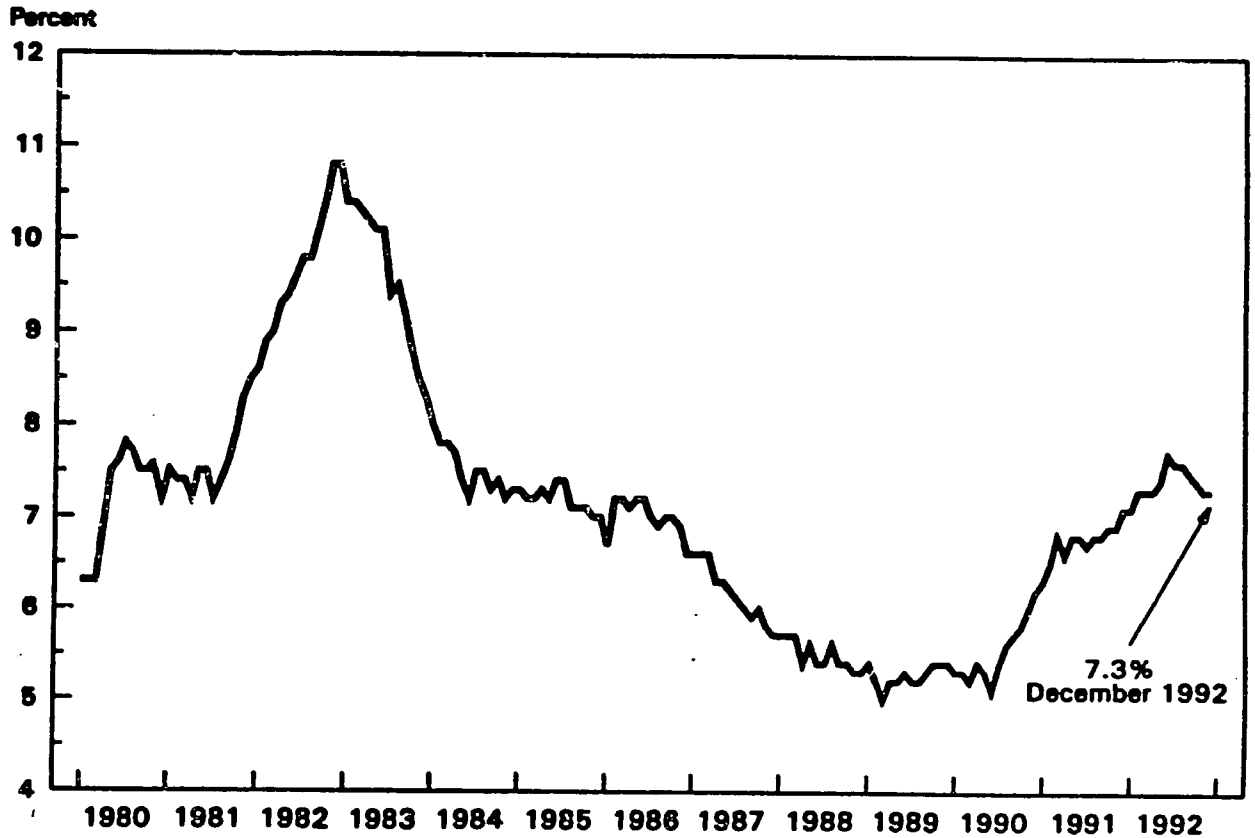

Percent change, December over December[a]
CONSUMER PRICE INDEX
15
10
5
0
1960
1965
1970
1975
1980
1985
1990

Chart 2-2 Civilian Unemployment Rate

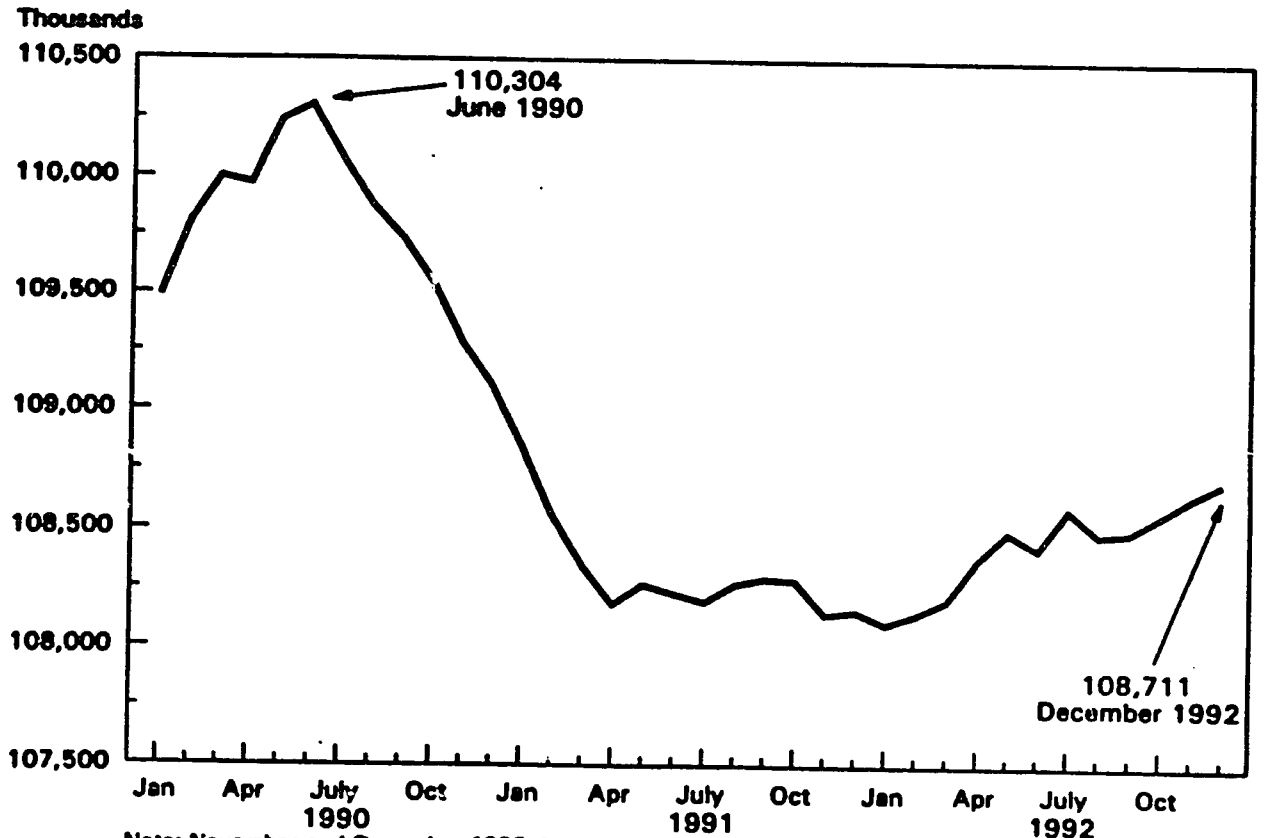
The unemployment rate fell steadily during the second half of 1992. The recent peak of 7.7 percent in June 1992 was well below the 10.8 percent peak following the 1981-82 recession.



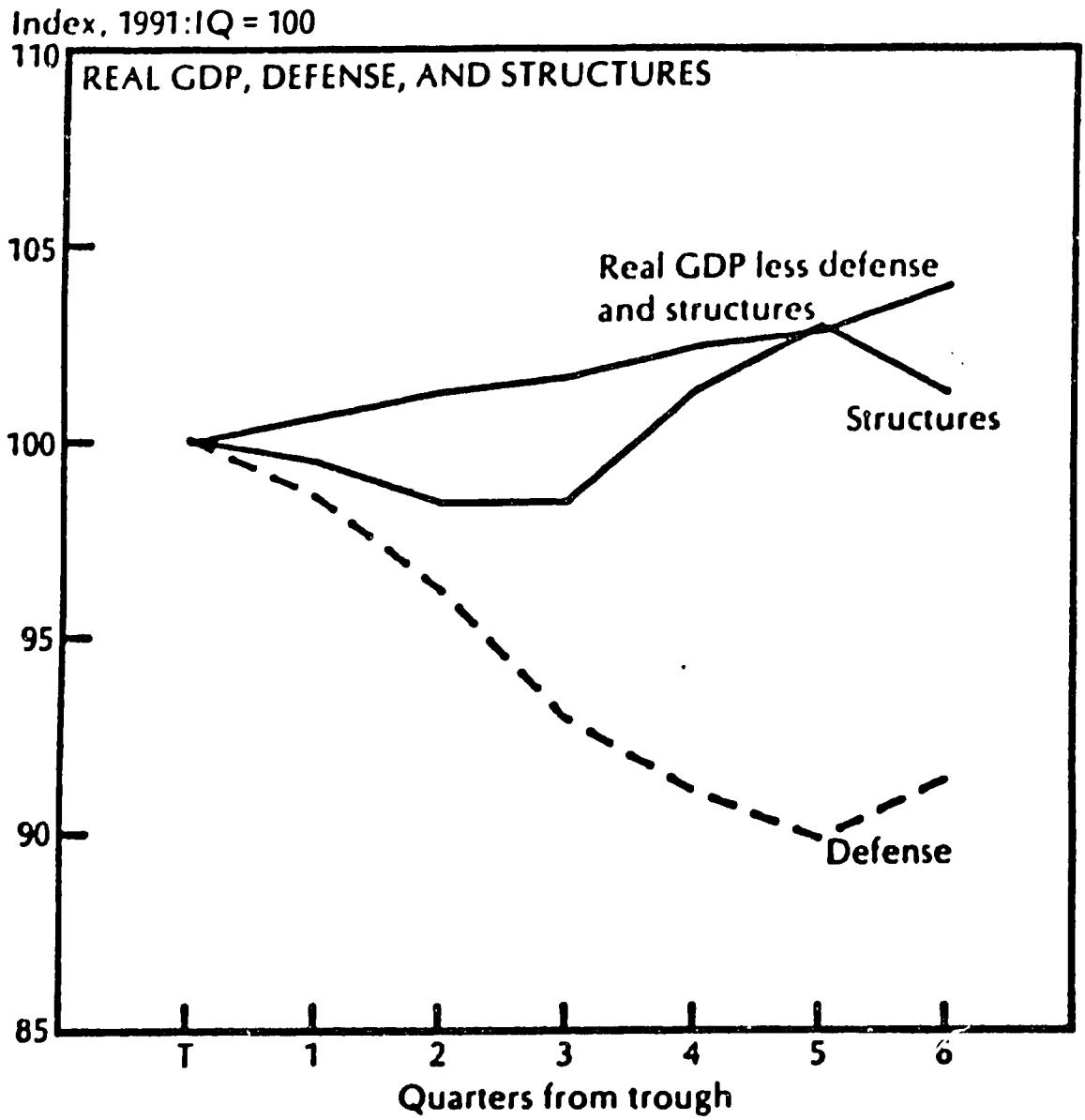
Source: Department of Labor.

Chart 2-3 Nonfarm Payroll Employment

Nonfarm payroll employment grew slowly during 1992, after being stagnant for much of 1991 following the recession.



Note: November and December 1992 data are preliminary.
Source: Department of Labor.


Index, 1991:1Q = 100
REAL GDP, DEFENSE, AND STRUCTURES
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105
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Real GDP less defense and structures
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Defense
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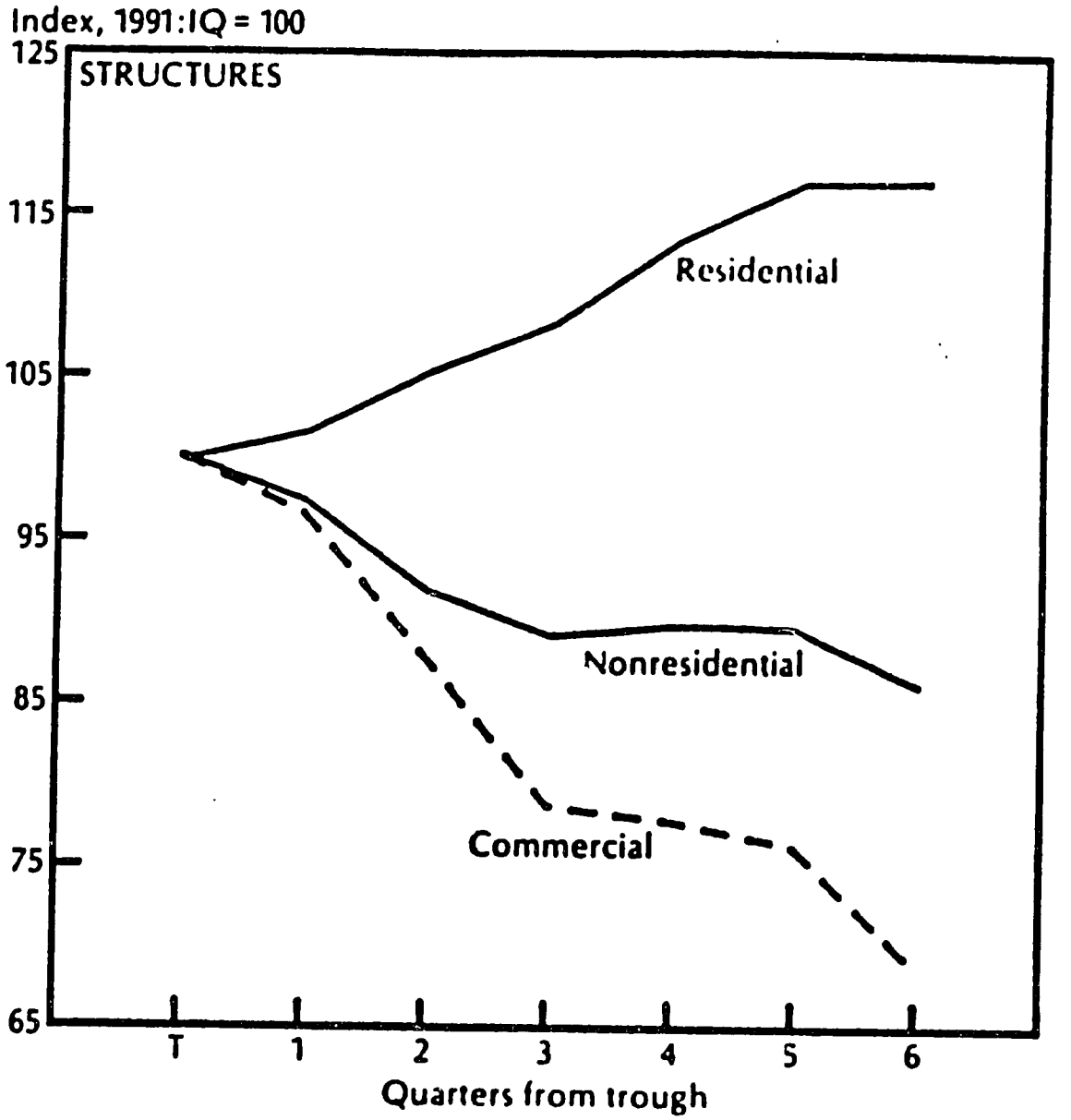
Quarters from trough


Index, 1991:IQ = 100
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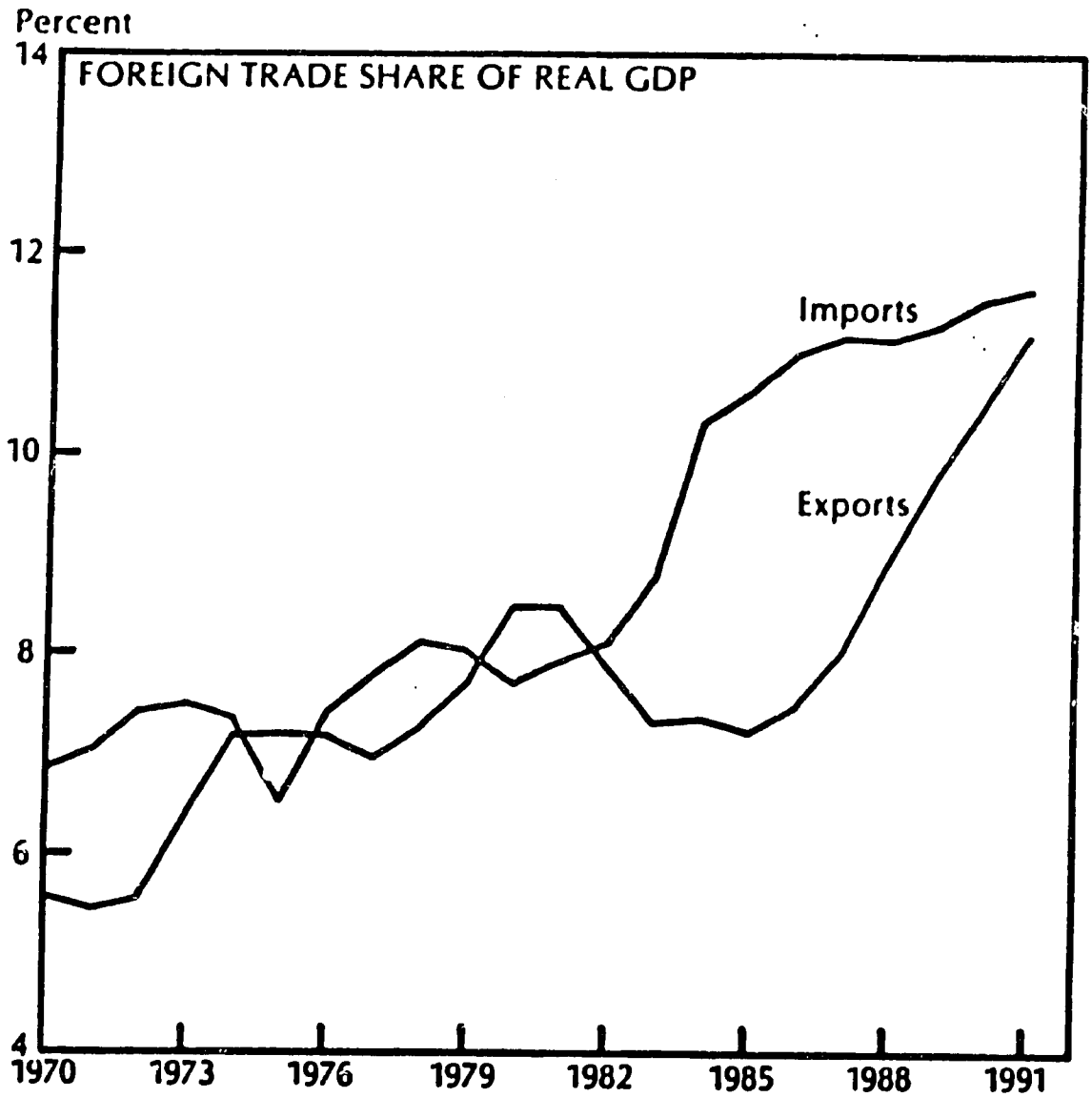
Quarters from trough


Percent
FOREIGN TRADE SHARE OF REAL GDP
14
12
10
8
6
4
Imports
Exports
1970
1973
1976
1979
1982
1985
1988
1991

292

Interest Rates and the Deficit

1965–1992

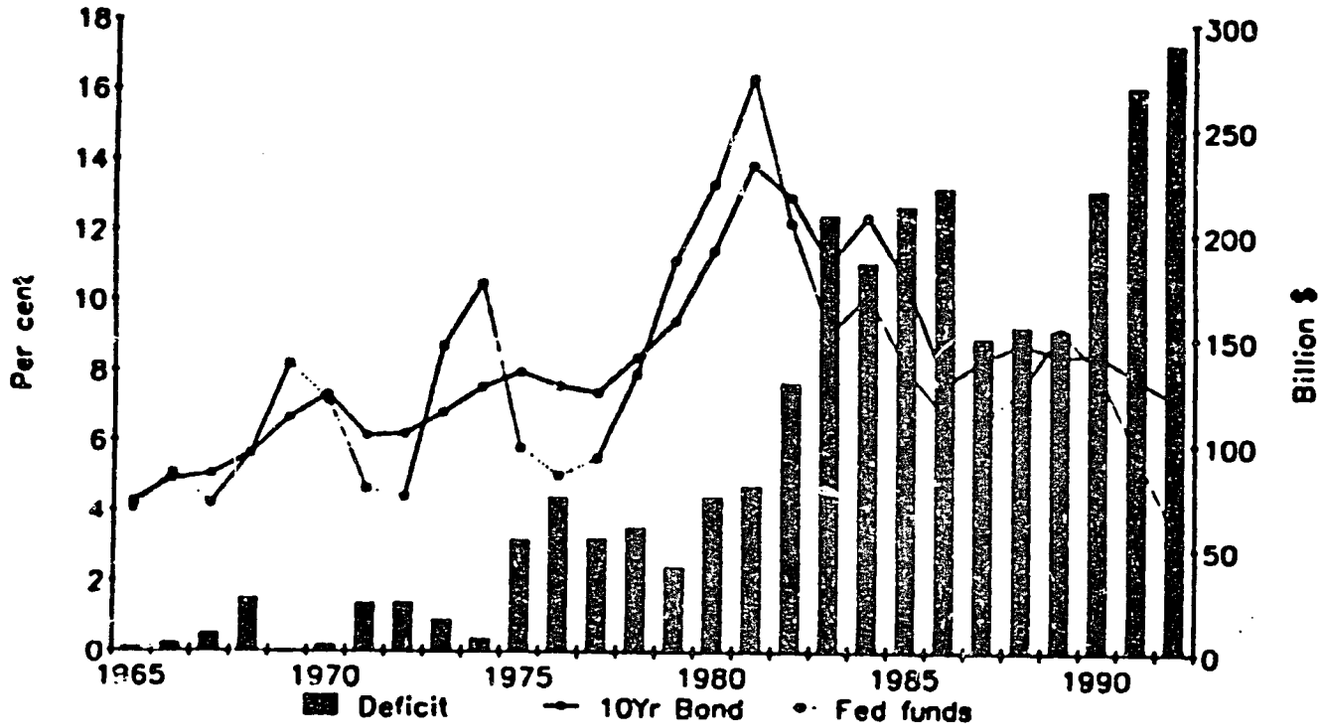
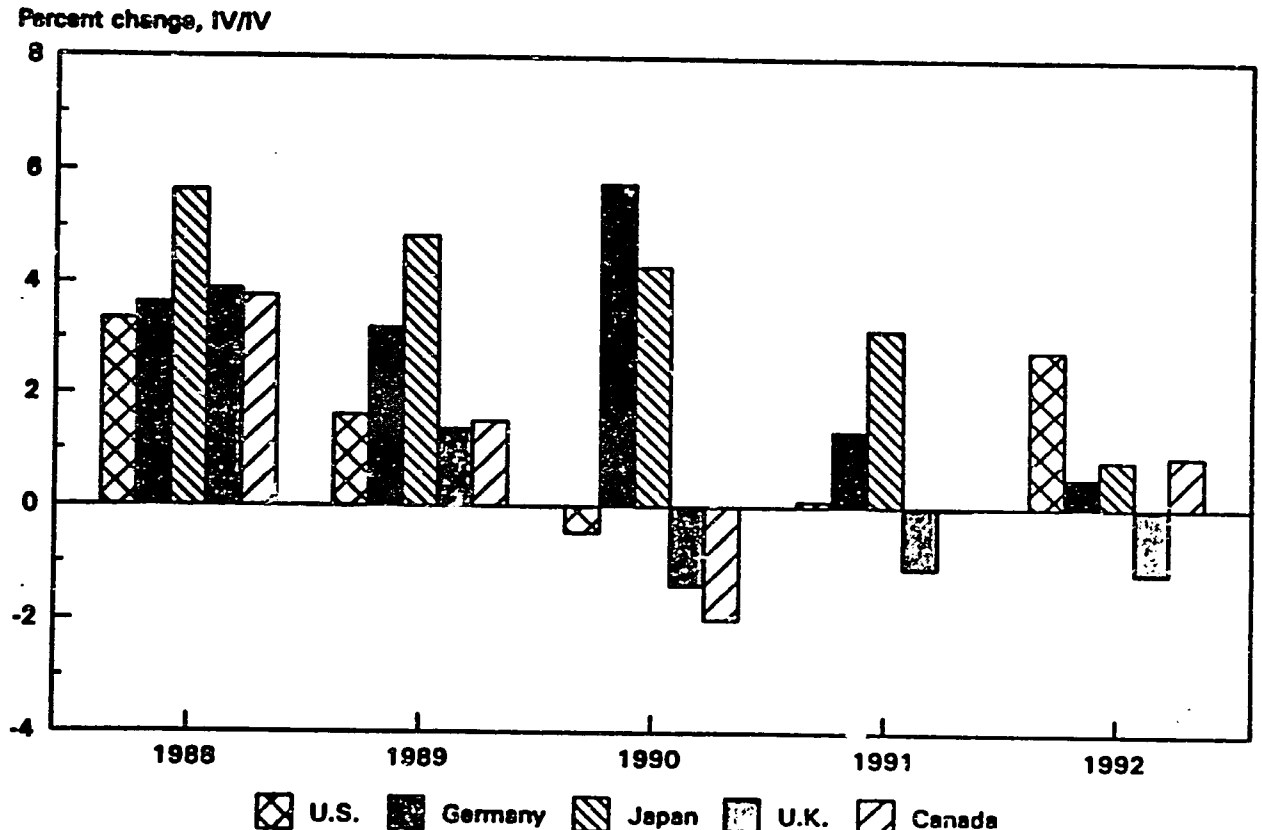


Chart 3-9 International Real GDP Growth

As the U.S. economy began to recover, output growth in Germany and Japan weakened considerably.



Note: Data for Japan and Germany are for GNP. Changes for 1992 are 1992.III/ 1991.IV at an annual rate.
Sources: Organization for Economic Cooperation and Development and The Economist.

Glossary of Economic and Business Terms

Agency costs: Costs associated with resolving conflicts of interest between shareholders, managers, and lenders. Agency costs include the cost of monitoring and bonding performance, the cost of constructing contracts designed to minimize agency conflicts, and the loss in efficiency resulting from unresolved agent-principal conflicts.

Benefit-cost ratio: The ratio of the present value of the benefits from a project or program (discounted at the social discount rate) to the present value of the costs (similarly discounted).

Capital rationing: A situation that exists when a firm has more acceptable investment projects than it has funds available to invest.

Complementary goods: Two goods, A and B, are substitutes if the quantity demanded of Good A *increases* (decreases) when the price of Good B is *increased* (decreased), assuming all other factors affecting demand remain unchanged.

Cost: The sacrifice incurred whenever an exchange or transformation of resources takes place.

Cost-benefit analysis: An analytical tool designed to assist public and private decision makers in their resource-allocation decisions. It requires the measurement of all benefits and costs arising from a particular project or program.

Cost-plus (or full cost) pricing: A method of determining prices in which a charge to cover overhead, plus a percentage markup or margin, is added to variable production and marketing costs to arrive at a selling price.

Discount rate: The rate of interest used in the process of finding present values (discounting).

Economies of scale: Declining long-run average costs as the level of output for the firm (or production plant) is increased.

Externalities: Impacts that occur whenever a third party receives benefits or bears costs arising from an economic transaction in which he or she is not a direct participant. An example would be the effects of industrial pollution on area residents.

Incremental analysis: The real-world counterpart to marginal analysis. Incremental analysis requires that an estimate be made of the changes in total cost or revenue that will result from a price change or from a decision to add or delete a product, accept or reject a new order, or undertake a new investment.

Input: A resource or factor of production, such as a raw material, labor skill, or piece of equipment, that is employed in a production process.

Internal rate of return: The discount rate that equates the present value of the stream of net cash flows from a project with the project's net investment.

Limit price: A price, lower than the short-run profit-maximization price, charged by a monopolist firm to discourage entry into the industry by potential rivals.

Long run: The period of time in which *all* the resources employed in a production process can be varied.

Marginal analysis: A basis for making various economic decisions which analyzes the additional (marginal) benefits derived from a particular decision and compares them with the additional (marginal) costs incurred.

Market failure: The failure of market-oriented institutions to generate optimal levels of desirable outputs (activities) and to eliminate suboptimal levels of undesirable outputs (activities) through the signals provided by the market price system.

Natural monopoly: An industry in which maximum economic efficiency is obtained when one firm produces, distributes, and transmits all of the commodity or service produced in that industry. The production of natural monopolists is typically characterized by increasing returns to scale throughout the range of output demanded by the market.

Opportunity cost: The value of a resource in its next best alternative use. Opportunity cost represents the return or compensation that must be foregone as the result of the decision to employ the resource in a given economic activity.

Peak-load pricing: The process of charging users of a utility's services a higher price during those periods of time when demand for that service is heaviest and lower prices when demand is light.

Prestige pricing: The practice of charging a high price for a product to enhance its prestige value.

Price discrimination: The act of selling the same good or service, produced by a single firm, at different prices to different buyers during the same period of time.

Price elasticity: The ratio of the percentage change in quantity demanded to the percentage change in price, assuming that all other factors influencing demand remain unchanged. Also called "*own*" price elasticity.

Production: The creation of any good or service that has value to either consumers or other producers.

Production externalities: Externalities that arise in the production process for a good or service. *Favorable* (to a third party) production externalities are called "external productions economies." *Unfavorable* (to a third party) production externalities are called "external production diseconomies."

Returns to scale: The proportionate increase in output that results from a given proportionate increase in *all* the inputs employed in the production process.

Risk: A decision-making situation in which there is variability in the possible outcomes and the probabilities of these outcomes can be specific by the decision maker.

Shadow Price: Measures the value (that is, contribution to the objective function) of one additional unit of a resource. It is equivalent to the dual variable.

Skimming: A new product-pricing strategy that results in a high initial product price. This price is reduced over time as demand at the higher price is satisfied.

Sunk cost: A cost incurred regardless of the alternative action chosen in a decision-making problem.

Technical progress: The increase in productivity over time that results from the development and use of more efficient capital equipment, labor skills, and production methods.

Transfer price: The price at which an intermediate good or service is transferred from the selling to the buying division within the same firm.

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THE PROFESSIONAL MANAGER PROGRAM
MANAGERIAL ECONOMICS & INDUSTRIAL ORGANIZATION
Budapest, Hungary

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	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly Disagree 5
1. The objectives of this course were clear to me.	1	2	3	4	5
2. The course exceeded my expectations.	1	2	3	4	5
3. The instructor(s) communicated effectively.	1	2	3	4	5
4. The instructor(s) made the subject matter more meaningful through the use of examples.	1	2	3	4	5
5. The instructor(s) encouraged participants to be involved in discussions.	1	2	3	4	5
6. The instructor(s) presented up-to-date material and information.	1	2	3	4	5
7. The instructor(s) was(were) well prepared and organized.	1	2	3	4	5
8. The instructor(s) did a good job of relating this course with other parts of the program.	1	2	3	4	5
9. The quantity and depth of material covered were appropriate for the allotted time.	1	2	3	4	5
10. I feel that I have a good understanding of the topics covered in this course.	1	2	3	4	5
11. This course helped me gain useful knowledge and/or skills.	1	2	3	4	5
12. I was pleased with the amount of interaction I had with the faculty in the course.	1	2	3	4	5
13. The participants enriched the course by sharing their ideas and experiences.	1	2	3	4	5
14. Overall, I would rate this course as an outstanding educational experience.	1	2	3	4	5
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152

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PRODUCTION & LOGISTICS

Materials will be handed out in class

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THE PROFESSIONAL MANAGER PROGRAM
PRODUCTION & LOGISTICS
Budapest, Hungary

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	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly Disagree 5
1. The objectives of this course were clear to me.	(1)	(2)	(3)	(4)	(5)
2. The course exceeded my expectations.	(1)	(2)	(3)	(4)	(5)
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4. The instructor(s) made the subject matter more meaningful through the use of examples.	(1)	(2)	(3)	(4)	(5)
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6. The instructor(s) presented up-to-date material and information.	(1)	(2)	(3)	(4)	(5)
7. The instructor(s) was(were) well prepared and organized.	(1)	(2)	(3)	(4)	(5)
8. The instructor(s) did a good job of relating this course with other parts of the program.	(1)	(2)	(3)	(4)	(5)
9. The quantity and depth of material covered were appropriate for the allotted time.	(1)	(2)	(3)	(4)	(5)
10. I feel that I have a good understanding of the topics covered in this course.	(1)	(2)	(3)	(4)	(5)
11. This course helped me gain useful knowledge and/or skills.	(1)	(2)	(3)	(4)	(5)
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14. Overall, I would rate this course as an outstanding educational experience.	(1)	(2)	(3)	(4)	(5)
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FINANCE MODULE

June 10 - 12, 1993
Budapest, Hungary

Session	Day 1 - June 10	Day 2 - June 11	Day 3 - June 12
8:30-10:00		Financial Statement Analysis	Capital Investment Decisions III
Break			
10:15-11:45		Financial Forecasting and Planning	Capital Investment Decisions IV
Lunch			
1:30-3:00	Introduction and Overview of Module	Capital Investment Decisions I	Financing Decisions I
Break			
3:15-4:45	Introduction to Financial Statements	Capital Investment Decisions II	Financing Decisions II

PROFESSIONAL MANAGERS PROGRAM

FINANCE MODULE
Budapest, Hungary

Thursday, June 10

Introduction and Overview of Module
- What is Financial Management?
- What is the Role of Financial Manager?
- Overview of Module

Introduction to Financial Statements
- Income Statements, Balance Sheets, Sources/Uses

Financial Statement Analysis
- Ratio Analysis - Measurement, Comparative Analysis
- Industry Case Study

Financial Forecasting and Planning
- Sales and Cash Budgeting
- Breakeven Analysis

Friday, June 11

Capital Investment Decisions I
- The Capital Budgeting Process
- Time Value of Money - The Mathematics of Finance

Capital Investment Decisions II
- Developing Investment Proposals: Cash Flow Projections
- Proposal Evaluation Criteria

Capital Investment Decisions III
- Investment Decisions: Conflicting Criteria
- Advanced Topics: Measuring Risk, Cost of Capitcl, Inflation

Capital Investment Decisions IV
- Metalcrafters, Inc. Case Study

Saturday, June 12

Financing Decisions I
- Alternative Financing Methods - Criteria
- Short-term Financing: Trade Credit, Bank Debt, Inventory Loans

Financing Decisions II
- Long-term Debt Financing
- Long-term Equity Financing: Common Stock, Warrants
- Venture Capital Financing

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in Central and Eastern Europe Project

PROFESSIONAL MANAGERS PROGRAM

ACCOUNTING AND FINANCE FOR NON-FINANCIAL MANAGERS

Fundamentals, New Developments and Practical Applications

SESSION 1

Module Overview

Module Instructor:

Professor Andrew Karolyi
College of Business
Ohio State University

1/05

Accounting and Finance for Non-Financial Managers

Fundamentals, New Developments and Practical Applications

MODULE OVERVIEW: We examine the fundamentals of financial management for practical application to business problems

FOCUS

- Analysis of Financial Performance
- Capital Investment Decisions
- Financing Decisions

MODULE OBJECTIVES:

To determine financial analysis techniques important for firms in transitional economy

To identify practical applications for financial planning strategies

To explore new developments in financial management practices

SESSION 1

MODULE OVERVIEW AND INTRODUCTION

A. WHAT IS FINANCIAL MANAGEMENT?

The study of financial management has undergone significant changes over the years. It first appeared as a separate field of study in the early 1900s. The early emphasis was on legal matters such as mergers, consolidations, formations of new firms and the various types of securities issued by corporations. With growing industrialization, the critical problem was how should a firm obtain capital for expansion. Over time, the issues of importance shifted:

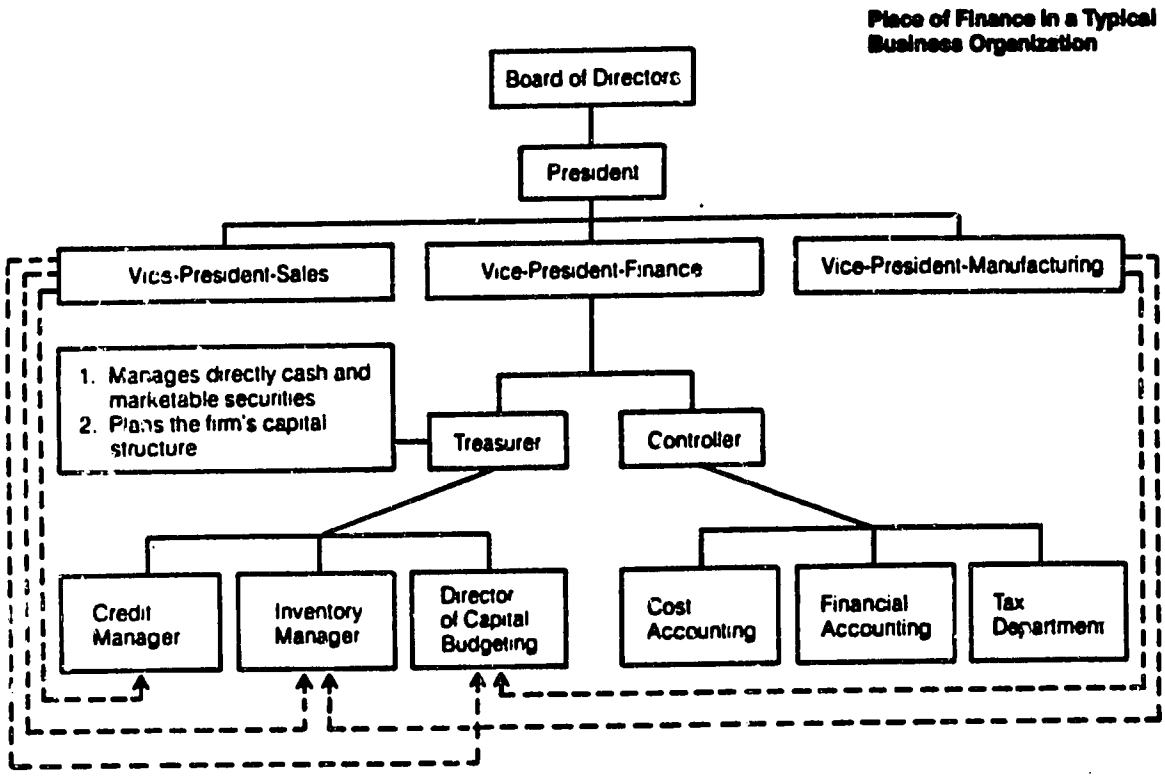
The Evolution of Financial Management

1920s	Development of Securities and Securities Markets Legal and Institutional issues
1930s	Bankruptcies, Reorganization, Government Regulation
1940-50s	Development of Methods of Analysis for Profits Asset Analysis: Cash, Accounts Receivable, Inventories New Importance of Stock Prices Mathematical Models introduced
1960s	Corporate Strategy: Optimal Mix of Securities, Cost of Capital New Focus on Liabilities Management Theory of Security Selection: Portfolio Management Merging of Corporate Finance and Investments
1970s	New issues of Inflation for Portfolios and Strategy Decisions New Financial Markets/Institutions: Options and Futures
1980s	Corporate Mergers, Acquisitions, Restructurings Financial Engineering for Financing, Portfolios Corporate Bankruptcies
1990s	Globalization of Financial Markets

The evolutionary changes have greatly increased the importance of financial management. Before, marketing manager projected sales, engineers determined what assets necessary to meet demands and financial manager would simply arrange to raise money to finance purchase of assets. Today, decisions are made in a coordinated or integrated manner.

B. WHAT IS THE PLACE OF FINANCE IN A BUSINESS ORGANIZATION?

Organizational structures vary from business to business but the Figure below gives a fairly typical picture of the role of finance within a business. The Chief Financial Officer (CFO), usually has the title of Vice-President-Finance, reports to the President. Key subordinates are the treasurer and the controller. The treasurer manages the firm's cash and marketable securities, plans the financial structure and raises the capital. The treasurer is the credit manager, inventory manager and director of capital budgeting and oversees the accounting and tax departments.



308

C. WHAT IS THE ROLE OF THE FINANCIAL MANAGER?

• **Business.** A modern company is comprised of a variety of REAL assets. Real assets include *tangible assets* such as machinery, factories, offices and *intangible assets* such as technical expertise, trademarks, and patents.

• **Markets.** To pay for these assets, the company sells securities or FINANCIAL assets. The financial manager in the company faces two basic problems:

1. How much should the firm invest and in which assets?

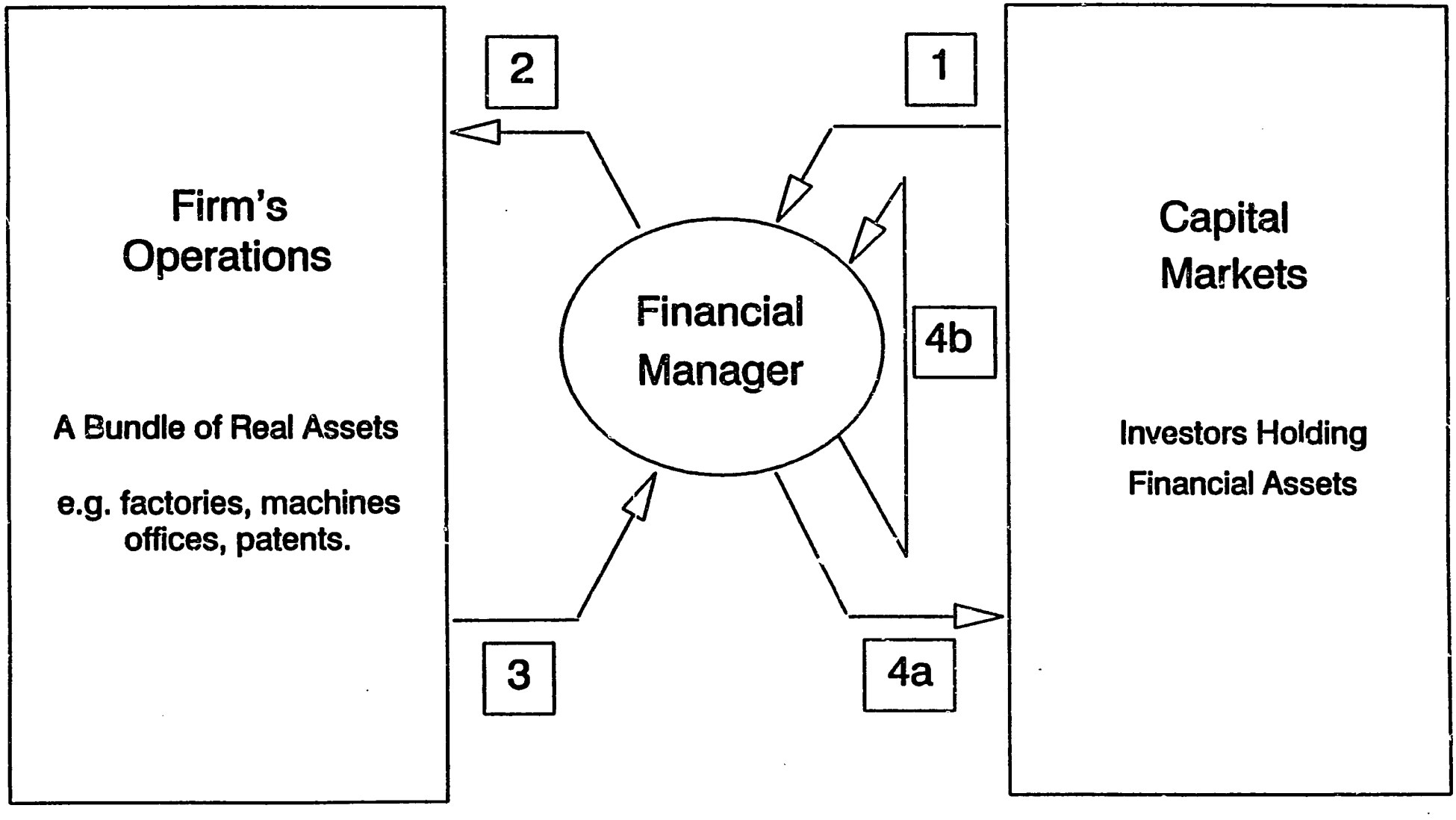
CAPITAL INVESTMENT DECISION

2. How should the cash required for investment be raised?

FINANCING DECISION

• The financial manager can be seen as the intermediary between the real business operations of the firm and the capital markets. See schematic diagram for illustration.

THE ROLE OF FINANCIAL MANAGMENT



1. The Importance of Capital Markets. The financial manager must act as an intermediary, standing between the firm's operations and the capital markets, where the firm's securities are traded. The flow of cash starts from the capital markets where the securities were first issued to raise cash. (See Arrow 1 in the accompanying schematic).

2. Investing in the Firm. The financial manager participates in the decision as to where to invest the cash raised in the capital market. Since a firm can be thought of as a bundle of real assets, the issue is which real assets to purchase. This is the capital investment decision. (See Arrow 2).

3. Returns on Investments. If the firm does well, the real assets of the firm's operations generate cash inflows which more than repay the initial investments. (See Arrow 3).

4. Reinvesting the Cash in Existing Operations. One option the financial manager has is to reinvest the incremental cash proceeds from the firm's operations into existing operations or to expand operations into new lines of business requiring the purchase of additional real assets. (See Arrow 4b).

5. Cash Returned to Investors. The alternative choice for the cash proceeds is to return them to the investors who purchased the original security issue. (See Arrow 4b). The choice between reinvesting the cash in the firm and returning the proceeds to investors may not be a choice at all. For example, if the investor is a bank and the financial security is a loan, some proceeds from operations must be repaid in interest.

31

D. WHAT IS THE GOAL OF THE FINANCIAL MANAGER?

• Success is usually judged by **VALUE**. If the net worth of the firm increases as a result of the decision made by the financial manager, the owners are better off. So, a good investment is one that results in the purchase of a real asset that is worth more than it costs – an asset that makes a net contribution to value. This is the secret of success for a financial manager.

Other possible objectives?

GOAL	OBJECTIVE
Profit Maximization?	Large Amounts of Profits
Owners' Wealth Maximization?	Large Net Worth of Firm
Market Share Maximization?	Maximize Sales/Revenues
"Satisficing"?	Satisfy everyone and keep operating as currently
Manager Reward Maximization?	Large Expense Accounts and Executive Salaries
Social Responsibility?	Promote Social Justice

How does the goal of maximizing the net worth of the business govern the activities of the financial manager?

• The financial manager has to deal with capital markets as well as the firm's operations. The manager must understand how the capital markets work because the financing decision relies on the impact of a choice of financing on the value or net worth of the firm.

• The investment decision cannot be separated from the capital markets either. The financial manager must act in the firm owners' interest so that only those investments in real assets that increase the value or net worth of the firm should be accepted.

How do the business owners ensure that the managers follow the stated goal? Are there conflicts in achieving the stated goals of the firm?

2,12

THE PROFIT MODEL

$ SALES

LESS Cost of Producing Product

$ = GROSS PROFIT

LESS Operating Expenses

$ = OPERATING INCOME

LESS Financing Costs

$ = PRETAX EARNINGS

LESS Corporate Taxes

$ = NET INCOME

E. THE ECONOMIC ENVIRONMENT

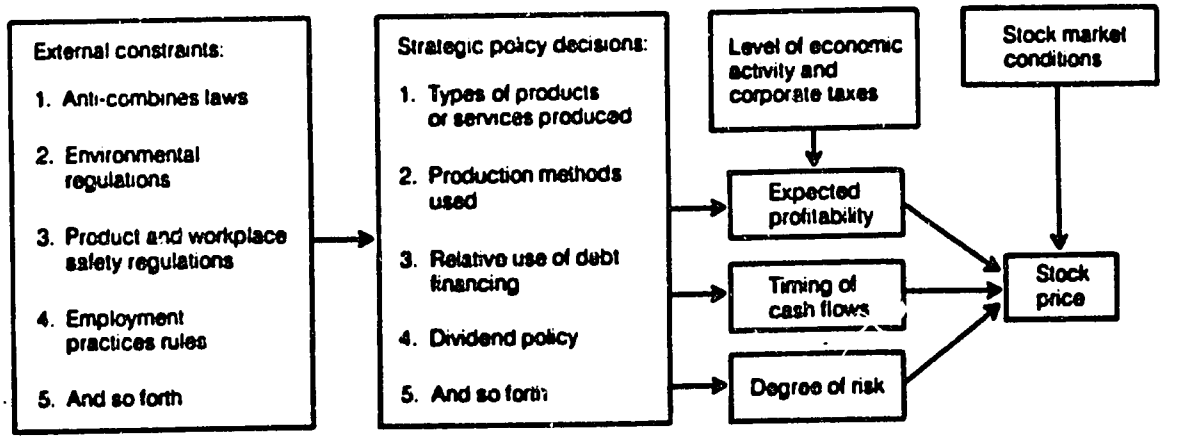
Managers can take actions to affect the value of the firm, but there are also other factors that influence the value of the firm including the general level of economic activity, external regulatory constraints, the business and personal income tax code, and conditions in the capital markets.

- The manager must work within a set of external regulatory constraints to set long-run strategic policy decisions which chart a future course for the firm.

- The level of corporate income taxes and general economic conditions determine the success of these policy decisions on the expected profitability of the firm, the timing of its earnings, their eventual transfer to shareholders in the form of dividends and the degree of uncertainty (or risk) in those projected future earnings and dividends.

- The general conditions in the capital markets (money markets, bond markets and stock markets) influence the value of the business.

Summary of Major Factors Affecting Stock Prices



E. THE FINANCIAL ENVIRONMENT

Business firms of all types and sizes (sole proprietorships, partnerships, corporations) need to raise capital to take advantage of growth opportunities. At the same time, there are individuals and firms that have incomes greater than current expenditures, so that they have funds available to invest in such business growth opportunities. One direct way to move available funds into business is by means of **private placements** through direct negotiations. Two more efficient ways of channeling funds to businesses are through:

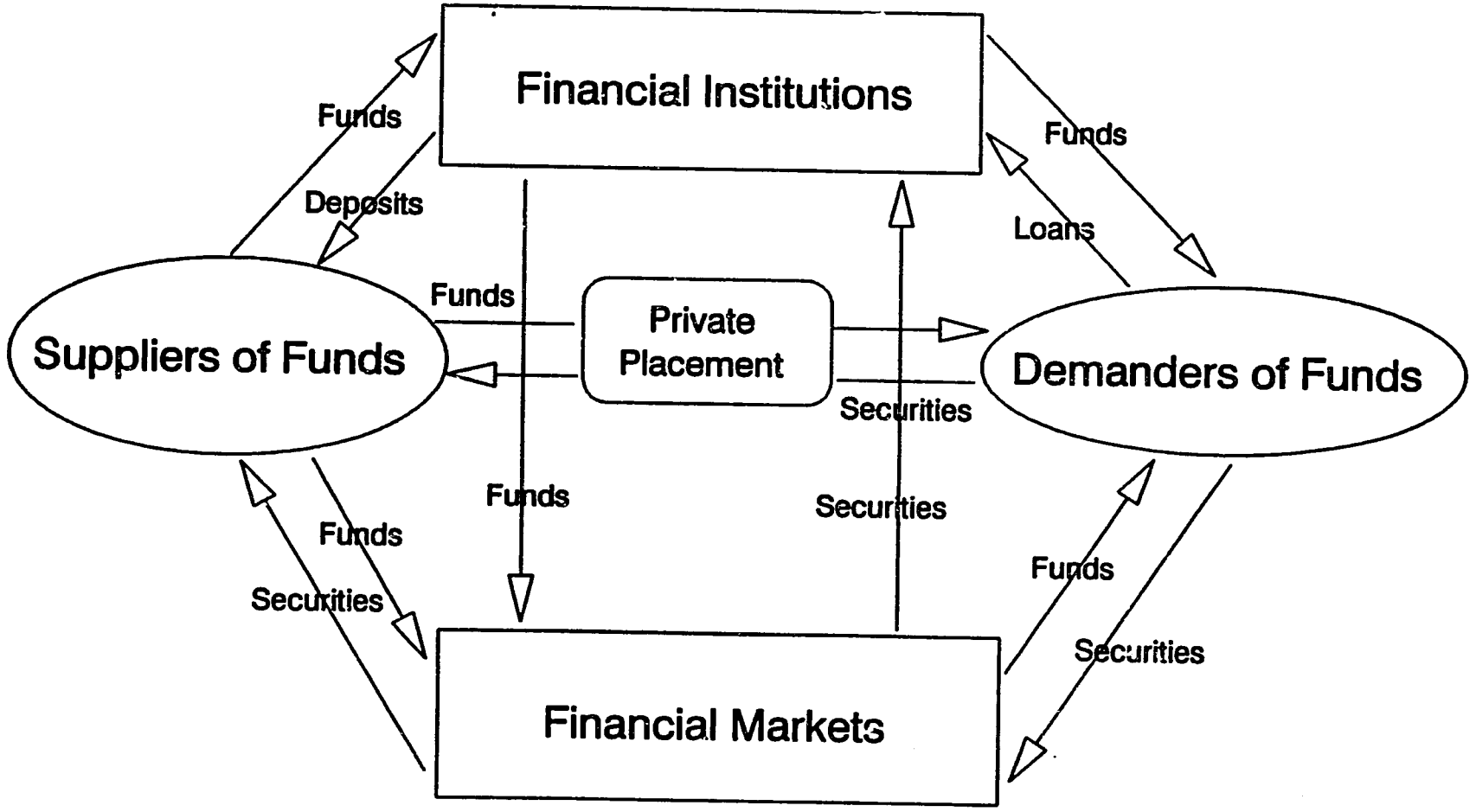
• **Financial Institutions.** These intermediaries channel savings of individuals, businesses and governments into loans or investments. Many institutions directly pay savers interest on deposited funds. Some accept savings and lend this to their customers; yet others invest savings in real estate, stocks, bonds or other assets.

• **Financial Markets.** The financial market provides a forum in which suppliers of funds and demanders of loans and investments can transact business daily. Whereas investments of institutions are made without direct knowledge of the supplier, suppliers in the markets know where their funds are being lent or invested.

(a) **Money Markets** are financial relationships created between suppliers and demanders of *short-term* funds which have horizons of one year or less. Usually, this is geographically dispersed but can be concentrated (New York, London, Frankfurt) and is dominated by large financial institutions like banks, local and foreign. Most transactions are with *marketable securities* such as Treasury bills, commercial paper issued by businesses, and negotiable certificates of deposit issued by government, business or financial institutions.

(b) **Capital Markets** are financial relationships created between suppliers and demanders of *long-term* funds which have horizons longer than one year. The key securities are *bonds*, or long-term debt, used by businesses and government to raise large sums of money from diverse groups of lenders, and *stocks*, which are units of ownership interest in the business. Some shares of stock are traded in central locations (stock exchanges) in order to facilitate the transfer of these units.

FLOW OF FUNDS FOR INSTITUTIONS AND MARKETS



Major Financial Institutions

Institution	Description
Commercial bank	Accepts both demand (checking) and time (savings) deposits and also offers negotiable order of withdrawal (NOW) accounts, which are interest-earning savings accounts against which checks can be written. In addition, currently offers money market deposit accounts, which pay interest at rates competitive with other short-term investment vehicles. Makes loans directly to borrowers or through the financial markets.
Mutual savings bank	Similar to commercial banks except that it may not hold demand (checking) deposits. Obtains funds from savings, NOW, and money market deposit accounts. Generally lends or invests funds through financial markets, although some residential real estate loans are made to individuals. Located primarily in New York, New Jersey, and the New England states.
Savings and loan	Similar to mutual savings banks in that it holds savings deposits, NOW accounts, and money market deposit accounts. Also raises capital through the sale of securities in the financial markets. Lends funds primarily to individuals and businesses for real estate mortgage loans. Some funds are channeled into investments in the financial markets.
Credit union	A financial intermediary that deals primarily in transfer of funds between consumers. Membership is generally based on some common bond, such as working for a given employer. Accepts members' savings deposits, NOW account deposits, and money market deposit accounts and lends the majority of these funds to other members, typically to finance automobile or appliance purchases or home improvements.
Life insurance company	The largest type of financial intermediary handling individual savings. Receives premium payments that are placed in loans or investments to accumulate funds to cover future benefit payments. Funds are lent to individuals, businesses, and governments or channeled through the financial markets to those who demand them.
Pension fund	Set up so that employees of various corporations or government units can receive income after retirement. Often employers match the contributions of their employees. Money is sometimes transferred directly to borrowers, but the majority is lent or invested via the financial markets.
Mutual fund	A type of financial intermediary that pools funds of savers and makes them available to business and government demanders. Obtains funds through sale of shares and uses proceeds to acquire bonds and stocks issued by various business and governmental units. Creates a diversified and professionally managed portfolio of securities to achieve a specified investment objective, such as liquidity with a high return. Hundreds of funds, with a variety of investment objectives, exist. Money market mutual funds, which provide competitive returns with very high liquidity, are currently popular.

F. WHAT DOES OUR MODULE FOCUS ON?

• **Analyzing Financial Performance.** In order to make financial decisions, whether investment or financing decisions, the manager needs to be able to understand the financial environment and needs tools to be able to analyze and evaluate financial performance in the past and present. The financial manager also needs to take advantage of this information to develop future investment and financing plans. This is the objective of the first session of the module.

Content Areas:

Financial Statement Analysis	• Review of Financial Statements • Financial Ratio Analysis • Competitive Analysis • Limitations and Examples • Breakeven Analysis
Forecasting Performance	• Financial Planning • Sales Forecasts • Cash Budgeting Forecasts • Cases and Examples

• **Capital Investment Decisions.** Companies invest in a variety of real assets. Every financial manager is engaged in the decision to invest money immediately in real assets with the expectation of a larger return in the future. How these decisions are made is the topic of the second session.

Content Areas:

Capital Budgeting: Basics	• Time Value of Money • Capital Investment Proposals • Evaluation Methods
Capital Budgeting: Advanced	• Risk • The Cost of Capital • Inflation • Cases and Examples

317

• **Financing Decisions.** The financial manager faces many short-term and long-term sources of financing. What forms of financing are available to the firm? What are the differences bewteen the various sources? Which sources are best for the corporation to use? Answering these questions is the aim of the third session.

Content Areas:

Short-term Financing Methods	• Trade Credit • Bank Debt • Commercial Paper • Bankers' Acceptances
Long-term Financing Methods	• Corporate Bonds • Convertible Bonds • Common and Preferred Stock • Warrants • Venture Capital

319

Midwest Universities Consortium for International Activities, Inc.

Management Training and Economics Education
in Central and Eastern Europe Project

PROFESSIONAL MANAGERS PROGRAM

ACCOUNTING AND FINANCE FOR NON-FINANCIAL MANAGERS

Fundamentals, New Developments and Practical Applications

SESSION 2

Analyzing Financial Performance

Module Instructor:

Professor Francis Longstaff
College of Business
Ohio State University

220

Financial Statements

- The financial performance of a firm is of great importance to many different people such as employees, managers, suppliers, customers, lenders and investors.

- Financial statements provide the basic information about the financial condition of the firm. This information can be analyzed to identify strengths and weaknesses.

- Review of Financial Statements.

    - The Income Statement.

    - The Balance Sheet.

FINANCIAL STATEMENTS

Mucia Management Training
Budapest, Hungary

Aldine Manufacturing Company balance sheet
(in thousands of dollars)

ASSETS	MARCH 31, 1989	MARCH 31, 1988
Cash and marketable securities	$ 177,689	$ 175,042
Accounts receivable	678,279	740,705
Inventories	1,328,963	1,234,725
Prepaid expenses	20,756	17,197
Accumulated tax prepayments	35,203	29,165
Current assets	$2,240,890	$2,196,834
Fixed assets at cost	1,596,886	1,538,495
Less: Accumulated depreciation	856,829	791,205
Net fixed assets	$ 740,057	$ 747,290
Investment, long term	65,376	—
Other assets	205,157	205,624
	$3,251,480	$3,149,748

LIABILITIES AND NET WORTH	MARCH 31, 1989	MARCH 31, 1988
Bank loans and notes payable	$ 448,508	$ 356,511
Accounts payable	148,427	136,793
Accrued taxes	36,203	127,455
Other accrued liabilities	190,938	164,285
Current liabilities	$ 824,076	$ 785,044
Long-term debt	630,783	626,460
Stockholders' equity		
Common stock	420,828	420,824
Paid-in capital	361,158	361,059
Retained earnings	1,014,635	956,361
Total stockholders' equity	$1,796,621	$1,738,244
	$3,251,480	$3,149,748

Aldine Manufacturing Company statement of earnings
(in thousands of dollars)

	YEAR ENDED MARCH 31, 1989	YEAR ENDED MARCH 31, 1988
Net sales	$3,992,758	$3,721,241
Cost of goods sold	2,680,298	2,499,965
Selling, general, and administrative expenses	801,395	726,959
Depreciation	111,509	113,989
Interest expense	85,274	69,764
Earnings before taxes	$ 314,282	$ 310,564
Income taxes	113,040	112,356
Earnings after taxes	$ 201,242	$ 198,208
Cash dividends	142,968	130,455
Retained earnings	$ 58,274	$ 67,753

Aldine Manufacturing Company sources and uses of funds March 31, 1988, to March 31, 1989 (in thousands)

SOURCES		USES	
Funds provided by operations			
Net profit	$201,242	Dividends	$142,968
Depreciation	111,509	Additions to fixed assets	104,276
		Increase, inventories	94,238
Decrease, accounts receivable	62,426	Increase, prepaid expenses	3,559
Decrease, other assets	467		
Increase, bank loans	91,997	Increase, tax prepayments	6,038
Increase, accounts payable	11,634	Increase, investments	65,376
Increase, other accruals	26,653	Decrease, accrued taxes	91,252
Increase, long-term debt	4,323	Increase, cash position	2,647
Increase, common stock and paid-in capital	103		
	$510,354		$510,354

326

Riker Electronics Corporation common size balance sheet

	1986	1987	1988	1989
	Assets			
Cash	1.0	1.8	3.8	5.1
Accounts receivable	29.3	27.4	28.9	30.9
Inventory	32.2	32.3	31.0	30.9
Other current assets	2.6	2.1	2.1	1.5
Current assets	65.1	63.6	65.9	68.5
Fixed assets, net	32.9	34.5	32.1	30.1
Other long-term assets	2.0	1.9	2.0	1.4
Total assets	100.0	100.0	100.0	100.0
	Liabilities and Net Worth			
Accounts payable	14.8	12.0	12.7	16.4
Notes payable	8.5	9.6	5.0	4.5
Other current liabilities	4.6	2.8	2.8	4.1
Current liabilities	28.0	24.3	20.5	25.0
Long-term debt	.4	.4	.4	.5
Total liabilities	28.3	24.7	20.9	25.5
Preferred stock	.0	.0	.0	.5
Common stock	5.3	9.6	8.8	6.9
Paid-in capital	15.0	12.5	15.6	16.4
Retained earnings	51.4	53.2	54.7	50.6
Net worth	71.7	75.3	79.1	74.4
Total liabilities and net worth	100.0	100.0	100.0	100.0

Riker Electronics Corporation common size income statement

	1986	1987	1988	1989
Sales	100.0	100.0	100.0	100.0
Cost of goods sold	45.7	46.5	49.2	46.7
Gross profit	54.3	53.5	50.8	53.3
Selling expenses	24.5	28.4	27.7	26.2
General and administrative expenses	13.5	13.1	12.1	12.9
Total expenses	38.0	41.5	39.8	39.1
Earnings before interest, and taxes	16.3	12.0	11.0	14.2
Other income	.5	1.2	.8	.6
Earnings before taxes	16.8	13.2	11.8	14.8
Taxes	8.9	6.5	5.4	6.8
Earnings after taxes	7.9	6.7	6.4	8.0

Riker Electronics Corporation Indexed balance sheet

	1986	1987	1988	1989
	Assets			
Cash	100.0	189.4	451.1	783.7
Accounts receivable	100.0	103.7	121.0	168.3
Inventory	100.0	111.3	118.1	153.2
Other current assets	100.0	89.2	96.3	93.3
Current assets	100.0	108.2	123.9	167.7
Fixed assets, net	100.0	116.0	119.5	145.8
Other long-term assets	100.0	106.9	125.6	117.0
Total assets	100.0	110.8	122.5	159.5
	Liabilities and Equities			
Accounts payable	100.0	89.3	105.0	175.9
Notes payable	100.0	125.0	71.6	84.4
Other current liabilities	100.0	66.3	73.6	142.4
Current liabilities	100.0	96.4	89.7	142.5
Long-term debt	100.0	110.2	143.7	215.9
Total liabilities	100.0	96.6	90.4	143.4
Preferred stock	0.0	0.0	0.0	100.0
Common stock	100.0	202.8	205.8	209.1
Paid-in capital	100.0	92.1	127.0	174.5
Retained earnings	100.0	114.6	130.3	157.2
Net worth	100.0	116.3	135.2	165.8
Total liabilities and net worth	100.0	110.8	122.5	159.5

Riker Electronics Corporation indexed income statement

	1986	1987	1988	1989
Sales	100.0	107.3	115.8	148.0
Cost of goods sold	100.0	109.0	124.6	151.0
Gross profit	100.0	105.8	108.5	145.4
Selling expenses	100.0	124.2	131.0	158.2
General and administrative expenses	100.0	104.8	103.9	141.6
Total expenses	100.0	117.3	121.4	152.4
Earnings before interest and taxes	100.0	78.9	78.5	129.1
Other income	100.0	239.3	168.6	171.7
Earnings before taxes	100.0	84.0	81.4	130.5
Taxes	100.0	78.5	70.7	112.9
Earnings after taxes	100.0	90.3	93.3	150.3

FINANCIAL STATEMENT ANALYSIS

Mucia Management Training
Budapest, Hungary

Ratio Analysis

- By analyzing the relationships between key financial variables, we can identify trends in financial performance, make comparisons to other enterprises, anticipate financial problems, and take corrective actions before they become fatal.

- Key financial ratios are generally grouped into four different categories.

  - **Profitability Ratios.** These are ratios designed to measure the earning power of the firm.

  - **Liquidity Ratios.** These are ratios designed to measure the ability of the firm to meet its short-term debts and obligations as they come due.

  - **Operating Efficiency Ratios.** These are ratios designed to measure how well the firm is using its resources.

  - **Capital Structure Ratios.** These are ratios designed to measure the dependence of the firm on debt.

All data in millions zloties

BALANCE SHEETS

	9 months 1990	1989	1988	1987
FIXED ASSETS				
- tangible fixed assets (I)	27,857	25,160	1,849	1,770
- assets under construction	5,865	1,526	277	48
- advance payments for investments	0	0	0	3
- capital investments (II)	70	70	24	5
	33.379	26,756	2,150	1,826
CURRENT ASSETS				
- inventories (III)	46,071	18,247	3,561	1,812
- receivables (IV)	12,503	12,965	1,630	991
- cash (V)	8,417	7,109	199	126
- prepayments and accruals	0	0	0	13
	66,991	38,321	5,390	2,942
TOTAL	100,783	65,077	7,450	4,768
SHAREHOLDERS EQUITY (VI)				
- basic assets and enterprise fund	1,843	1,857	1,872	1,923
- revaluation of fixed assets	23,930	23,930	747	747
- retained profits	18,620	1,450	852	11
- profit for current year	23,912	22,304	1,225	1,023
	68,305	49,541	4,696	3,704
LONG-TERM LIABILITIES (VII)	10	10	20	20
SHORT-TERM LIABILITIES (VIII)	32,411	15,508	2,821	1,042
ACCRUALS AND DEFERRED INCOME	57	18	3	2
TOTAL	100,783	65,077	7,540	4,768

(in millions zlotiez)

INCOME STATEMENT

	9 months 1990	1989	1988	1987
Sales (IX)	103,871	36,444	11,344	7,092
Costs (X)	(71,887)	(27,236)	(9,650)	(6,087)
Operating profit	31,984	9,208	1,694	1,005
Additional sale (XI)	21	46	36	0
Financial income (XII)	4,820	14,433	31	7
Tax returns (XIII)	5,482	920	469	365
Exceptional profits (XIV)	1,742	6,117	48	34
Exceptional losses (XIV)	(2,316)	(518)	(64)	(41)
Profit before taxation	41,733	30,206	2,214	1,385
Taxes paid from profit (XV)	(17,821)	(7,902)	(989)	(362)
Profit after taxation	23,912	22,304	1,225	1,023

EMPLOYMENT FIGURES AS AT 30TH SEPTEMBER 1990				
Plant	Administrative	Operational		Total
		Directly engaged in production	Others	
ŁODŹ	189	485	249	923
PODDĘBICE	55	471	155	681
UNIEJÓW	10	90	29	129
RAWA MAZOWIECKA	50	536	124	710
JANIKOWO	9	19	8	36
TOTAL	313	1,601	565	2,479

X. COSTS

(in millions zloties)

	9 months 1990	1989	1988	1987
Direct materials	36,162	16,231	6,056	4,126
Wages	17,912	6,252	1,858	946
Depreciation	1,437	143	87	51
Energy	1,673	254	83	51
Basic services	1,080	306	123	77
Maintenance	191	34	6	8
Other services	1,868	422	91	62
Taxes	3,822	1,729	405	208
Social securities	7,273	2,248	668	356
Interests	7,697	2,814	152	79
Workers fund rates	1,698	96	192	107
Changes in finished goods stocks	(8,949)	(3,293)	(71)	16
Turnover tax	23	-	-	-
TOTAL	71,887	27,236	9,650	6,087

MANUFACTURERS - MEN'S & BOYS' SUITS, COATS & OVERCOATS SIC# 2311

Current Data Sorted By Assets						Type of Statement	Comparative Historical Data	
1	4	3	6	1	1	Unqualified	17	19
						Qualified	2	1
	6	4	2	1		Reviewed	6	12
2	1	2				Compiled	6	4
		1	2	1		Other	4	4
	12(6/30-9/30/89)		26(10/1/89-3/31/90)				6/30/86-3/31/89	6/30/87-3/31/87
0-500M	500-2MM	2-10MM	10-50MM	50-100MM	100-250MM		ALL	ALL
3	11	10	10	3	1	NUMBER OF STATEMENTS	37	40
%	%	%	%	%	%	ASSETS	%	%
	4.8	8.9	3.6			Cash & Equivalents	6.9	10.5
	39.4	24.7	37.2			Trade Receivables - (net)	23.4	29.6
	37.3	43.7	33.6			Inventory	42.2	38.4
	.5	1.8	1.0			All Other Current	4.1	2.4
	82.0	79.2	75.7			Total Current	76.6	80.9
	13.8	18.7	13.8			Fixed Assets (net)	14.0	12.5
	.1	.2	2.7			Intangibles (net)	.6	.7
	4.2	3.9	7.7			All Other Non-Current	8.8	5.9
	100.0	100.0	100.0			Total	100.0	100.0
						LIABILITIES		
	12.8	21.5	18.0			Notes Payable-Short Term	14.7	13.3
	2.8	1.5	2.1			Cur. Mat.-L/T/D	1.3	1.5
	18.9	10.6	10.5			Trade Payables	12.7	11.9
	.9	.1	.5			Income Taxes Payable	1.4	1.2
	8.8	12.2	5.9			All Other Current	10.3	13.9
	45.5	45.6	37.6			Total Current	40.4	42.0
	8.3	12.3	13.8			Long Term Debt	8.8	10.0
	.1	.0	.5			Deferred Taxes	.4	.3
	4.3	3.6	6.2			All Other Non-Current	1.0	2.5
	43.8	38.2	42.0			Net Worth	48.3	45.2
	100.0	100.0	100.0			Total Liabilities & Net Worth	100.0	100.0
						INCOME DATA		
	100.0	100.0	100.0			Net Sales	100.0	100.0
	25.4	28.8	19.5			Gross Profit	24.9	26.5
	21.2	25.0	13.8			Operating Expenses	21.6	21.8
	4.2	3.5	5.6			Operating Profit	3.3	4.7
	.9	.7	1.5			All Other Expenses (net)	.4	.9
	3.3	2.8	4.2			Profit Before Taxes	2.8	3.7
						RATIOS		
	2.2	5.4	3.1			Current	3.4	2.2
	2.0	1.8	2.4				2.1	2.0
	1.4	1.1	1.3				1.4	1.3
	1.5	3.0	1.5			Quick	1.4	1.6
	.8	.7	1.3				.9	1.0
	.7	.3	.8				.5	.5
31	11.8	30 12.1	33 11.0			Sales/Receivables	23 15.9	26 13.8
51	7.2	46 8.0	55 6.6				45 8.1	43 8.5
82	5.9	69 5.3	111 3.3				69 5.3	72 5.1
14	25.9	72 5.1	37 9.9			Cost of Sales/Inventory	76 4.8	53 6.8
55	6.6	114 3.2	111 3.3				113 3.1	88 4.1
96	3.8	183 2.0	122 3.0				146 2.5	128 2.9
14	26.3	7 54.1	6 61.8			Cost of Sales/Payables	12 29.9	11 34.1
26	13.8	28 14.2	31 11.9				29 12.6	21 17.4
28	9.5	47 7.7	43 8.4				49 7.5	42 8.7
	8.7	3.3	2.8			Sales/Working Capital	3.5	3.4
	7.8	5.9	3.6				5.0	7.1
	17.4	NM	12.1				8.0	10.8
	5.5	20.7				EBIT/Interest	7.5	4.8
(10)	3.4	2.8					(34) 3.5	(35) 3.1
	1.9	.8					1.5	1.8
						Net Profit + Depr., Dep., Amort./Cur. Mat. L/T/D	7.9	15.6
							(21) 3.6	(24) 4.9
							1.5	1.8
	.1	.1	.1			Fixed/Worth	.1	.1
	.3	.4	.3				.3	.3
	.4	1.3	.8				.5	.5
	.7	.7	1.0			Debt/Worth	.0	.8
	1.2	3.1	1.4				1.0	1.7
	3.1	7.0	3.0				2.1	2.8
	53.5	77.8				% Profit Before Taxes/Tangible Net Worth	23.4	33.1
	28.4	32.9					(35) 14.8	18.4
	13.2	−18.8					2.2	5.4
	15.1	18.5	11.0			% Profit Before Taxes/Total Assets	12.0	10.3
	12.4	5.4	5.1				5.8	8.5
	7.3	−2.6	1.8				.8	2.9
	76.5	79.2	85.9			Sales/Net Fixed Assets	31.2	42.1
	27.5	27.8	14.3				15.9	20.1
	16.1	8.7	8.5				9.9	12.3
	4.0	2.0	2.2			Sales/Total Assets	2.5	2.8
	3.0	1.8	1.8				1.8	2.2
	2.7	1.5	1.5				1.8	1.6
			.3			% Depr., Dep., Amort./Sales	.8	.5
			1.6				(34) 1.2	(33) .9
			2.4				1.9	1.4
						% Officers' Comp/Sales	1.7	1.5
							(13) 3.1	(16) 2.8
							7.8	5.2
1388M	47791M	616345M	5287033M	3565548M	3565545M	Net Sales ($)	879705M	10468209M
350M	14286M	48229M	2876339M	2107954M	2078468M	Total Assets ($)	5479777M	5767069M

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$$ = $thousand MM = $million

See Pages 1 through 15 for Explanation of Ratios and Data

Profitability Ratios

- **Return on Sales.**

$$\text{Return on Sales} = \frac{\text{Earnings after Tax}}{\text{Net Sales}}$$

- **Interpretation.** This ratio measures the percentage of each unit of sales left over after paying all of the costs of doing business. This ratio should increase as the volume of business expands because fixed costs are spread over more units of sales.

- **Return on Investment.**

$$\text{ROI} = \frac{\text{Earnings after Tax}}{\text{Net Sales}}$$

- **Interpretation.** This ratio measures the percentage return on the physical assets used by the firm. Efficient management of assets leads to higher ROIs.

- **Return on Equity.**

$$\text{ROE} = \frac{\text{Earnings after Tax}}{\text{Equity}}$$

- **Interpretation.** This ratio is a measure of the return on the capital invested in the firm. If this return is too low, equity holders are not being compensated for the use of their money and the firm could find it more difficult to raise capital in the future.

Liquidity Ratios

- **The Current Ratio.**

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

- **Interpretation.** The current ratio is a rough indication of a firm's ability to service its current obligations. The higher the current ratio, the greater the cushion between current obligations and a firm's ability to pay them.

- **The Quick Ratio.**

$$\text{Quick Ratio} = \frac{\text{Cash Equivalents} + \text{Receivables}}{\text{Current Liabilities}}$$

- **Interpretation.** This ratio is a refinement of the current ratio and is a more conservative measure of liquidity. The ratio expresses the degree to which a firm's current liabilities are covered by its most liquid current assets. A ratio of less than 1 signals a potential cash shortage.

- **Average Collection Period.**

$$\text{ACP} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$$

- **Interpretation.** This ratio expresses the average time in days that receivables are outstanding. Generally, the greater the number of days outstanding, the greater the probability of delinquencies.

- **Inventory Turnover.**

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

- **Interpretation.** This ratio measures the number of times inventory is turned over during the year. High inventory turnover can indicate better liquidity or superior merchandising. Conversely, it can indicate a shortage of needed inventory for sales. Low inventory turnover can indicate poor liquidity, possible overstocking, or obsolete items. When business is seasonal, this ratio should vary through the year.

- **Payables Turnover.**

$$\text{Payables Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Trade Payables}}$$

- **Interpretation.** This ratio measures the number of times trade payables turn over during the year. The higher the turnover of payables, the shorter the time between purchase and payment. If this ratio is increasing, it may mean that the firm is experiencing cash shortages and losing the benefit of any discounts for prompt payment. Alternatively, an increase in this measure may also mean that suppliers are helping to finance the firm's inventory.

Operating Efficiency Ratios

- **Net Sales per Employee.**

$$\text{Net Sales per Employee} = \frac{\text{Net Sales}}{\text{Number of Employees}}$$

- **Interpretation.** This is a measure of how capital or labor intensive the firm is. A low measure indicates that the firm is very labor intensive. Alternatively, a low measure may indicate overstaffing or that labor resources are not managed well.

- **Net Sales to Working Capital.**

$$\text{Net Sales to Working Capital} = \frac{\text{Net Sales}}{\text{Working Capital}}$$

- **Interpretation.** Working capital is a measure of the margin of protection for current creditors. it reflects the ability to finance current operations. This ratio measures how efficiently working capital is being used. A low ratio may indicate an inefficient use of working capital while a high ratio may indicate that creditors are at risk.

- **Net Sales to Total Assets.**

$$\text{Net Sales to Total Assets} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

- **Interpretation.** This ratio is a measure of the productive use of a firm's assets. A highly labor intensive operation or depreciated fixed assets may distort this ratio.

Capital Structure Ratios

- **Fixed Asset-Equity Ratio**

$$\text{Fixed Asset} - \text{Equity Ratio} = \frac{\text{Fixed Assets}}{\text{Equity}}$$

- **Interpretation.** This ratio measures the extent to which owner's equity has been invested in plant and equipment (fixed assets). A lower ratio indicates a smaller investment in fixed assets and a better cushion for creditors in the event of a liquidation.

- **Debt-Equity Ratio**

$$\text{Debt} - \text{Equity Ratio} = \frac{\text{Total Debt}}{\text{Equity}}$$

- **Interpretation.** This ratio expresses the relation between capital contributed by creditors and that contributed by the owners. It expresses the degree of protection provided by the owners for the creditors. The higher the ratio, the greater the risk being faced by creditors. A lower ratio generally indicates greater long-run financial safety. A firm with a low debt-equity ratio usually has greater flexibility to borrow in the future.

- **Times Interest Earned.**

$$\text{Times Interest Earned} = \frac{\text{E.B.I.T.}}{\text{Interest Expense}}$$

- **Interpretation.** This ratio is a measure of a firm's ability to meet interest payments. A high ratio may indicate that the firm will have little difficulty in meeting the interest obligations of a loan. This ratio also serves as an indicator of a firm's ability to take on additional debt.

The Unidentified Industries Case

- Try to match the following five companies with their corresponding balance sheets and financial ratios.
  - An Electrical Utility.
  - A Japanese Trading Company.
  - An Automobile Manufacturer.
  - A Supermarket Chain.
  - A Retail Jewelry Chain.

	A	B	C	D	E
Balance Sheet Percentages					
Cash and marketable	15.4%	7.6%	.5%	2.7%	7.2%
Receivables	15.6	2.2	3.8	19.0	60.3
Inventories	26.5	41.4	2.2	55.8	8.7
Other current assets	2.0	4.7	2.6	1.1	7.3
Property and equipment (net)	29.6	42.9	90.0	21.4	4.3
Other assets	10.9	1.2	.9	–	12.2
Total assets	100.0%	100.0%	100.0%	100.0%	100.0%
Notes payable	–	2.3%	3.1%	4.9%	50.8%
Accounts payable	15.1%	33.3	2.6	8.0	15.2
Accrued taxes	3.9	4.0	1.4	6.6	.5
Other current liabilities	11.5	–	2.6	5.0	5.2
Long-term debt	5.8	6.7	43.3	11.4	22.7
Other liabilities	4.3	3.2	1.8	–	1.3
Owners' equity	59.4	50.5	45.2	64.1	4.3
Total liabilities and equity	100.0%	100.0%	100.0%	100.0%	100.0%
Selected Ratios					
Net profits/net sales	.04	.02	.15	.04	.01
Net profits/total assets	.06	.09	.05	.12	.01
Net profits/owners' equity	.10	.19	.11	.12	.13
Net sales/total assets	1.65	6.06	.32	1.94	2.07
Receivables collection period (days)	33	1	44	61	106
Inventory turnover	5.2	11	–	2.4	2.3
Total debt/total assets	.41	.50	.55	.36	.96
Long-term debt/owners' equity	.10	.13	.96	.18	5.25
Current assets/current liabilities	1.62	1.41	.93	4.02	1.02
Quick ratio	1.08	.37	.64	.93	.90
Average price/earnings ratio	10.5	12.0	7.5	16.0	15.0

FINANCIAL FORECASTING

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Murphy's Apparel Case

- **The Assumptions.**

1. Sales will be seasonal, peaking in the summer. In general, sales will increase by 10% annually.
2. About 10% of sales will be for cash. Credit terms during summer peak months will be about eight weeks, off-season collections average four weeks.
3. Suppliers will require payment within 30 days.
4. The bank will not allow more than the current $50,000 credit line.
5. The expected purchase of new equipment will require a $15,000 payment in May 1990.
6. Cost of sales will be 79% of sales.
7. Selling and administrative expenses will be 9% of sales.
8. Fixed operating costs will be $5,400 a month, including $500 depreciation expense.
9. The monthly lease and interest payments will total $3,000. This is a simplifying assumption, since interest costs will depend on the actual amount borrowed.
10. No taxes will be paid because of a tax loss carryforward.

- **The Sales Forecast.**

	Net Sales	*Cash Sales (10%)*	*Credit Sales*
1989:			
September	$ 95	$10	$ 85
October	75	8	67
November	55	6	49
December	45	5	40
1990:			
January	35	4	31
February	45	5	40
March	70	7	63
April	105	11	94
May	145	15	130
June	180	18	162
July	165	17	148
August	135	14	121

- **The Collections and Payments Forecast.**

Collections from Accounts Receivable	*Purchases of Merchandise**
$111	$ 67
144	51
137	40
51	32
41	32
32	45
39	69
61	99
16	128
85	136
117	119
159	95

- **The Cash Budget.**

	1989				1990							
	Sept.	*Oct.*	*Nov.*	*Dec.*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*
Receipts:												
Cash sales	$ 10	$ 8	$ 6	$ 5	$ 4	$ 5	$ 7	$ 11	$ 15	$ 18	$ 17	$ 14
Collections	111	144	137	51	41	32	39	61	16	85	117	159
Total receipts	$121	$152	$143	$ 56	$ 45	$ 37	$ 46	$ 72	$ 31	$103	$134	$173
Disbursements:												
Accounts payable payments	$ 84	$ 67	$ 51	$ 40	$ 32	$ 32	$ 45	$ 69	$ 99	$128	$136	$119
Administrative and selling expenses	9	7	5	4	3	4	6	9	13	16	15	12
Fixed costs*	5	5	5	5	5	5	5	5	5	5	5	5
Lease and interest	3	3	3	3	3	3	3	3	3	3	3	3
New equipment	0	0	0	0	0	0	0	0	15	0	0	0
Total disbursements	$101	$ 82	$ 64	$ 52	$ 43	$ 44	$ 59	$ 86	$ 135	$152	$159	$139
Receipts less disbursements	$ 20	$ 70	$ 79	$ 4	$ 2	$ (7)	$ (13)	$ (14)	$ (104)	$ (49)	$ (25)	$ 34
Cumulative cash flow	20	90	169	173	175	168	155	141	37	(12)	(37)	(3)
Monthly cash change:												
Beginning cash	$ 9	$ 29	$ 99	$178	$182	$184	$177	$164	$ 150	$ 46	$ (3)	$ (28)
Change in cash	20	70	79	4	2	(7)	(13)	(14)	(104)	(49)	(25)	34
Ending cash	$ 29	$ 99	$178	$182	$184	$177	$164	$150	$ 46	$ (3)	$ (28)	$ 6

*Not including depreciation.

Murphy's Apparel—Part Two.

- In the previous case, Murphy's production was seasonal. The majority of their production was in May, June, July and August which corresponds to the season of peak sales.
- Murphy's is now considering whether to produce at a constant rate year round. The benefit of level production, however, is that it would reduce the cost of goods sold from 79 percent of sales to 77 percent of sales. Over the next 12 months, this would lead to a savings of 23.
- Moving to level production, however, would increase the size of the inventory during the off season months and would require additional borrowing. The additional cost of interest would reduce the savings. Assume that the cost of borrowing is 5 percent per month.
- Revise the cash budget to reflect level production and compute the cash balance each month.
    - Sales and collections remain the same.
    - Accounts payable each month will equal the total cost of goods sold divided by 12; $888/12 = 74$.
    - All other expenses remain the same except for interest.
    - Calculate the additional interest expense by adding 5 percent of the loan amount at the end of the previous month to the interest cost for the current month.
- Does the line of credit with the bank have to be increased?

- Does it make sense to go to level production?

	1989			
	Sept.	*Oct.*	*Nov.*	*Dec.*
Receipts:				
Cash sales	$ 10	$ 8	$ 6	$ 5
Collections	111	144	137	51
Total receipts	$121	$152	$143	$ 56
Disbursements:				
Accounts payable payments	$ 84	$ 67	$ 51	$ 40
Administrative and selling expenses	9	7	5	4
Fixed costs*	5	5	5	5
Lease and interest	3	3	3	3
New equipment	0	0	0	0
Total disbursements	$101	$ 82	$ 64	$ 52
Receipts less disbursements	$ 20	$ 70	$ 79	$ 4
Cumulative cash flow	20	90	169	173
Monthly cash change:				
Beginning cash	$ 9	$ 29	$ 99	$178
Change in cash	20	70	79	4
Ending cash	$ 29	$ 99	$178	$182

*Not including depreciation.

	1989				1990							
	Sept.	*Oct.*	*Nov.*	*Dec.*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*
Receipts:												
Cash sales	$ 10	$ 8	$ 6	$ 5	$ 4	$ 5	$ 7	$ 11	$ 15	$ 18	$ 17	$ 14
Collections	111	144	137	51	41	32	39	61	16	85	117	159
Total receipts	$121	$152	$143	$ 56	$ 45	$ 37	$ 46	$ 72	$ 31	$103	$134	$173
Disbursements:												
Accounts payable payments	$ 84	$ 67	$ 51	$ 40	$ 32	$ 32	$ 45	$ 69	$ 99	$128	$136	$119
Administrative and selling expenses	9	7	5	4	3	4	6	9	13	16	15	12
Fixed costs*	5	5	5	5	5	5	5	5	5	5	5	5
Lease and interest	3	3	3	3	3	3	3	3	3	3	3	3
New equipment	0	0	0	0	0	0	0	0	15	0	0	0
Total disbursements	$101	$ 82	$ 64	$ 52	$ 43	$ 44	$ 59	$ 86	$ 135	$152	$159	$139
Receipts less disbursements	$ 20	$ 70	$ 79	$ 4	$ 2	$ (7)	$ (13)	$ (14)	$(104)	$ (49)	$ (25)	$ 34
Cumulative cash flow	20	90	169	173	175	168	155	141	37	(12)	(37)	(3)
Monthly cash change:												
Beginning cash	$ 9	$ 29	$ 99	$178	$182	$184	$177	$164	$ 150	$ 46	$ (3)	$ (28)
Change in cash	20	70	79	4	2	(7)	(13)	(14)	(104)	(49)	(25)	34
Ending cash	$ 29	$ 99	$178	$182	$184	$177	$164	$150	$ 46	$ (3)	$ (28)	$ 6

*Not including depreciation.

	1989				1990							
	Sept.	*Oct.*	*Nov.*	*Dec.*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*
Receipts:												
Cash sales	$ 10	$ 8	$ 6	$ 5	$ 4	$ 5	$ 7	$ 11	$ 15	$ 18	$ 17	$ 14
Collections	111	144	137	51	41	32	39	61	16	85	117	159
Total receipts	$121	$152	$143	$ 56	$ 45	$ 37	$ 46	$ 72	$ 31	$103	$134	$173
Disbursements:												
Accounts payable payments	$ ~~94~~ 74	$ ~~87~~ 74	$ ~~71~~ 74	$ ~~40~~ 74	$ ~~32~~ 74	$ ~~32~~ 74	$ ~~45~~ 74	$ ~~69~~ 74	$ ~~96~~ 74	~~$120~~ 74	~~$136~~ 74	~~$110~~ 74
Administrative and selling expenses	9	7	5	4	3	4	6	9	13	16	15	12
Fixed costs*	5	5	5	5	5	5	5	5	5	5	5	5
Lease and interest	3	3	3	3	3	3	3	3.15	4.10	8.11	9.11	6.52
New equipment	0	0	0	0	0	0	0	0	15	0	0	0
Total disbursements	~~$101~~ 91	~~$ 89~~ 89	~~$ 84~~ 87	~~$ 52~~ 86	~~$ 43~~ 85	~~$ 44~~ 86	~~$ 59~~ 88	~~$ 86~~ 91.15	~~$ 135~~ 111.1	~~$152~~ 103.11	~~$150~~ 102.11	~~$189~~ 97.52
Receipts less disbursements	$ 20	$ 70	$ 79	$ 4	$ 2	$ (7)	$ (13)	$ (14)	$(104)	$ (49)	$ (25)	$ 34
Cumulative cash flow	20	90	169	173	175	168	155	141	37	(12)	(37)	(3)
Monthly cash change:												
Beginning cash	$ 9	$ ~~20~~ 37	$ ~~89~~ 102	~~$170~~ 158	~~$182~~ 128	~~$184~~ 88	~~$177~~ 39	~~$164~~ -3	$ ~~150~~ -22.15	$ ~~46~~ -102.25	$ ~~(3)~~ -102.36	$ ~~(20)~~ 70.49
Change in cash	30 ~~-20~~	63 ~~70~~	56 ~~79~~	-30 ~~-4~~	-40 ~~-2~~	-49 ~~(7)~~	-42 ~~(13)~~	-19.15 ~~(14)~~	-80.1 ~~(104)~~	-.11 ~~(49)~~	31.14 ~~(25)~~	75.49 ~~-84~~
Ending cash	$ ~~29~~ 39	$ ~~99~~ 102	~~$178~~ 158	~~$182~~ 128	~~$174~~ 88	~~$177~~ 39	~~$164~~ -3	~~$159~~ -22.15	$ ~~-46~~ -102.25	$ ~~(3)~~ -102.36	$ ~~(20)~~ 70.49	$ ~~-0~~ 4.98

*Not including depreciation.

364

XYZ Inc. for the fiscal year ending on December 31, 1988, had the income statement and balance sheet presented in Exhibits 1 and 2, respectively. Assuming that sales were to increase by 15% in 1989 and that new fixed assets amounting to $150 would be purchased, what would the income statement and balance sheet look like at the end of next year and how much outside funds would be required if the firm were going to repay the current notes payable? Assume all new borrowing will have an interest rate of 13%. The interest rate on the outstanding long-term debt is 11.75%.

The simplest and most widely used approach is the percentage-of-sales approach, in which the forecasts are all based on sales. The assumption is that certain items on the income statement and balance sheet will remain unchanged, but items that do change with sales are a constant percentage of sales.

Exhibit 1
XYZ Inc. Income Statement

December 31, 1987-December 31, 1988

Sales		$1,200
Cost of Goods Sold:		
Beg. Inventory	$295	
+ Purchases	760	
- Ending Inventory	$335	
Total Cost of Goods Sold		720
Gross Profit		480
Depreciation		100
Selling & Administrative Exp.		96
Profit Before Interest & Taxes		284
Interest		48
Profit Before Taxes		236
Taxes		113
Net Income		123
Less: Dividends		50
Additions to Retained Earnings		$ 73

Exhibit 2
XYZ Inc. Balance Sheet

December 31, 1988

Assets		Liabilities & Net Worth	
Cash	$ 24	Notes Payable, Bank	$ 75
Accounts Rec.	220	Accounts Payable	120
Inventory	335	Income Taxes Payable	35
Total Curr. Assets	579	Other Accruals	10
		Total Curr. Liab.	240
Fixed Assets, Net	400		
Other Assets	61	Long-Term Debt	325
Total Assets	$1,040	Common Stock ($1 par)	50
		Retained Earnings	425
		Total Liab. & N.W.	$1,040

A. Income Statement

The place to begin is the income statement. Our key assumptions are as follows:

1. Cost of goods sold will be the same percentage of sales in 1989 as it was in 1988, $720/$1,200 = 60%.

2. Depreciation in 1989 will be the same as 1988.

3. Selling and administrative expenses will increase with sales and represent the same percentage of sales in 1989 as in 1988, $96/$1,200 = 8%.

4. Because we do not know how much outside financing will be required, the interest expense on the initial estimate will be the same in 1989 as in 1988. Note that this figure includes the $38 of interest on the long-term debt of $325 and the $10 of interest on the short-term debt of $75.

5. The effective tax rate will be the same percentage of taxable income in 1989 as it was in 1988, $141/$294 = 48%.

6. Dividends remain at the same level in 1989.

Exhibit 3
Forecasted XYZ Inc. Income Statement

December 31, 1988-December 31, 1989

Sales ($1,200 x 1.15)	$1,380
Cost of Goods Sold ($1,380 x 60%)	828
Gross Profit	480
Depreciation	100
Selling & Administrative Exp. ($1,380 x 8%)	110
Profit Before Interest & Taxes	342
Interest	48
Profit Before Taxes	294
Taxes ($294 x 48%)	141
Net Income	153
Less: Dividends	50
Additions to Retained Earnings	$ 103

B. Balance Sheet

For the forecasted balance sheet, certain items do not change; others are forecasted as a percentage of sales, while others depend on the assumptions about policy. An item-by-item discussion follows:

1. Forecasted cash needs depend on the situation. Often a percentage of sales is not appropriate. However, as a first approximation, we will assume that cash is 2% of sales (from 1988, $24/$1,200 = 2%).

2. Accounts receivable as a percentage of sales in 1988 was 18.333% ($220/$1,200). Assuming that accounts receivable will remain the same, percentage of sales yields an estimate of $253 (18.333% x $1,380) for 1989. Note that this assumption is consistent with no change in accounts-receivable policy.

   An alternative way of estimating accounts receivable is based on the fact that accounts receivable is usually measured in terms of days sales outstanding (DSO). In 1988 XYZ had approximately 67 days worth of sales in accounts

receivable (Accounts receivable/Sales per day) for a DSO of 67 days. Assuming that the accounts-receivable policy will not change, the estimate of the accounts receivable for 1989 is sales per day x 67 days, or $253. Note that this method gives the same answer as the percentage-of-sales approach used, but the unit of measurement is different. Estimating accounts receivable in this manner makes it easier to estimate if there is a change in accounts-receivable policy, such as a proposed reduction of the DSO to 30 days.

3. Inventory can be estimated as a straight percentage of sales. In 1988 it was 27.92%. Assuming that inventory is a constant percentage of sales yields an estimate for 1989 of $385 (.2792 x $1,380).

   An alternative way of estimating inventory is based on the inventory turnover (Cost of goods sold/Inventory). In 1988 the inventory turnover was 2.15. The estimate for 1989 is the cost of goods sold in 1989 divided by 2.15, or $385. Again the result is the same, but using inventory turnover bases the estimate of the inventory in 1989 on the inventory policy of the firm, which is usually stated in terms of inventory turnover.

4. Fixed assets are almost never a constant percentage of sales. A firm with excess capacity can usually increase sales without an increase in fixed assets. In other cases, an increase in sales requires a larger than proportional increase in fixed assets: it is difficult to build half a factory. In this example, the fixed-assets estimate assumes that $150 in new assets are purchased. The estimate for 1989 is the 1988 figure plus $150 less the depreciation in 1989.

5. Other assets are assumed to be a constant percentage of sales, which may or may not be reasonable. In 1988 other assets represented about 5% of sales. The 1989 estimate is made on this basis.

6. Using a simple percentage-of-sales approach gives accounts payable as 10% of sales in 1988. Assuming no change in the payable policy of the firm, the estimate for 1989 would be $138 (10% x $1,380).

   Accounts payable can also be based on days' purchases outstanding (Accounts payable/Purchases per day). In 1988 the days' purchases outstanding were 57.6 days [120/(760/365)]. Assuming that this payment policy does not change, the estimate will be based on a days' purchases outstanding of 57.6 days. Purchases in 1989 will be equal to

	Cost of Goods Sold	$828
+	Ending Inventory	+385
-	Beginning Inventory	-335
	Purchases	$878

Accounts payable will then be (purchases/365) x 57.6 days, or $138. Again the answer is the same, but this approach makes the accounts-payable estimate for a change in payable policy easier to adjust.

7. Income taxes payable and other accruals are estimated on the assumption that they will be the same percentage of sales in 1989 as in 1988.

8. Long-term debt does not change, because no debt is being paid off.

9. Common stock has no change.

10. Retained earnings are equal to last year's retained earnings plus additions to retained earnings in 1989.

11. Notes payable is assumed to be zero, and we create a new category, "New Financing", which is the estimate of outside financing required to make assets balance liabilities and net worth.

Exhibit 4 presents the forecasted balance sheet for 1989, where X is the amount of outside financing required to support the projected 15% increase in sales for 1989. In order for assets to equal liabilities and net worth, X must be equal to $91.

Exhibit 4
Forecasted XYZ Inc. Balance Sheet

December 31, 1989

Assets		Liabilities & Net Worth	
Cash	$ 27	Notes Payable	$ 0
Accounts Rec.	253	Acccunts Payable	138
Inventory	385	Income Taxes Payable	40
Total Curr. Assets	665	Other Accruals	12
		Total Curr. Liab.	190
Fixed Assets (Net)	450	New Financing	X
Other Assets	69	Long-Term Debt	325
Total Assets	$1,184	Common Stock ($1 par)	50
		Retained Earnings	528
		Total Liab. & N. W.	$1,093+X

BREAKEVEN ANALYSIS

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374

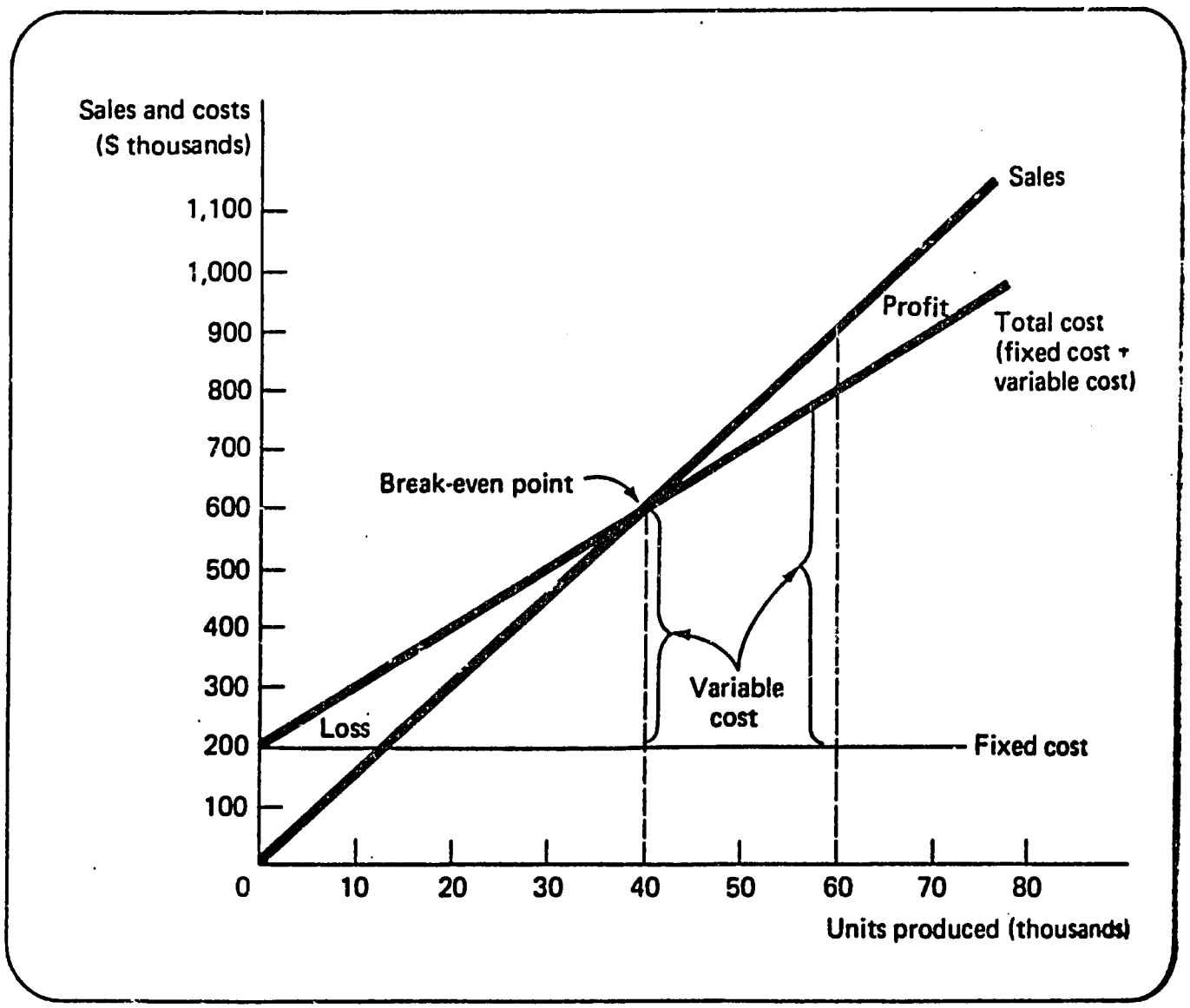
Costs of Arcan Corporation	
Fixed costs:	
Depreciation	$100,000
Plant maintenance	15,000
Executive salaries	40,000
Rentals	8,000
Office expense	12,000
Advertising	5,000
Interest on debt	20,000
Total	$200,000
Variable costs per unit of output:	
Labor	$ 3.00
Materials	5.00
Sales commissions	2.00
Total	$10.00

375

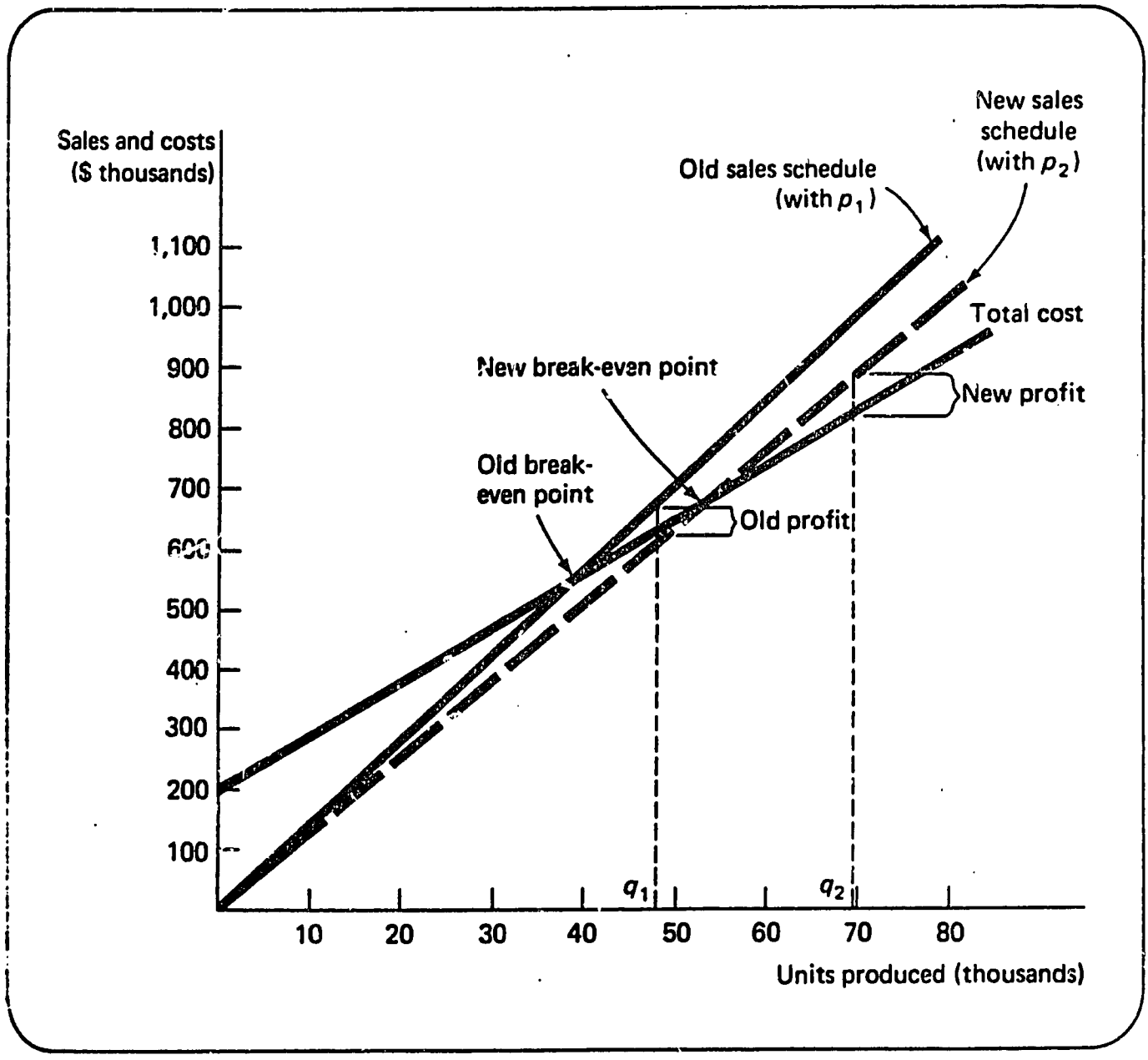
Exhibit 12-2. Arcan Corporation Cost and Profit Schedule

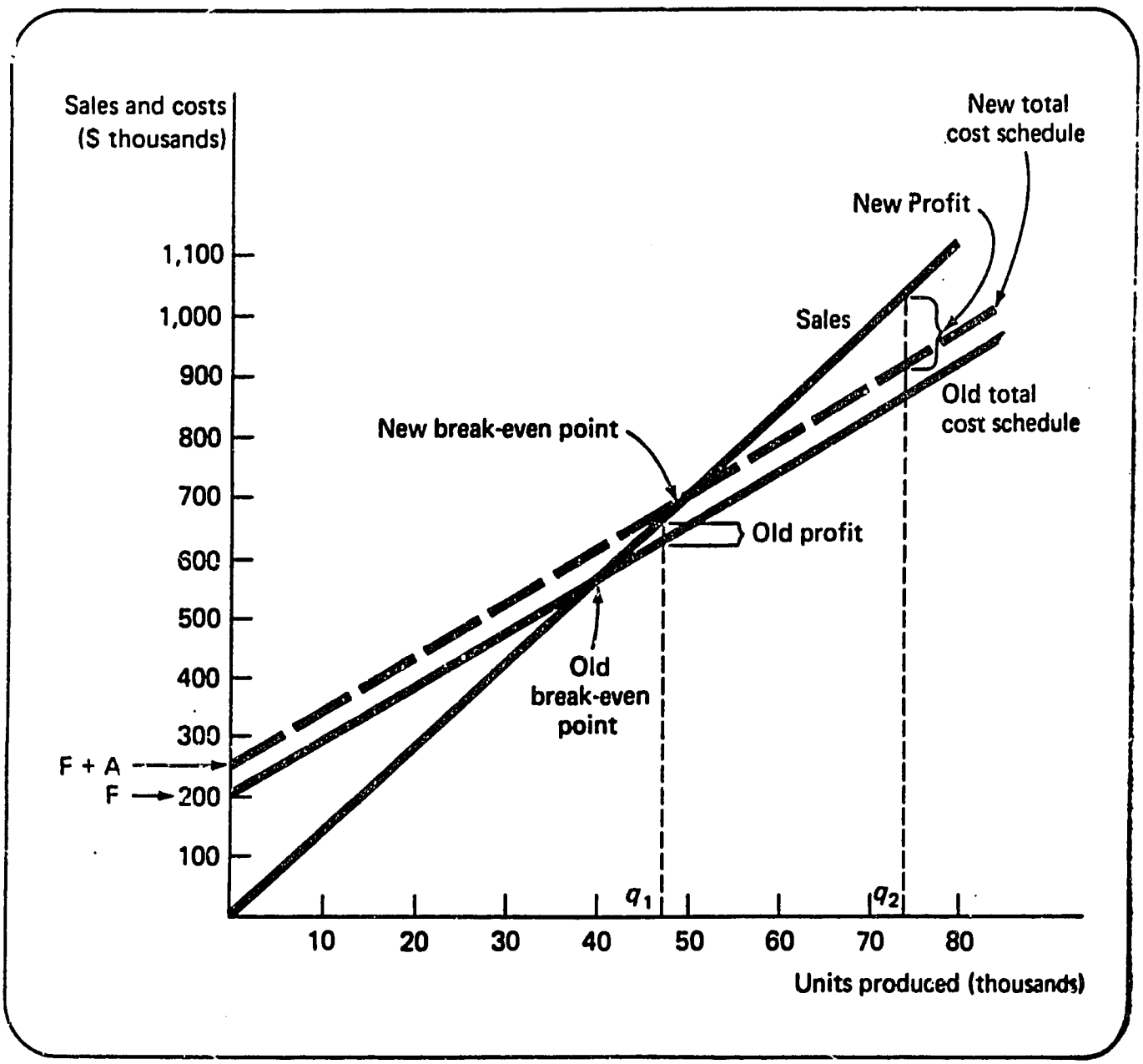
Units sold x	Total fixed cost F	Total variable cost vx	Total cost $F + vx$	Sales px	Profit" (loss) (sales − total cost)
0	$200,000	$ 0	$200,000	$ 0	$(200,000)
10,000	200,000	100,000	300,000	150,000	(150,000)
20,000	200,000	200,000	400,000	300,000	(100,000)
30,000	200,000	300,000	500,000	450,000	(50,000)
40,000	200,000	400,000	600,000	600,000	0
50,000	200,000	500,000	700,000	750,000	50,000
60,000	200,000	600,000	800,000	900,000	100,000
70,000	200,000	700,000	900,000	1,050,000	150,000

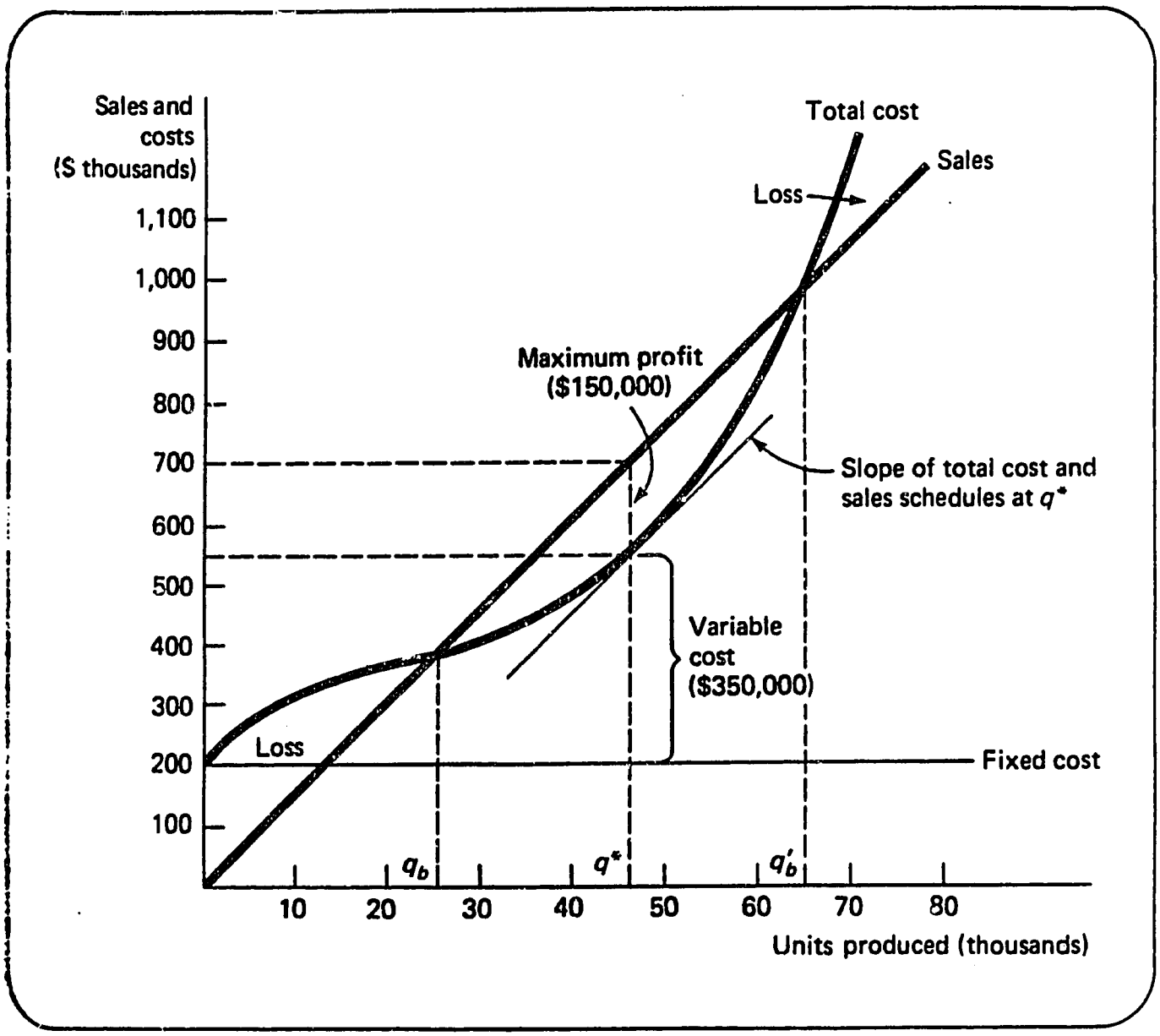
Unit selling price $p = \$15.00$
Fixed costs $F = \$200,000$
Unit variable cost $v = \$10.00$
Total cost $F + vx = \$200,000 + \$10x$
Break-even point = 40,000 units


Sales and costs
($ thousands)
1,100
1,000
900
800
700
600
500
400
300
200
100
0
10
20
30
40
50
60
70
80
Units produced (thousands)
Sales
Profit
Total cost
(fixed cost +
variable cost)
Break-even point
Variable
cost
Loss
Fixed cost

371


Sales and costs
($ thousands)
1,100
1,000
900
800
700
600
500
400
300
200
100
New sales
schedule
(with p_2)
Old sales schedule
(with p_1)
Total cost
New break-even point
New profit
Old break-
even point
Old profit
q_1
q_2
10
20
30
40
50
60
70
80
Units produced (thousands)


Sales and costs
(S thousands)
1,100
1,000
900
800
700
600
500
400
300
F + A
F
200
100
New total
cost schedule
New Profit
Sales
Old total
cost schedule
New break-even point
Old profit
Old
break-even
point
q_1
q_2
10
20
30
40
50
60
70
80
Units produced (thousands)


Sales and costs ($ thousands)
1,100
1,000
900
800
700
600
500
400
300
200
100
Total cost
Sales
Loss
Maximum profit ($150,000)
Slope of total cost and sales schedules at q^*
Variable cost ($350,000)
Loss
Fixed cost
q_b
q^*
q_b'
10
20
30
40
50
60
70
80
Units produced (thousands)

Midwest Universities Consortium for International Activities, Inc.

Management Training and Economics Education in Central and Eastern Europe Project

PROFESSIONAL MANAGERS PROGRAM

ACCOUNTING AND FINANCE FOR NON-FINANCIAL MANAGERS

Fundamentals, New Developments and Practical Applications

SESSION 3

Capital Investment Decisions

Module Instructor:

Professor Andrew Karolyi
College of Business
Ohio State University

SESSION 3

CAPITAL INVESTMENT DECISIONS

TOPIC 1
THE TIME VALUE OF MONEY

• Every manager is engaged in decision-making which involves the immediate commitment of a sum of money with the expectation of a larger return in the future:

Research and development money is spent today with the hope of increasing profit at a later date.

Factories and machines are acquired in anticipation that they will produce income for the company in excess of their salaries.

Money is borrowed with the realization that the amount to be paid back will exceed the amount borrowed.

• In evaluating and comparing investment proposals, we will want to examine the payments and receipts that arise from accepting these proposals. The problem: money today is worth more than money tomorrow. This is called the TIME VALUE OF MONEY. This is related to the concept of interest or, what economists like to call, the *opportunity cost* of passing up the earning potential of money today. With these investment proposals, the payments and receipts happen at different times. We need to make these cash flows comparable, so that all the benefits and costs of the investment proposals can be measured in today's money and so that today's value of the investment can be determined.

• We need to understand the mathematics of interest for advanced financial management. This is the objective of the first segment of our session on Capital Investment Decisions.

A. COMPOUND VALUES

• Suppose we place $100 in a savings account in a bank that pays 8 percent interest each year. How will our savings grow?

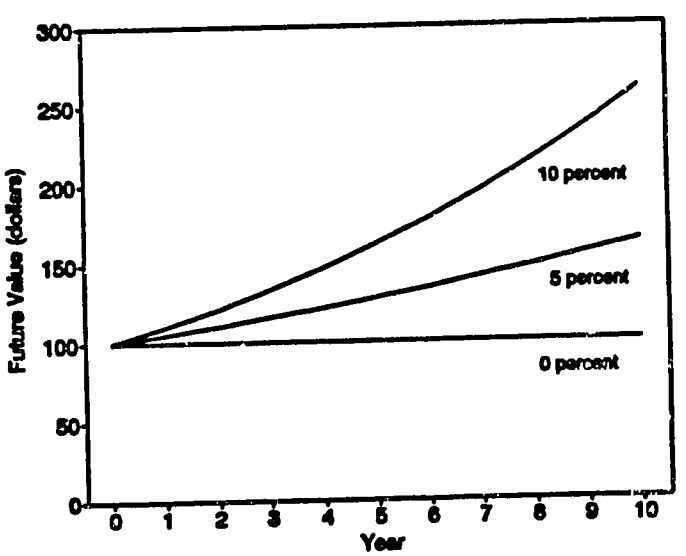
At the end of one year?

If we leave money on deposit, at the end of two years?

• For convenience, the compound value concept can be stated in a simple general formula:

$$\boxed{F_n = P(1+i)^n}$$

where F_n is the future value of the investment at the end of year n, i is the annual interest rate and P is the original amount invested at the beginning of the first year. We can see how the value of an $100 investment grows at different rates of interest from the following graph:



Suppose $100 was left on deposit at 8 percent for 10 years. What is the amount available at that time?

• Because the calculations can be quite time consuming when an investment is held for a number of years, tables have been compiled for values of $(1+i)^n$. (See Table A).

EXAMPLE: How many years will it take for an initial investment of $300 to grow to $774 if it is invested at 9 percent compounded annually?

354

B. COMPOUND VALUES WITH NON-ANNUAL PERIODS

• Interest is frequently compounded on other than a yearly basis. For example, a bank may advertise that is pays interest on a savings account every quarter. Quarterly compounding means that one-fourth of a year's interest is added to the account each quarter, and the interest for the next quarter is computed on the new balance. This raises the *effective* interest rate on the money because the interest is earned sooner than with annual compounding.

• Suppose we receive 8 percent on our $100 savings for the year but quarterly compounded. That is, we receive 2 percent per quarter for four quarters. What is our savings at the end of one year?

• For convenience, we can generalize the compound value formula for non-annual periods:

$$\boxed{F_n = P(1 + \frac{i}{m})^{mn}}$$

where m is the number of times compounding occurs in a year.

EXAMPLE: Suppose you recently sold your Fiat for $10000 and placed this amount in a savings account paying 12 percent compounded monthly. What is the amount of money accrued after five years if there are no withdrawals from the account?

C. PRESENT VALUE

• Money on hand today can be invested to grow to larger amounts in the future, so that money at a future date is worth less than money today. We can reverse the questions:

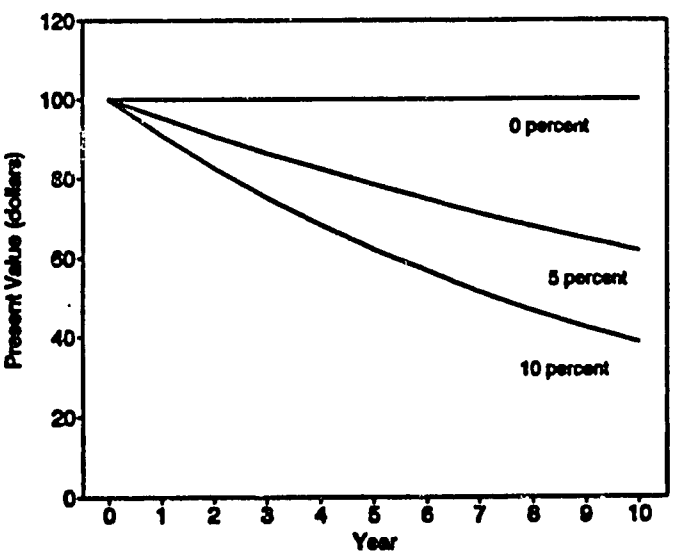
What is the value today of a sum of money to be received in the future?

• In *compounding* we needed to know the initial investment and the compounding rate of interest; to find the *present value* we talk about the *opportunity cost* of money or the *discount rate* and the present value of the future cash flow.

• The mathematical equation is again simple:

$$\boxed{P = \frac{F_n}{(1+i)^n}}$$

• To aid in the computation of present values, tables have been compiled for values of $1/(1+i)^n$. (See Table B). The following figure shows the present value of a future cash payment of $100 at different future dates and different rates of interest:



EXAMPLE: What is the present value of $1500 to be received at the end of 10 years if our opportunity cost for funds is 8 percent?

386

D. ANNUITIES

• Many business decisions involve an expenditure today with an expectation of a *series* of cash receipts in the future. One can determine the value of the investment by finding the present value of each future payment and adding up the present values.

• Suppose a company has a number of investment alternatives that each will earn 6 percent. One particular investment opportunity is expected to return cash of \$500000 per year for each of the next five years. Is the investment worth its \$2000000 cost?

A Five-Year Annuity at \$500 per year Discounted at 6 Percent

Year	0	1	2	3	4	5
Received at End of Year		500	500	500	500	500
	471.70					
	445.00					
	419.80					
	396.05					
	373.65					
Present Value of Annuity	2106.20					

$$P = \$500\frac{1}{(1+.06)} + \$500\frac{1}{(1+.06)^2} + \$500\frac{1}{(1+.06)^3} + \$500\frac{1}{(1+.06)^4} + \$500\frac{1}{(1+.06)^5}$$

• The formula for the present value of an annuity of cash flows is:

$$\boxed{P = A\left(\sum_{t=1}^{n} \frac{1}{(1+i)^t}\right)}$$

where A is the annuity received at the end of each year, i is the annual interest rate, P is the present value of the annuity, n is the number of years of the annuity. For convenience, tables have been constructed to compute $\sum_{t=1}^{n}\left(\frac{1}{(1+i)^t}\right)$. (See Table D).

• Some projects involve a mix of single cash payments and annuities in which the cash flows are uneven over several years. How do you use our techniques to evaluate such investments?

EXAMPLE: You are given three investment alternatives to analyze. The cash flows from these three investments are as follows:

End of Year	Investments			
	A	B	C	D
1	$1000	$1000	$1000	
2		$1000	$1000	
3		$1000	$ 500	
4		$1000	$2000	$1000
5	$5000	$1000	$1000	$1000
6				$1000
7				$2000
8	$1000			$2000

Assuming a 20 percent interest rate and that the cost of each project is $3000, find the present value of each investment.

Example. (A Difficult One) As a financial consultant, you are helping a client to plan her retirement. She is now 50 years old and plans to retire in eight years at age 58. She will be able to save $6000 per year for the next four years while she pays for her son to go to law school and $20000 per year for the following four years. In addition, she has $300000 currently invested in undeveloped real estate.

If her annual savings over the next eight years are deposited in an account that pays 6 percent compounded annually, while the value of the real estate appreciates at the rate of 10 percent per year, how much will your client have upon retirement at age 58 (ignoring taxes)?

If your client expects to live to be 88 years old, (thirty years beyond retirement), and at age 58 she deposits all her wealth into a savings account that pays 7 percent annual interest, how much can she withdraw at the end of each year to end up with a zero balance? What if she intends to leave an estate of $200000 to her son when she dies?

Table A. Compound Sum of $1: (1 + i)^n

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3676	1.4049
4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116	1.4641	1.5181	1.5735
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386	1.6105	1.6851	1.7623
6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716	1.8704	1.9738
7	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487	2.0762	2.2107
8	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7182	1.8509	1.9926	2.1436	2.3045	2.4760
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1710	2.3579	2.5580	2.7731
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1589	2.3674	2.5937	2.8394	3.1058
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4785
12	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127	3.1384	3.4985	3.8960
13	1.1381	1.2933	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0658	3.4523	3.8833	4.3635
14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975	4.3104	4.8871
15	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4736
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950	5.3109	6.1304
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545	5.8951	6.8660
18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171	5.5599	6.5436	7.6900
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159	7.2633	8.6128
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275	8.0623	9.6463
21	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0338	6.1058	7.4002	8.9492	10.8038
22	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	4.4304	5.4365	6.6586	8.1403	9.9336	12.1003
23	1.2572	1.5769	1.9735	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579	8.9543	11.0263	13.5523
24	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111	9.8497	12.2392	15.1786
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231	10.8347	13.5855	17.0001
26	1.2953	1.6734	2.1566	2.7725	3.5557	4.5494	5.8074	7.3964	9.3992	11.9182	15.0799	19.0401
27	1.3082	1.7069	2.2213	2.8834	3.7335	4.8223	6.2139	7.9881	10.2451	13.1100	16.7386	21.3249
28	1.3213	1.7410	2.2879	2.9987	3.9201	5.1117	6.6488	8.6271	11.1671	14.4210	18.5799	23.8839
29	1.3345	1.7758	2.3566	3.1187	4.1161	5.4184	7.1143	9.3173	12.1722	15.8631	20.6237	26.7499
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.0627	13.2677	17.4494	22.8923	29.9599
40	1.4889	2.2080	3.2620	4.8010	7.0400	10.2857	14.9745	21.7245	31.4094	45.2593	65.0009	93.0510
50	1.6446	2.6916	4.3839	7.1067	11.4674	18.4202	29.4570	46.9016	74.3575	117.3909	184.5648	289.0022
60	1.8167	3.2810	5.8916	10.5196	18.6792	32.9877	57.9464	101.2571	176.0313	304.4816	524.0572	897.5966

Table A. Compound Sum of $1: (1 + i)^n

Period	13%	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%
1	1.1300	1.1400	1.1500	1.1600	1.1700	1.1800	1.1900	1.2000	1.2400	1.2800	1.3200	1.3600
2	1.2769	1.2996	1.3225	1.3456	1.3689	1.3924	1.4161	1.4400	1.5376	1.6384	1.7424	1.8496
3	1.4429	1.4815	1.5209	1.5609	1.6016	1.6430	1.6852	1.7280	1.9066	2.0972	2.3000	2.5155
4	1.6305	1.6890	1.7490	1.8106	1.8739	1.9388	2.0053	2.0736	2.3642	2.6844	3.0360	3.4210
5	1.8424	1.9254	2.0114	2.1003	2.1924	2.2878	2.3864	2.4883	2.9316	3.4360	4.0075	4.6528
6	2.0820	2.1950	2.3131	2.4364	2.5652	2.6996	2.8398	2.9860	3.6352	4.3980	5.2899	6.3275
7	2.3526	2.5023	2.6600	2.8262	3.0012	3.1855	3.3793	3.5832	4.5077	5.6295	6.9826	8.6054
8	2.6584	2.8526	3.0590	3.2784	3.5115	3.7589	4.0214	4.2998	5.5895	7.2058	9.2170	11.7034
9	3.0040	3.2519	3.5179	3.8030	4.1084	4.4355	4.7854	5.1598	6.9310	9.2234	12.1665	15.9166
10	3.3946	3.7072	4.0456	4.4114	4.8068	5.2338	5.6947	6.1917	8.5944	11.8059	16.0598	21.6466
11	3.8359	4.2262	4.6524	5.1173	5.6240	6.1759	6.7767	7.4301	10.6571	15.1116	21.1989	29.4393
12	4.3345	4.8179	5.3503	5.9360	6.5801	7.2876	8.0642	8.9161	13.2148	19.3428	27.9825	40.0375
13	4.8980	5.4924	6.1528	6.8858	7.6987	8.5994	9.5964	10.6993	16.3943	24.7588	36.9370	54.4510
14	5.5348	6.2613	7.0757	7.9875	9.0075	10.1472	11.4198	12.8392	20.3191	31.6913	48.7568	74.0334
15	6.2543	7.1379	8.1371	9.2655	10.5387	11.9737	13.5895	15.4070	25.1956	40.5648	64.3590	100.7126
16	7.0673	8.1372	9.3576	10.7480	12.3303	14.1290	16.1715	18.4884	31.2426	51.9230	84.9538	136.9691
17	7.9861	9.2765	10.7613	12.4677	14.4265	16.6722	19.2441	22.1861	38.7408	66.4614	112.1390	186.2779
18	9.0243	10.5732	12.3755	14.4625	16.8790	19.6732	22.9005	26.6233	48.0386	85.0706	148.0235	253.3380
19	10.1974	12.0557	14.2318	16.7765	19.7484	23.2144	27.2516	31.9480	59.5679	108.8904	195.3911	344.5397
20	11.5231	13.7435	16.3665	19.4608	23.1056	27.3930	32.4294	38.3376	73.8641	139.3797	257.9162	468.5740
21	13.0211	15.6676	18.8215	22.5745	27.0336	32.3238	38.5910	46.0051	91.5915	178.4060	340.4494	637.2808
22	14.7138	17.8610	21.6447	26.1864	31.6293	38.1421	45.9233	55.2061	113.5735	228.3596	449.3932	866.6744
23	16.6266	20.3616	24.8915	30.3762	37.0062	45.0077	54.6487	66.2474	140.8312	292.3003	593.1990	*********
24	18.7881	23.2122	28.6252	35.2364	43.2973	53.1090	65.0320	79.4968	174.6306	374.1444	783.0227	*********
25	21.2305	26.4619	32.9190	40.8742	50.6578	62.6686	77.3881	95.3962	216.5420	478.9049	*********	*********
26	23.9905	30.1666	37.8568	47.4141	59.2697	73.9490	92.0918	114.4755	268.5121	612.8992	*********	*********
27	27.1093	34.3899	43.5353	55.0004	69.3455	87.2598	109.5093	137.3706	332.9550	784.6777	*********	*********
28	30.6335	39.2045	50.0656	63.8004	81.1342	102.9666	130.4112	164.8447	412.8642	*********	*********	*********
29	34.6158	44.6931	57.5755	74.0085	94.9271	121.5005	155.1893	197.8136	511.9516	*********	*********	*********
30	39.1159	50.9502	66.2118	85.8499	111.0047	143.3706	184.6753	237.3763	634.8199	*********	*********	*********
40	132.7816	188.8835	267.8635	378.7212	533.8687	750.3783	*********	*********	*********	*********	*********	*********
50	450.7359	700.2330	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********
60	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********

Table B. Present Value of $1: 1/(1 + i)^n

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118
4	0.9610	0.9239	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588
26	0.7720	0.5976	0.4637	0.3607	0.2812	0.2198	0.1722	0.1352	0.1064	0.0839	0.0663	0.0525
27	0.7644	0.5859	0.4502	0.3468	0.2678	0.2074	0.1609	0.1252	0.0976	0.0763	0.0597	0.0469
28	0.7568	0.5744	0.4371	0.3335	0.2551	0.1956	0.1504	0.1159	0.0895	0.0693	0.0538	0.0419
29	0.7493	0.5631	0.4243	0.3207	0.2429	0.1846	0.1406	0.1073	0.0822	0.0630	0.0485	0.0374
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334
40	0.6717	0.4520	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035
60	0.5504	0.3048	0.1697	0.0951	0.0535	0.0303	0.0173	0.0099	0.0057	0.0033	0.0019	0.0011

Table B. Present Value of $1: 1/(1 + i)^n

Period	13%	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%
1	0.8850	0.8772	0.8696	0.8621	0.8547	0.8475	0.8403	0.8333	0.8065	0.7813	0.7576	0.7353
2	0.7831	0.7695	0.7561	0.7432	0.7305	0.7182	0.7062	0.6944	0.6504	0.6104	0.5739	0.5407
3	0.6931	0.6750	0.6575	0.6407	0.6244	0.6086	0.5934	0.5787	0.5245	0.4768	0.4348	0.3975
4	0.6133	0.5921	0.5718	0.5523	0.5337	0.5158	0.4987	0.4823	0.4230	0.3725	0.3294	0.2923
5	0.5428	0.5194	0.4972	0.4761	0.4561	0.4371	0.4190	0.4019	0.3411	0.2910	0.2495	0.2149
6	0.4803	0.4556	0.4323	0.4104	0.3898	0.3704	0.3521	0.3349	0.2751	0.2274	0.1890	0.1580
7	0.4251	0.3996	0.3759	0.3538	0.3332	0.3139	0.2959	0.2791	0.2218	0.1776	0.1432	0.1162
8	0.3762	0.3506	0.3269	0.3050	0.2848	0.2660	0.2487	0.2326	0.1789	0.1388	0.1085	0.0854
9	0.3329	0.3075	0.2843	0.2630	0.2434	0.2255	0.2090	0.1938	0.1443	0.1084	0.0822	0.0628
10	0.2946	0.2697	0.2472	0.2267	0.2080	0.1911	0.1756	0.1615	0.1164	0.0847	0.0623	0.0462
11	0.2607	0.2366	0.2149	0.1954	0.1778	0.1619	0.1476	0.1346	0.0938	0.0662	0.0472	0.0340
12	0.2307	0.2076	0.1869	0.1685	0.1520	0.1372	0.1240	0.1122	0.0757	0.0517	0.0357	0.0250
13	0.2042	0.1821	0.1625	0.1452	0.1299	0.1163	0.1042	0.0935	0.0610	0.0404	0.0271	0.0184
14	0.1807	0.1597	0.1413	0.1252	0.1110	0.0985	0.0876	0.0779	0.0492	0.0316	0.0205	0.0135
15	0.1599	0.1401	0.1229	0.1079	0.0949	0.0835	0.0736	0.0649	0.0397	0.0247	0.0155	0.0099
16	0.1415	0.1229	0.1069	0.0930	0.0811	0.0708	0.0618	0.0541	0.0320	0.0193	0.0118	0.0073
17	0.1252	0.1078	0.0929	0.0802	0.0693	0.0600	0.0520	0.0451	0.0258	0.0150	0.0089	0.0054
18	0.1108	0.0946	0.0808	0.0691	0.0592	0.0508	0.0437	0.0376	0.0208	0.0118	0.0068	0.0039
19	0.0981	0.0829	0.0703	0.0596	0.0506	0.0431	0.0367	0.0313	0.0168	0.0092	0.0051	0.0029
20	0.0868	0.0728	0.0611	0.0514	0.0433	0.0365	0.0308	0.0261	0.0135	0.0072	0.0039	0.0021
21	0.0768	0.0638	0.0531	0.0443	0.0370	0.0309	0.0259	0.0217	0.0109	0.0056	0.0029	0.0015
22	0.0680	0.0560	0.0462	0.0382	0.0316	0.0262	0.0218	0.0181	0.0088	0.0044	0.0022	0.0012
23	0.0601	0.0491	0.0402	0.0329	0.0270	0.0222	0.0183	0.0151	0.0071	0.0034	0.0017	0.0008
24	0.0532	0.0431	0.0349	0.0284	0.0231	0.0188	0.0154	0.0126	0.0057	0.0027	0.0013	0.0006
25	0.0471	0.0378	0.0304	0.0245	0.0197	0.0160	0.0129	0.0105	0.0046	0.0021	0.0010	0.0005
26	0.0417	0.0331	0.0264	0.0211	0.0169	0.0135	0.0109	0.0087	0.0037	0.0016	0.0007	0.0003
27	0.0369	0.0291	0.0230	0.0182	0.0144	0.0115	0.0091	0.0073	0.0030	0.0013	0.0005	0.0002
28	0.0326	0.0255	0.0200	0.0157	0.0123	0.0097	0.0077	0.0061	0.0024	0.0010	0.0004	0.0002
29	0.0289	0.0224	0.0174	0.0135	0.0105	0.0082	0.0064	0.0051	0.0020	0.0008	0.0003	0.0001
30	0.0256	0.0196	0.0151	0.0116	0.0090	0.0070	0.0054	0.0042	0.0016	0.0003	0.0002	0.0001
40	0.0075	0.0053	0.0037	0.0026	0.0019	0.0013	0.0010	0.0007	0.0002	0.0001	0.0000	0.0000
50	0.0022	0.0014	0.0009	0.0006	0.0004	0.0003	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000
60	0.0007	0.0004	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table C. Sum of an Annuity of $1 for n Periods

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0700	2.0800	2.0900	2.1000	2.1100	2.1200
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100	3.3421	3.3744
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410	4.7097	4.7793
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847	6.1051	6.2278	6.3528
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7156	7.9129	8.1152
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004	9.4872	9.7833	10.0890
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.2598	10.6366	11.0285	11.4359	11.8594	12.2997
9	9.3685	9.7546	10.1591	10.5828	11.0266	11.4913	11.9780	12.4876	13.0210	13.5795	14.1640	14.7757
10	10.4622	10.9497	11.4639	12.0061	12.5779	13.1808	13.8164	14.4866	15.1929	15.9374	16.7220	17.5487
11	11.5668	12.1687	12.8078	13.4864	14.2068	14.9716	15.7836	16.6455	17.5603	18.5312	19.5614	20.6546
12	12.6825	13.4121	14.1920	15.0258	15.9171	16.8699	17.8885	18.9771	20.1407	21.3843	22.7132	24.1331
13	13.8093	14.6803	15.6178	16.6268	17.7130	18.8821	20.1406	21.4953	22.9534	24.5227	26.2116	28.0291
14	14.9474	15.9739	17.0863	18.2919	19.5986	21.0151	22.5505	24.2149	26.0192	27.9750	30.0949	32.3926
15	16.0969	17.2934	18.5989	20.0236	21.5786	23.2760	25.1290	27.1521	29.3609	31.7725	34.4054	37.2797
16	17.2579	18.6393	20.1569	21.8245	23.6575	25.6725	27.8881	30.3243	33.0034	35.9497	39.1899	42.7533
17	18.4304	20.0121	21.7616	23.6975	25.8404	28.2129	30.8402	33.7502	36.9737	40.5447	44.5008	48.8637
18	19.6147	21.4123	23.4144	25.6454	28.1324	30.9057	33.9990	37.4502	41.3013	45.5992	50.3959	55.7497
19	20.8109	22.8406	25.1169	27.6712	30.5390	33.7600	37.3790	41.4463	46.0185	51.1591	56.9395	63.4397
20	22.0190	24.2974	26.8704	29.7781	33.0660	36.7856	40.9955	45.7620	51.1601	57.2750	64.2028	72.0524
21	23.2392	25.7833	28.6765	31.9692	35.7193	39.9927	44.8652	50.4229	56.7045	64.0025	72.2651	81.6987
22	24.4716	27.2990	30.5369	34.2480	38.5052	43.3923	49.0057	55.4568	62.8733	71.4027	81.2143	92.5026
23	25.7163	28.8450	32.4529	36.6179	41.4305	46.9958	53.4361	60.8933	69.5319	79.5430	91.1479	104.6029
24	26.9735	30.4219	34.4265	39.0826	44.5020	50.8156	58.1767	66.7648	76.7898	88.4973	102.1742	118.1552
25	28.2432	32.0303	36.4593	41.6459	47.7271	54.8645	63.2490	73.1059	84.7009	98.3471	114.4133	133.3339
26	29.5256	33.6709	38.5530	44.3117	51.1135	59.1564	68.6765	79.9544	93.3240	109.1818	127.9988	150.3339
27	30.8209	35.3443	40.7096	47.0842	54.6691	63.7058	74.4838	87.3508	102.7231	121.0999	143.0786	169.3740
28	32.1291	37.0512	42.9309	49.9776	58.4026	68.5281	80.6977	95.3388	112.9682	134.2099	159.8173	190.6989
29	33.4504	38.7922	45.2189	52.9963	62.3227	73.6398	87.3465	103.9659	124.1354	148.6309	178.3972	214.6828
30	34.7849	40.5681	47.5754	56.0849	66.4388	79.0582	94.4608	113.2832	136.3075	164.4940	199.0209	241.3327
40	48.8864	60.4020	75.4013	95.0255	120.7998	154.7620	199.6351	259.0565	337.8824	442.5926	581.8261	767.0914
50	64.4632	84.5794	112.7969	152.6671	209.3480	290.3359	406.5289	573.7702	815.0836	*********	*********	*********
60	81.6697	114.0515	163.0534	237.9907	353.5837	533.1282	813.5204	*********	*********	*********	*********	*********

Table C. Sum of an Annuity of $1 for n Periods

Period	13%	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.1300	2.1400	2.1500	2.1600	2.1700	2.1800	2.1900	2.2000	2.2400	2.2800	2.3200	2.3600
3	3.4069	3.4396	3.4725	3.5056	3.5389	3.5724	3.6061	3.6400	3.7776	3.9104	4.0384	4.2096
4	4.8498	4.9211	4.9934	5.0665	5.1405	5.2154	5.2913	5.3680	5.6842	6.0156	6.3624	6.7251
5	6.4803	6.6101	6.7424	6.8771	7.0144	7.1542	7.2966	7.4416	8.0484	8.6999	9.3963	10.1481
6	8.3227	8.5395	8.7537	8.9775	9.2068	9.4420	9.6830	9.9299	10.9801	12.1359	13.4058	14.7967
7	10.4047	10.7305	11.0668	11.4139	11.7720	12.1415	12.5227	12.9159	14.6153	16.5339	18.6956	21.1282
8	12.7573	13.2328	13.7268	14.2401	14.7733	15.3270	15.9020	16.4991	18.1229	22.1634	25.0782	28.7316
9	15.4157	16.0853	16.7858	17.5185	18.2847	19.0859	19.9234	20.7989	24.7125	29.3692	34.8953	41.4350
10	18.4197	19.3373	20.3037	21.3215	22.3931	23.5213	24.7089	25.9587	31.6434	38.5926	47.0618	57.3516
11	21.8143	23.0445	24.3493	25.7329	27.1999	28.7551	30.4035	32.1504	40.2379	50.3665	63.1215	78.9982
12	25.6502	27.2707	29.0017	30.8502	32.8239	34.9311	37.1802	39.5805	50.8950	65.5100	84.3204	108.4375
13	29.9847	32.0887	34.3519	36.7862	39.4040	42.2187	45.2445	48.4966	64.1097	84.8529	112.3030	148.4750
14	34.9827	37.5811	40.5047	43.6720	47.1027	50.8180	54.8409	59.1959	80.4991	109.6117	149.2399	202.9260
15	40.4175	43.8424	47.5804	51.6595	56.1101	60.9653	66.2607	72.0351	100.8151	141.3029	197.9967	276.9793
16	46.6717	50.9804	55.7175	60.9250	66.6488	72.9390	79.8502	87.4421	126.0109	181.8677	262.3557	377.6919
17	53.7391	59.1176	65.0751	71.6730	78.9792	87.0680	96.0218	105.9306	157.2534	233.7907	347.3095	514.6010
18	61.7251	68.3941	75.8364	84.1407	93.4056	103.7403	115.2659	128.1167	195.9942	300.2521	456.4485	700.9339
19	70.7494	78.9692	88.2118	98.6032	110.2846	123.4135	138.1064	154.7400	244.0328	385.3227	607.4721	954.2769
20	80.9468	91.0249	102.4436	115.3797	130.0329	146.6280	165.4180	186.6880	303.6006	494.2131	802.6831	*********
21	92.4699	104.7684	118.8101	134.8405	153.1385	174.0210	197.8474	225.0256	377.4848	633.5927	*********	*********
22	105.4910	120.4360	137.6316	157.4150	180.1721	206.3448	236.4385	271.0307	469.0563	811.9987	*********	*********
23	120.2048	138.2970	159.2764	183.6014	211.8013	244.4868	282.3618	326.2369	582.6298	*********	*********	*********
24	136.8315	158.6586	184.1678	213.9776	248.8076	289.4945	337.0105	392.4842	723.4610	*********	*********	*********
25	155.6196	181.8708	212.7930	249.2140	292.1049	342.6035	402.0425	471.9811	898.0916	*********	*********	*********
26	176.8501	208.3327	245.7120	290.0883	342.7627	405.2721	479.4306	567.3773	*********	*********	*********	*********
27	200.8406	238.4993	283.5688	337.5024	402.0323	479.2211	571.5224	681.8528	*********	*********	*********	*********
28	227.9499	272.8892	327.1041	392.5028	471.3778	566.4909	681.1116	819.2233	*********	*********	*********	*********
29	258.5834	312.0937	377.1697	456.3032	552.5121	669.4475	811.5228	984.0680	*********	*********	*********	*********
30	293.1992	356.7868	434.7451	530.3117	647.4391	790.9480	966.7122	*********	*********	*********	*********	*********
40	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********
50	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********
60	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********	*********

Table D. Present Value of an Annuity of $1 for n Periods

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.7016	7.2497
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.8393	7.3658
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.9633	7.4694
21	18.8570	17.0112	15.4150	14.0292	12.8212	11.7641	10.8355	10.0168	9.2922	8.6487	8.0751	7.5620
22	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	11.0612	10.2007	9.4424	8.7715	8.1757	7.6446
23	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	11.2722	10.3711	9.5802	8.8832	8.2664	7.7184
24	21.2434	18.9139	16.9355	15.2470	13.7986	12.5504	11.4693	10.5288	9.7066	8.9847	8.3481	7.7843
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	8.4217	7.8431
26	22.7952	20.1210	17.8768	15.9828	14.3752	13.0032	11.8258	10.8100	9.9290	9.1609	8.4881	7.8957
27	23.5596	20.7069	18.3270	16.3296	14.6430	13.2105	11.9867	10.9352	10.0266	9.2372	8.5478	7.9426
28	24.3164	21.2813	18.7641	16.6631	14.8981	13.4062	12.1371	11.0511	10.1161	9.3066	8.6016	7.9844
29	25.0658	21.8444	19.1885	16.9837	15.1411	13.5907	12.2777	11.1584	10.1983	9.3696	8.6501	8.0218
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.6938	8.0552
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.9511	8.2438
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	9.0417	8.3045
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	9.0736	8.3240

Table D. Present Value of an Annuity of $1 for n Periods

Period	13%	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%
1	0.8850	0.8772	0.8696	0.8621	0.8547	0.8475	0.8403	0.8333	0.8065	0.7813	0.7576	0.7353
2	1.6681	1.6467	1.6257	1.6052	1.5852	1.5656	1.5465	1.5278	1.4568	1.3916	1.3315	1.2760
3	2.3612	2.3216	2.2832	2.2459	2.2096	2.1743	2.1399	2.1065	1.9813	1.8684	1.7663	1.6735
4	2.9745	2.9137	2.8550	2.7982	2.7432	2.6901	2.6389	2.5887	2.4043	2.2410	2.0957	1.9658
5	3.5172	3.4331	3.3522	3.2743	3.1993	3.1272	3.0576	2.9906	2.7454	2.5320	2.3452	2.1807
6	3.9975	3.8887	3.7845	3.6847	3.5892	3.4976	3.4098	3.3255	3.0205	2.7594	2.5342	2.3388
7	4.4226	4.2883	4.1604	4.0386	3.9224	3.8115	3.7057	3.6046	3.2423	2.9370	2.6775	2.4550
8	4.7996	4.6389	4.4873	4.3436	4.2072	4.0776	3.9544	3.8372	3.4212	3.0758	2.7860	2.5404
9	5.1317	4.9464	4.7716	4.6065	4.4506	4.3030	4.1633	4.0310	3.5655	3.1842	2.8681	2.6033
10	5.4262	5.2161	5.0188	4.8332	4.6586	4.4941	4.3389	4.1925	3.6819	3.2689	2.9304	2.6495
11	5.6869	5.4527	5.2337	5.0286	4.8364	4.6560	4.4865	4.3271	3.7757	3.3351	2.9776	2.6834
12	5.9176	5.6603	5.4206	5.1971	4.9884	4.7932	4.6105	4.4392	3.8514	3.3868	3.0133	2.7084
13	6.1218	5.8424	5.5831	5.3423	5.1183	4.9095	4.7147	4.5327	3.9124	3.4272	3.0404	2.7268
14	6.3025	6.0021	5.7245	5.4675	5.2293	5.0081	4.8023	4.6106	3.9616	3.4587	3.0609	2.7403
15	6.4624	6.1422	5.8474	5.5755	5.3242	5.0916	4.8759	4.6755	4.0013	3.4834	3.0784	2.7502
16	6.6039	6.2651	5.9542	5.6685	5.4053	5.1624	4.9377	4.7296	4.0333	3.5026	3.0882	2.7575
17	6.7291	6.3729	6.0472	5.7487	5.4746	5.2223	4.9897	4.7746	4.0591	3.5177	3.0971	2.7629
18	6.8399	6.4674	6.1280	5.8178	5.5339	5.2732	5.0333	4.8122	4.0799	3.5294	3.1039	2.7668
19	6.9380	6.5504	6.1982	5.8775	5.5845	5.3162	5.0700	4.8435	4.0967	3.5386	3.1090	2.7697
20	7.0248	6.6231	6.2593	5.9288	5.6278	5.3527	5.1009	4.8696	4.1103	3.5458	3.1129	2.7718
21	7.1016	6.6870	6.3125	5.9731	5.6648	5.3837	5.1268	4.8913	4.1212	3.5514	3.1158	2.7734
22	7.1695	6.7429	6.3587	6.0113	5.6964	5.4099	5.1486	4.9094	4.1300	3.5558	3.1180	2.7746
23	7.2297	6.7921	6.3988	6.0442	5.7234	5.4321	5.1668	4.9245	4.1371	3.5592	3.1197	2.7754
24	7.2829	6.8351	6.4338	6.0726	5.7465	5.4509	5.1822	4.9371	4.1428	3.5619	3.1210	2.7760
25	7.3300	6.8729	6.4641	6.0971	5.7662	5.4669	5.1951	4.9476	4.1474	3.5640	3.1220	2.7765
26	7.3717	6.9061	6.4906	6.1182	5.7831	5.4804	5.2060	4.9563	4.1511	3.5656	3.1227	2.7768
27	7.4086	6.9352	6.5135	6.1364	5.7975	5.4919	5.2151	4.9636	4.1542	3.5669	3.1233	2.7771
28	7.4412	6.9607	6.5335	6.1520	5.8099	5.5016	5.2228	4.9697	4.1566	3.5679	3.1237	2.7773
29	7.4701	6.9830	6.5509	6.1656	5.8204	5.5098	5.2292	4.9747	4.1585	3.5687	3.1240	2.7774
30	7.4957	7.0027	6.5660	6.1772	5.8294	5.5168	5.2347	4.9789	4.1601	3.5693	3.1242	2.7775
40	7.6344	7.1050	6.6418	6.2335	5.8713	5.5482	5.2582	4.9966	4.1659	3.5712	3.1250	2.7778
50	7.6752	7.1327	6.6605	6.2463	5.8801	5.5541	5.2623	4.9995	4.1666	3.5714	3.1250	2.7778
60	7.6873	7.1401	6.6651	6.2492	5.8819	5.5553	5.2630	4.9999	4.1667	3.5714	3.1250	2.7778

SESSION 3

CAPITAL INVESTMENT DECISIONS

TOPIC 2
CAPITAL BUDGETING

• **Capital Budgeting** involves the decision-making process that determines when to invest money in long-term assets. All financial managers are continuously faced with decisions among competing alternatives – how successful the manager and business are depends on how well these decisions are made.

• In evaluating capital investment proposals, we compare the costs and benefits of each in a number of ways – some based on the time value of money (Topic 1) and some not. Each decision involves *measuring the incremental cash flows* associated with the investment proposal and *evaluating* the attractiveness of these cash flows relative to the project's costs.

The Capital Budgeting Process

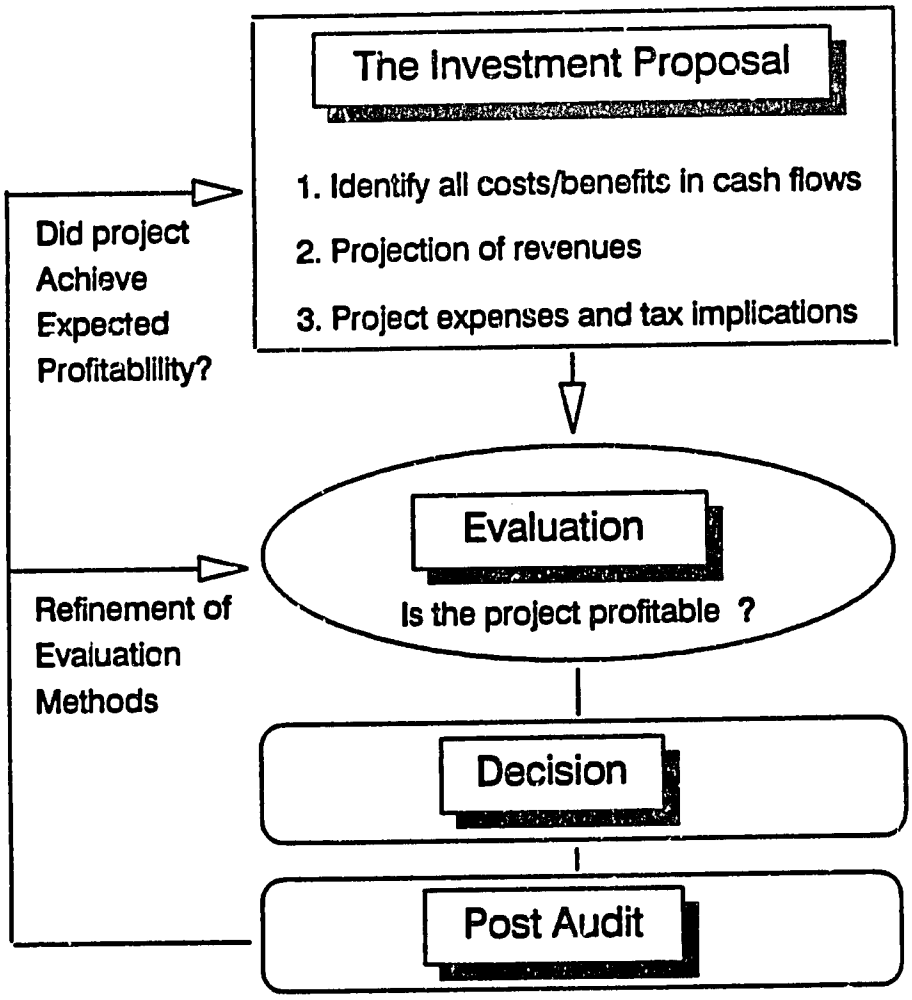
1. Proposal. The capital investment is proposed by managers who feel that money can be profitably used for a project in their areas of responsibility. The main part of proposal development involves an identification of all costs and benefits in terms of cash flows. The proposal includes projections of the revenue-generating ability of the project and all expenses and tax implications.

2. Evaluation. The expected costs and benefits are analyzed to determine if the project is sufficiently profitable compared with other investment opportunities available and if the company can raise the money to finance it.

3. Decision. Based on the evaluation of the proposed project and comparison with other projects proposed, management chooses the project for which money will be allocated.

4. Post Audit. An effective capital budgeting system will include a post audit to assess which projects achieved their expected profit targets and to refine evaluation methods where necessary.

The Capital Budgeting Decision



A. The Project Proposal

- In order to determine the value of an investment proposal, certain guidelines must be set:

    1. Focus on *cash flows* not accounting profits from project
        - Only cash flows are received and reinvested in firm
        - Only with cash flows can the timing of benefits be analyzed
    2. Focus only on *incremental* and not *total* cash flows
        - Relevant cash flows relate to additional revenues and costs
        - Includes opportunity costs of not accepting project
    3. Separate the investment decision from the financing decision
        - Do not consider additional costs of financing project
        - Determine first desirability of project; then, how best to finance it

- The most important part of developing a capital budgeting investment proposal is the identification of the costs and benefits of the project measured in terms of the estimated cash flows. The worth of the manager's decision depends on the accuracy of the cash flow estimates. We focus on measuring three types of cash flows:

    1. The Initial Outlay
    2. The Differential Cash Flows over Project's Life
    3. The Terminal Cash Flow

1. The Initial Outlay

• The initial outlay involves the immediate cash outflow necessary to purchase the asset and put it into operating order. This amount includes: the cost of shipping and installing the asset; any nonexpense cash outlays, such as increased working capital requirements due to increased inventory or cash necessary for operation; any new investments for employee training or for special engineering expenses; tax expenses from sale or disposal of old assets if the project is a replacement investment.

Summary of Initial Outlay Incremental After-Tax Cash Flow

1. Installed Cost of the Asset
2. Additional nonexpense outlays incurred (e.g. working capital investments)
3. Additional expenses on an after-tax basis (e.g. training expenses)
4. In replacement decisions, after-tax cash flow from sale of old equipment

EXAMPLE: Consider an oil and gas company in the 34 percent marginal tax bracket. It considers a new machine that costs $30000 and has an expected life of five years. This machine will replace an existing machine originally purchased for $30000, 10 years ago, which has five more years of useful life and a current book value of $10000. To put the new machine in running order, it is necessary to pay shipping charges of $2000 and installation charges of $3000. Because the new machine will work faster than the old one, it will require an increase in goods-in-process inventory of $5000. Finally, the old machine will be sold to a scrap dealer for $15000.

397

2. Differential Cash Flows over Project's Life

• We need to measure the incremental after-tax cash flows resulting from increased revenues, plus labour or material savings and reductions in selling expenses. Changes in overhead expenses such as utilities, heat, light and executive salaries should be included. Changes in the required rate of return for the financing of the investment should *not* be included. Finally, an adjustment for the incremental changes in taxes should be made, including any increase in taxes that might result from increased profit or tax-savings from an increase in depreciation expenses.

• Depreciation plays an important role in the calculation of cash flows. It is not a cash flow item, but it lowers before-tax profits and this lowers taxes. The actual depreciation rules are complicated, different for each country and change regularly. We will use the easiest method, which is "straight-line", where each year's depreciation expense is computed:

$$\text{Annual Depreciation using Simple Straight-line Method} = \frac{\text{Initial Depreciable Value}}{\text{Depreciable Life (in years)}}$$

where the initial depreciable value is the cost of the asset plus any expenses necessary to get the new asset into operating order.

EXAMPLE: What is the annual depreciation expense for the new machine purchase by the oil and gas firm?

395

• We can summarize the main elements of the calculation of differential after-tax cash flows over the life of a project:

Summary of Differential After-tax Cash Flows from Project

1. Added revenue offset by increased expenses
2. Labour and material savings
3. Increases in overhead incurred
4. For replacement decisions, additional depreciation allowances incurred
5. Do not include additional project financing charges

EXAMPLE: Suppose that once the oil and gas firm purchases the new machine, salaries are expected to be reduced by $10000 each year and medical benefits by $1000 because it takes only one operator whereas the old machine required two operators. In addition, the cost of defects will fall from $8000 per year to $3000 per year. However, maintenance expenses will increase by $4000 per year. The annual depreciation is based on the "straight-line" method for the new machine, but disposing of the old machine will involve the loss of $2000 for each of the next five years. What is the annual net cash flows from acceptance of the new, replacement machine?

3. Terminal Cash Flow

• Cash flows associated with the project's termination generally include the salvage value of the project plus or minus any gains or losses associated with its sales.

• Most countries tax the gain associated with the salvage value of an asset at termination if the salvage value exceeds the book value of the asset. This is usually the case since the asset is usually projected to have depreciated to zero by termination. Sometimes, there may be a net cash outlay because the fixed asset has no salvage value but needs to be disposed of at the firm's expense (usually tax-deductible).

• Net cash inflows may occur at the termination of the project because the increased working capital outlay at the initiation of the project (e.g. higher work-in-process inventory) would no longer be necessary.

Summary of Terminal After-tax Cash Flows from Project

1. After-tax salvage value of the project
2. Cash outlays associated with termination of project
3. Recapture of non-expense outlays that occurred at the project's initiation

EXAMPLE: For the oil and gas firm the depreciated book value and salvage value of the machine at the termination date in five years is zero. But there is a positive cash flow from the liquidation of the initial outlay of work-in-process inventory of $5000. What are the cash flow projections from the overall replacement project for the oil and gas firm?

400

Capital Budgeting Exercise
Oil and Gas Firm's Equipment Replacement Problem

Year	0	1	2	3	4	5
Cost Savings:						
Reduced Salary		10,000	10,000	10,000	10,000	10,000
Reduced Benefits		1,000	1,000	1,000	1,000	1,000
Reduced Defects		5,000	5,000	5,000	5,000	5,000
New Depreciation Allowances		(7,000)	(7,000)	(7,000)	(7,000)	(7,000)
Additional Costs:						
Increased Maintenance		4,000	4,000	4,000	4,000	4,000
Lost Depreciation Allowance		(2,000)	(2,000)	(2,000)	(2,000)	(2,000)
Net Savings:		7,000	7,000	7,000	7,000	7,000
Taxes:		(2,380)	(2,380)	(2,380)	(2,380)	(2,380)
Net Savings after taxes:		4,620	4,620	4,620	4,620	4,620
Total Depreciation Allowances		5,000	5,000	5,000	5,000	5,000
New Machine Purchase	30,000					
Shipping Fee	2,000					
Installation Fee	3,000					
Taxes on Sale of Old Machine	1,700					
Increased Inventory Needs	5,000					
Salvage Value of Old Machine:	(15,000)					
Liquidation of Inventory						(5,000)
Net Cash Flow:	(26,700)	9,620	9,620	9,620	9,620	14,620

401

B. EVALUATION OF THE PROPOSAL

• Net cash inflows represent the benefits and cash outlays represent the costs generated from accepting the capital-budgeting proposal. Once the project's cash inflows and outflows have been identified, the project's profitability is evaluated.

How do we interpret these cash flows in order to determine whether or not the investment decision should be accepted?

• There are five different criteria:

A. Non-discounted Cash Flow Criteria

(i) Payback Period

(ii) Accounting Rate of Return (AROR)

B. Discounted Cash Flow Criteria

(i) Net Present Value (NPV)

(ii) Profitability Index (PI)

(iii) Internal Rate of Return (IRR)

• We review each of these criteria, focus on how they are calculated, use them for several different examples and address their respective advantages and disadvantages. After all, even if a financial manager does not have personal responsibility for evaluating capital investment proposals, he or she should know how they will be evaluated. This will benefit them in their proposal development with a more objective perspective.

402

1. Payback Period

• The **payback period** is the number of years needed to recover the initial cash outlay. This measures how quickly the project will return its original investment. It deals directly with cash flows and not accounting profits.

• The criterion for accepting/rejecting the investment proposal involves whether or not the project's payback period is less than or equal to the firm's maximum desired payback period.

Payback Period Criterion for Capital Investment Proposals

Definition:	Payback Period = Number of Years to Recover Initial Costs
Rule:	Accept if Payback $\leq$ Maximum Acceptable Payback Period Reject if Payback $>$ Maximum Acceptable Payback Period

EXAMPLE: For the oil and gas firm, if the maximum acceptable payback period is three years, would the firm decide to replace the old machine in favor of the new one?

EXAMPLE: Consider two investment projects, A and B, both of which involve an initial cash outlay of $10000 and annual cash flows below:

	Investment A	Investment B
Initial Cash Outlay	-$10000	-$10000
Annual Cash Inflows:		
Year 1	6000	5000
Year 2	3000	5000
Year 3	2000	0
Year 4	1000	0

Which project would you choose?

403

Advantages:	Disadvantages:
1. Uses cash flows	1. Ignores the time value of money
2. Easy to use and calculate	2. Ignores cash flows after payback period
3. Useful as a preliminary screening device	

2. Accounting Rate of Return (AROR)

• This measure compares the *average annual after-tax profits* with the *average total cost* of the investment. The average profits figure is computed by adding up the after-tax profits generated by the investment each year over its life and dividing by the number of years. The average investment is given by the average of the total initial outlay and the expected salvage value at termination.

• The criterion for accepting/rejecting the proposal associated with AROR compares the actual projected AROR with a minimum acceptable AROR level. If the actual AROR exceeds the minimum acceptable, the proposal is accepted; otherwise it is rejected.

Accounting Rate of Return Criterion for Capital Investment Proposals

Definition: $AROR = \frac{\sum_{t=1}^{n} PROFIT_t/n}{(OUTLAY_0+SALVAGE_n)/2}$

where:

$PROFIT_t$ is annual after-tax profit at time t

$OUTLAY_0$ is initial outlay of investment at time $t = 0$

n is the number of years in the project's life

$SALVAGE_n$ is salvage value at end of project's life $t = n$

Rule: Accept if Actual AROR $\geq$ Minimum Acceptable AROR

Reject if Actual AROR $<$ Minimum Acceptable AROR

404

EXAMPLE: Consider the following three investment proposals, each with an expected life of five years. Assume that each has an initial outlay of $10000 and an expected salvage value of zero in five years. The minimum acceptable AROR for this firm is 8 percent and the projected annual accounting profits after-tax are:

	Investment A	Investment B	Investment C
Initial Cash Outlay	-$10000	-$10000	-$10000
Annual After-tax Profits:			
Year 1	0	500	0
Year 2	1000	500	0
Year 3	500	500	0
Year 4	500	500	0
Year 5	500	500	2500

Which project would you choose on the basis of AROR?

Advantages:	Disadvantages:
1. Uses profits	1. Ignores the time value of money
2. Easy to use	2. Uses accounting profits not cash flows
3. Easily accessible information/terms	

405

3. Net Present Value (NPV)

• The net present value of an investment proposal equals the present value of its annual net after-tax cash flows less the investment's initial outlay. The project's NPV gives a measure of the NET VALUE of an investment proposal in terms of today's money. This measure is directly consistent with the assumption of the time value of money.

• The NPV decision rule is simple: if the project's NPV is greater than or equal to zero, accept the proposal; otherwise, reject the proposal.

Net Present Value Criterion for Capital Investment Proposals

Definition:	$NPV = \sum_{t=1}^{n} \frac{ACF_t}{(1+k)^t} - OUTLAY_0$
	where:
	ACF_t is annual after-tax cash flow in period t
	k is the firm's required rate of return for project
	n is the number of years in the project's life
	$OUTLAY_0$ is initial outlay of investment at time $t = 0$
Rule:	Accept if NPV ≥ 0
	Reject if NPV < 0

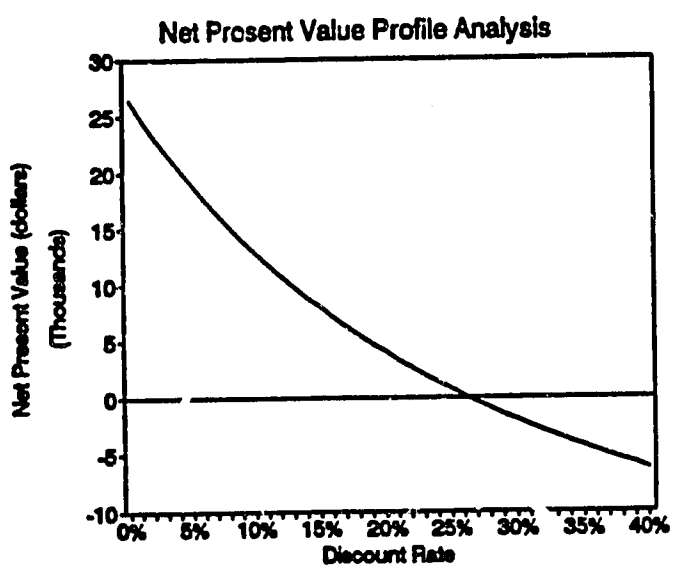
EXAMPLE: Consider the example of the oil and gas firm's new, replacement machine problem. If the firm's required rate of return on such investment proposals is 19 percent, should the old machine be replaced based on the NPV criterion?

406

Advantages:	Disadvantages:
1. Uses cash flows	1. Requires long-term benefit/cost forecasts
2. Recognizes time value of money	
3. Consistent with wealth maximization	

• Most investment managers find that the NPV criterion is the most superior primarily because it is consistent with the primary goal of the firm which is the maximization of wealth of the shareholders.

• We have not yet discussed how the firm determines its required rate of return for the project which is necessary to justify raising funds to finance it. This is a complex problem with which we will deal later. One useful tool, however, is to construct a NET PRESENT VALUE PROFILE ANALYSIS. This diagram computes the NPV of a given project for a *range* of different values for the required rate of return. This provides the manager with a guideline as to how the profitability of a project changes with various *cutoff* criteria for discount rates. (See the NPV Profile for the oil and gas firm's equipment replacement problem).



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4. Profitability Index (PI)

• The profitability index or benefit/cost ratio is the ratio of the present value of the net after-tax cash flows to the initial outlay. While the NPV criterion gives a measure of the *absolute* value of the profitability of an investment, the PI criterion gives a measure of its *relative* value.

• The decision rule: if the PI measure exceeds the value of one, accept the project; otherwise, reject it.

Profitability Index Criterion for Capital Investment Proposals

Definition:	$PI = \left[\sum_{t=1}^{n} \frac{ACF_t}{(1+k)^t}\right] / OUTLAY_0$
	where:
	ACF_t is annual after-tax cash flow in period t
	k is the firm's required rate of return for project
	n is the number of years in the project's life
	$OUTLAY_0$ is initial outlay of investment at time $t = 0$
Rule:	Accept if PI ≥ 1
	Reject if PI < 1

• We can see that the PI criterion will always make the same recommendation as the NPV criterion for the accept/reject decision. So the primary advantages and disadvantages of the PI criterion are the same as for the NPV criterion. But in terms of comparing the desirability of a number of projects, these two criteria will not always *rank* projects in the same order. We will review this point later.

EXAMPLE: What is the Profitability Index measure for the oil and gas firm's equipment replacement problem?

408

5. Internal Rate of Return (IRR)

• The Internal Rate of Return criterion asks: What rate of return does this project earn? That is, the IRR is defined as the discount rate that equates the present value of the investment's future net after-tax cash flows to the project's initial cash outlay.

• Mathematically, we need to find the value for IRR that solves:

$$\sum_{t=1}^{n} \frac{ACF_t}{(1+IRR)^t} = OUTLAY_0$$

The decision criterion associated with the internal rate of return is to accept the project if the IRR exceeds the firm's required return on the project (sometimes called the *hurdle rate*); and reject it, otherwise.

Internal Rate of Return Criterion for Capital Investment Proposals

Definition:	IRR is the discount rate that equates present value of the project's future net cash flows with its initial cash outlay $\sum_{t=1}^{n} \frac{ACF_t}{(1+IRR)^t} = OUTLAY_0$ where: ACF_t is annual after-tax cash flow in period t n is the number of years in the project's life $OUTLAY_0$ is initial outlay of investment at time $t = 0$
Rule:	Accept if IRR $\geq$ Required rate of return Reject if IRR $<$ Required rate of return

• Generally, the IRR criterion provides the same recommendation as the NPV and PI criteria in terms of accepting/rejecting an investment proposal. For example, if the required rate of return, k, in an NPV calculation generates a zero net present value for the project, the the PI criterion must equal one and the computed IRR must equal k. If the net present value of a project is positive, the PI index value will exceed one and IRR will be greater than the required return k for the project.

• Internal Rate of Return calculations can range from very simple to very complex, especially when there are a large number of uneven net cash flows to discount. Computer spreadsheet programs can make these calculations straightforward, however.

EXAMPLE: Consider a firm with a required rate of return of 10 percent that is considering a project that involves an initial outlay of $45555. If the investment is accepted, the after-tax cash flows are expected to be $15000 per year for the project's four year life. What is the IRR for the project? Should the firm accept it?

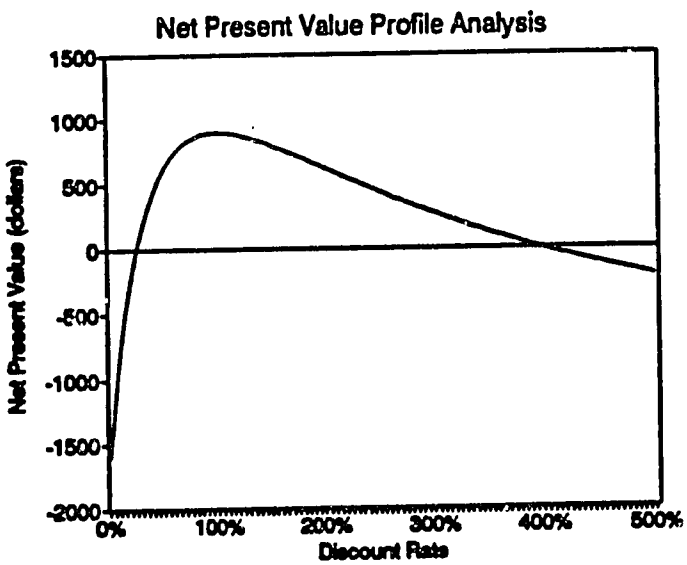
EXAMPLE: Consider the oil and gas firm and its machine replacement problem. What is the investment's IRR? If the firm's required rate of return on such investment proposals is 19 percent, should the old machine be replaced based on the IRR criterion?

410

• There are serious complications with the internal rate of return technique because a single project can sometimes have more than one IRR value. This is because of the nature of the formula (polynomial of degree n). If current cash outlay is negative and all future net cash inflows are positive, there is no problem. But if the future cash inflows reverse sign (e.g. some positive, some negative), then multiple solutions can result.

EXAMPLE: Compute the internal rate of return for the following investment project:

	After-tax Cash Flows
Initial Cash Outlay	-$1600
Year 1	10000
Year 2	-10000



Advantages:	Disadvantages:
1. Uses cash flows	1. Requires long-term benefit/cost forecasts
2. Recognizes time value of money	2. Tedious calculations possible
	3. Multiple solutions for IRR possible

TABLE 5-21.
Past Surveys of Capital-Budgeting Practices—Percent of Respondents Using Each Technique

Capital-Budgeting Technique	*Klammer, 1959*	*Klammer, 1964*	*Klammer, 1970*	*Petty et al., 1972*	*Kim and Farragher, 1975*	*Gitman and Forrester, 1977*	*Kim and Farragher, 1979*	*Kim, Crick, and Kim, 1986*
Primary method:								
NPV	5%	15%	27%	15%	26%	13%	19%	21%
IRR	8	17	30	41	37	53	49	49
Payback	34	24	12	11	15	9	12	19
AROR	34	30	26	31	10	25	8	8
Secondary method:								
NPV	2%	3%	7%	14%	7%	28%	8%	24%
IRR	1	2	6	19	7	14	8	15
Payback	18	21	32	37	33	44	39	35
AROR	4	9	11	24	3	14	3	19

Sources:
Thomas Klammer, "Empirical Evidence of the Adoption of Sophisticated Capital Budgeting Techniques," *Journal of Business* (July 1972), 387–397; J. William Petty, David F. Scott, Jr., and Monroe M. Bird, "The Capital Expenditure Decision-Making Process of Large Corporations," *Engineering Economist* (Spring 1975), 159–172; S. H. Kim and E. J. Farragher, "Capital Budgeting Practices in Large Industrial Firms," *Baylor Business Studies* (November 1976), 19–25; Lawrence J. Gitman and John R. Forrester, Jr., "Forecasting and Evaluation Practices and Performance: A Survey of Capital Budgeting," *Financial Management* #6 (Fall 1977), 66–71; S. H. Kim and E. J. Farragher, "Current Capital Budgeting Practices," *Management Accounting* (June 1981), 26–30; Suk H. Kim, T. Crick, and Sesung H. Kim, "Do Executives Practice What Academics Preach?" *Management Accounting* (November 1986), 49–52.

C. THE DECISION

• Once the proposal and evaluation have been completed, the decision must be made as to which project will be funded. There are important questions that arise:

Who has the authority to make the decision?

Which criterion should the decision be based on?

If there are many profitable projects available but constraints on capital, which projects are chosen for funding and which are not?

If the projects are mutually exclusive, by which criteria are the projects ranked in relative desirability or profitability?

How can two competitive projects with different expected life spans be compared using the usual criteria for investment decisions?

• We will focus on several issues relating to the capital-budgeting decision:

1. The Capital Rationing Problem
2. Project Ranking Problems
   - (i) Size Disparity
   - (ii) Time Disparity
   - (iii) Unequal Lives

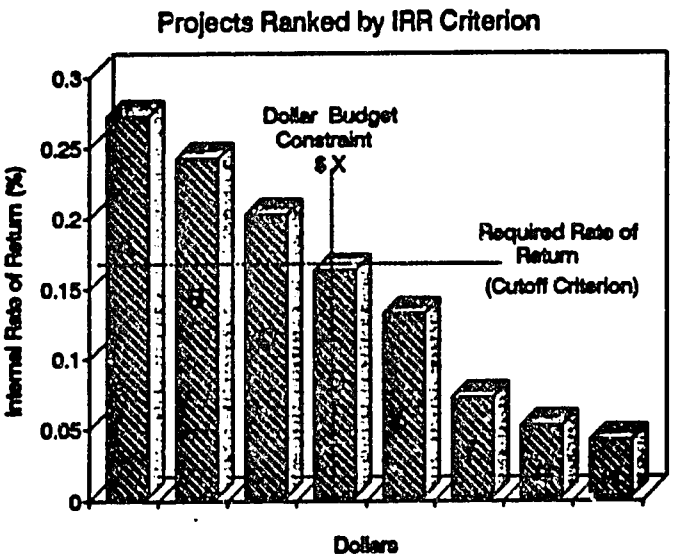
413

1. The Capital Rationing Problem

• The capital-budgeting decision rules imply that the size of the capital budget is determined by the number of acceptable investment proposals available. Actually, the money in the capital budget is limited so that some positive NPV projects may have to be rejected. This is the problem of *capital rationing.*

Why might capital rationing exist?

• The problem can be illustrated by the application of the IRR technique to the following investment projects:



• **Recommended Strategy:** Choose the highest net present value projects subject to the capital constraints, even if some higher-ranked projects in terms of profitability (PI) or internal rate of return must be rejected.

EXAMPLE: Consider a firm with the following set of proposals and with a capital budget constraint of $1000000. Which projects should be selected?

Project	Initial Outlay	Profitability Index	Net Present Value
A	$200000	2.4	$280000
B	$200000	2.3	$260000
C	$800000	1.7	$560000
D	$300000	1.3	$ 90000
E	$300000	1.2	$ 60000

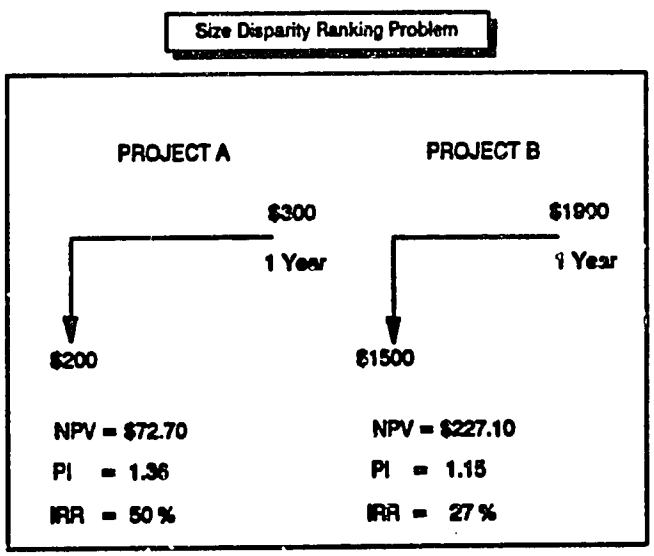
41

2. Project Ranking Problems

• Sometimes where two projects may be judged acceptable by a discounted cash flow criterion, it may be necessary to select only one of them because they are *mutually exclusive.* This would occur if the two investment proposal projects perform essentially the same task for the firm. This would be a problem only if different criteria conflict in the ranking of the two projects. We consider three examples.

(i) The Size Disparity Problem

EXAMPLE: Suppose a firm with a required rate of return of 10 percent is considering two mutually-exclusive one-year investments, A and B, with initial outlays of $200 and $1500, respectively. A pays off $300 at year end; B returns $1900. Which project should be chosen?



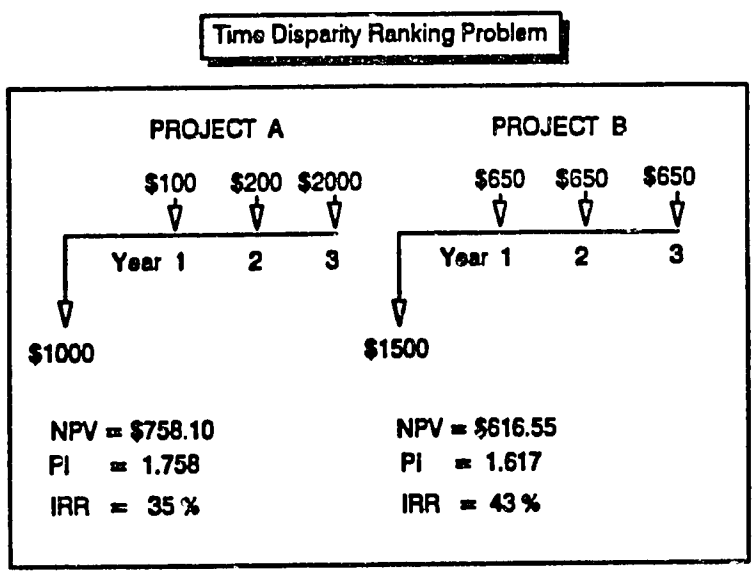
• **Recommended Strategy:** Choose the project with the larger net present value, if there are no capital constraints. If there are capital constraints, choose the set of projects with the largest net present value.

415

(ii) The Time Disparity Problem

• The time disparity problem arises because of conflicting rankings by competing projects due to different reinvestment assumptions made by the NPV and IRR criteria. The NPV criterion assumes that cash flows are reinvested at the required rate of return over the life of the project; the IRR criterion assumes that cash flows are reinvested at the internal rate of return.

EXAMPLE: Consider a firm with a required rate of return of 10 percent and with no capital constraints. Two mutually exclusive projects with their respective cash flows are shown below. Which project should be accepted?



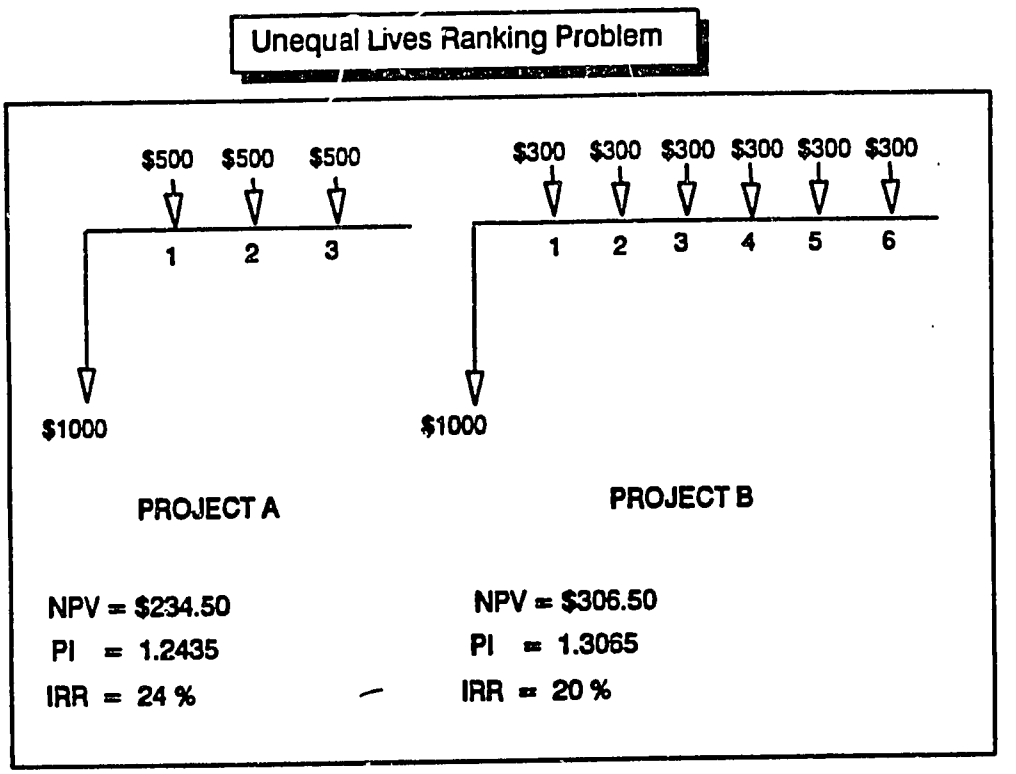
• **Recommended Strategy:** Use the NPV criterion as the most conservative approach since the cash flows are assumed to be reinvested at the minimum acceptable reinvestment rate which is the required rate of return.

416

(iii) Unequal Lives Problem

- How can two projects with unequal expected life spans be compared?

EXAMPLE: Suppose a firm with a 10 percent required rate of return is faced with the problem of replacing an aging machine and is considering two replacement machines, one with a three-year life and one with a six-year life. The cash flows are as follows:



- The difficulty in comparison is that future possible investment opportunities may be rejected though they are not part of the analysis. If the shorter-life project were accepted, at the termination the firm could replace the machine and receive additional benefits, while acceptance of the longer-life project would preclude this possibility. If we do not have this information on other investment possibilities, no comparison can legitimately be made.

- **Recommended Strategy:** (1) Forecast future cash flow reinvestment opportunities beyond the end of the shorter-life project (difficult); (2) Assume future cash flows beyond the termination of the shorter-life project will be reinvested at the firm's required rate of return (simplistic); and (3) Construct a "replacement chain" to equalize the life spans – assume that the shorter-life project can be replaced by a similar project at its termination.

417

SESSION 3

CAPITAL INVESTMENT DECISIONS

TOPIC 3

ADVANCED CAPITAL BUDGETING AND CASE STUDIES

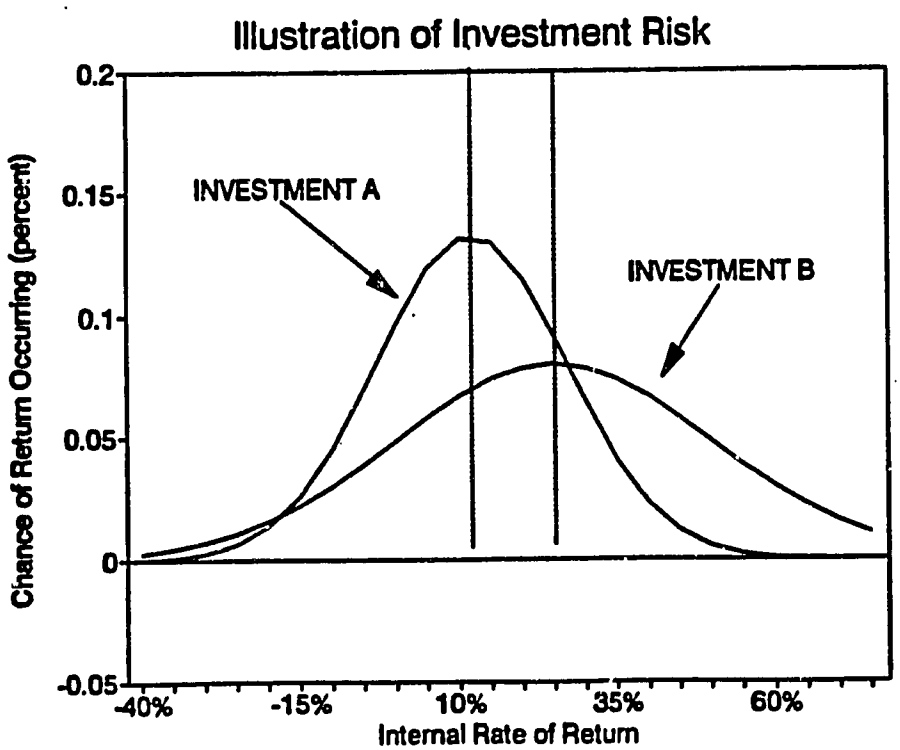
A. RISK ANALYSIS IN INVESTMENT DECISIONS

• In reality, the future cash flows projected in new investment proposals are just estimates of what is expected to happen in the future. The nature of all business investments requires some expenditure of a known sum of money today for uncertain future benefits. We need to incorporate the effects of risk into our discounted cash flow techniques.

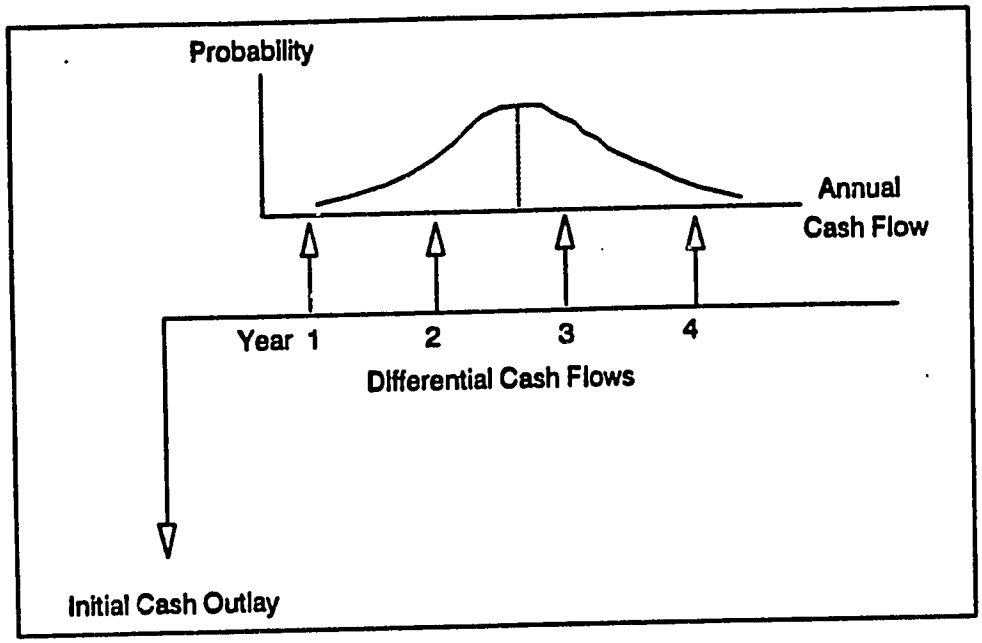
(i) Defining Risk

• RISK can be defined as the relative measure of the degree of variability of possible outcomes over time. For capital investments, risk reflects the variability or range of possible outcomes for the project's net present value. If two investments promise the same return but have different risks, most firms will prefer the lower risk alternative – we assume investors are *risk averse*.

EXAMPLE: Consider the following two investments each of which face of range of possible internal rates of return. Each possible return has associated with it the chance of that return occurring (probability). How would these two projects be evaluated?



• A cash flow diagram based on the possible outcomes of an investment proposal rather than the expected values of these outcomes would be illustrated below:



RISKY CASH FLOW DIAGRAM

(ii) Methods of Incorporating Risk into Investment Evaluation

• **Risk Classification.** One method frequently used by many companies is to assign projects to broad risk categories:

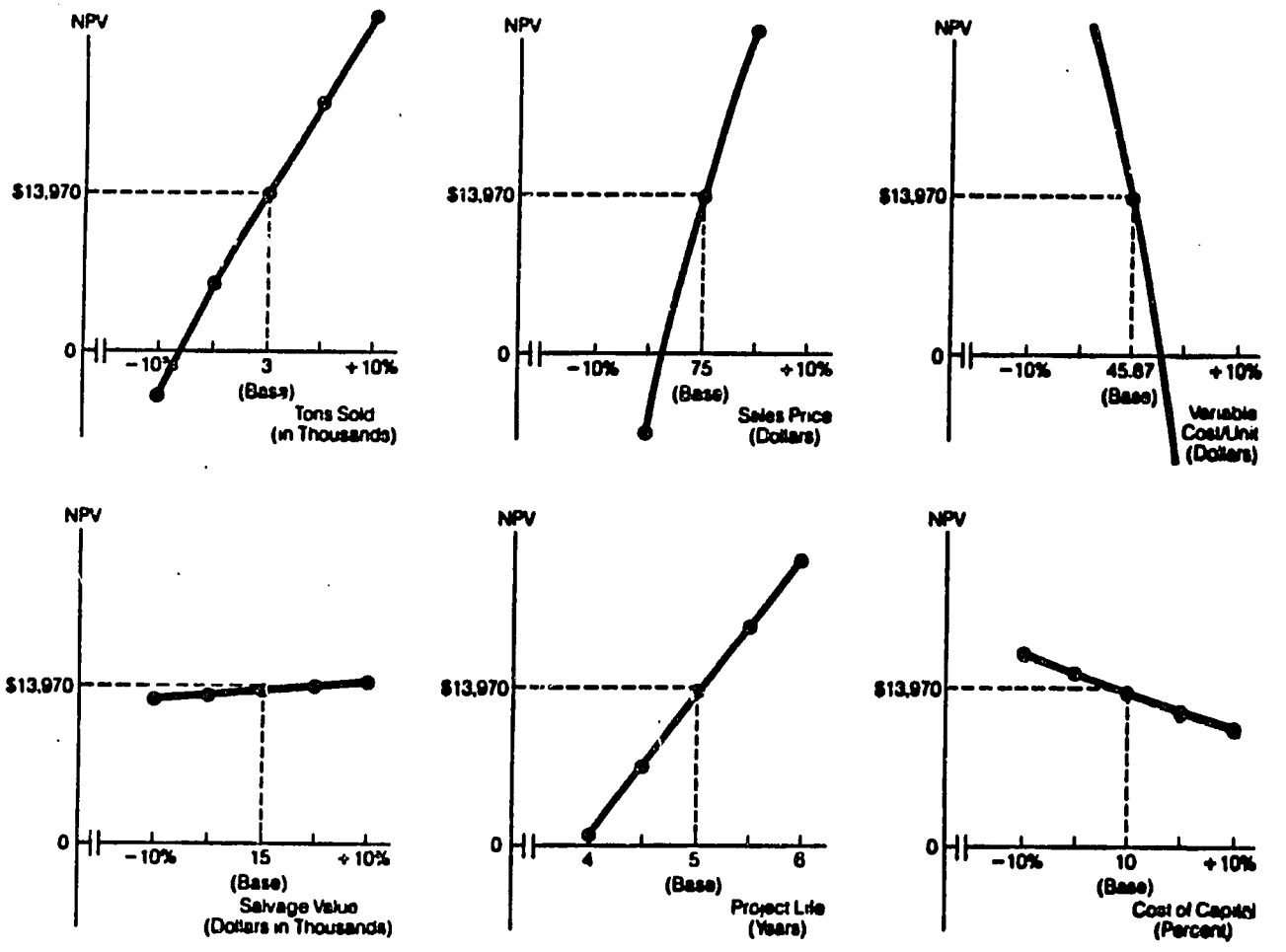
- Asset replacement – low risk
- Expansion of existing product lines – medium risk
- Productive efficiency gains – low risk
- Diversification into new product areas – high risk
- Research and development operations – high risk

This approach is simplistic but straightforward to implement in comparing or ranking projects.

• **Sensitivity Analysis.** Computers allow for the possibility of more sophisticated measurement of corporate risk. Sensitivity analysis indicates *how much NPV will change in response to a given change in an input variable, other things held constant.* It is also known as "what if" analysis.

The first step is to establish a BASE CASE scenario in which values for unit sales, sales price, fixed and variable costs and construction costs *that are most likely* are defined. Second, we ask now "what if" certain variables change by 10% above and below the forecasted value. Third, we plot the NPV values against the variables in question – the slopes of the lines indicate how sensitive NPV is to changes in each of the inputs. In comparing two projects, the one with the steeper sloped sensitivity lines is the riskier project.

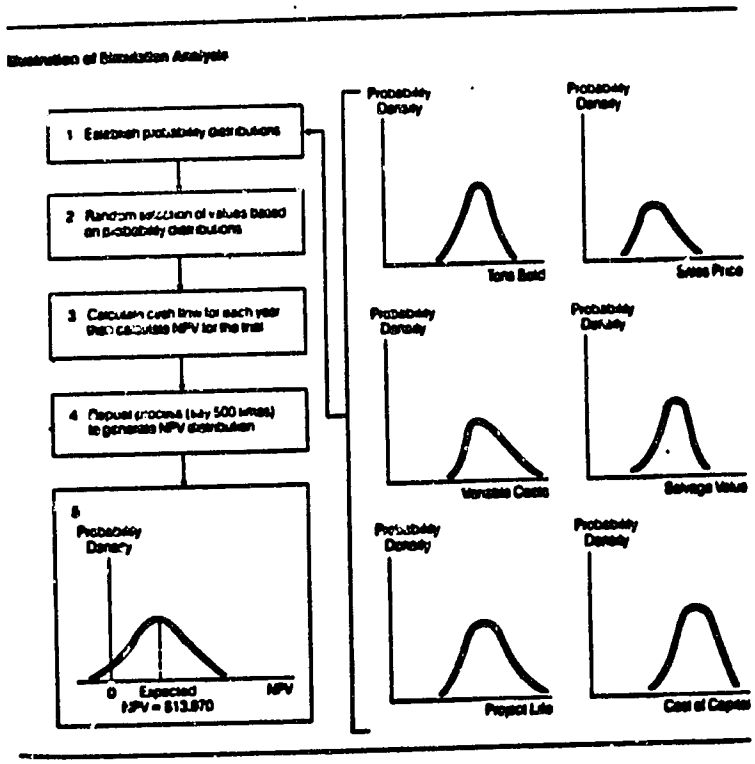
Sensitivity Analysis for Project Y



420

• **Simulation Analysis.** Another method for incorporating risk into the investment decision is through the use of computer simulation. The computer program *imitates* the performance of the project being evaluated by randomly selecting possible outcomes for key input variables for the uncertain future cash flows of the project. Those observations are combined to determine the prospective future cash flows and therefore the NPV of the project. This process is repeated many times until a representative record of the project's probable NPV is assembled.

The improvement of simulation analysis over sensitivity analysis is that the sensitivities of NPV to input variables is tied together with the probabilities of different possible outcomes for these variables. This allows us to *quantify* the project's risk. For example, since we have the profile of possible NPV values and the relative likelihood of each value, we can use the *expected* NPV as a measure of the project's profitability and the *variability* of possible NPV values as a measure of its risk. Finally, the *coefficient of variation* or the ratio of the variability to expected value of NPV is a standardized risk measure that can be used to rank the relative riskiness of projects.

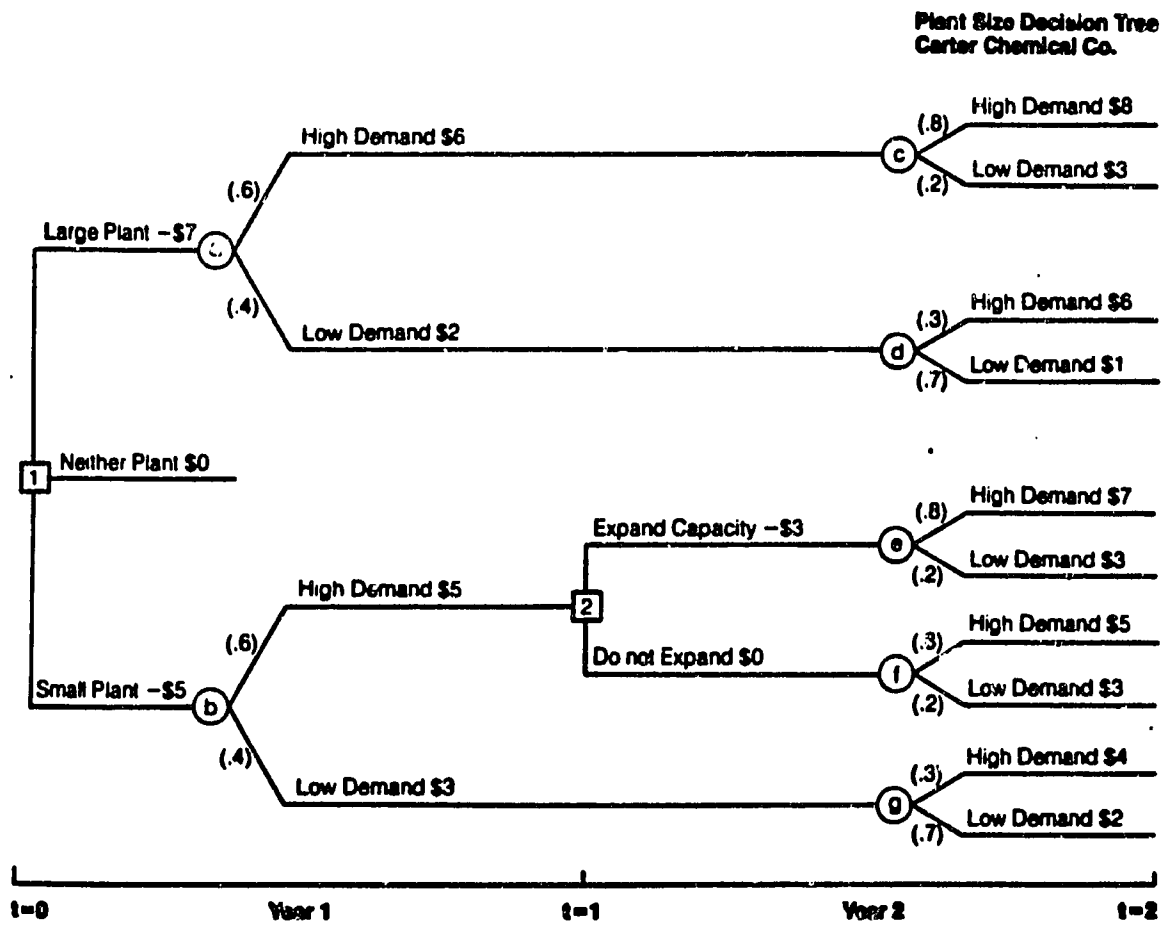


Limitations of Simulation Analysis:

- Costs vs. Benefits
- Interdependencies among the Input Variables Ignored
- No Specific Decision Rule

421

• **Hillier's Decision Tree Analysis.** This simple version of a scenario analysis allows important decisions to be made in stages instead of all at once. The sequence of events is drawn like branches of a tree with *decision points* (points 1 or 2) in time at which point a decision leads to a *chance event* or random outcome (points *a* to *g*).



422

NPV of Small Plant (millions omitted)

Event (1)	Probability (2)	Cash Flow (3)	Product (2) × (3) (4)	PVIFs for 18% (5)	Present Value NCF (4) × (5) (6)
Initial Outlay	1.0	−$5	−$5.00	1.0000	−$5.000
High Demand Yr. 1	.6	$5	$3.00		
Low Demand Yr. 1	.4	$3	$1.20		
	Expected Cash Flow Year 1		$4.20	.8696	$3.652
High Demand Yr. 1, High Demand Yr. 2	(.6) × (.8) = .48	$5	$2.40		
High Demand Yr. 1, Low Demand Yr. 2	(.6) × (.2) = .12	$3	$0.36		
Low Demand Yr. 1, High Demand Yr. 2	(.4) × (.3) = .12	$4	$0.48		
Low Demand Yr. 1, Low Demand Yr. 2	(.4) × (.7) = .28	$2	$0.56		
	Expected Cash Flow Yr. 2		$3.80	.7561	$2.873
				NPV =	$1.525

Table 12-5
NPV of Large Plant (millions omitted)

Event (1)	Probability (2)	Cash Flow (3)	Product (2) × (3) (4)	PVIF's for 18% (5)	Present Value NCF (4) × (5) (6)
Initial Outlay	1.0	−$7	−$7.00	1.0000	−$7.000
High Demand Yr. 1	.6	$6	$3.60		
Low Demand Yr. 1	.4	$2	$0.80		
	Expected Cash Flow Yr. 1		$4.40	.8696	$3.826
High Demand Yr. 1, High Demand Yr. 2	(.6) × (.8) = .48	$8	$3.84		
High Demand Yr. 1, Low Demand Yr. 2	(.6) × (.2) = .12	$3	$0.36		
Low Demand Yr 1, High Demand Yr. 2	(.4) × (.3) = .12	$6	$0.72		
Low Demand Yr. 1, Low Demand Yr. 2	(.4) × (.7) = .28	$1	$0.28		
	Expected Cash Flow Yr. 2		$5.20	.7561	$3.932
				NPV =	$0.758

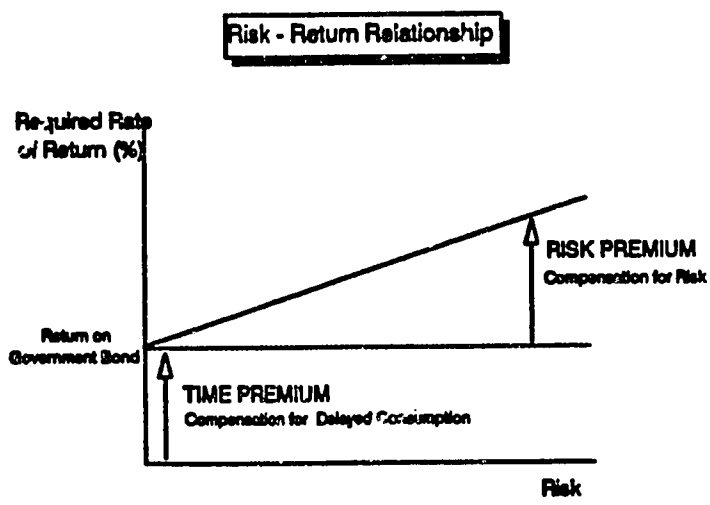
• **Risk-Adjusted Discount Rates.** To now, the required rate of return used to discount the future cash flows of an investment was determined by the firm as the rate of return necessary to justify raising funds to finance the project. This is an **opportunity cost** to the firm of the return on internally-generated funds that could be invested in other possible projects or a *direct cost* to the firm of having to raise money in the capital markets (bank loan, issue corporate bonds or equity).

• When the future cash flows are uncertain, the most popular way to incorporate risk into the analysis adjusts the required rate of return to include compensation for any additional risk taken on. If the risk associated with the investment is greater than the risk involved in a typical project, the discount rate is adjusted upward appropriately. For example, in a NPV calculation:

$$NPV = \sum_{t=1}^{n} \frac{ACF_t}{(1+k^*)^t} - OUTLAY_0$$

where ACF_t is annual after-tax cash flow in period t, n is the number of years in the project's life, $OUTLAY_0$ is initial outlay of investment at time $t = 0$, and k^* is the firm's risk-adjusted required rate of return for project.

• The logic behind the trade-off relationship between risk and required return is fundamental to much of finance. Over the past two decades, researchers have demonstrated that under idealized conditions, and with risk defined in a specific way, the risk-return relation is a linear one as shown below:



• In practice, when the risk-adjusted discount rate is used, projects are grouped according to purpose or risk class; then the discount rate preassigned to that risk class is used:

Project Type	Required Return
Replacement Decision	12%
Expansion of Existing Product Line	15%
Project Unrelated to Current Operations	18%
Research and Development Operations	25%

B. THE COST OF CAPITAL

• When creditors and owners invest money in a firm, they incur an opportunity cost equal to the return they could have earned on alternative investments. This opportunity cost is the firm's *cost of capital* – it is the minimum rate of return the company can earn on existing assets and still meet the expectations of its capital providers. The cost of capital is the discount rate that we use to evaluate new investment proposals.

• To compute the firm's cost of capital we note that different rates of return are earned on the set of alternative investments faced by the different creditors. So the overall measure of the cost of capital for a firm will be a *weighted average* of the costs of the different sources of financing.

EXAMPLE: Consider a firm with the following financing for its current operations:

Source of Capital	Amount	Percentage of Total Assets
Bank Loan	$ 600000	30%
Long-term Bond	$ 200000	10%
Common Stock	$1200000	60%

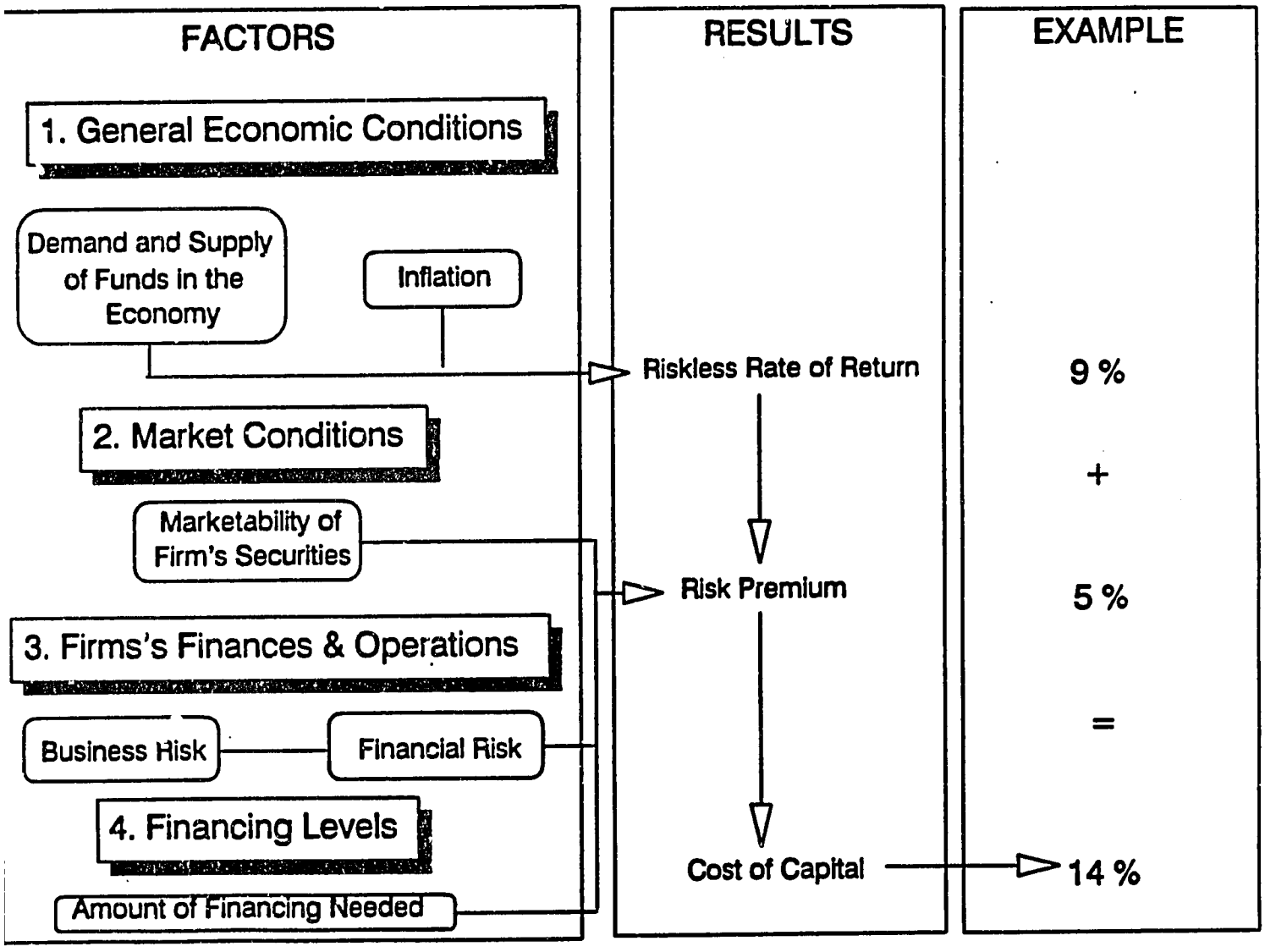
The current cost of the firm's capital for each source of financing has been determined to be:

Cost of Bank Debt	10%
Cost of Long-term Bond	12%
Cost of Common Stock	16%

What is the weighted cost of capital for this firm?

426

• There are several factors that influence the cost of capital to a firm: general economic conditions, market conditions for the firm's securities, operating and financing conditions within the company and the amount of financing needed for new investments.



C. INFLATION AND CAPITAL INVESTMENTS

• In recent years it has become important to consider the effect of inflation in capital-budgeting decisions. There are four general ways in which inflation can affect the decisions:

(1) Increased inflation will cause the required rate of return on the project to rise. As cash flows received in the future will buy less with increased inflation, investors will demand higher returns on invested funds today. We refer to the gross required rate of return that incorporates the inflation adjustment as the *nominal* rate and the net required rate of return before the inflation adjustment as the *real* rate.

Example: If investors seek a *real* rate of return of 8% on an investment with a given degree of risk and the prevailing rate of inflation expected for the investment horizon is 6%, what must be the *nominal* rate of return to induce the investor into accepting the project?

---

(2) Both future expected cash inflows and outflows could be affected by inflation because of its influence on wages, salaries, material costs and other expenses. More importantly, these various components of revenues and costs could be differently affected by inflation.

(3) The salvage value of the project could also be affected by inflation.

(4) Depreciation charges do not change with inflation because they are based on historical (not replacement) costs. This effect will distort cash flow estimates since a smaller portion of the future cash flow will be sheltered by depreciation and a larger percentage will be given up to taxes – the after-tax cash flows will be smaller.

428

• These concepts can be used to analyze capital budgeting under inflation. First, define $RACF_t$ as the real annual after-tax cash flow in period t, and let k_n^* and k_r^* be the real and nominal risk-adjusted required rates of return for the firm where the expected rate of inflation annually is i.

Step 1. If inflation affects all incremental revenues and costs equally, the nominal annual after-tax cash flows can be computed:

$$ACF_t = RACF_t(1+i)^t$$

Step 2. If the same inflation factor is built into the cost of capital, then:

$$NPV = \sum_{t=1}^{n} \frac{RACF_t(1+i)^t}{(1+k_r^*)^t(1+i)^t} - OUTLAY_0$$

Note: The cost of capital usually includes an inflation premium, so the key is to match the numerator and denominator in real or nominal terms to avoid biased NPV values.

Step 3. If both revenue and cost components are not expected to rise at exactly the same rate of inflation as is built into the cost of capital, the best procedure is to incorporate expected inflation into the basic cash flow component projections for each year

429

Example: Nuclear Data, Inc. (NDI), a firm which manufactures monitoring equipment usd in nuclear power plants, is considering a majore expansion into equipment to measure sulphur dioxide emissions in coal-burning power plants. The cost of the expansion would be $10 million. The project would have a life of ten years, and its expected net cash flows over this time are $1.5 million in current dollars. NDI's after-tax cost of long-term capital is 15 percent for projects of this degree of risk. The average rate of inflation forecasted for the general economy over the next ten years is 9 percent and NDI estimates that both its input costs and sales prices will rise at about this same rate. Should NDI undertake the project?

430

DARDEN
Graduate School of Business Administration
University of Virginia

UVA-F-919

Metalcrafters, Inc.

In September 1985, Mark Chen, a new financial analyst at Metalcrafters, Inc., was preparing the analysis of four investments and two contracts that Metalcrafters' budget committee would review at the end of the week. This analysis was the first real assignment he had received from his boss, Dena Brownowski, chief financial officer at Metalcrafters, and he wanted to make a good impression.

THE COMPANY

Metalcrafters was founded in the early 1960s by two Korean War buddies who had returned home to Detroit, Michigan, after the war and gone to work in the automobile industry. They had seen an opportunity to go into business producing specialized polished and anodized[1] aluminum hardware and molding parts for the auto industry, and Metalcrafters was the result. The plant was located just outside Detroit.

In the late 1960s, the company diversified in an attempt to insulate itself from the cyclicality of the auto industry. By 1985, Metalcrafters was producing parts for aluminum windows, ladders, and industrial lighting fixtures, as well as some consumer products. Of the 800 different parts produced in 1985, over half were for customers outside the auto business, accounting for about 40 percent of total revenues.

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[1]Anodizing is a process that treat parts electromagnetically to make them corrosion resistant.

This case was prepared as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. Copyright (c) 1987 by the Darden Graduate Business School Foundation, Charlottesville, VA.

43

Metalcrafters management was known for its conservativism. The company expanded slowly, and large investments were carefully considered. For instance, all capital-investment proposals exceeding $5,000 were submitted to the company's budget committee. The proposal for each investment had to include a description and justification of the investment as well as detailed forecasts for costs and revenues. Ms. Brownowski and her staff had the job of reviewing the proposals and preparing a detailed financial analysis for each. The budget committee, consisting of the company's four top officers--president, CFO, and directors of marketing and operations--relied on these analyses in making their decisions.

In September 1985, several requests were on Mr. Chen's desk. Two were for investments in new equipment--replacement of a stamping press and the purchase of an extrusion press. In addition, Ms. Brownowski had asked Mr. Chen to look at two orders for extruded parts and see whether capital-budgeting techniques could be adapted for use in deciding between them. Ordinarily the company would fill both orders, but because it currently lacked the capacity to do so, and new equipment could not be installed in time to meet the contract provisions, the company would have to choose between the orders.

THE STAMPING PRESS

Because of rapidly rising repair costs of the old machine and the greatly improved efficiency of new presses, management had decided that it was time to replace an old stamping press. The two options that had been proposed differed primarily in expected life and cost. Both machines could be purchased from the same company. The first, called the SX-65, would cost $65,000 installed and would last 5 years. At the end of its 5-year life, management believed it could be sold for about $5,000. Annual savings of $28,000 were expected from its operation.

The second press was more durable. It cost $90,000, but would last 10 years. Annual savings were also expected to be $28,000 and, at the end of its life the press could be sold for an estimated $5,000. Regardless of which press management decided to purchase, the old, fully depreciated press could be sold for $1,000.

THE EXTRUSION PRESS

Metalcrafters' management had been forced to turn down several contracts recently because the company lacked sufficient extrusion capacity. Management had considered two extrusion

432

presses and engaged in considerable debate over the choice. One had a much larger capacity, and a price to match.

A small press was available for $650,000 installed. The press could handle aluminum billets up to 4 inches in diameter and it would allow Metalcrafters to fill most of the orders it currently turned away. The press was expected to produce annual sales of $750,000 for its 10-year life. Of the revenues, 65 percent would cover labor and materials. An additional 5 percent would be needed to cover marketing and administrative costs, which were typical of extrusion-press operations and would not be incurred if the sales did not materialize. At the end of the 10 years, management believed that it could sell the small press for $20,000.

With the larger press, Metalcrafters could accept all the orders that it now could not take and, because the press could accept 8-inch billets, the company could consider expanding by producing larger parts used in consumer products. This press cost $1 million, would also last 10 years, and was expected to result in annual sales of $1.075 million. At the end of its life, management forecast it could be sold for $45,000.

Some of the sales that were forecast for each of the two new extrusion presses would come from parts that would otherwise have been produced on Metalcrafters' present presses. Management estimated that about $100,000 of sales per year would have been produced without a new press. The old presses were expected to be used for only 7 more years before being scrapped.

THE NEW PARTS ORDERS

Because the company had limited extrusion-press capacity, management had to choose between orders from the Sawmasters and Eades companies. Once a new extrusion press was in place, they would not be confronted with the same problem, particularly if they chose the larger press. However, both Sawmasters and Eades had written in their contracts that capacity had to be in place at the time the contract was accepted. Mr. Chen was not sure that a capital-budgeting approach was the way to choose between these two projects. Neither required new capital.

Eades Electric was one of Metalcrafters' oldest and largest customers, but it had been switching from aluminum to plastic for many of its components. The result had been a decline of 15 percent in orders from Eades during the last 2 years. Eades urgently needed a new part that Metalcrafters could easily produce. The contract would generate sales of $50,000 each year for 3 years.

Sawmasters' order was for a special chainsaw part. Sawmasters had never ordered from Metalcrafters before, although it was a customer that Metalcrafters had long courted. The contract would add sales of $30,000 in the first year, $36,000 in the second, and $99,000 in the third and final contract year.

To set up the equipment and train staff to produce the parts for either order would cost $8,000. Cost of materials and labor averaged 65 percent of sales for parts of this type. New expenses associated with administering either of the projects would be 5 percent of sales.

CAPITAL BUDGETING

As Mr. Chen prepared to do his analysis, he recalled Ms. Brownowski's comments about the criteria used by the budget committee. Two of the committee members preferred payback, the other two, net present value. The committee was using a 15-percent required rate of return for all projects.

Mr. Chen had failed to ask Ms. Brownowski about how to handle taxes. Currently the marginal tax rate was 48 percent, and depreciation was calculated according to the ACRS (accelerated cost recovery system) rules passed by the U.S. Congress as part of the Economic Recovery Tax Act of 1981. Metalcrafters could take an investment tax credit of 8 percent on the presses and still depreciate the full purchase price. The four presses were classified as 5-year ACRS property and could be depreciated as follows:

ACRS Depreciation Schedule
5-Year Life Equipment

Year	Proportion Depreciated
1	15%
2	22
3	21
4	21
5	21

There was, however, ongoing and serious consideration of a change in the tax code by the president and Congress. The new

434

tax code would reduce the tax rate (most companies would pay 34 percent), eliminate the investment tax credit, extend depreciable lives, and use an accelerated method of depreciation called double-declining balance.[2] Mr. Chen talked with old classmates from his MBA days who worked for Big-Eight accounting firms, and they said that the stamping presses would probably still be depreciated over 5 years, but the extrusion presses' depreciable lives would be 7 years.

Ms. Brownowski was on vacation until Friday, the budget committee's meeting day. Mr. Chen was to be ready on her return to brief her on his analysis and recommend which, if any, of the projects should be approved.

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[2]To calculate double-declining balance, take the straight-line depreciation rate for the same project life and apply it to the undepreciated value of the investment. When it is advantageous, a switch can be made to straight-line depreciation.

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426

RAISING CAPITAL

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131

Why Study Methods of Financing?

- There is a common core of financial instruments that are used worldwide to raise capital for firms.

- Understanding how these corporate securities work and how they transfer risk and reward to different classes of investors is valuable.

- Understanding how corporate financing is structured in other countries and markets can help in developing financial markets here.

- To be able to compete effectively for capital, it is important for a financial manager to be aware of the alternative investments that are being offered to investors.

Hungarian Phone Firm to Sell Shares In U.S. in Bid to Upgrade Its Network

By Cortney Murdoch
Staff Reporter of The Wall Street Journal

WASHINGTON—Hungarian Telephone & Cable Corp. wants to reach out and touch some investors.

The fledgling venture, formed last March, is seeking to develop local telephone exchanges in Hungary as an adjunct to ambitious plans to upgrade the national telecommunications system.

In a filing with the Securities and Exchange Commission, the New York and Budapest company said Hungary's telephone network is "one of the most backward in Europe," with about nine telephones per 100 persons, compared with a European Community average of more than 40 per 100 persons.

The company filed to sell 805,000 common shares, including 105,000 shares for underwriter over-allotments, at an anticipated price of $7 a share. After the offering, the company will have 1,533,000 common shares outstanding. Texas Capital Securities Inc. and J.W. Barclay & Co. will underwrite the offering.

'Outdated' Network

The Hungarian network, operated by state-owned Hungarian Telecom Ltd., is "outdated, based on old electromechanical exchanges," the filing asserts. Work began in 1990 to replace the old network with a new national digital network, and Hungarian Telecom intends to invest $1.5 billion upgrading the system by 1995, partly financed by loans from the World Bank and the European Industrial Bank.

Hungarian Telephone & Cable wants to piggyback on that upgrade, proposing to provide working capital, technical expertise and management services to newly emerging community telecommunications corporations throughout Hungary, including Elso Hazai Tavkozlesi Rt., described as the only Hungarian company other than Hungarian Telecom licensed to operate a local exchange. Hungarian Telephone owns a 50% interest in Elso, and has agreed to purchase an additional 47.5% of Elso owned by Hungarian Telecom, as soon as Hungarian law permits. Proceeds from the public offering will be used to purchase the Elso shares, pay debt and provide working capital. Elso so far is quite small, having built a 1,000-line exchange in a Budapest suburb, and a 600-subscriber cable television service. It has been asked to add another 4,000 telephone lines.

Possible Problems

The filing notes that the venture could be affected by changes in regulatory requirements and any new licensing demands that might be adopted. Moreover, failure to adopt pending telecommunications legislation could stifle growth. And Hungarian Telephone's results will depend upon dividend policies adopted by local phone ventures, which could vary widely.

According to the filing, the Hungarian government and Hungarian Telecom envision a national trunk line system, while local companies provide direct connections to local exchanges. To assist the local companies, Hungarian Telecom has already arranged for 56 local communities to organize telecom exchanges and to help with financing the developments.

Hungarian Telephone & Cable has signed letters of intent to enter joint ventures with three local corporations with a potential 57,000 subscribers, and is negotiating with another venture with an additional 50,000; by the end of 1994, Hungarian Telephone envisions building and operating local exchanges with at least 250,000 lines. The developer said it expects to purchase equipment, including digital telephone switches, with 100% financing from suppliers. It has been negotiating with several major switch equipment makers, including Northern Telecom Ltd. and Alcatel N.V.

The new local exchanges envision basic phone service as well as features more common in the U.S. such as fire alarm and security alarm repeat dialing, call-back, call waiting, and answering services, as well as local phone directories.

Hungarian Telephone plans to use digital signal technology to permit transmission of text, cable television and data over the network as well as voice conversations.

439

An Overview

- There are many different types of financing vehicles used to raise capital. We will consider each of the following in turn.

  - Trade Credit.
  - Bank Lending.
  - Commercial Paper.
  - Bankers Acceptances.
  - Leasing.
  - Corporate Bonds.
  - Convertible Bonds.
  - Preferred Stock.

- Warrants.
- Stock.
- Venture Capital.

Trade Credit

- Having your suppliers provide you with inventory and then be willing to wait 30, 60, or even 90 days for payment can be an extremely important form of corporate financing.

- For example, if a firm makes purchases of 100 during the year but creditors are willing to grant 90 days of trade credit, the savings in interest costs are approximately $100 \times (90/365) \times$ the interest rate. If this interest rate is .15, the annual savings is 3.69. In addition to the interest savings, using trade credit reduces the need to find outside sources of capital to finance ongoing operations.

- This form of financing is more common in some industries than in others. For example, an electrical utility will have little in the way of trade credit. On the other hand, a clothing retailer may be able to get several months of trade credit from a supplier.

- Since it is costly for a supplier to provide trade credit, suppliers often find it profitable to give their customers a strong incentive to pay their accounts as quickly as possible.

- Standard trade credit terms.

- Failing to take advantage of trade discounts can be very costly. For example, consider the case where a supplier will grant you a 5 percent discount if you pay immediately but requires payment in twenty days. Thus, if the purchase price is 100, you pay only 95 if you pay immediately. If you don't pay immediately, you get a 20-day loan, but have to pay 100/95 times as much which is the same as paying a 5.26 percent rate of interest over the 20-day period. Since there are $365/20 = 18.25$ 20-day periods in a year, this works out to an annual interest rate of 155 percent per year. Not paying immediately can work be a very expensive way of financing inventory!

- *Pig iron—net 30.* If no cash discount is allowed, products are said to sell on a *net* basis. Pig iron is one of the many items that are normally sold net 30; this means that payment is due within 30 days of the date of invoice.
- *Hams—½/10.* Where the payment period is short, the seller may offer a cash discount to customers who pay by the due date. For instance, hams are generally sold on a ½ percent, 10 day basis. In other words, customers who pay by the tenth day, which is the due date, are entitled to deduct ½ percent from the face amount of the bill.
- *Bearings—5/10, net 30.* The cash discount is more frequently used as an inducement to pay *before* the final date. Thus, if bearings are purchased on terms of 5/10, net 30, the buyer may claim a 5 percent discount if payment is made within 10 days but otherwise must pay in full (less any possible anticipation) by the thirtieth day.
- *Dresses—8/10, EOM.* For many items that are bought on a recurrent basis it is inconvenient to require separate payment for each delivery. A common solution in such cases is to pretend that all sales during the month in fact occur at the end of the month. Thus, sales of dresses are typically made on an 8 percent discount with the bill payable within 10 days of the end of the month (EOM). By convention the twenty-fifth day is the end of the month in the clothing trade.
- *Electrical supplies—2/15th prox., net 60.* "Proximo" billing is similar in character to end-of-month billing. Thus, manufacturers' sales of electrical goods usually carry a 2 percent discount as long as payment is made by the fifteenth of the following month. Otherwise payment is due within 60 days of the date of invoice.
- *Carpets—4/10, 60 extra.* "Extra dating" is used for some products such as carpets which have long payment periods. As long as payment is made within 60 days of the 10-day period—in other words, within 70 days of the invoice date—the buyer may claim a 4 percent discount. "4/10, 60 extra" is, therefore, just another way of writing 4/70.
- *Sugar—2/7 ROG.* Normally the payment date is reckoned from the date of invoice rather than from delivery. However, particularly where delivery times may be long relative to the payment period, the terms may be based on the "receipt of goods" (ROG). Sugar, for example, is commonly sold on a 2 percent cash discount with payment due 7 days after delivery.
- *Fur garments—season datings.* Where purchases are subject to marked seasonal patterns, manufacturers often encourage customers to take early delivery by allowing them to delay payment until the usual order season. This may be accomplished by varying the payment terms or by simply postdating the invoice.
- *Gasoline—load-to-load.* Gas stations often purchase gasoline on a "load-to-load" basis. In this case payment for one delivery is made at the time of the subsequent one.

Bank Lending

- Bank lending is often the most common means of raising short term capital for small and medium sized firms.

- Bank lending is generally short term, typically with maturities of less than a year. These types of maturities are suitable for financing short term assets such as accounts receivable and inventories.

- How do banks lend money?

How Do Banks Lend Money?

It is often quipped that a banker is a man who lends you an umbrella when it is fair, and takes it away when it rains. Actually, bankers utilize two very basic approaches to lending money. The first is commonly referred to as secured lending which can be loosely translated to mean lending on the borrower's assets, and the second is cash flow lending.

Secured lending involves lending money based upon the borrower's assets as collateral. In *The Merchant of Venice* Shylock demanded a pound of flesh as security for a loan. In practice banks accept a wide variety of objects as collateral. In any case to be acceptable as collateral the object must have three basic attributes: (i) It must first be worth at least as much as the amount being lent. Of course the worth of any asset is not always known with certainty nor is it assured that its worth will remain constant over the term of the loan. For these reasons banks will vary the percentage of the value of the collateral they will lend in response to their assessment of the riskiness of the collateral asset's value. For instance, if the borrower has a portfolio of U.S. Government securities that it wants to use as collateral then the bank might advance a loan of up to 90 percent of the face value of these securities while it might loan as little as 20 percent against the estimated worth of the firm's work in progress inventories. (ii) To be good collateral it must be relatively easy to take possession of the asset. Here it helps if the collateral is not too mobile. For example, following the collapse of the shipping industry beginning in 1982 bankers found themselves with over $10 billion in bad debts which required that they quite literally search the ports of the world in search of their *floating security*. (iii) Finally, collateral must be easily identified. This requirement is actually an important element of item (ii) above. For example, although banks do make loans based on *blanket liens* against all or a portion (for example, inventories) of a firm's assets they prefer not to since it is more difficult to determine just what assets they hold claim to in the event of default.

An alternative to asset based loans banks also engage in *cash flow lending* or loans based upon the supposed ability of the debtor to repay the loan. The key to this type of lending is a good estimate of the borrower's normal free cash flow that can serve as the basis for creditors. One commonly used basis for assessing this free cash flow is the sum of the firm's net profit after tax, its depreciation expense and its interest charges. The idea here is that this sum is the amount of cash the firm could use to meet its principal and interest charges. The ratio of the firm's free cash flow to its interest and principal expenses is generically referred to as the firm's interest cover. What constitutes an acceptable interest cover will vary with the nature of the firm's business with riskier businesses demanding a higher coverage ratio.

All of this sounds very scientific and quantifiable to this point. However, we know from the history of bank failures and crises that the lending process is fraught with uncertainty. In the end there is no substitute for common sense. For example, when the Texas oil boom was in full swing hind sight tells us that Houston property lenders seldom looked outside their high-rise office towers to count the number of construction cranes on the horizon.

Source: "How Banks Lend," *The Economist*, (February 4, 1989), 78–79.

- An example of a bank note.

- Inventory Lending. This form of financing is secured by the inventories it is used to acquire. The amount that can be loaned depends on both the marketability and the perishability of the inventory. Some items, such as raw materials like grains, oils, lumber and chemicals are good sources of collateral since they are easily liquidated. Other items such as work in process inventories are poor collateral since they are not marketable. A lender may choose to keep strict control over inventory that is pledged on a loan by requiring that it be phyically separated from other inventory such as in a warehouse.

- Pledging. Some lenders will advance funds on the basis of a claim against the accounts receivable of a firm. A lender will typically only be willing to advance a percentage of the actual receivables amount, where the percentage is a function of the credit history of the customer. Pledging often requires receiving approval from the lender before making a credit sale to a customer.

- Factoring. This form of financing actually involves selling the accounts receivable to a third party. The factor is often a industrial finance company that does only factoring or it may be a commercial bank. The factor takes the risk of bad debts and slow collections. As payment for taking this risk,

NAME XYZ CORPORATION DUE DATE July 29, 1990 NO. . $ 5,000.00

January 30 19 '90

ON DEMAND, or if no demand is made, then -----180 days----- after date, without grace, for value received, I, we, and each of us, as principals, promise to pay to the order of THIRD NATIONAL BANK at Bryan, Texas the sum of ----------FIVE THOUSAND AND NO/100---------- DOLLARS, including n/with a FINANCE CHARGE of 221.92 which is an ANNUAL PERCENTAGE RATE of -9- % from 1/30/90 until maturity, and if not then paid, at the rate of 10% per annum until paid.

In the event of default in the payment of this note, when due, or in the performance of any agreement contained in the security agreement if any is taken to secure payment hereof, or in the event the holder deems itself insecure, then the holder of this note shall have the option, without demand or notice to declare the principal and interest at once due and payable and to exercise any and all other rights or remedies provided in this note and in the security agreement, if any, including the right to set off against this note and all other liabilities of the undersigned to the holder, all money or other property in its possession held for or owed to the undersigned.

Each maker, surety, endorser, and guarantor of this note hereby waives presentment for payment or acceptance, notice of non payment or dishonor, protest, and diligence in the collection hereof or in filing suit hereon and agrees that liability for the payment hereof shall not be affected or impaired by any release of or change in the security, if any, or by any extension in the time for payment, and further agrees to pay all costs and expenses of collection incurred by the holder if this note is placed in the hands of an attorney for collection after maturity, or is collected by legal proceedings of any kind, to pay a reasonable attorney's fee, but shall not in any event be less than the sum of $50.00 and shall bear interest at the rate of 10% per annum from the date of its accrual.

Payment of this note is secured by all money or other property of the undersigned now or at any time hereafter in the possession of the holder in any capacity and also by

SAMPLE

INSURANCE AGREEMENT

CREDIT LIFE INSURANCE is not required for this loan. No charge is made for credit insurance and no credit insurance is provided unless the borrower checks the appropriate statement below:

(a) The cost for Credit Life Insurance alone will be $ _____ for the term of credit.

☐ I desire Credit Life Insurance.

☐ I do not desire Credit Life Insurance.

1/30/90

Date

Signature for Insurance Acknowledgment

Address 36 Nine Street, Bryan, Texas 77800

Phone: Bus. 713-895-2519 Res. 713-693-1707

Age _____ Filing Fee _____

XYZ CORPORATION

By: _____

_____

848

the factor will discount the accounts receivable he buys by an amount that reflects both the time value of money and the risk of the receivables.

- As an example of factoring, consider a firm with receivables due in 60 days of 100,000. The maximum amount that the firm could receive from factoring the receivables is 100,000 minus the factor's fee of 2,000 minus a 6,000 reserve for uncollectibles minus interest of $.12 \times 60/365 \times 92,000 = 1815$ which equals 90,185. The effective annual rate of interest is

$$\frac{1,815 + 2,000}{90,185} \times \frac{365}{60}$$

which equals 25.73 percent.

- The ins and outs of factoring.

GETTING IN

Factors are necessarily selective in the companies they agree to take on as clients. Detailed negotiations take place with prospective clients and their financial advisers; two key items of information that the factor will require are:

- Audited accounts for the past year and the current management accounts.
- A list of the customers and a monthly turnover projection for each.

Commencement date. Once agreement has been reached a date will be arranged for the factor to assume responsibility for the sales ledger.

Introducing the service. At the start of the factoring arrangement, it is useful for the client to send a letter to customers explaining the introduction of the factor. Where appropriate, the factor may speak personally to some customers.

Invoices. Once factoring starts, clients will be encouraged to invoice their customers immediately a valid debt has been created, passing copies of invoices to the factor or, in some cases, passing the invoices to the factor for mailing. Clients must ensure that their invoicing procedure is efficient, with the terms and conditions clearly stated so that they will be understood by customers.

Factoring. With recourse and non-recourse factoring, clients may only draw on a financial facility within the credit limits agreed for each customer. These credit limits must be monitored constantly to ensure they are realistic.

Credit cover. In the case of non-recourse factoring, clients must ensure they have credit approval from the factor before delivering the goods or providing the service. They must seek credit cover for new customers before delivery, and should monitor the level of credit cover on existing customers to ensure that it is adequate.

Management accounts. During the course of the year, a factor will ask to see its client's management accounts, usually at about quarterly intervals, in order to monitor the progress of the business.

Day-to-day operation. A number of routine procedures and associated documentation will be employed in the operation of the factoring arrangement, depending on the precise system of the factor concerned. Factors will usually supply a concise set of operating instructions to guide the client.

GETTING OUT

Companies should not be inhibited from entering into factoring arrangements for fear that they may find it difficult to discontinue the service. Indeed they may wish to discontinue for a variety of reasons. For instance:

- Acquisition by a larger parent who does not wish to factor.
- Change in the pattern of business, resulting for example in a significant reduction in customers.
- Replacement from another source of funding at present being taken from the factor.
- Generation of increased profits rendering factoring unnecessary.

A factoring agreement will almost certainly contain a clause relating to the notice requirement—usually about three months on either side. On deciding to withdraw from factoring, clients will need to address themselves to just three principal matters:

- The availability of funds to finance the buying back of the outstanding debts from the factor.
- The setting up of a sales ledger system and the acquisition of necessary sales ledger administration, credit control and collection staff, to be effective from the agreed handing-over date.
- Credit insurance arrangements to replace the credit cover at present provided by the factor in the case of a non-recourse agreement.

Factors have no wish to hold clients to agreements if their services are no longer needed. Indeed they will provide every assistance to effect a smooth change over when client wishes to terminate the arrangement.

Source: Michael Maberly, "Factoring: A Catalyst for Growth and Profits," *Accountancy*, Institute of Chartered Accountants 97 (April 1986), 122–124.

Commercial Paper

- Larger firms can borrow short-term money directly from investors without going through the intermediary of a bank. These short-term borrowings are known as commercial paper and often have lower interest rates than bank borrowings.

- An example of a commercial paper issue.

- Investors in U.S. commercial paper.

- Investors in Euro commercial paper.

- Maturities on commercial paper are usually 30 to 90 days. Some commercial paper may have maturities as long as 270 days. Commercial paper is almost always used for short-term financing of assets such as inventories or receivable. Commercial paper, however, has also been used as bridge financing—to fund the start up of an investment project that is later permanently funded through a long-term source of financing.

- Since commercial paper has a short maturity, the issuer

A commercial paper specimen, Ford Motor Credit Company

Ford Motor Credit Company

For Value Received, Ford Motor Credit Company,
a corporation of the State of Delaware, will pay on
to the order of
the sum of *dollars plus interest of*
at the office of

This note shall become valid only when it shall have been
countersigned by a duly authorized officer, employee or agent of

DATED

COUNTERSIGNED FOR AUTHENTICATION ONLY

DEARBORN, MICHIGAN
Ford Motor Credit Company

By _____
AUTHORIZED COUNTERSIGNATURE

SPECIMEN

SEAL

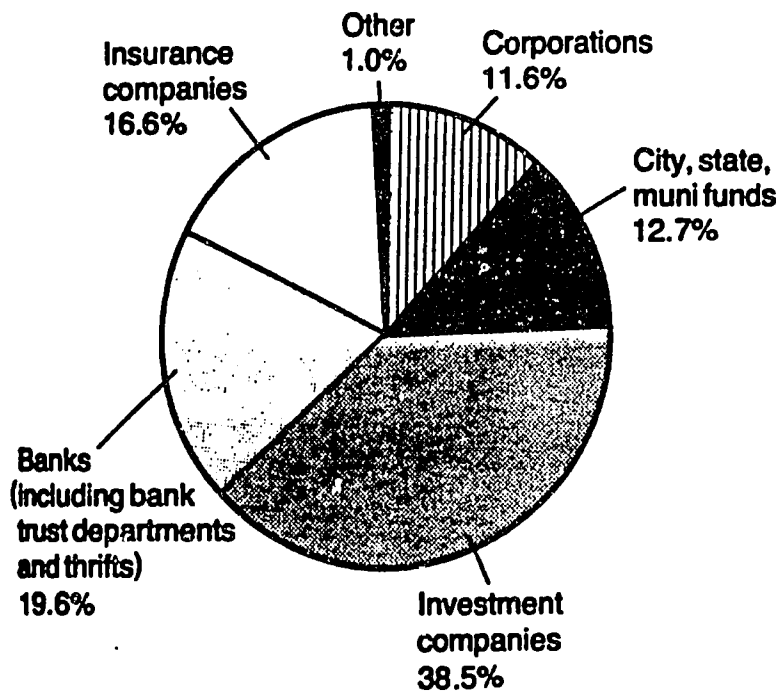
John C Dean

PRESIDENT

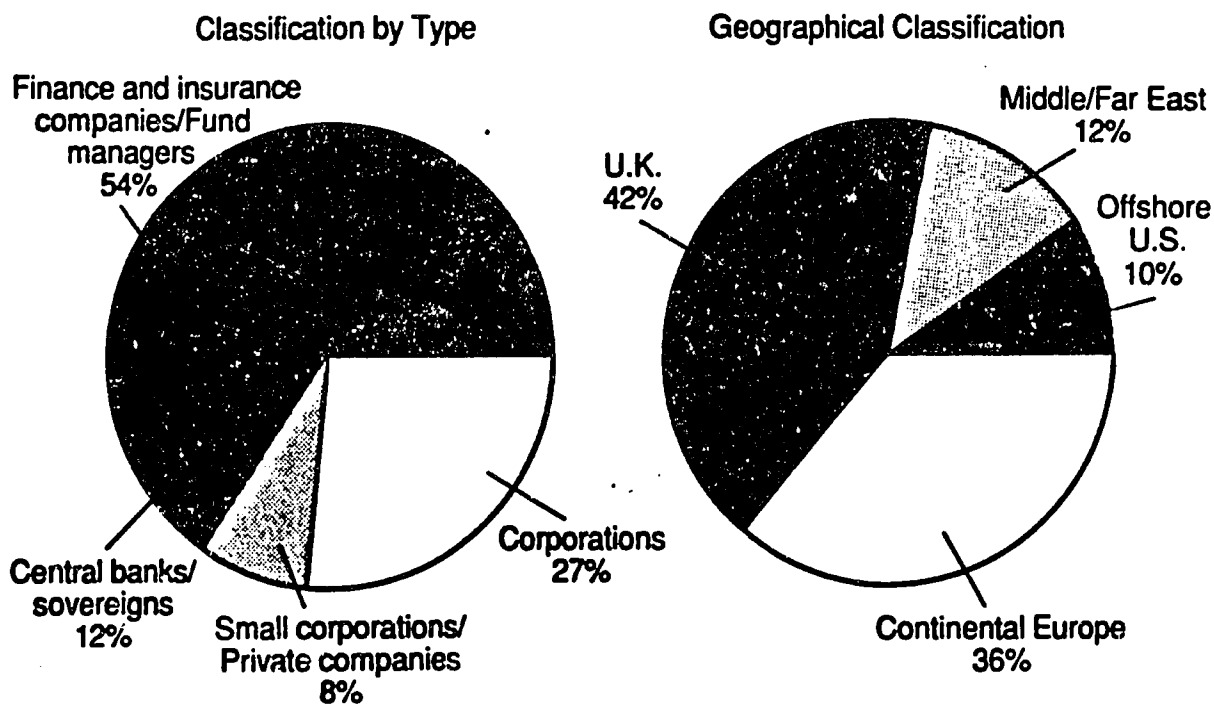
452

Investors in U.S. commercial paper

Placement by Industry



Euro commercial paper market: Profiles of Goldman Sachs' investors



needs to continually return to the market to roll it over. Since there is a risk that the issuer may have difficulty doing this if there is a problem either with the issuer or in the financial markets, many issuers of commercial paper will have a standby line of credit with a bank that will be used only if there is a problem with rolling over a commercial paper issue.

- A smaller and less well-known firm may have some difficulty entering into this market. One way to circumvent this problem may be to have a bank or some other large and creditworthy institution provide a guarantee that the loan will be repaid. For example, for a fee, a bank may provide such a guarantee. If the firm cannot roll over the paper at its maturity date, the bank will make the repayment by issuing a loan to the firm. This letter of credit (LOC) paper now represents about 10 percent of the total market for commercial paper.

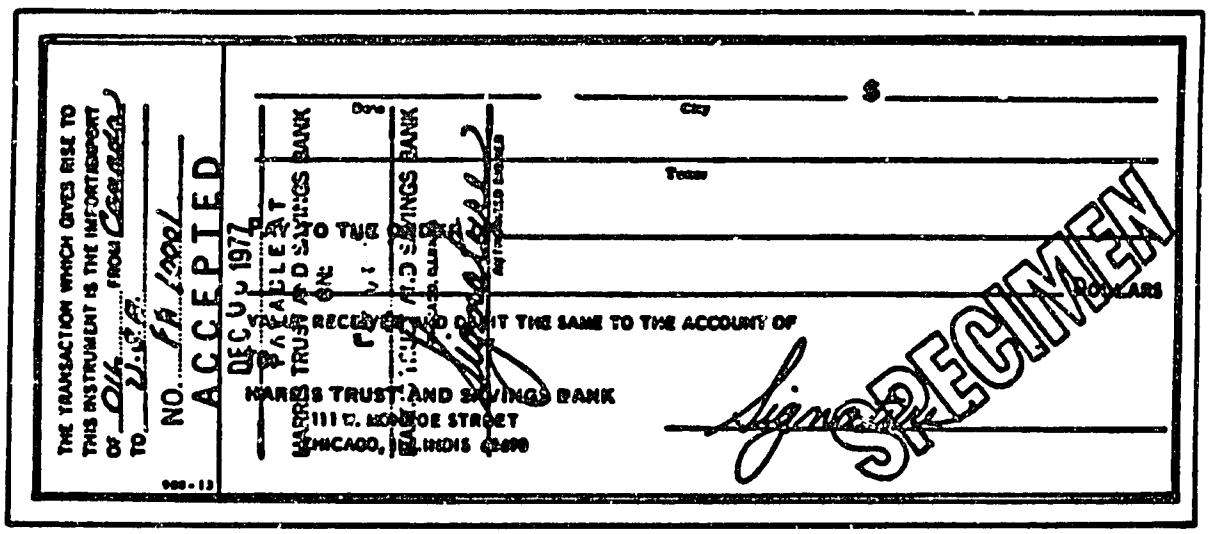
Bankers Acceptances

- A bankers acceptance is a financing tool in which a bank agrees to take the responsibility to repay a loan. This type of financing is often used in international transactions where the firms involved may not be familiar with each other.

- An example of a bankers acceptance.

- An illustration of how bankers acceptances work.

Specimen bankers' acceptance, Harris Bank


THE TRANSACTION WHICH GIVES RISE TO THIS INSTRUMENT IS THE IMPORT/EXPORT OF Oil FROM Canada TO U.S.A.

NO. FA 12001

ACCEPTED

DEC 19 1977

PAYABLE AT HARRIS TRUST AND SAVINGS BANK

Date

City

$

Tenor

PAY TO THE ORDER OF

DOLLARS

VALUE RECEIVED AND CHARGE THE SAME TO THE ACCOUNT OF

HARRIS TRUST AND SAVINGS BANK
111 W. MONROE STREET
CHICAGO, ILLINOIS 60690

HARRIS TRUST AND SAVINGS BANK

AUTHORIZED SIGNER

Signature

SPECIMEN

The Creation of a Banker's Acceptance. The best way to explain the creation of a banker's acceptance is by an illustration. The following entities will be involved in our transaction:

- Car Imports Corporation of America (Car Imports), a firm in New Jersey that sells automobiles
- West Germany Autos (WGA), a manufacturer of automobiles in West Germany
- Hoboken Bank of New Jersey (Hoboken Bank), a commercial bank in Hoboken, New Jersey
- West Berlin National Bank (Berlin Bank), a bank in West Germany
- High Caliber Money Market Fund, a mutual fund in the United States that invests in money market instruments

The following commercial transaction is being considered by Car Imports and WGA. Car Imports wants to import 15 cars manufactured by WGA. WGA is concerned with the ability of Car Imports to make payment on the 15 cars when they are received.

Acceptance financing is suggested as a means for facilitating this commercial transaction. Car Imports offers $300,000 for the 15 cars. The terms of the sale stipulate that the payment is to be made to WGA 60 days after it ships the 15 cars to Car Imports. WGA determines whether it is willing to accept

the $300,000. In considering the offering price, WGA will calculate the present value of the $300,000 because it will not be receiving the payment until 60 days after shipment. Suppose that WGA agrees to these terms.

Car Imports arranges with its bank, Hoboken Bank, to issue a letter of credit. The letter of credit indicates that Hoboken Bank will make good on the payment of $300,000 sixty days after shipment that Car Imports must make to WGA. The agreement to pay $300,000 sixty days after shipment is called a time draft. The letter of credit will be sent by Hoboken Bank to WGA's bank, Berlin Bank. Upon receipt of the letter of credit, Berlin Bank will notify WGA, who will then ship the 15 cars. After the cars are shipped, WGA presents the shipping documents to Berlin Bank and receives the present value of $300,000. WGA is now out of the picture.

Berlin Bank presents the time draft and the shipping documents to Hoboken Bank. The latter will then stamp "accepted" on the time draft. By doing so, Hoboken Bank has created a bankers' acceptance. This means that Hoboken Bank agrees to pay the holder of the bankers' acceptance $300,000 at the maturity date. Car Imports will receive the shipping documents so that it can procure the 15 cars once it signs a note or some other type of financing arrangement with Hoboken Bank.

At this point, the holder of the bankers' acceptance is the Berlin Bank. It has two choices. It can retain the bankers' acceptance as an investment in its loan portfolio, or it can request that Hoboken Bank make a payment of the present value of $300,000. Let's assume that Berlin Bank requests payment of the present value of $300,000.

Now the holder of the bankers' acceptance is Hoboken Bank. It has two choices: retain the bankers' acceptance as an investment as part of its loan portfolio or sell it to an investor. Suppose that Hoboken Bank chooses the latter and that High Caliber Money Market Fund is seeking a high quality investment with the same maturity as that of the bankers' acceptance. Hoboken Bank sells the bankers' acceptance to the money market fund at the present value of $300,000. Rather than sell a banker's acceptance directly to an investor such as High Caliber Money Market Fund, Hoboken Bank could sell it to a dealer. The dealer would then find an investor such as a money market fund to resell the banker's acceptance. In either case, at the maturity date, the money market fund presents the banker's acceptance to Hoboken Bank, receiving $300,000.

Leasing

- Leasing is a popular tool for financing longer term assets. Leasing has been used to finance assets such as trucks, railroad cars, aircraft, ships, electric power plants, nuclear fuel, handball courts, and zoo animals.

- Roughly two thirds of the leasing in the US is done through firms specializing in financial leases. Recently, however, banks have become much more active in this type of financing. Banks now account for about one third of all leasing activity.

- A lease is simply a long term rental agreement. The cash flow consequences of leasing are very similar to borrowing. These can best be illustrated by an example.

Imagine yourself in the position of Thomas Pierce, III, president of Greymare Bus Lines. Your firm was established by your grandfather, who was quick to capitalize on the growing demand for transportation between Widdicombe and nearby townships. The company has owned all its vehicles from the time the company was formed; you are now reconsidering that policy. Your operating manager wants to buy a new bus costing $100,000. The bus will last only 6 years before going to the scrap yard. You are convinced that investment in the additional equipment is worthwhile. However, the representative of the bus manufacturer has pointed out that her firm would also be willing to lease the bus to you over 6 years for an annual payment of $20,600. Greymare would remain responsible for all maintenance, insurance, and operating expenses.

Table 26-1 shows the direct cash-flow consequences of signing the lease contract. (An important indirect effect is considered later.) The consequences are:

Cash-flow consequences of the lease contract offered to Greymare Bus Lines (figures in thousands)

	YEAR					
	0	1	2	3	4	5
Cost of new bus	+100					
Lost depreciation tax shield	− 0.8	−10.88	− 6.53	− 3.92	− 3.92	− 1.96
Lease payment	− 20.6	−20.6	−20.6	−20.6	−20.6	−20.6
Tax shield of lease payment	+ 7.0	+ 7.0	+ 7.0	+ 7.0	+ 7.0	+ 7.0
Cash flow of lease	+ 79.60	−24.48	−20.13	−17.52	−17.52	−15.56

1. Greymare does not have to pay for the bus. This is equivalent to a cash inflow of $100,000.
2. Greymare no longer owns the bus, and so it cannot depreciate it. Therefore it gives up a valuable depreciation tax shield. In Table 26-1, we have assumed depreciation would be calculated using 5-year tax depreciation schedules. (See Table 6-5.)
3. Greymare must pay $20,600 per year for 6 years to the lessor. The first payment is due immediately.
4. However, these lease payments are fully tax-deductible. At a 34 percent marginal tax rate, the lease payments generate tax shields of $7000 per year. You could say that the after-tax cost of the lease payment is $20,600 − $7000 = $13,600.

We must emphasize that Table 26-1 assumes that Greymare will pay taxes at the full 34 percent marginal rate. If the firm were sure to lose money, and therefore pay no taxes, lines 2 and 4 would be left blank. The depreciation tax shields are worth nothing to a firm that pays no taxes, for example.

Table 26-1 also assumes the bus will be worthless when it goes to the scrap yard at the end of year 6. Otherwise there would be an entry for salvage value lost.

Corporate Bonds

- Most long term borrowing by corporations is of the form of a bond or mortgage. Corporate bonds may have maturities as short as one year or as long as 40 or 50 years. The issuance of bonds is generally used to finance the long term assets of the firm such as property, factories, and equipment.

- Bonds have a promised payoff at maturity known as the principal payment. During the life of the bond, however, the issuer must make periodic payments known as coupon payments. Coupons are generally expressed as a percentage of the principal value of the bond.

An Example of a Bond

EXCERPTS FROM A PROSPECTUS FOR A BOND ISSUE

Prospectus Supplement

(To Prospectus Dated October 9, 1985)

$75,000,000

Potomac Electric Power Company

First Mortgage Bonds, 11¼% Series due 2015

The New Bonds will mature on November 1, 2015. Interest on the New Bonds is payable semi-annually on May 1 and November 1 beginning May 1, 1986. The New Bonds will be redeemable, in whole or in part, on not less than 30 days notice at the option of the Company and at the redemption prices set forth herein; provided, however, that none of the New Bonds shall be redeemed prior to November 1, 1990, if such redemption is for the purpose or in anticipation of refunding such New Bonds through the use, directly or indirectly, of funds borrowed by the Company at an effective interest cost of less than 11.36% per annum. See "Description of the New Bonds—Redemption of New Bonds" herein.

Application will be made to list the New Bonds on the New York Stock Exchange.

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS SUPPLEMENT OR THE PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Price to Public (1)	Underwriting Discount	Proceeds to Company (1) (2)
Per Bond	99.500%	.401%	99.099%
Total	$74,625,000	$300,750	$74,324,250

(1) Plus accrued interest from November 1, 1985, to date of delivery.
(2) Before deduction of expenses payable by the Company, estimated to be $490,000.

The New Bonds are offered subject to receipt and acceptance by the Underwriters, to prior sale and to the Underwriters' right to reject any order in whole or in part and to withdraw, cancel or modify the offer without notice. It is expected that delivery of the New Bonds will be made at the office of Salomon Brothers, Inc, One New York Plaza, New York, New York or through the facilities of The Depository Trust Company on or about November 13, 1985.

Salomon Brothers Inc

The First Boston Corporation

Kidder, Peabody & Co.
Incorporated

Merrill Lynch Capital Markets

PaineWebber
Incorporated

Prudential-Bache
Securities

The date of this Prospectus Supplement is October 28, 1985.

IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE NEW BONDS OFFERED HEREBY AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH TRANSACTIONS MAY BE EFFECTED ON THE NEW YORK STOCK EXCHANGE OR OTHERWISE. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

THE ISSUE IN BRIEF

The following is a summary of certain pertinent facts, and is qualified in its entirety by detailed information and financial statements appearing elsewhere in this Prospectus Supplement or the Prospectus to which it is attached, or in documents incorporated in the Prospectus by reference. See "Incorporation of Certain Documents by Reference."

THE OFFERING

Company	Potomac Electric Power Company
Securities Offered	$75,000,000 First Mortgage Bonds, 11¼% Series due 2015
Interest Payment Dates	May 1 and November 1, commencing May 1, 1986
Application for Listing	New York Stock Exchange
Redemption	"Redemption of New Bonds"

THE COMPANY

Business and Service Area	Generation, transmission, distribution and sale of electricity in the Washington metropolitan area
1984 Fuel Mix	Coal 89%; Oil 11%

For selected financial information and the Company's ratio of earnings to fixed charges see "Selected Financial Information" and "Ratio of Earnings to Fixed Charges."

DESCRIPTION OF THE NEW BONDS

The following description of the particular terms of the New Bonds offered hereby supplements the description of the general terms and provisions of the New Bonds set forth in the Prospectus, to which description reference is hereby made. See "Description of Bonds and Mortgage."

General. The New Bonds offered hereby, of which $75 million principal amount will be issued, will be due November 1, 2015, and will bear interest at the rate set forth in the title thereof, payable semiannually on May 1 and November 1 in each year, commencing May 1, 1986.

Redemption of New Bonds. The New Bonds offered hereby are to be redeemable prior to maturity, in whole or in part, at any time upon at least 30 days notice, at the election of the Company, at the redemption prices (in terms of percentage of principal amount) set forth in the following table, together, in each

case, with accrued interest to the redemption date; *provided, however,* that prior to November 1, 1990 the Company may not redeem any of such New Bonds from or in anticipation of moneys borrowed having an effective interest cost (computed in accordance with generally accepted financial practice) of less than 11.36%, the interest cost to the Company of such New Bonds.

If Redeemed During the 12 Month Period Ending November 1	Redemption Price Expressed as Percentage of the Principal Amount of Bonds	If Redeemed During the 12 Month Period Ending November 1	Redemption Price Expressed as Percentage of the Principal Amount of Bonds
1986	110.75%	1997	104.84%
1987	110.21	1998	104.30
1988	109.67	1999	103.76
1989	109.14	2000	103.22
1990	108.60	2001	102.69
1991	108.06	2002	102.15
1992	107.52	2003	101.61
1993	106.99	2004	101.07
1994	106.45	2005	100.54
1995	105.91	2006 and	
1996	105.37	thereafter	100.00

UNDERWRITING

Subject to the terms and conditions set forth in the Underwriting Agreement, the Company has agreed to sell to each of the Underwriters named below, and each of the Underwriters has severally agreed to purchase, the principal amount of the New Bonds set forth opposite its name below:

Underwriters	Principal Amount of New Bonds
Salomon Brothers, Inc.	$12,500,000
The First Boston Corporation	12,500,000
Kidder, Peabody & Co. Incorporated	12,500,000
Merrill Lynch, Pierce, Fenner & Smith Incorporated.....	12,500,000
PaineWebber Incorporated	12,500,000
Prudential-Bache Securities Inc.....	12,500,000
Total	$75,000,000

The Underwriting Agreement provides that the several obligations of the Underwriters are subject to certain conditions precedent and that the Underwriters will be obligated to purchase all of the New Bonds if any are purchased.

The Company has been advised by the Underwriters that they propose initially to offer the New Bonds to the public at the public offering price set forth on the cover page of this Prospectus Supplement, and to certain dealers at such price less a concession not in excess of .30% of the principal amount of the New Bonds. The Underwriters may allow and such dealers may reallow a concession not in excess of .25% of the principal amount of the New Bonds to certain other dealers. After the initial public offering, the public offering price and such concessions may be changed.

465

The Underwriting Agreement provides that, subject to certain conditions, the Company will indemnify the several Underwriters and their controlling persons against certain liabilities, including liabilities under the Securities Act of 1933, arising out of or based upon, among other things, any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, the Prospectus or this Prospectus Supplement, or the documents incorporated by reference therein, or the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

POTOMAC ELECTRIC POWER COMPANY

FIRST MORTGAGE BONDS

Potomac Electric Power Company (the "Company") may offer from time to time up to $150,000,000 aggregate principal amount of its First Mortgage Bonds (The "New Bonds"), which may be offered as separate series in amounts, at prices and on terms to be determined by market conditions at the time of sale. The aggregate principal amount, rate (or method of calculation) and time of payment of interest, maturity, offering price, any redemption terms or other specific terms of the series of New Bonds in respect of which this Prospectus is being delivered are set forth in the accompanying Prospectus Supplement (the "Prospectus Supplement").

The Company may sell the New Bonds through underwriters designated by the Company, or dealers, directly to a limited number of institutional purchasers or through agents. See "Plan of Distribution". The Prospectus Supplement sets forth the names of such underwriters, dealers or agents, if any, any applicable commissions or discounts and the net proceeds to the Company from such sale.

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this Prospectus is October 9, 1985.

THE COMPANY

Potomac Electric Power Company (the "Company") is engaged in the generation, transmission, distribution and sale of electric energy in the Washington metropolitan area, including the District of Columbia, major portions of Montgomery and Prince George's Counties in Maryland, and a small portion of Arlington County in Virginia. It also supplies, at wholesale, most of the electricity distributed in Calvert, Charles and St. Mary's Counties in southern Maryland. During 1984, approximately 53% of its revenue was derived from Maryland, 45% from the District of Columbia and 2% from Virginia. Approximately 17% and 4% of such revenue were derived from departments of the United States and District of Columbia governments, respectively.

The Company's principal executive offices are located at 1900 Pennsylvania Avenue, N.W., Washington, D.C. 20068 and its telephone number is (202) 872-2456.

USE OF PROCEEDS

The proceeds from the sale of the New Bonds will be applied to refund the Company's senior securities: long-term debt retirements, preferred and preference stock redemptions and contractual sinking fund requirements. Proceeds may be used to pay off short-term debt incurred to fund the above-mentioned senior security retirements or may be temporarily placed in short-term investments pending the application of the proceeds as stated above.

The Company does not plan to use the proceeds to support its ongoing construction program which will be financed through internally generated funds and short-term borrowings.

PLAN OF DISTRIBUTION

The Company may sell the New Bonds in any of three ways: (i) through underwriters or dealers; (ii) directly to a limited number of institutional purchasers or to a single purchaser; or (iii) through agents. The Prospectus Supplement with respect to any New Bonds being offered thereby sets forth the terms of the offering of such New Bonds, including the name or names of any underwriters, the purchase price of such New Bonds and the proceeds to the Company from such sale, any underwriting discounts and other items constituting underwriters' compensation, any initial public offering price and any discounts or concessions allowed or reallowed or paid to dealers and any securities exchanges on which such New Bonds may be listed.

If underwriters are used in the sale, the New Bonds will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. The New Bonds may be either offered to the public through underwriting syndicates represented by the underwriter or underwriters to be designated by the Company, or directly by one or more of such firms. Unless otherwise set forth in the Prospectus Supplement, the obligations of the underwriters to purchase the New Bonds offered thereby will be subject to certain conditions precedent, and the underwriters will be obligated to purchase all such New Bonds if any are purchased. Any initial public offering price and any discounts or concessions allowed or reallowed or paid to dealers may be changed from time to time.

New Bonds may be sold directly by the Company or through agents designated by the Company from time to time. The Prospectus Supplement sets forth the name of any agent involved in the offer or sale of the New Bonds in respect of which the Prospectus Supplement is delivered as well as any commission payable by the Company to such agent. Unless otherwise indicated in the Prospectus Supplement, any such agent is acting on a best efforts basis for the period of its appointment.

If so indicated in the Prospectus Supplement, the Company will authorize agents, underwriters or dealers to solicit offers by certain specified institutions to purchase the New Bonds from the Company at the public offering price set forth in the Prospectus Supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. Such contracts will be subject to those conditions set forth in the Prospectus Supplement, and the Prospectus Supplement will set forth the commission payable for solicitation of such contracts.

Agents and underwriters may be entitled under agreements entered into with the Company to indemnification by the Company against certain civil liabilities, including liabilities under the Securities Act of 1933, or to contribution with respect to payments which the agents or underwriters may be required to make in respect thereof. Agents and underwriters may be customers of, engage in transactions with, or perform services for the Company in the ordinary course of business.

DESCRIPTION OF BONDS AND MORTGAGE

General. The New Bonds are to be issued under the Mortgage and Deed of Trust dated July 1, 1936, between the Company and The Riggs National Bank of Washington, D.C., as Trustee, as amended and supplemented and as to be supplemented by a separate supplemental indenture (the "Supplemental Indenture") each time New Bonds are offered under this Prospectus and the accompanying Prospectus Supplement. Said mortgage, as so amended and supplemented and to be supplemented, is herein sometimes called the "Mortgage". Copies of the documents currently constituting the Mortgage are exhibits to the Registration Statement, as is the form of the Supplemental Indenture.

Reference is made to the Prospectus Supplement which accompanies this Prospectus for the following terms and other information with respect to the New Bonds being offered thereby: (1) the designation and aggregate principal amount of such New Bonds; (2) the date on which such New Bonds will mature; (3) the rate per annum at which such New Bonds will bear interest, or the method of determining such rate; (4) the dates on which such interest will be payable; and (5) any redemption terms or other specific terms applicable to the New Bonds.

The New Bonds will be available only in fully registered form without coupons in the denominations of $1,000 or any multiple thereof. Both principal and interest on the New Bonds will be payable at the agencies of the Company, The Riggs National Bank of Washington, D.C. and Bankers Trust Company, New York, N.Y. The Company will not impose charges for any exchanges of New Bonds.

The Supplemental Indenture will contain no provision for an improvement and sinking fund or any maintenance and replacement requirement or dividend restriction; neither does the Mortgage and all indentures supplemental thereto relating to any outstanding Series of Bonds contain any such provisions; the supplemental indentures relating to certain outstanding Series of Bonds do, however, contain sinking fund provisions.

The following statements are outlines of certain provisions contained in the Mortgage and do not purport to be complete. They are qualified by express reference to the cited Sections and Articles of the Mortgage. Certain terms used are as defined in the Mortgage.

Security. The New Bonds will be secured, together with all other Bonds now or hereafter issued under the Mortgage, by a valid and direct first lien (subject to certain leases, Permitted Liens and other minor matters) on substantially all the properties and franchises of the Company (the principal properties being its generating stations and its electric transmission and distribution systems), other than cash, accounts receivable and other liquid assets, securities (including securities evidencing investments in subsidiaries of the Company), leases by the Company as lessor, equipment and materials not installed as part of the fixed property, and electric energy and other materials, merchandise or supplies produced or purchased by the Company for sale, distribution or use. The Company's 9.72% undivided interest in a mine-mouth, steam-electric generating station, known as the Conemaugh Generating Station, which is located in Indiana County, Pennsylvania, and its associated transmission lines is that of a tenant in common with eight other utility owners. Substantially all of such Conemaugh transmission lines and of the transmission and distribution lines of less than 230,000 volts, portions of the 230,000 and 500,000 volt transmission lines and 13 substations are located on land owned by others or on public streets and highways.

The Mortgage contains provisions subjecting after-acquired property (subject to pre-existing and Permitted Liens) to the lien thereof. The lien on such property is, however, subject (except for property in Pennsylvania) to rights of persons having superior equities attaching prior to the recording or filing of an appropriate supplemental indenture.

Issuance of Additional Bonds. Additional Bonds ranking equally with the New Bonds may be issued in an aggregate amount of up to (i) 60% of the Net Bondable Value of Property Additions not subject to an Unfunded Prior Lien, (ii) the amount of cash deposited with the Trustee (which may thereafter be withdrawn on the same basis that Additional Bonds are issuable under (i) and (iii)), and (iii) the amounts of Bonds retired or to be retired (except out of trust moneys or by any sinking or analogous fund if the fund prevents such use) (Secs. 4, 6 and 7, Art. III; Sec. 4 Art. VIII).

Additional Bonds may not be issued unless Net Earnings of the Company Available for Interest and Property Retirement Appropriations (i.e., earnings before depreciation, amortization, income taxes and interest charges) during 12 of the immediately preceding 15 months shall have been at least twice the annual interest charges on all Bonds and Prior Lien Bonds then outstanding and then being issued, unless they are being issued on the basis of Bonds paid at or redeemed or purchased within two years of maturity or on the basis of Property Additions subject to an Unfunded Prior Lien (which simultaneously becomes a Funded Prior Lien) and the Bonds are issued within two years of the maturity of the Prior Lien Bonds secured by such Prior Lien (Secs. 3, 4 and 7, Art. III). Giving effect to the issuance of the New Bonds at an assumed rate of interest of 11% (and before giving effect to any interest reductions arising from debt refundings), such Net Earnings for the twelve months ended June 30, 1985 would be approximately 4.7 times the aggregate annual interest charges referred to above. Such coverage would permit issuance of approximately $1.25 billion of mortgage bonds (in addition to the New Bonds) at an assumed average interest rate of 11% per annum, against property additions or cash deposits, although only approximately $540 million of such additional bonds could currently be issued in compliance with unbonded net property addition limitations contained in the mortgage indenture.

So long as any New Bonds are outstanding, Property Additions constructed or acquired on or before December 31, 1946 may not be made the basis for the issue of Bonds, or the withdrawal of cash, or the reduction of cash required to be paid to the Trustee (Sec. 2, Part IV, Supplemental Indenture).

Prior Lien Bonds secured by an Unfunded Prior Lien may be issued under the circumstances and subject to the limitations contained in the Mortgage (Sec. 16, Art. IV)

After giving effect to the issuance of the New Bonds (which are to be issued against Property Additions), approximately $905 million of the Property Additions as of June 30, 1985 will remain available for the purposes permitted in the Mortgage, including the issuance of Bonds.

Release of Property. The Mortgage permits property to be released from the lien of the Mortgage upon compliance with the provisions thereof. Such provisions generally require that cash be deposited with the Trustee in an amount equal to the fair value of the property to be released. The Mortgage also contains certain requirements relating to the withdrawal of cash deposited to obtain a release of property. (Art. VII and Art. VIII.)

Modification of Mortgage. With the consent of 80% in amount of Bonds and of 80% in amount of Bonds of each series affected if less than all are affected, the Mortgage may be changed except to affect the terms of payment of the principal or interest on any Bond or to reduce the percentage of Bondholders required to effect any change (Sec. 6, Art. XV).

The Supplemental Indenture, however, provides that the foregoing percentages shall be reduced to 60% upon the consent or agreement to such change by 80% of outstanding Bonds. Purchasers of the New Bonds will be deemed to have agreed to such reduction pursuant to the terms of the Supplemental Indenture.

Events of Default. 25% in amount of Bonds, upon any Event of Default, may require the Trustee to accelerate maturity of the Bonds (although a majority in amount of Bonds may waive such default and rescind such acceleration if such default is cured) and to enforce the lien of the Mortgage upon being indemnified to its satisfaction (Sec 1 and 4, Art. IX).

A majority in amount of Bonds may direct proceedings for the sale of the trust estate, or for the appointment of a receiver or any other proceedings under the Mortgage, but have no right to involve the Trustee in any personal liability without indemnifying it to its satisfaction (Sec. 11, Art. IX).

Events of Default include failure to pay principal, failure for 30 days to pay interest or to satisfy any improvement, maintenance or sinking fund obligation, failure for 60 days (after notice by the Trustee or the holders of 15% in amount of Bonds) to perform any other covenant, and certain events in bankruptcy, insolvency or reorganization (Sec. 1, Art. IX).

The Mortgage does not require that periodic evidence be furnished to the Trustee as to the absence of default or as to compliance with the terms of the Mortgage.

Security for Bonds

- Mortgage bonds often give the bondholders first right to the assets of the firm in the event of a default. This type of a bond is often used when the proceeds of the bond issue are used to acquire fixed assets.

- Collateral trust bonds are often used when the proceeds are going to a firm that does not have much in the way of fixed assets. For example, a holding company may only own shares or bonds of other companies. Bonds issued by the holding company will need to pledge whatever assets the holding company owns.

- Equipment trust certificates have often been used by firms such as railways. The idea is that the money will be used to acquire some form of standardized equipment that could be used by other firms as well. In this type of financing, a trustee is set up who issues the bonds. The bonds are used to purchase equipment such as railway cars. The trustee then rents the equipment to the firm for an amount calculated to be able to make coupon payments on the debt as well as to retire the principal amount of the debt at maturity. An advantage of this arrangement is that the firm doesn't actually have to own the equipment. This may preserve its ability to raise additional capital if need arises. If

there is a problem with repayment, the trustee may be able to rent the equipment to another railway or firm. This is a form of lease financing.

- Subordinated debentures are bonds issued without any specific security. These are bonds that are riskier than those backed by a mortgage. This type of financing is used if many of the fixed assets of the firm are already pledged as collateral on a loan.

- Guaranteed bonds have become more popular as smaller and less well known firms try to tap the bond markets for capital. Many large insurance companies, for a fee, will provide bond insurance to a small issuer that will enable the bond issue to have the same credit rating and standing as the insurance company.

Provisions for Paying Off Bonds

- Call and refund provisions. These are provision that allow the issuer to pay off the bonds earlier than scheduled. For example, if a firm issues a 15 percent bond and interest rates later drop to 10 percent, it makes sense to pay off the higher coupon rate debt and refinance.

- When the bonds are paid off earlier than planned because the interest rate drops, this is known as a call. If the bonds are paid off earlier for other reasons, this is known as a refunding. Refundings can occur is a firm starts off as a highly risky firm and must pay a higher interest rate on its debt. If the firm does well and a large amount of the risk is resolved over time, then it may be possible to profitably refund the debt even if interest rates have not decreased. The refunding provision can be very valuable for start up companies.

- A call or refunding of the bonds usually involves paying the bondholders something more than the principal amount of the debt.

- Sinking Funds. Many bond issues will require that the issuer contribute a portion of the principal amount of the

bonds into a fund called the sinking fund. For example, if a twenty year bond has a principal amount of 100, the firm may be required to deposit 5 into the sinking fund each year. At the end of the life of the bond, the sinking fund will contain enough money to pay off the principal on the bonds.

High Yield Bonds

- In the past ten years there has been much growth in the number of bond issues for firms with low credit ratings and higher risk. The experience in this market may be somewhat comparable to what we would expect to see in emerging markets in Central and Eastern Europe.

- These high yield bonds have a number of unique characteristics which are generally designed to give the issuing firm as much time and flexibility as possible to make good on their debts. Some examples of features that are often included into these bond issues are listed below.

- Zero coupon. These types of bonds will typically pay no coupons for the first three to seven years of the life of the bond and then pay a regular coupon payment thereafter. The use of zero or zero/fixed coupon bonds was developed to provide an initial period of additional liquidity for newly formed companies. During the zero-coupon period, the firm has time to develop plans for enhancing cash flows that would ultimately support higher interest payments.

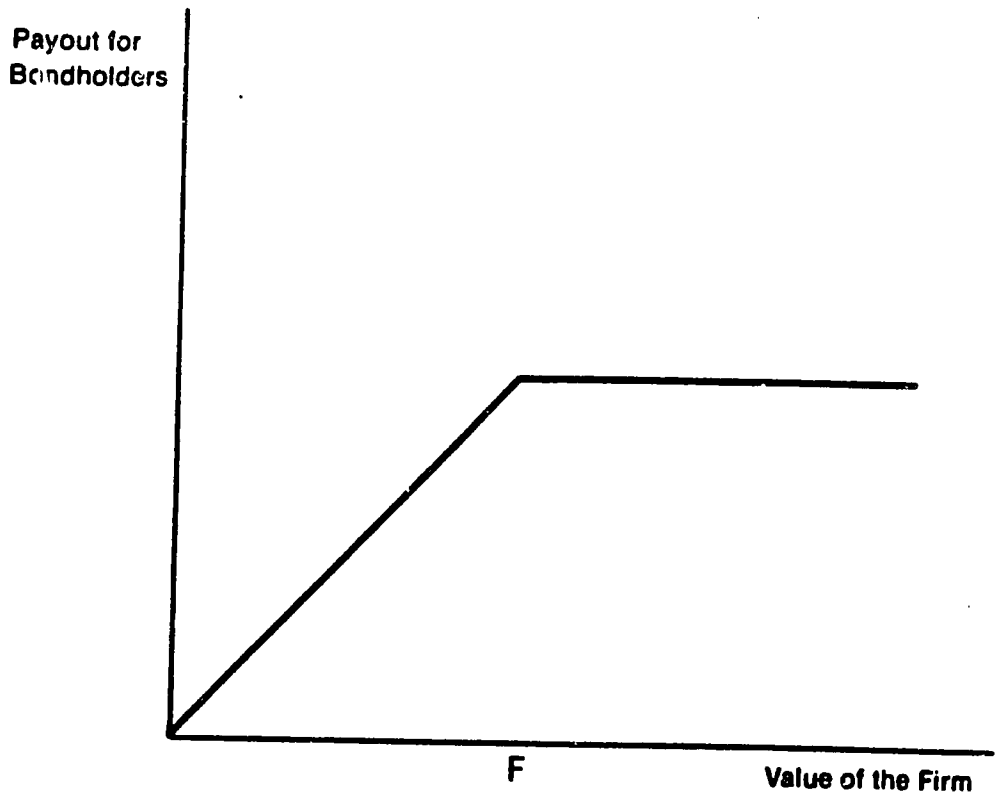
- Pay-in-Kind. This type of bond pays coupons, not in cash, but in the form of additional bonds or other securities of

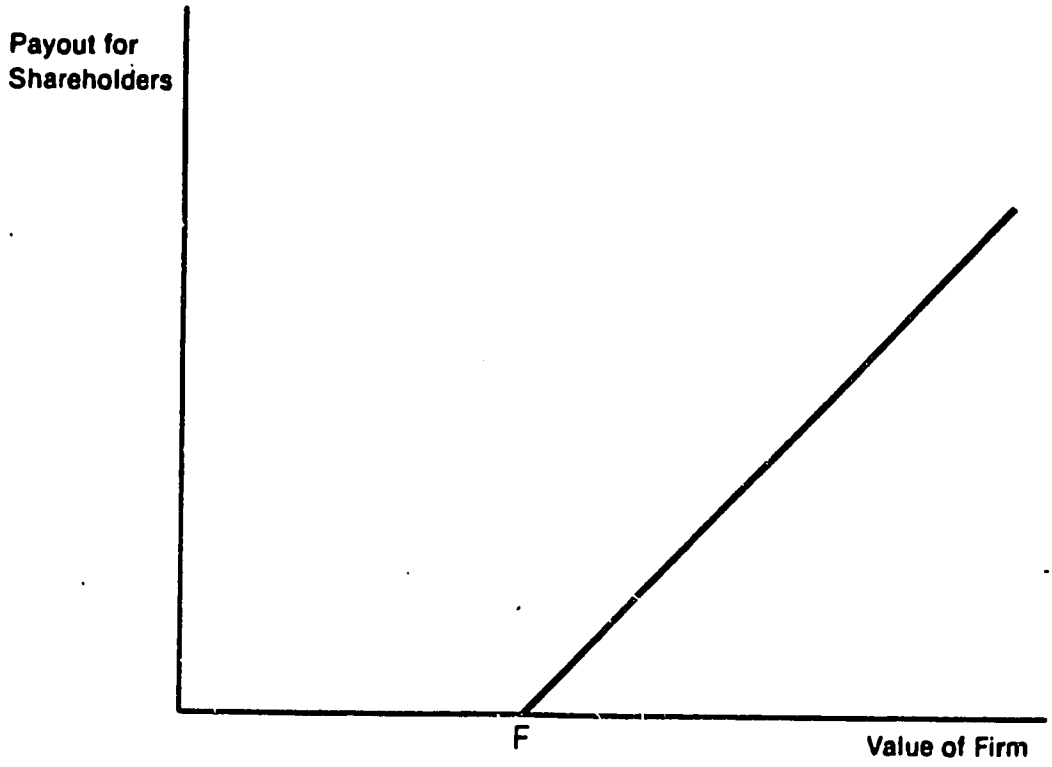
the firm. Thus, no actual cash is involved in the periodic payments on the bond. This is effectively the same thing as a zero-coupon bond but with the exception that the number of bonds owned by an investor increases over time.

- Step coupons. These are bonds where there is a small initial coupon rate. Over time, however, the coupon rate increases to a higher level.

- Extendible Reset Bonds. Instead of having a fixed maturity, an extendible bond can have an optional extension, usually at the option of the firm. This gives the firm the flexibility to adjust the maturity date of the bonds in a way that minimizes the risk of a default.

- The risk and return characteristics of corporate bonds.





478

Issuing Bonds

- Bonds are usually issued in two ways—a public offering or a private placement.

- In a public offering, a investment banking firm acts as an agent for the firm in selling the bonds to the investment community, which may be in country or international. This method is usually only available for larger and better known firms with a successful history.

- A private placement is more common for smaller and less well known firms. In a private placement, the firm through an intermediary, finds a small group of investors who are willing to loan the money to the firm. This small group of investors can coordinate better and tailor the terms of the loan in a way that is difficult to do with a public offering. Sometimes this is to the disadvantage of the firm since the investors may impose many restrictive covenants. In the US, the two most common types of lenders a private placement are life insurance companies and pension funds—investors with long horizons.

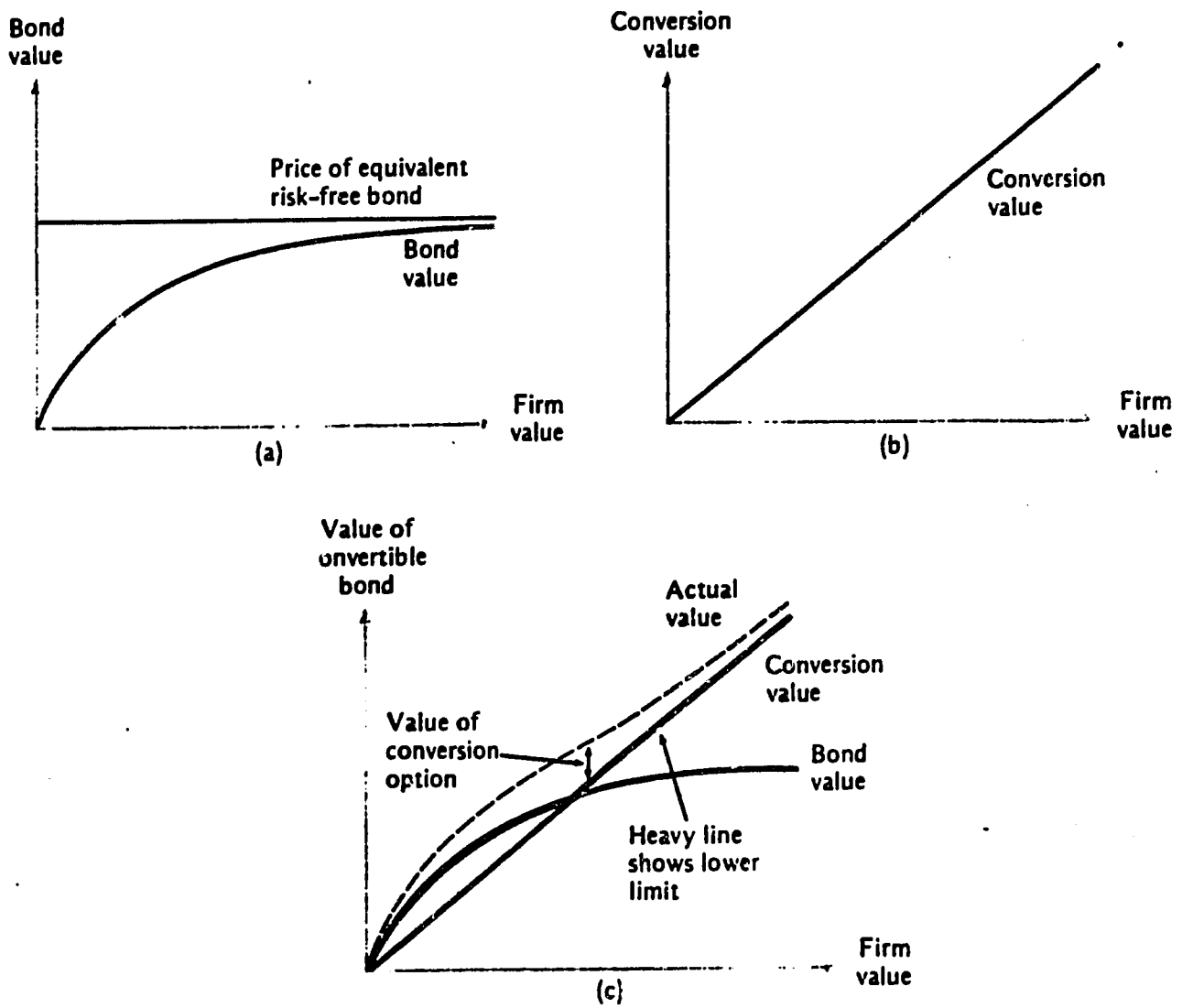
Convertible Bonds

- One of the problems with corporate bonds is that if the firm does poorly, the bondholders can lose money. If the firm does well, however, the bondholders do not get to share in that success.

- To make bond issues more attractive to investors, many firms will allow bondholders to convert their bonds into stock of the firm in some circumstances. These are known as convertible bonds.

- Convertible bond value graph.

- Convertible bonds offer a number of advantages to issuing firms. First, convertible bonds generally will not need to offer as high of a coupon rate or as restrictive covenants as for a nonconvertible issue. Second, the firm may be able to sell the bond at a better price because of the conversion feature. The risk of issuing convertible bonds is that the fortunes of the firm will improve significantly and the value of the equity of the firm will be diluted as bondholders convert their bonds into shares at very favorable conversion rates.


Bond value
Price of equivalent risk-free bond
Bond value
Firm value
(a)
Conversion value
Conversion value
Firm value
(b)
Value of convertible bond
Actual value
Conversion value
Value of conversion option
Bond value
Heavy line shows lower limit
Firm value
(c)

Preferred Stock

- Preferred stock is a hybrid between a bond and a share of stock. Preferred stock pays dividends that are based on a specific formula. For example, a share of preferred stock may promise to pay an amount equal to 6 percent of its par value every year. In this sense, it is similar to a bond. What is different, however, is that if a payment date is missed, the preferred stockholder cannot force the firm to liquidate—unlike the case for a bank loan or a bond.

- Advantages of Preferred Stock.

  - Preferred stock does not have any default risk to the issuer.

  - Dividend payments are limited to a stated amount. The preferred stockholder does not participate in excess earnings.

- Disadvantages of Preferred Stock.

  - Because preferred stock is riskier than bonds, investors require a higher interest rate on preferred stock—more

expensive.

- o Preferred stock often has a cumulative feature that prohibits the firm from making dividend payments to stockholders until all of the promised payments to preferred stockholders have been made.

- Adjustable rate preferred stock example.

- Call feature example.

Adjustable Rate Preferred Stock

Issuer	Amount of Offering ($000)	Dividend Rate at Offering	Dividend Rate Thereafter (Applicable Rate)[a]	Dividend Rate Band	Call Protection
Bank America Corp.	$400,000	9.25%	Adjusted quarterly to 4.00% below the applicable rate	6%–12%	No call allowed for the first 5 years
J. P. Morgan & Co., Inc.	250,000	9.25	Adjusted quarterly to 4.875% below the applicable rate	5%–11½%	No call allowed for the first 3 years
Integrated Resources, Inc.	100,000	12.50	Adjusted quarterly to 0.75% higher than the applicable rate	8%–15%	No call allowed for the first 5 years
Liberty National Corp.	25,000	11.00	Adjusted quarterly at the applicable rate	6½%–13%	No call allowed for the first 5 years
Reading & Bates Corp.	37,500	13.00	Adjusted quarterly to 0.75% higher than the applicable rate	7%–14%	No call allowed for the first 5 years
Gulf States Utilities Corp.	30,000	11.50	Adjusted quarterly to 0.65% higher than the applicable rate	7%–13%	No call allowed for the first 5 years

[a]In all cases the "applicable rate" refers to the highest of (1) the 3-month Treasury bill rate, (2) the 10-year Treasury bond maturity rate, or (3) the 20-year Treasury bond constant maturity rate.

Date		*Call Price*
Date of issue	until 7/19/80	Not callable
7/20/80	until 7/19/85	$109.56
7/20/85	until 7/19/90	107.17
7/20/90	until 7/19/95	104.78
7/20/95	until 7/19/00	102.39
After 7/19/00		100.00

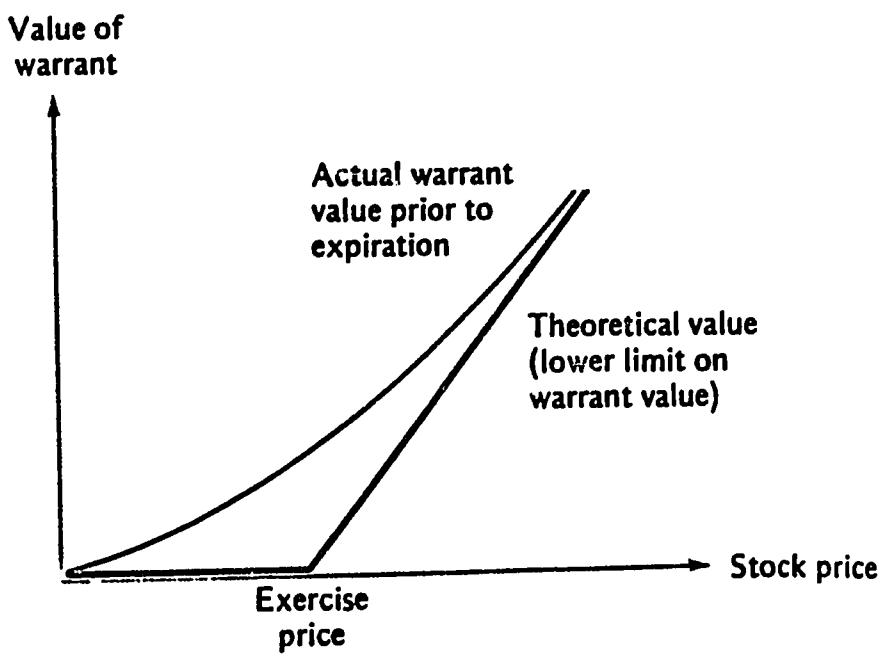
Warrants

- A warrant is essentially a stock option that gives the warrantholder the right, but not the obligation to purchase a share of stock at some future point in time for a prespecified price.

- As an example, assume that the common stock of company X is 50 per share and that an investor expects the price to rise to 100 per share in several years. The firm now issues a warrant giving its holder the right to buy a share of stock for 50 anytime during the next ten years. This right is valuable and an investor might be willing to pay a price of 10 for the warrant. If the stock subsequently goes to 100, an investor who bought the stock for 50 will double his money. The investor who buys the warrant, however, will be able to buy the stock at a price of 50 when it is worth 100 and will make a profit of 50, which is more than five times the cost of the warrant.

- Warrant value graph.

- The risk and return characteristics of warrants.


Value of warrant
Actual warrant value prior to expiration
Theoretical value (lower limit on warrant value)
Stock price
Exercise price

- Stock options and warrants are often used in conjunction with the issuance of other types of securities. They allow an investor to participate in the full upside potential of an enterprise without losing a lot of money if the enterprise does not do well and the warrants cannot be exercised. In the US, warrants or stock option are often given to firm managers to make sure they have the incentive to make the equity in the firm as valuable as possible.

Common Stock

- Stockholders are the residual claimants to a firm—they only get paid when all other claimholders to the firm are paid. Thus, the stockholders take the greatest risk and should get the highest average returns on their investment.

- Common stock involves ownership in the firm. In effect, bondholders and preferred stockholder can be viewed as creditors, with common stockholders being the true owners of the firm. Common stock does not have a maturity date, but exists as long as the firm does. Common stock pays dividends as they are declared by the board of directors of the firm. There is generally no limit on how large the dividends may be, but the covenants and restrictions imposed by the creditors will require that they be paid first and that their security be protected. Common stock traditionally has the voting rights. An important feature of common stock is its limited liability. This means that common stockholders cannot lose more that the amount that they invest in the firm.

- Advantages of common stock.

    - The firm is not legally obligated to pay common stock

dividends. Thus, in times of financial distress there need not be a cash outflow associated with common stock, while there must be with bonds.

- Because common stock has no maturity date, the firm does not have a cash outflow associated with its redemption. If the firm wishes, it can repurchase its stock in the stock market, but has no obligation to do so.

- By issuing common stock, the firm increases its financial base and its future borrowing capacity. Alternatively, borrowing increases the financial base of the firm but also cuts into the firm's future borrowing capacity. Financing with common stock increases the firm's financing flexibility.

- The disadvantages of common stock.

  - Dividends may not be deductable from taxes. The cost of issuing stock may be higher than for issuing debt. These factors tend to make common stock a more expensive source of capital.

  - The issuance of new common stock may result in a change in the ownership and control of the firm. While

the owners have a preemptive right to retain their proportionate control, they may not have the funds to do so. If this is the case, the original owners may see their control diluted by the issuance of the new stock.

Venture Capital Financing

• Case Study of a Venture Capital Deal.

On April 1, 2003, George and Mildred Marvin met with Chip Norton in their research lab (which also doubled up as a bicycle shed) to celebrate the incorporation of Marvin Enterprises. The three entrepreneurs had raised $100,000 from savings and personal bank loans and had purchased 1 million shares in the new company. At this *zero stage* investment, the company's assets were $90,000 in the bank ($10,000 had been spent for legal and other expenses of setting up the company), plus the *idea* for a new product, the household gargle blaster. George Marvin was the first to see that the gargle blaster, up to that point an expensive curiosity, could be commercially produced using microgenetic refenestrators.

Marvin Enterprises's bank account steadily drained away as design and testing proceeded. Local banks did not see Marvin's idea as adequate collateral, so a transfusion of equity capital was clearly needed. Preparation of a *business plan* was a necessary first step. The plan was a confidential document describing the proposed product, its potential market, the underlying technology, and the resources—time, money, employees, plant and equipment—needed for success.

Most entrepreneurs are able to spin a plausible yarn about their company. But it is as hard to convince a venture capitalist that your business plan is sound as it is to get a first novel published. Marvin's management were able to point to the fact that they were prepared to put their money where their mouths were. Not only had they staked all their savings in the company but they were mortgaged to the hilt. This *signaled* their faith in the business.[1]

First Meriam Venture Partners were impressed with Marvin's presentation and agreed to buy 1 million new shares for $1 each. After this *first-stage* financing, the company's market value balance sheet looked like this:

Marvin Enterprises First-Stage Balance Sheet
(market values in millions)

Cash from new equity	$1	$1	New equity from venture capital
Other assets, mostly intangible	1	1	Original equity held by entrepreneurs
Value	$2	$2	Value

By accepting a $2 million *after-the-money* valuation, First Meriam implicitly put a $1 million value on the entrepreneurs' idea and their commitment to the enterprise. They also handed the entrepreneurs a $900,000 paper gain over their original $100,000 investment. In exchange, the entrepreneurs gave up half their company and accepted First Meriam's representatives to the board of directors.[2]

The success of a new business depends critically on the effort put in by the managers. So venture capital firms try to structure a deal so that management has a strong incentive to work hard. For example, any entrepreneur who demands a water-tight employment contract and a fat salary is not going to find it easy to raise venture capital. The Marvin team agreed to put up with modest salaries and, therefore, they could cash in only from appreciation of their stock. If Marvin failed they would get nothing, because First Meriam actually bought *preferred* stock designed to convert automatically into common stock when and if Marvin Enterprises succeeded in an initial public offering or consistently generated more than a target level of earnings. This raised even further the stakes for the company's management.[3]

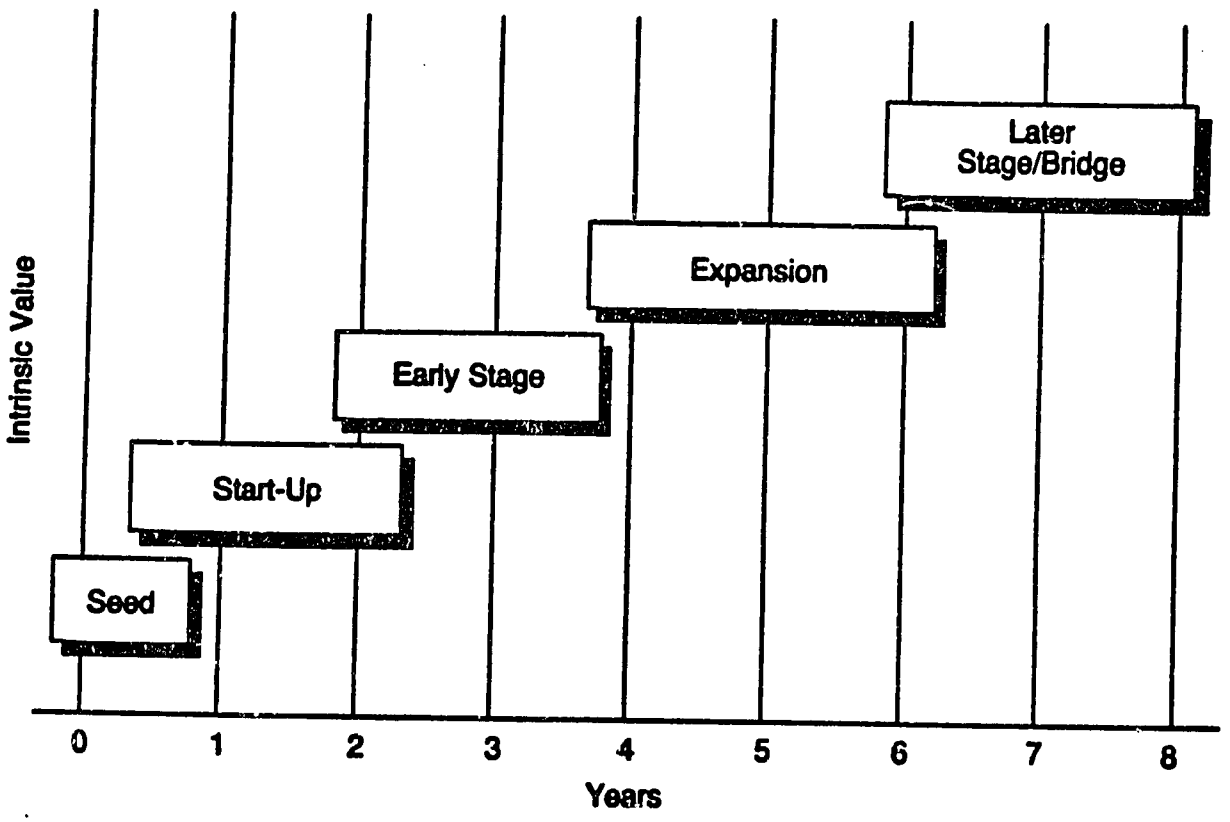
Venture capitalists rarely give a young company all the money it will need all at once. At each stage they give enough to reach the next major checkpoint. Thus in spring 2005, having designed and tested a prototype, Marvin Enterprises was back asking for more money for pilot production and test marketing. Its *second-stage* financing was $4 million, of which $1.5 million came from First Meriam, its original backers, and $2.5 million from two other venture capital partnerships and wealthy individual investors. The balance sheet just after the second stage was as follows:

Marvin Enterprises Second-Stage Balance Sheet
(market values in millions)

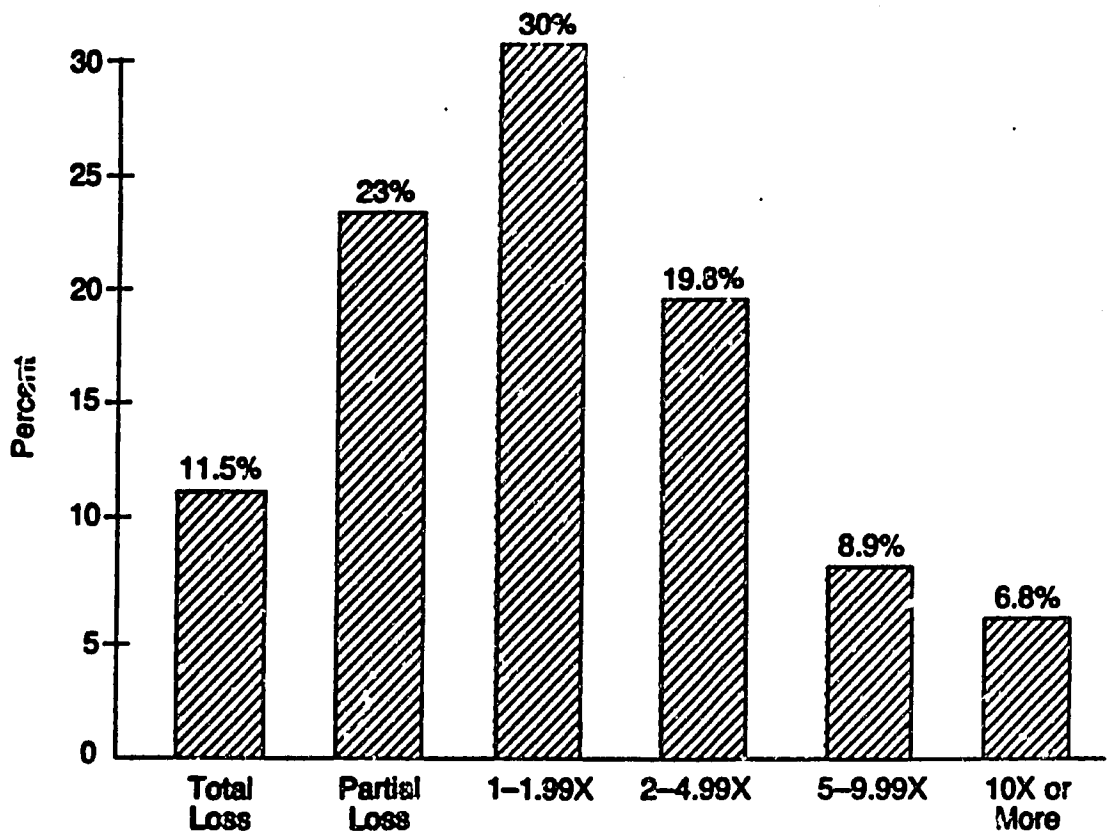
Cash from new equity	$ 4	$ 4	New equity, second stage
Fixed assets	1	5	Equity from first stage
Other assets, mostly intangible	9	5	Original equity held by entrepreneurs
Value	$14	$14	Value

Now the after-the-money valuation was $14 million. First Meriam marked up its original investment to $5 million, and the founders noted an additional $4 million paper gain.

- Venture Capital Life Cycle.



- Venture Capital Returns.



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DO NOT WRITE IN THIS AREA

THE PROFESSIONAL MANAGER PROGRAM
FINANCE
Budapest, Hungary

PLEASE USE PENCIL

	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly Disagree 5
1. The objectives of this course were clear to me.	1	2	3	4	5
2. The course exceeded my expectations.	1	2	3	4	5
3. The instructor(s) communicated effectively.	1	2	3	4	5
4. The instructor(s) made the subject matter more meaningful through the use of examples.	1	2	3	4	5
5. The instructor(s) encouraged participants to be involved in discussions.	1	2	3	4	5
6. The instructor(s) presented up-to-date material and information.	1	2	3	4	5
7. The instructor(s) was(were) well prepared and organized.	1	2	3	4	5
8. The instructor(s) did a good job of relating this course with other parts of the program.	1	2	3	4	5
9. The quantity and depth of material covered were appropriate for the allotted time.	1	2	3	4	5
10. I feel that I have a good understanding of the topics covered in this course.	1	2	3	4	5
11. This course helped me gain useful knowledge and/or skills.	1	2	3	4	5
12. I was pleased with the amount of interaction I had with the faculty in the course.	1	2	3	4	5
13. The participants enriched the course by sharing their ideas and experiences.	1	2	3	4	5
14. Overall, I would rate this course as an outstanding educational experience.	1	2	3	4	5
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1196

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STRATEGY MODULE

June 14 - 16, 1993
Budapest, Hungary

Session	Day 1 - June 14	Day 2 - June 15	Day 3 - June 16
8:30-10:00	Choosing a Strategic Posture: Role of Distinctive Competency	Staffing the Business Enterprise, Establishing and Using a Board of Directors, and Strategic Management Decision Making	Strategies for Managing Growth, Sustainable Growth Rate, and Financial Decision Making
Break			
10:15-11:45	Organization Type and Strategy	Developing Effective Policies, Managing Time, and Managing Conflict	Strategies for Increasing Firm Value, Business Valuation Techniques, Review and Joint Discussions, and Wrap up
Lunch			
1:30-3:00	Strategies for Control and Decisions that Determine the Growth of a Firm	Financing Strategic Plans and Strategies for Improving Financial Performance	
Break			
3:15-4:45	Survival Strategy of a Firm and Operating Strategies	Cash Flow Management Strategies	

498

STRATEGY MODULE
Budapset, Hungary

Choosing a Strategic Posture: Role of Distinctive Competency

Organization Types and Strategy

Strategies for Control

Decisions that Determine the Growth of a Firm

Survival Strategy of a Firm

Operating Strategies

Staffing the Business Enterprise

Establishing and Using Board of Directors

Strategic Management Decision Making

Developing Effective Policies

Managing Time

Financing Strategic Plans

Strategies for Improving Financial Performance

Cash Flow Management Strategies

Sustainable Growth Rate and Financial Decision Making

Business Valuation and Strategies for Increasing Value

Wrap Up

STRATEGIC MANAGEMENT

June 14-16, 1993
Budapest, Hungary

June 17-19, 1993
Prague, Czech Republic

CONFERENCE LEADERS

DR. ALAN C. FILLEY
Professor, University of Wisconsin-Madison

DR. ROBERT W. PRICER
Professor, University of Wisconsin-Madison

Participant:_____

The Enterprise Center
The Graduate School of Business
University of Wisconsin
Madison, Wisconsin

MANAGEMENT TRAINING AND ECONOMICS
EDUCATION IN CENTRAL AND EASTERN EUROPE PROJECT
MANAGED BY
SCHOOL OF BUSINESS, INDIANA UNIVERSITY
MIDWEST CONSORTIUM FOR INTERNATIONAL ACTIVITIES, INC.

500

AREAS OF DISTINCTIVE COMPETENCE

1. QUALITY
2. SERVICE
3. LOCATION
4. FILLING A SPECIAL NICHE
5. FLEXIBILITY AND ADAPTABILITY
6. STRONG CONSUMER ORIENTATION
7. REPUTATION AND IMAGE
8. PERSONNEL
9. COMFORT/ENJOYMENT
10. PRICE/CREDIT

501

ROLE OF DISTINCTIVE COMPETENCY

"A MEANINGFUL, COMPETITIVE ADVANTAGE OVER BUSINESS RIVALS"

1. COMPETENCY MAY BE PRESENT AS A PART OF THE FIRM'S OPERATIONS.

2. COMPETENCY MAY BE DEVELOPED BUILDING ON A STRENGTH.

502

MISSION STATEMENT

1. NATURE OF THE BUSINESS

   --INDUSTRY
   --PRODUCT LINE
   --TYPE OF SERVICES
   --DISTRIBUTION CHANNEL
   --PRIME GOALS (QUALITY, BREADTH OF PRODUCT LINE, PRICE OR SERVICE)
   --TARGET MARKET

2. MANAGEMENT PHILOSOPHY (CULTURE OF THE ORGANIZATION)

- 502

MISSION

1. INTERNAL ASSESSMENT

2. EXTERNAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT

3. MISSION STATEMENT

204

STRATEGIC PLANNING

- ADAPT TO ANTICIPATED ENVIRONMENTAL CHANGES

- PROVIDES AN OVERVIEW AND ANALYSIS OF THE BUSINESS ITS EVIRONMENT

- DESCRIBES THE FIRM'S CURRENT CONDITION

- IDENTIFIES THE KEY EXTERNAL FACTORS AFFECTING THE FIRM'S SUCCESS

- PRESCRIBES AN ACTION PLAN OR OUTLINE OF HOW THE BUSINESS WILL PROCEED TO CAPITALIZE ON ITS STRENGTHS AND MINIMIZE ITS WEAKNESS AND THREATS

505

ENVIRONMENTAL OPPORTUNITIES VERSUS RELEVANT BUSINESS OPPORTUNITIES

1. ENVIRONMENTAL OPPORTUNITY--PERHAPS:

   --LARGE COMPETITORS DON'T PROVIDE "PERSONAL TOUCH"
   --NEW SEGMENTER NICHE IS EMERGING
   --CONSUMER NEEDS AND PREFERENCES ARE CHANGING

2. BUSINESS OPPORTUNITY = A PARTICULAR FIRM IS <u>ABLE</u> TO RESPOND TO ENVIRONMENTAL OPPORTUNITY

506

COMPETITIVE WEAKNESS

"AREA OF VULNERABILITY--AN AREA WHERE COMPETITORS RECOGNIZE A MEANINGFUL COMPETITIVE EDGE."

--ONE FIRM'S COMPETENCY IS OFTEN ANOTHER FIRM'S WEAKNESS

507

CHOOSING A STRATEGIC POSTURE

1. TYPES OF STRATEGIC POSTURES
   --SINGLE PRODUCT---NICHE---EXPANSIVE GROWTH---DEVELOPMENTAL GROWTH---PRODUCT INNOVATION---DIVERSIFICATION

2. CHOICE FACTORS
   --STAGE OF SMALL BUSINESS DEVELOPMENT
   --ATTRACTIVENESS OF THE FIRM'S PRODUCTS/SERVICES AND INDUSTRY
   --RELATIVE COMPETITIVE STRENGTH
   --OWNER/MANAGER DESIRES, ASPIRATIONS, AND COMMITMENTS

3. CHOICE OF APPROPRIATE STRATEGIC POSTURE

6 TYPES OF STRATEGIC POSTURES

1. SINGLE PRODUCT/MARKET
2. NICHE
3. EXPANSIVE GROWTH (EXPANDS EXITING)
4. DEVELOPMENTAL GROWTH (DEVELOPS NEW)
5. PRODUCT/SERVICE INNOVATION
6. DIVERSIFICATION

STRATEGIES DESCRIBE HOW THE

FIRM INTENDS TO ACHIEVE ITS

OBJECTIVES

- 510

SMALL BUSINESS STRATEGIC PLANNING

ANALYSIS PHASE

1. ENVIRONMENTAL ANALYSIS
2. INTERNAL FIRM ANALYSIS
3. DISTINCTIVE COMPETENCIES
4. COMPETTITIVE WEAKNESSES

ACTION PHASE

5. MISSION STATEMENT
6. STRATEGIC POSTURE
7. GOAL SETTING
8. SPECIFIC STRATEGIES
9. WRITING THE PLAN

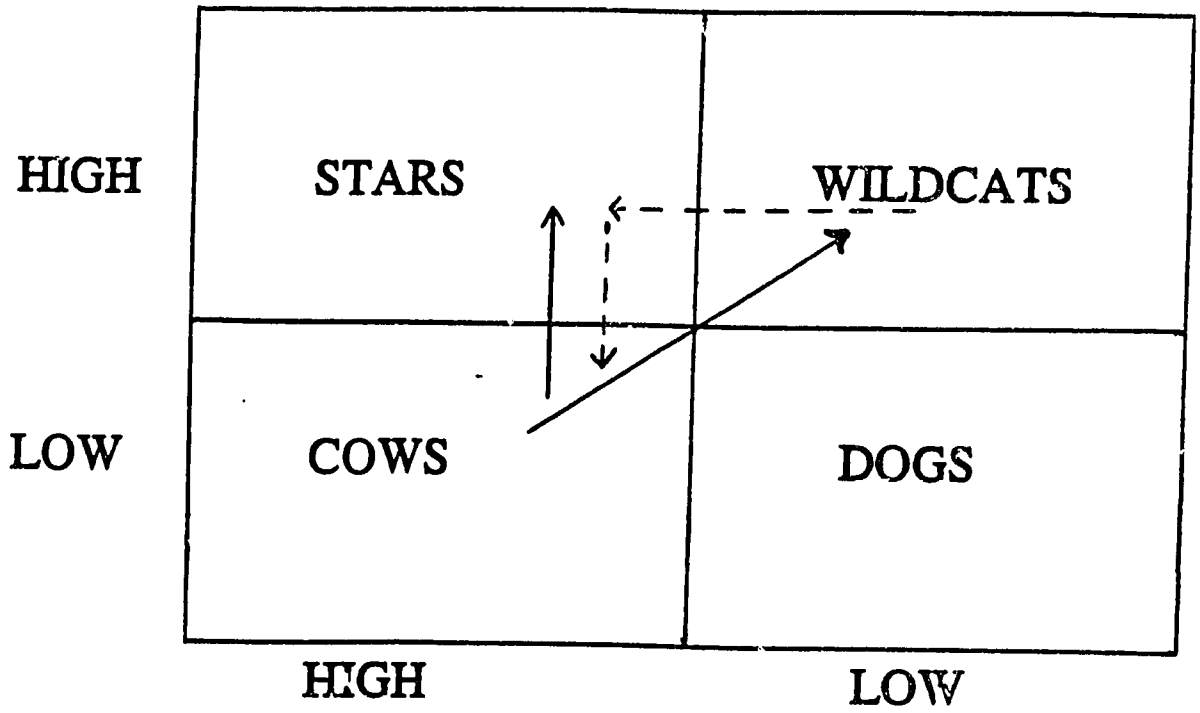
511

STRATEGIC ISSUES
VULNERABILITY ANALYSIS (SRI)

1. NEEDS AND WANTS SERVED BY THE BUSINESS
2. RESOURCES AND ASSETS
3. STABILITY OF COSTS RELATIVE TO COMPETITION
4. CUSTOMER BASE
5. TECHNOLOGIES
6. SPECIAL ABILITIES
7. STRONG FIRM IDENTITY SYMBOLS
8. INSTITUTIONAL BARRIERS TO COMPETITION
9. SOCIAL VALUES
10. SANCTIONS, SUPPORTS, INCENTIVES
11. INTEGRITY OF PRODUCTS AND THE ORGANIZATION
12. AVAILABILITY OF COMPLEMENTARY PRODUCTS OR SERVICES

512

BCG PORTFOLIO MANAGEMENT



------CASH - - - - -DESIRED MOVEMENT OVER TIME

STARS = MAINTAIN OR INCREASE MARKET DOMINANCE
COWS = MILK
WILDCATS = HAVE POTENTIAL, WILL BECOME DOGS WITHOUT INVESTMENT. WITH INVESTMENT, CAN BECOME STARS
DOGS = TERMINATE OR DIVEST

*ALSO, McKINSEY 3X3 AND ADL 5X4 MATRIX.

— 513

STRATEGIC PLANNING INSTITUTE
PROFIT IMPACT OF MARKETING STRATEGIES (PIMS)

"OVER 1,000 FIRMS, REGRESSION ANALYSIS FOR MANY YEARS."

80% OF A FIRM'S PROFITABILITY IS THE RESULT OF THE INTERACTION OF 9 STRATEGIC VARIABLES.

1. INVESTMENT INTENSITY = INCREASES IN FIXED CAPITAL OR WORKING CAPITAL REDUCE PROFITABILITY AND CASH FLOW

2. PRODUCTIVITY = INCREASES IN VALUE ADDED PER EMPLOYEE IMPROVES PROFITABILITY

3. MARKET POSITION = INCREASE IN MARKET SHARE IMPROVES PROFITABILITY AND CASH FLOW

4. MARKET GROWTH = GROWTH MARKETS INCREASE PROFIT, BUT REQUIRE INVESTMENT

5. QUALITY OF PRODUCTS/SERVICES = HIGH QUALITY IMPROVES PROFITS

6. INNOVATION = R&D AND ENGINEERING ACTIVITY <u>ONLY</u> BENEFITS FIRMS WITH A <u>STRONG</u> MARKET POSITION

PIMS CONTINUED

7. VERTICAL INTEGRATION = IF THE MARKET IS STABLE AND MATURE, VERTICAL INTEGRATION IMPROVES PERFORMANCE. IF NOT, VERTICAL INTEGRATION IS UNDESIRABLE

8. COST PUSH = A FIRM'S RESPONSE TO INCREASED COSTS DEPENDS ON ITS ABILITY TO ACCOMMODATE THEM INTERNALLY OR TO RAISE PRICES

9. CURRENT STRATEGIC EFFORT = CHANGES IN ANY OF THE PREVIOUS EIGHT FACTORS MAY HAVE EFFECTS THAT ARE NEGATIVE AT FIRST. FOR EXAMPLE, GETTING ADDITIONAL MARKET SHARE IS COSTLY

KEY-RESULT-AREA: An area of operations that is crucial to the long-run survival and success of your company.

Key-Result-Areas

Marketing
Innovation
Human Resources
Financial Resources
Physical Resources
Productivity
Social Responsibility
Profit

P.F. Drucker, Management: Tasks, Responsibilities, Practices

CHARACTERISTICS OF GOOD GOALS

1. PHRASED IN TERMS OF OUTCOMES RATHER THAN ACTIONS

2. MEASURABLE

3. CHALLENGING, YET REALISTIC

4. COMMUNICATED

517

THREE ORGANIZATION TYPES

1. CRAFT
2. PROMOTION
3. ADMINISTRATIVE

STB

CRAFT ORGANIZATIONS

1. COMFORT AND SURVIVAL OBJECTIVES
2. OWNER/MANAGER PERFORMS TECHNICAL DUTIES
3. POLICIES EVOLVE BY TRADITION
4. LEVELS OF POWER
5. ABSENCE OF CHANGE
6. LITTLE OR NO INDIRECT LABOR
7. LOW EMPLOYEE EXPECTATIONS
8. LOW RISK TAKING
9. LOW INNOVATION
10. PRODUCT OR SERVICE CENTERED

CRAFT PROBLEMS

1. NOT ADAPTIVE TO CHANGE

2. LITTLE GROWTH

PROMOTION TYPE

1. MANAGER/OWNER IS A "PROMOTER"

2. NO FIXED POLICIES

3. EMPLOYEES ARE DIRECTLY INFLUENCED BY THE OWNER/MANAGER

4. USE OF INDIRECT LABOR

5. WORK FUNCTIONS ARE NOT PLANNED IN ADVANCE

6. FLEXIBLE AND INNOVATIVE

7. HIGH MORALE AND EMPLOYEE EXPECTATIONS

8. UNIQUE PRODUCT OR MARKET ADVANTAGE

PROMOTION PROBLEM

"THE UNIQUE ADVANTAGE <u>ENDS</u> WHEN

COMPETITORS AND IMITATORS ENTER THE FIELD"

522.

ADMINISTRATIVE TYPE

1. ADAPTIVE THROUGH PLANNING AND FORMAL ORGANIZATION

2. FORMALLY STRUCTURED

3. USE OF INDIRECT LABOR

4. COMMON EMPLOYEE VALUES

5. FORMAL PLANNING AND BUDGETING PROCESS

6. EMPHASIS ON PRODUCT IMPROVEMENT, NOT INNOVATION

FEEDBACK

AND

FEEDFORWARD

CONTROL

524

FEEDBACK CONTROL

1. SKILLED JUDGMENT

2. CAPACITY OF SINGLE CONTROLLER IS LIMITED

3. CONSTANT REVIEW AND CORRECTIVE ACTION

4. NO "LEARNING"

525

FEEDFORWARD CONTROL

1. DETAILED PLANNING

2. INDIRECT LABOR

3. LIMITED REVIEW

4. "LEARNING"

"It is the decision to use feedforward control to the extent possible that characterizes the administrative form of organization."

526

DECISIONS THAT DETERMINE GROWTH OF A FIRM

1. DOMAIN
   - (a) WHAT DO WE DO?
   - (b) HOW DO WE DO IT?
   - (c) WHO DO WE DO IT FOR?

2. TECHNOLOGY AND GROWTH
   - (a) STANDARD (LONG-LINKED)
   - (b) NON-STANDARD (MEDIATING)

3. ORGANIZATIONAL STRUCTURE
   - (a) EFFICIENCY SEEKING
   - (b) FLEXIBILITY SEEKING

527

BUSINESS DOMAIN

1. DESCRIPTION OF COMPANY

2. DESCRIPTION OF THE PRODUCT OR SERVICE

3. DESCRIPTION OF CUSTOMERS AND APPLICATIONS

4. DESCRIPTION OF THE INDUSTRY

5. DESCRIPTION OF THE MARKET

6. DESCRIPTION OF THE CUSTOMERS AND WHAT THEY WILL USE THE PRODUCT OR SERVICE FOR

528

ORGANIZATION GROWTH

1. REQUIRES A "PARTICULAR" MIXTURE OF RESOURCES

2. REQUIRES A CHANGE IN THE RELATIONSHIP BETWEEN SIZE, SHAPE, AND FUNCTION

3. CONSTANT STRUGGLE BETWEEN INHERITED AND REQUIRED FORM

"GROWTH CREATES FORM, BUT FORM LIMITS GROWTH"

521

RETURN ON TOTAL ASSETS

$$ROA = \frac{NET\ INCOME}{NET\ SALES} \times \frac{SALES}{TOTAL\ ASSETS}$$

EXAMPLE A:

20% ROA = 2% X 10

(2% PROFIT TIMES CAPITAL TURNOVER OF 10)

EXAMPLE B:

20% ROA = 10% X 2

(10% PROFIT TIMES CAPITAL TURNOVER OF 2)

520

OPERATING STRATEGIES

FLEXIBILITY - SEEKING

1. CREATIVITY, FLEXIBILITY

2. SERVICE, QUALITY

3. CUSTOM DESIGN

4. QUALITY CONTROL

5. HIGH MARGINS

6. CUSTOMER DETERMINED LEVEL OF QUALITY

- 501

OPERATING STRATEGIES

EFFICIENCY - SEEKING

1. DEPENDABILITY (MINIMIZE EXCEPTIONS)
2. VERTICAL INTEGRATION
3. LONG PRODUCT RUNS
4. SPECIALIZED EQUIPMENT
5. ECONOMIES OF SCALE
6. STANDARDIZED MATERIALS
7. PRESCRIBED <u>MINIMUM</u> LEVELS OF QUALITY

532

JOB DESIGN

EFFICIENCY - SEEKING

1. DO <u>NOT</u> USE JOB ENRICHMENT OR ENLARGEMENT

2. STAFF SERVICES

3. DO <u>NOT</u> PROMISE ADVANCEMENT

FLEXIBILITY - SEEKING

1. USE JOB ENRICHMENT AND ENLARGEMENT

2. FEEDBACK CONTROL

JOB REWARDS

1. <u>EFFICIENCY SEEKING</u>

   (a) Pay and promotion opportunities tied to job performance.

   (b) Formal pay structures and sophisticated systems for appraising performance.

2. <u>FLEXIBILITY SEEKING</u>

   (a) Skill level, autonomy and task identity provide a sense of achievement.

   (b) Simple pay structures.

   (c) Reward based in part on skill development.

   (d) Performance appraisal should include:

      1. Quality of task completed.

      2. Client approval.

      3. Judgment of peers.

Efficiency Seeking = Reward Extrinsic, <u>not</u> part of job

Flexibility Seeking = Reward Intrinsic, part of job

COMPANY REWARDS

1. Efficiency- Seeking Organizations

"Because work is simple and repetitive, firm must see that workers achieve satisfaction if absenteeism, turnover, and poor work are to be avoided.

"QUALITY OF WORK LIFE ACTIONS MUST BE TAKEN"

a. Participative Supervision
b. Problem Solving Committees
c. Job Security
d. Open information
e. Pleasant Working Conditions, etc.

"ATTACH" MEMBERS TO AN ORGANIZATION

535.

2. Flexibility - Seeking Organizations

"Because the labor market permits mobility for skilled workers, "ATTACHMENT" through company rewards is important.

a. Professional and Skill Development

b. Peer Review

c. Challenging Tasks

d. High Quality Job Resources

53

CONSEQUENCES OF GROWTH

EFFICIENCY - SEEKING

- BENEFIT BY ECONOMIES OF SCALE

FLEXIBILITY - SEEKING

- DISECONOMIES OF SCALE
  - BECOMES "COMPLEX"

SELECTING EMPLOYEES

1. Listing Job Activities
2. Identification of Job Activities Categories
3. Assignment of Job Activities to Categories
4. Drafting a Preliminary Job Description
5. Review of Preliminary Job Description
6. Preparing Final Job Description

ESTABLISHING AND USING

A

BOARD OF DIRECTORS

MANAGEMENT DECISION MAKING

WHEN YOU SHOULD:

1. Make Decisions By Yourself

2. Obtain Information From Subordinates, Make Decision Yourself

3. Share the Problem with Subordinates Without Getting Them Together as a Group, Get Their Ideas and Make Decision Yourself

4. Share the Problem with Subordinates as a Group and Make the Decision Yourself

5. Share the Problem with Subordinates and Make Decision as a Group

WRITING EFFECTIVE

COMPANY POLICIES

MANAGING YOUR TIME

Superior-Imposed Time

System-Imposed Time

Self-Imposed Time

542

FINANCIAL MANAGEMENT FOR SMALL AND MEDIUM SIZE FIRMS

by

Dr. Robert W. Pricer
School of Business
University of Wisconsin-Madison

Good financial management is essential for the success of small and medium size businesses and this is an area that is frequently overlooked by owners and managers of these firms. The need for a better understanding of financial management techniques and tools is becoming even more important as firms are forced to deal with fluctuating interest rates and varying rates of inflation. These are relatively new forces facing the business owner and the ability to compete effectively in today's economy is directly related to the use and understanding of financial management tools.

When considering the importance of financial management to the success of your firm, it is useful to review the following reasons for business failure:

1) inadequate sales,
2) too many sales,
3) heavy operating expenses,
4) receivables difficulties,
5) competitive weakness,
6) inventory difficulties,
7) poor location,
8) excessive fixed assets, and
9) management neglect

It is interesting to note that seven of the nine reasons are problems that are avoidable through the use of good financial management and control. Unfortunately, many of the financial management techniques described in textbooks and in management literature are not applicable to smaller firms. Small and medium size businesses need financial control

systems that are not complex, that provide early indications of potential problems, and that do not result in "paralysis by analysis." This paper provides a framework for financial management for the smaller rapidly growing firm that meets the needs of most businesses, and is relatively easy to understand and use. It allows the owner or manager of a small or medium size business to clearly establish goals and objectives for their firm and it provides a framework for effective and efficient decision making.

The objectives of most smaller businesses is to maximize the return on the owner's equity in the business. The value of owner's equity is directly determined by the financial management decision making of the owner/manager in their attempt to have satisfactory return on owner's equity.

The objective of maximizing return on owner's equity is based on the assumption that the operation of a small business is basically for the benefit of the owner or owners. This objective takes into consideration the "lifestyle" goal of many small business owners who strive for "independence" as this goal is enhanced if return on owner's equity is increased. Stated another way, an owner will increase individual income that can be used to satisfy nonbusiness needs through enhanced financial management decision making.

The measure for return on owner's equity is calculated as follows:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Owner's Equity}}$$

Return on owner's equity can be evaluated over time or it can be compared to a standard. The standard can be an industry average or it can be a goal established by management. It is important to note that return on equity will change when net income changes at a different percentage rate than owner's equity. That is, the smaller business

owner should attempt to increase the net income at a percentage rate that is higher than the increase in owner's equity for the operating period. The decision making that leads to this outcome recognizes that return on equity is a function of maximizing return on investment, using debt effectively, and planning to lessen the impact of tax on total profit.

Normalize Financial Statements

To use financial statements for decision making, business managers must first normalize both the balance sheet and operating statement to reflect actual or "normal" operating conditions. First of all, the balance sheet needs to be adjusted to see that assets are properly valued and that depreciation represents an actual decline in useful life. It is not uncommon for smaller businesses to list fixed assets at a grossly underestimated value. This situation normally results from carrying an asset that was acquired at a very low cost or as a result of the application of accelerated depreciation to fixed assets. Also, accounts receivable may include uncollectible amounts and intangible assets may have to be significantly reduced or be removed from the balance sheet.

After the balance sheet has been adjusted to provide a realistic look at the asset and liability structure of the business, the operating or income statement needs to be examined to see if changes should be made in it. For example, many small business owners are either under or over compensated and it is important to adjust the operating statement to reflect a "normal" or "realistic" owner's compensation level. Depreciation expenses should also be examined and adjusted to reflect decline in useful life especially when accelerated methods of depreciation have been used. Also, extraordinary income and expense items should be adjusted out of the operating statement.

Once financial statements have been normalized, they become useful tools for financial management decision making. The next section provides an outline of how the statements can be used by business owners and managers to increase return on owner's equity.

Financial Analysis

The first step in analyzing the financial condition of a small business is to subtract noninterest-bearing, spontaneous current liabilities, (accounts payable, accruals, etc.), from both sides of the balance sheet. The intent is to subtract from the balance sheet those expense items that are incurred as a normal part of the operation of the business during an accounting period. These liabilities are generated and paid for through operating income and do not represent the underlying financial capitalization of the smaller business. Stated another way, the adjustment represents the Asset Investment in the firm. Another way to say this is that the business' Asset Investment is equal to the sum of its interest bearing debt plus owner's equity.

After noninterest-bearing, spontaneous current liabilities have been subtracted from both sides of the balance sheet, the owner should calculate the return on asset investment using the adjusted figure described in the preceding paragraph. The following formula is used for this calculation:

$$\text{ROAI} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Asset Investment}}$$

The return on asset investment is calculated using earnings before interest and taxes and provides a direct measure of the earnings ability of a business. The earnings ability is related to the investment in assets using both debt and equity. This calculation allows the

business owner to see whether an adequate return is being earned on the assets that have been purchased by the business regardless of the amount of debt that is carried by the firm.

As the return on owner's equity is a function of more than earnings on asset investment, the next step for the business owner is to calculate leverage or the percentage of debt to owner's equity of the firm. Leverage is calculated using the following formula:

$$\text{Leverage} = \frac{\text{Interest Bearing Debt}}{\text{Owner's Equity}}$$

Leverage provides the owner with an indication of the amount of debt being carried as a percentage of owner's equity and this is considered to be a measure of the risk being assumed by the owner. It may be important to compare the leverage rate of a business with the industry average and it is important to recognize that the firm must have a return on asset investment that is greater than the cost of debt if leverage is to be used successfully.

After leverage has been calculated, the owner must determine the cost of debt to the firm. The cost of debt is calculated as follows:

$$\text{Cost of Debt} = \frac{\text{Interest Expense}}{\text{Interest Bearing Debt}}$$

With escalating or fluctuating interest rates, the business owner must constantly measure the cost of debt to the firm. Of particular importance is the cost of debt in relation to the ability of the firm to earn income on the debt in excess of its cost. A comparison of the cost-of-debt with the return on asset investment rate will quickly allow the owner to determine whether leverage is being used effectively by the firm.

Once cost of debt has been determined, it is important to calculate the tax rate ratio, (Tax Rate = Income Tax/Income Before Taxes), to assess whether sufficient tax planning

has taken place to maximize income or to lessen the impact of tax on the firm's income. Understanding the return on asset investment, the amount of debt or leverage rate for the firm, the cost of debt, and the effective tax rate, will allow the smaller business owner to begin to establish a framework for financial decision-making that will maximize return on owner's equity. Return on owner's equity, using these three elements, can be viewed as:

ROI = (1 - Tax Rate)[ROAI + (Leverage x [ROAI - Cost of Debt])]

By considering return on owner's equity in terms of the preceding formula, the manager of the business can begin to understand the impact of the three essential elements that determine the rate of return on the owner's investment. The first element, one less the effective tax rate, is an indication of the tax planning that has been taken by the business owner or manager. With this information, the owner can begin to understand how a different tax policy will effect return on income and earnings for a given period. The second element, return on asset investment, is the fundamental measure of the business' productivity or earnings power. For most firms, this is the most important element determining return on owner's equity and it must be watched closely. Return on asset investment, less the cost of debt, lets the owner know if leverage is being used successfully by the firm. During periods of fluctuating interest rates it is important to monitor this element to be sure that the return on asset investment exceeds the cost of debt. The last element, leverage times return on asset investment, less the cost of debt, provides the gain or loss that has resulted from using financial leverage.

Return on asset investment is the key operation measure that must be monitored by smaller business owners and managers. An important way to view this indicator is to

calculate return on asset investment as follows:

ROAI = Asset Turnover x Operating Margin

With this formula, asset turnover is equal to sales divided by the asset investment. Asset investment is equal to the working investment plus total fixed assets. The working investment is the current assets less noninterest-bearing spontaneous current liabilities or that portion of current assets invested by the owner in equity and in interest-bearing debt. Operating margin is equal to earnings before interest and taxes divided by sales. Earnings before interest and taxes equals sales less expenses, and expenses are equal to the cost of goods sold plus operating expenses.

A review of the operating margin should be completed at very short intervals as most businesses cannot compete on the basis of price and their success is directly dependent on maintaining an adequate operating margin. In fact, the operating margin is the single most important success variable of the smaller business and its decline will usually be the first signal that a firm is headed for cash flow difficulty. This indicator should be compared with common size income statements for similar businesses and against predetermined objectives.

Asset turnover allows the business owner/manager to review the use of fixed assets and to better understand the cash conversion cycle. It provides an understanding of how the asset investment has been allocated to current and fixed assets and how these are being used to generate earnings for the firm.

The structure presented permits a thorough examination of the elements that influenced return on owner's equity. For example, it provides an analysis of a business' use of debt or financial leverage including the potential benefits and risks to the firm's owners.

When little or no debt or leverage is used by a business, the owner is only concerned with ordinary business risks and income is generated based on the owner's investment in the firm. The capitalization of a business' working investment and fixed assets through higher amounts of debt or leverage results in an ever-increasing risk because of the requirement to repay principal and also to cover interest on the amounts borrowed. From the owner's perspective, the amount of debt or leverage can increase as long as the incremental increase in return on owner's equity is greater than the calculated additional risk associated with the requirement to repay principal and interest. From a lender's perspective, increasing amounts of debt or leverage are acceptable as long as the interest rate charged for the debt is great enough to offset the increased risk associated with higher levels of debt. When analyzing the amount of leverage or debt a firm should hold, both lenders and owners will desire or prefer a positive difference between return on asset investment and the cost of debt. This is true because the greater the return on asset investment over the cost of debt, the higher the return on owner's equity and the less difficulty the owner will have in repaying both the principal and interest from cash flows generated by the business.

The structure presented allows for a complete analysis of these leverage issues as it illustrates the profit or loss generated from using debt as being a function of both the amount of debt carried and the difference between the return on asset investment and the cost of the debt carried. It is important for the business owner or manager to understand how the amount of debt and the difference between the return on asset investment, and the cost of debt, has changed over time especially during periods of fluctuating interest rates.

Another advantage of using this structure is that it provides a framework for

550

completing and understanding traditional ratio analysis. The structure has been designed to allow the business owner or manager to evaluate the return on owner's equity over time and to establish goals or objectives for this return. Also, the return on owner's equity can be evaluated in terms of the tax planning and tax decisions that are made, the amount of debt used, and as a measure of the basic earnings power or business productivity of the firm.

In a similar fashion, the effective tax rate being paid by the business can be analyzed by evaluating legal tax rates, the existing tax laws, and the firm's accounting practices regarding such things as deferred taxes and investment tax credits. In addition, the use of debt can be evaluated using different assumptions regarding capitalization rates and different spreads between the cost of debt and the return on asset investment.

Most importantly, the structure provides a detailed analysis of return on asset investment which leads to decisions that maximize the earnings ability of a smaller business. As this measurement or indicator provides an understanding of the effectiveness of decisions by management in using each dollar of investment, regardless of whether it is debt or equity, return on investment is viewed as being a function of asset investment turnover and of the operating margin of a business. The asset investment turnover, (sales divided by asset investment), indicates how efficient management decisions have been in generating sales from the assets that have been purchased or leased by a business.

Operating margin, defined as earnings before interest and taxes divided by sales, is a fundamental measure of the operating profitability of the business and of the sales generated by the firm. When operating margin is evaluated by comparing actual performance with predetermined objectives it provides a guide for business' pricing policies and for the

551

financial control of production, selling, general, and management expenses. This indicator is not affected by debt and interest expense or taxes and this allows management to better understand what costs can actually be controlled.

As is apparent, the procedure for evaluating return on asset investment leads directly to individual line item analysis on the balance sheet and operating statement. This is true because sales, cost of goods sold, operating expenses, and changes in accounts receivable, inventory, accounts payable and accruals directly affect the small business' operating cash flow. Therefore, an evaluation of the smaller business' return on asset investment is an indirect analysis of the operating cash flow of the firm. Thus, decisions that improve the return on asset investment are also decisions that improve operating cash flow and the return on owner's equity.

In summary, the three factors that determine return on owner's equity are return on asset investment, financial leverage (both in amount and in cost), and the effective tax rate. If a business only has owner's funds invested and no borrowed capital, and if all earnings are retained and no income tax is paid, the return on owner's equity of the firm will equal its return on asset investment. The impact of leverage on return on owner's equity will depend on the relationship between the return on asset investment and the cost of capital or debt. If the return on asset investment is greater than the cost of capital or debt, if income taxes are excluded, the return on owner's equity will be greater than the return on asset investment. Conversely, the return on owner's equity will be lower than the return on asset investment. Also, when income tax increases the return on owner's equity will decrease.

The use of the financial structure presented in the preceding sections of this paper

allows the business owner or manager to assess the firm's use of leverage. Stated another way, the business owner/manager needs to consider the use of debt in regard to the risks and rewards to both owners and lenders. When leverage or debt are not used, small business owners must only assess business risk and they are compensated for this risk through the return on asset investment that is generated by the firm. The purchase of assets through an increasing amount of debt introduces additional risk as the business owner or manager must now assess the ability of the firm to generate funds in sufficient amounts to pay principal and interest.

From the owner's point of view, the amount of debt used should be increased as long as the increment return on owner's equity more than compensates them for the additional risk associated with new debt. From the lender's position, increasing levels of debt will be permitted as long as the cost of the debt charged by them more than compensates them for the increased risk they are exposed to. Thus, for any given level of debt to equity, both lenders and owners will prefer a very positive difference between the return on asset investment and the cost of debt as owners want maximized or higher return on equity and lenders want to be certain that the business will have little difficulty in paying both the principal and interest on the debt from cash generated internally.

The structure presented permits an examination of all of these issues as it calculates the gain or loss that results from using debt both in terms of amount and the difference between the return on asset investment and the cost of the debt. The business owner or manager will be able to answer questions involving how the amount of debt and the spread between the return on asset investment and the cost of debt has changed over time and

whether the business has been earning a positive return on asset investment compared to the cost of debt in the past. This will allow an estimate to be made as to whether there will be a positive difference between return on asset investment over the cost of debt in the future and what the proportion of debt to equity should be to maximize return on equity without assuming unnecessary risk.

Another benefit of the structure presented is that it provides a framework for completing and understanding standard ratio analysis. The structure can be used to follow return on owner's equity changes over time and its variation from a standard as it relates to tax policy, leverage, and fundamental business productivity. Each of these important variables can be further investigated using common ratio analysis.

For example, the effective tax rate of the firm can be better understood by evaluating existing tax rates, tax laws, the business' accounting practices and by comparing actual tax rate with those of similar businesses. Leverage, or the use of debt, can be assessed to see if it is in line with capitalization ratios and coverage ratios for the industry of the business or with businesses with similar size and operations. The cost of debt, or interest rate, of the smaller business can be evaluated in terms of the price of outstanding debt and/or the general level of interest rates when fluctuating debt agreement are used.

Return on asset investment can provide a measure of how effective management has been in using capitalization regardless of the combination of debt and equity and it can be looked at in terms of asset turnover and of the critical operating margin of the smaller business. Asset turnover, which has been defined as sales divided by asset investment, indicated how efficiently management has generated sales from the capitalization base of the

business. This provides an indication of how well the working asset investment and net fixed assets have been selected and managed and it also provides a basis for evaluating the cash conversion cycle and turnover of fixed assets.

For businesses, operating margin is a key indicator of success and it measures the operating profitability of each dollar of sales. When analyzed in comparison with common size income statements and businesses, the operating margin provides a measure of the business' pricing policies and of management's control of production, selling, general, and administrative expenses. Operating margin will not be affected by interest expense and taxes which are viewed in the structure when management looks at the cost of debt and the tax rate paid by the firm.

It is obvious that the process of evaluating return on asset investment leads directly to individual line items of both the balance sheet and the operating statement. Sales, cost of goods sold, operating expenses, accounts receivable, inventory, accounts payable, and various accruals all affect the firm's cash flow. For this reason, the evaluation of past return on asset investment provides an analysis of the business' historical net operating cash flow.

The following ratios should be used when evaluating asset turnover of a smaller business:

1) Average Age of Inventory
   a. Inventory divided by the cost of goods sold times 365
   b. Days cost of goods sold in inventory
   c. Days it takes, on average, to convert raw materials into finished goods and to deliver as a sale

2) Collection Period
   a. Accounts receivable divided by net sales times 365
   b. The number of days, on average, it takes to collect a credit sale

3) Payment Deferral Period
   a. Days cash expenses and accounts payable and accruals
   b. Accounts payable plus other accrued expenses divided by cash expenses per day

4) Cash Conversion Cycle
   a. Average age of inventory plus collection period minus payment deferral period
   b. Number of days between cash outflow and cash inflow

5) Fixed Assets Turnover
   a. Sales divided by fixed assets
   b. Number of dollars generated for each dollar invested in fixed assets

This outlines a system for ratio analysis that provides a clear connection between the operating and financial objectives that a business owner/manager establishes. It provides a framework for evaluating past performance and to make decisions for the future.

When looking at the future, the business owner/manager needs to make decisions that will increase return on owner's equity. The preceding analysis will allow a determination to be made as to whether there should be an increase in leverage, restructuring of debt to reduce its cost, or whether a lowering of the effective tax rate is possible.

In broad terms, management can take two actions to increase return on asset investment. The first will be to increase the asset investment turnover or find ways to generate more sales given the asset base of the business. The second would be to increase operating margin for the firm.

In more specific terms, the business owner/manager can take a number of steps to increase return on asset investment. The first may be to simply increase the volume of business handled by the firm. Another might be to increase the selling price of the business' product or service if demand is inelastic or lowering the selling price if it has been

556

determined that demand is elastic. Also, it is important to see if there can be a reduction in the cost of goods sold as a percentage of sales.

As most successful firms have good systems of financial control, the business manager must do all that is reasonable to reduce selling, general, and administrative expenses as a percentage of sales. In addition, an attempt should be made to lower the average age of inventory and to decrease the collection period of accounts receivable. By lengthening the payment deferral period and increasing fixed asset turnover the manager can also improve performance.

The preceding are examples of how return on asset investment can be increased with a resulting improvement in the return on owner's equity. These represent only a few of the techniques that are possible but it does illustrate the usefulness of the structure presented in the chapter.

Sustainable Growth Rate

In addition to the benefits previously described, the structure presented in this paper provides data that can be used to project the sustainable growth rate of a business. Stated another way, the business owner/manager has a need to determine if projected growth is consistent with the underlying capitalization structure of the firm and with both operating and financial objectives. If the calculation of sustainable growth rate shows that planned expansion is greater than the level indicated, a reduced level of sales will need to be planned for or a revision will have to be made in the capital structure or the operating and financial objectives of the business.

Sustainable growth rate is calculated using the following formula:

$$SGR = \frac{P(1-R)(1+L)}{T-(P)(1-R)(1+L)}$$

P = Profit Margin on Sales After Taxes
R = Return to Owners (1-R = Retained Earnings)
L = Debt to Equity Ratio
T = Ratio of Assets to Sales

The calculation of this rate will allow the business owner or manager to understand the annual percentage increase in sales that can be achieved with the firm's underlying capital structure, consistent with established operating and financial objectives, without having to resort to additional owner equity contributions and/or new debt.

Small Business vs Larger Business

It must be recognized that small and medium size businesses are fundamentally different than large businesses and that management practices that are appropriate for one may be disastrous for the other. For appropriate and effective management practices to be selected, small business owners must be aware of some of these fundamental differences in operating characteristics.

To begin with, most small businesses are undercapitalized and tend to be located in sectors that are diverse, fragmented and highly competitive. This volatility has a direct impact on planning as conditions are seldom stable for any length of time and the firm typically will not have direct control over resources for optimum decision making. Many decisions will be made based on fluctuating market conditions and on resource availability at any given period of time.

Another difference is that the compensation of the small business owner or manager usually represents a larger percentage of earnings than would be found with larger

companies. In addition, the owners of small businesses often use company resources for personal use and this combination results in a situation where there is insufficient income available to hire management or staff specialists or to pay for outside advisors or consultants. The consequence of this situation is that management techniques usually have to be relatively simple to apply and easily understood as the small business owner will often be the only manager available to the firm.

The unique characteristics of small businesses and their management results in a situation where the firm cannot survive long periods of recession, high interest rates (cost of debt above the return on asset investment), the introduction of new technology or the impact of major management mistakes or misjudgments. The management tools described in this paper attempt to overcome some of these problems and to put small business owner/managers into a position where sound decisions can be made without creating an environment of "paralysis by analysis."

When applying the structure presented in the paper, small and medium size business owner/managers should keep the following difficulties inherent with small firms in mind:

1. Cash Flow Forecasting

Cash flow management is the most essential part of administering a small business and it is extremely important to accurately predict future cash flow. However the amount of cash consumed by growth usually is greater than the increased revenues generated and this can lead to direct cash flow deficits. Cash is consumed or held in accounts receivable, inventory, and other expenditures that have not yet generated direct cash flow.

2. Calculating Break-Even In Sales

The concept of traditional breakeven analysis or calculation for small businesses is

551

extremely misleading as many commonly defined variable costs are not within the direct control of the small business owner/manager. For this reason, actual breakeven levels for most small firms is much higher than traditional accounting methodology would suggest.

3. **Liquidity**

It is much more important for small businesses to generate cash flow, or sufficient liquidity, to meet obligations than it is to generate an accounting profit. The survival of the small firm is based on its liquidity and this should be looked at as closely as profit and return on asset investment.

4. **The Leverage Ratio**

Most small business owners or managers have a goal regarding their debt to equity ratio and they follow this blindly. However, in periods when interest rates are high the cost of debt exceeds the return on asset investment, owner's equity will be liquidated and this will automatically distort the leverage ratio. The debt to equity percentage must be viewed realistically with long-term survival and growth in mind.

In summary, the financial management of a small or medium size business is distinctly different from that of larger firms. The small business owner/manager cannot afford specialized employees or hire expensive outside consultants to apply sophisticated techniques to the decision making process. For this reason, this paper has been written to provide an understanding of those variables that are important in the financial management decision making process and suggest a system that can be applied and understood by most operators of small and medium size businesses.

RWP07

ABC COMPANY
BALANCE SHEET

Assets	
Current:	$
Cash	23,638
Receivables	3,137,287
Inventories	4,532,640
Other	733,942
Total Current Assets	$8,427,507
Fixed:	
Land, Buildings & M&E	6,720,885
Less Accum. Dep.	(4,060,786)
Other Fixed	1,314,081
Total Fixed Assets	$3,974,180
Total Assets	$12,401,687
Liabilities	
Current:	$
Accounts Payable	1,470,687
Accrued Wages	536,593
Accrued Taxes	114,439
Accrued Interest	2,915
Dividends Payable	99,092
Accrued Payroll Tax	10,965
Current Portion of Long-term Debt	312,881
Total Current Liabilities	$2,547,572
Noncurrent Liabilities:	
Long-term Debt	6,194,886
Total Noncurrent Liabilities	$6,194,886
Shareholders' Equity:	
Common Stock	339,955
Retained Earnings	3,319,274
Total Equity	$3,659,229
Total Liabilities & Equity	$12,401,687

561

ABC COMPANY
INCOME STATEMENT

Sales	$22,380,026
Less:	
Cost of Goods Sold	(12,532,800)
Gross Profit	$ 9,847,226
Less:	
Operating Expenses*	8,376,131
Earnings Before Interest and Taxes	1,471,095
Less	
Interest Expense	(780,932)
Income Taxes	(234,655)
Net Income	$ 455,508

*Depreciation = $450,000

rwp08

562

FINANCIAL ANALYSIS WORKSHEET

1. Net Income (Operating Statement): _____

2. Current Liabilities (Balance Sheet): _____

3. Sales (Operating Statement): _____

4. Interest Expense (Operating Statement): _____

5. Income Before Taxes (Operating Statement): _____

6. Earnings Before Interest and Taxes (Operating Statement): _____

7. Owner Equity (Balance Sheet): _____

8. Long-term Liabilities (Balance Sheet): _____

9. Interest-bearing Debt (Balance Sheet): _____

10. Income Tax (Operating Statement): _____

11. Expenses (Operating Statement): _____

12. Earnings Before Interest and Taxes (Operating Statement): _____

13. Non Interest-bearing Spontaneous Current Liabilities (Balance Sheet): _____

RWP09

FINANCIAL ANALYSIS WORKSHEETS

NEED: INCOME STATEMENT (DETAILED)
BALANCE SHEET (DETAILED)

1. NORMALIZE STATEMENTS

2. CALCULATE RETURN ON OWNER'S EQUITY (ROE)

NET INCOME _____
OWNER'S EQUITY _____

DIVIDE NET INCOME BY OWNER'S EQUITY:

$$\text{ROE} = \frac{\text{NET INCOME}}{\text{OWNER'S EQUITY}} = \_\_\_\_\_$$

OBJECTIVE: MAXIMIZE ROE

ROE CAN BE EVALUATED:
1. OVER TIME
2. COMPARED TO A STANDARD

ROE IS A FUNCTION OF MAXIMIZING RETURN ON ASSET INVESTMENT, USING DEBT EFFECTIVELY AND THE EFFECTIVE TAX RATE.

3. ADJUST BALANCE SHEET BY SUBTRACTING NONINTEREST-BEARING, SPONTANEOUS CURRENT LIABILITIES FROM BOTH SIDES OF THE BALANCE SHEET (ACCOUNTS PAYABLE, ACCRUALS, ETC.).

CURRENT LIABILITIES _____
LESS ADJUSTMENT _____
EQUALS ASSET INVESTMENT _____

(ALSO, ASSET INVESTMENT EQUALS INTEREST BEARING DEBT PLUS OWNER'S EQUITY)

INTEREST BEARING DEBT _____
PLUS OWNER'S EQUITY _____
EQUALS ASSET INVESTMENT _____

4. CALCULATE RETURN ON ASSET INVESTMENT (ROAI)

EARNINGS BEFORE INTEREST AND TAXES _____
ASSET INVESTMENT _____

$$\text{ROAI} = \frac{\text{EARNINGS BEFORE INTEREST AND TAXES}}{\text{ASSET INVESTMENT}} = \_\_\_\_\_$$

ROAI IS THE MEASURE OF THE EARNINGS POWER OF A BUSINESS

564

5. CALCULATE LEVERAGE

INTEREST BEARING DEBT _____
OWNER'S EQUITY _____

$$\text{LEVERAGE} = \frac{\text{INTEREST BEARING DEBT}}{\text{OWNER'S EQUITY}} = \_\_\_\_\_$$

LEVERAGE INDICATES THE RISK BEING ASSUMED BY THE OWNER. COMPARE LEVERAGE WITH INDUSTRY AVERAGE.

6. CALCULATE COST OF DEBT

INTEREST EXPENSE _____
INTEREST BEARING DEBT _____

$$\text{COST OF DEBT} = \frac{\text{INTEREST EXPENSE}}{\text{INTEREST BEARING DEBT}} = \_\_\_\_\_$$

COMPARE COST OF DEBT WITH ROAI AND WITH INDUSTRY AVERAGE.

7. CALCULATE THE TAX RATE RATIO

INCOME TAX _____
INCOME BEFORE TAX _____

$$\text{TAX RATE} = \frac{\text{INCOME TAX}}{\text{INCOME BEFORE TAX}}$$

COMPARE WITH INDUSTRY AVERAGE

8. CALCULATE ROE

TAX RATE _____
ROAI _____
LEVERAGE _____
COST OF DEBT _____

ROE = (1 - TAX RATE)[ROAI + (LEVERAGE x [ROAI - COST OF DEBT])]

9. CALCULATE ASSET INVESTMENT TURNOVER

SALES _____
ASSET INVESTMENT _____

$$\text{ASSET INVESTMENT TURNOVER} = \frac{\text{SALES}}{\text{ASSET INVESTMENT}}$$

ASSET INVESTMENT TURNOVER PROVIDES A MEASURE OF THE USE OF ASSETS, (USE OF FIXED ASSETS AND THE CASH CONVERSION CYCLE) AND IT SHOULD BE COMPARED TO THE INDUSTRY AVERAGE AND OVER TIME.

563

10. CALCULATE OPERATING MARGIN

EARNINGS BEFORE INTEREST AND TAXES _____
SALES _____

$$\text{OPERATING MARGIN} = \frac{\text{EARNINGS BEFORE INTEREST AND TAXES}}{\text{SALES}}$$

OPERATING MARGIN SHOULD BE COMPARED WITH INDUSTRY AVERAGE AND A STANDARD. THIS IS THE MOST IMPORTANT SUCCESS INDICATOR.

11. CALCULATE ROAI

ASSET INVESTMENT TURNOVER _____
OPERATING MARGIN _____

ROAI = ASSET INVESTMENT x OPERATING MARGIN

12. CALCULATE SUSTAINABLE GROWTH RATE

P = PROFIT MARGIN ON SALES AFTER TAXES:
NET (AFTER TAX) PROFIT _____
SALES _____

$$P = \frac{\text{NET PROFIT}}{\text{SALES}}$$

R = RETURN TO OWNERS:
DISTRIBUTION OF NET PROFIT TO OWNERS _____
NET PROFIT _____

$$R = \frac{\text{DISTRIBUTION TO OWNERS}}{\text{NET PROFIT}}$$

L = LEVERAGE:
INTEREST BEARING DEBT _____
OWNER'S EQUITY _____

$$L = \frac{\text{INTEREST BEARING DEBT}}{\text{OWNER'S EQUITY}}$$

T = RATIO OF ASSETS TO SALES:
TOTAL ASSETS _____
SALES _____

$$T = \frac{\text{ASSETS}}{\text{SALES}}$$

$$SGR = \frac{P(1 - R)(1 + L)}{T - (P)(1 - R)(1 + L)}$$

566

ROAI INCREASE WORKSHEET

1. Price Increase

Existing Sales		_____
Times Price Increase		X 1. _____
New Sales	=	
Less Expenses	-	_____
Divided by Asset Investment	-	_____
ROAI	=	

2. Increase Sales

Existing Sales	_____
Times Sales Increase	X 1. _____
New Sales	
Less Variable Cost Percent of Sales	_____
Less Fixed Costs	_____
Divided by Asset Investment	_____
Return on Asset Investment	_____

567

3. Decrease Variable Expense

Sales		_____
Less Reduced Variable Percent of Sales	-	_____
Less Fixed Cost	-	_____
Divided by Asset Investement	-	_____
Return on Asset Investment		_____

4. Decrease Fixed Expenses

Sales		_____
Less Variable Costs	-	_____
Less Reduced Fixed Expenses	-	_____
Divided by Asset Investment	-	_____
Return on Asset Investment		

- 568

5. Decrease Asset Investment

Net Income
Divided by Reduced Asset Income _____

569

Cash Flow Management
The Modern Approach to Liquidity

Small business management is essentially cash flow management and the concept of sustainable growth is nothing more than estimating if a firm will generate enough "free cash" in the future to repay debts.

The following elements are useful when evaluating the liquidity of a firm:

NWC = Net Working Capital

WCR = Working Capital Requirements

NBP = Net Balance Position

The traditional view of Net Working Capital is to simply subtract current liabilities from current assets. The problem with this approach is that it assumes an annual flow of funds and this does not reflect the reality of short term cash flow. A better understanding of Net Working Capital can be obtained by determining the CONTINUOUS (or permanent) level of current assets and current liabilities.

By considering the continuous level of current assets and current liabilities, it is possible to calculate the liquidity of a business or its Net Balance Position. The Net Balance Position of a firm is calculated as follows:

NBP = NWC - WCR

If the Net Balance Position of a business is positive, it has liquidity. The goal of management is to maintain or increase the liquidity of a business and a Net Balance Position of at least 0 is necessary for survival.

The Net Working Capital of a business is its Permanent Capital less Fixed Assets or the Minimum Cash required for operating plus Accounts Receivable and Inventory minus Accounts Payable. This is the "modern" approach to understanding and managing liquidity and cash flow of a business.

The first step in determining your Net Balance Position is to determine which Balance Sheet items are directly related to sales. On the asset side, this will usually include some cash (the minimum required for operations), inventory and accounts receivable. This represents the operating "needs" of the business.

570

Looking at your Balance Sheet, identify the current assets that are related to sales:

Current Assets Related to Sales:

Next, identify the current liabilities related to sales such as accounts payable, taxes payable, etc.:

Current Liabilities Related to Sales:

You now need to calculate your "excess" current assets by subtracting Current Assets Related to Sales from total Current Assets:

"Excess" Current Assets:

A similar approach is taken to determine "Other" Current Liabilities, that is, Current Liabilities Related to Sales are subtracted from total Current Liabilities:

"Other" Current Liabilities:

Permanent Capital is determined by adding Long-Term Debt and Owners Equity as this represents the existing "investment" in the firm:

Permanent Capital:

The continuous level of current liabilities related to sales is a "resource" available to the business to finance operations. When the current liabilities related to sales are subtracted from the current assets related to sales (operating needs), the Working Capital Required is determined. The Working Capital Required figure is also called "Operational Quick Assets" and this is the cash that is needed for operations. Calculate your Working Capital Requirement by subtracting current liabilities related to sales from current assets related to sales:

Working Capital Required:

The operating cycle of a business is directly related to the relationship between the "cash" needed and the "cash" provided by the firm. The operating cycle is the "key" to success as your suppliers will finance your growth with good cash flow management.

FINANCING CYCLE WORKSHEET

	1988	1989	1990
Permanent Capital			
Fixed Assets			
Net Working Capital (NWC)			
Operating Needs			
Operating Resources (less)			
Working Capital Required (WCR)			
Other Current Assets			
Other Current Liabilities (less)			
*Net Balance Position (NBP)			

Permanent Capital - Long-term debt plus owners equity

Net Working Capital - Permanent capital less fixed assets

Operating Needs - Accounts receivable, inventory and minimum cash needed

Operating Resources - Accounts payable related to operations

Working Capital Required - Operating needs less operating resources

*Net Balance Position (NBP) - Net working capital less working capital required or other current assets less other current liabilities

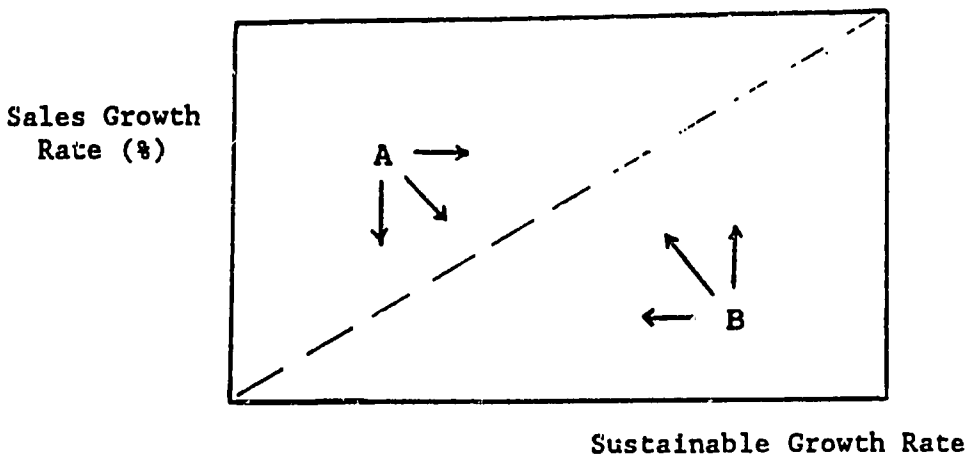
572

CASH FLOW ANALYSIS

FINANCIAL DECISIONS	Financial Cycle: Operational Cycle	Investment Cycle	Financing Cycle
Operational	Operating Cash Flow		
Strategic	Cash Available for Strategic Decisions	Cash Flow from Business	Change in Net Balance Position
Tactical (short-term)			Change in Cash and Equivalents
	↓	↓	↓
	Growth	Diversification	Liquidity or Equilibrium

513

Sustainable Growth Matrix



A - High sales, beyond sustainable growth
(can change margin, increase capital, etc.)

B - Low sales, less than ability to finance growth
(growth strategy, new markets, diversification, etc.)

574

Sustainable Growth Rate
-- A Detailed Expansion --

S = Sales
CM = Contribution Margin
EBIT = Earnings Before Interest and Taxes
EBT = Earnings Before Taxes
EBEIT = Earnings Before Extraordinary Items and Taxes
NP = Net Profit
D = Dividend Payout Ratio
A = Assets or Investment
OE = Owners Equity
G = Sustainable Growth Rate

$$G = \underbrace{\underbrace{\underbrace{\frac{CM}{S}}_{\text{Contribution Margin}} \times \underbrace{\frac{EBIT}{CM}}_{\text{Fixed Costs}}}_{\text{Operating Margin}} \times \underbrace{\frac{S}{A}}_{\text{Asset Turnover}}}_{\text{Return on Assets (ROA)}} \times \underbrace{\underbrace{\frac{EBEIT}{EBIT}}_{\text{Interest Changes Effect}} \times \underbrace{\frac{A}{OE}}_{\text{Leverage}}}_{\text{Financial Leverage}} \times \underbrace{\frac{NP}{EBEIT}}_{\text{Fiscal Effect}} \times \underbrace{(1-D)}_{\text{Payout Effect}}$$

Return on Equity (ROE)

CASH FLOW WORKSHEET

1. Determine Permanent Capital by adding Long-Term Debt and Owner's Equity

   Permanent Capital _____

2. Determine Net Working Capital by Subtracting Fixed Assets from Permanent Capital

   Net Working Capital _____

3. Estimate Operating Needs by adding Accounts Receivable, Inventory and Minimum Cash Needed

   Operating Needs _____

4. Determine Operating Resources by Estimating Continuous Level of Accounts Payable Related to Operations

   Operating Resources _____

5. Determine Working Capital Required by Subtracting Operating Resources from Operating Needs

   Working Capital Required _____

6. Calculate Net Balance Position (NBP) by Subtracting Working Capital Required from Net Working Capital

   NBP _____

NBP IS THE FUNDAMENTAL MEASURE OF BUSINESS LIQUIDITY

576

CASH CONVERSION CYCLE WORKSHEET

You will need:

Sales	_____
Cost of Goods Sold	_____
Inventory	_____
Accounts Receivable	_____
Noninterest bearing Cash Expenses (Exp. less non-cash exp.)	_____
Non-interest bearing spontaneous current liabilities	_____

Step 1: Calculate Age of Inventory

a) Cost of goods sold/365 = _____

b) Inventory = _____

Age = Inventory/Cost of Goods Sold-Day

Step 2: Calculate Collection Period

a) Sales/365 = _____

b) Accounts Receivable = _____

Collection Period = Accounts Receivable/Sales Per Day

Step 3: Calculate Payment Deferral Period

a) Non-interest bearing Current Liabilities = _____

b) Cash Expenses/365 = _____

Pay. Def. Period = Non-interest bearing Current Liabilities/Cash Expense Per Day

Step 4: Calculate Cash Conversion Cycle

Cash Conv. Cycle = Age of Inventory + Collection Period - Payment Deferral Period

1

THE PROCESS OF BUSINESS VALUATION

by

Robert W. Pricer

Determining the realistic value of a business is extremely important and a balance sheet usually will not provide the information needed to make this determination. Also, appropriate techniques used for estimating the value of a business will vary depending on the purpose of the valuation.

Business consultants are asked to make business valuations for the following purposes:

1. placing a value on the founder's interest in the business;

2. valuing ownership interest as a result of the addition of investors with a reduction in ownership percentage;

3. the sale or purchase of a business;

4. insuring key partners or individual owners;

6. estate planning;

7. financing; and

8. buy/sell agreements.

The appropriate valuation technique will depend on which of these or other objectives you are trying to achieve.

There are two basic philosophies used when approaching the questions of business valuation. The first position contends that a business should be valued based on past performance of the business as this will be reflected in the firm's asset value. The people that follow this line of reasoning contend that successful businesses build their asset value and that this is the only accurate method for measuring the true worth of a firm.

The second philosophy holds that the value of a business is the product of its ability to generate income and that the only valid valuation techniques include a business' ability to generate future earnings. Thus, the asset valuation technique looks at past performance and the income valuation approaches consider the future performance of a business.

Most business valuations are conducted in an attempt to estimate "fair market value" of a business from either a seller or buyer's perspective. For this reason, it is important to identify those techniques that best estimate the actual selling price of businesses to allow individuals to fairly establish a reasonable market price for a firm.

REVENE RULING 59-60

In valuing a closely-held corporation, no general formula may be used and the following must be taken into consideration:

1. Nature and History of the Business.

You should look at the past stability or instability, growth or lack of growth, diversity of operations, and degree of risk associated with the business. You need to look at the nature of the business, its products or services, operating and investment assets, capital structure, plant facilities, sales records and management. Events of the past that are unlikely to recur in the future should be discounted, since value has a close relationship to future expectancy.

2. Economic Outlook in General and for Industry.

You need to look at current and prospective economic conditions as of the date of the appraisal, both in the national economy in the industry or industries with which the company is allied. It is important to know if the company is more or less successful than its competitors in the same industry, or that it is maintaining a stable position with respect to competitors. You will also want to determine the ability of the industry with which the company is allied to compete with other industries. Potential competition that has not been present in prior years should be given close attention. The public's appraisal of the future prospects of competitive industries or of competitors within an industry may be indicated by price trends in the markets for commodities and for securities. The loss of the owner/manager of a "one-man" business may have depressing effects on the value of a company.

3. Book Value and Financial Condition of Firm.

You need to obtain financial statements for the company for at least the past three years with five years being preferable. You will also need year-to-date financials for the period preceding the valuation. Any balance sheet descriptions that are not self-explanatory, and balance sheet items with consolidated assets and liabilities, should be clarified in essential detail by supporting supplemental schedules. You should pay particular attention to the: liquid position, gross and net book value of principal classes of fixed assets, working capital, long-term indebtedness, capital structure and net worth.

4. Earnings Capacity of Firm.

Detailed income statements should be obtained and considered for a representative period immediately prior to the required date of appraisal, preferably five years or more. These statements should show: gross income by principal items, principal deductions from gross income including major prior items of operating expenses, interest and other expenses on each item of long-term debt, depreciation and deletion if such deductions are made, officers' salaries, in total if they appear to be reasonable or in detail if not, taxes by principal items, net income available for dividends, rates and amounts of dividends on each class of stock, remaining amount carried to surplus, and adjustments to, and reconciliation with, surplus as stated on the balance sheet. With income statements, you should be able to separate recurrent from non recurrent items of income and expense, to distinguish between operating income and investment income, and to ascertain whether or not any line of business in which the company is engaged is operating consistently at a loss and might be abandoned with benefit to the company. The percentage of earnings retained for business expanseion should be noted when dividend-paying capacity is considered. Potential future income is a major factor in valuing closely-held companies, and all information concering past income which will be helpful in predicting the future should be secured. IRS holds that past earnings records are usually the most reliable guide as to the future expectancy, however, resort to arbitrary five-year averages without regard to current trends or future prospects will not produce a realistic valuation. It is helpful when judging risk to consider deductions from income and net

5'19

income in terms of percentage of sales. Major categories of cost and expense are to be so analyzed include the consumption of raw materials and supplies in the case of manufacturers, the cost of purchased merchandise in the case of merchants, utility services, insurance, taxes, depreciation, and interest.

5. Dividend Paying Capacity.

Primary consideration should be given to the dividend-paying capacity of the company rather than to dividends actually paid in the past. Recognition needs to be given to the necessity of retaining a reasonable portion of profits in a company to meet competiton. Realize that owner's of small businesses try to avoid double taxation and therefore take salaries and bonuses from a company instead of dividends. This reduces the net income and understates the dividend-paying capacity of a company. As a result, dividends are less reliable criteria for determining fair market value than other applicable factors.

6. Goodwill and Other Intangible Assets.

In the final analysis, goodwill is based upon earning capacity. The presence of goodwill and its value, therefore, rests upon the excess of net earnings over and above a fair return on the net tangible assets, (excess earnings approach). Look for other intangible assets that may have value.

7. Sale Price of Stock and Size of Stock Sold.

The intended transfer of stock, if any, should be investigated to see if it represents an "arms-length" transaction, or if forced or distressed sale. In addition, controlling interest sales of stock may carry a premium and minority sales of stock will almost always be at a discount.

8. Market Price of Stock or Firms in Same Industry.

The IRS Code requires that you consider the selling price of stock for other companies in the same industry when valuing a closely-held firm. It is important to select companies that are similar to the company being valued and it may be necessary to discount the firm's value if your comparable is a public company, (lack of liquidity discount).

When considering all of the information required by 59-60, most weight should be given to current and projected earnings, the next most important information is that involving comparables.

The following valuation techniques are representative of those most frequently used by accountants, lawyers, bankers, and brokers and a description of their strengths and weaknesses is provided:

1. Book Value

To calculate book value, the total assets of a business, less liabilities, is considered to be a fair representation of the value of a company. This is a technique used by many bankers and it does provide a tangible starting point for estimating value and the books of a firm are usually easy to examine.

However, accounting practices, as well as other policy decisions, can have a significant affect on book value and distort the final estimate made for a business. Studies conducted in the United States have found that there is no consistency in asset valuations shown on balance sheets between firms, and this suggests that the book value technique would be of little use in estimating a "fair" value for a particular firm. In fact, this procedure does not provide an accurate measure of the actual selling price of either large or small businesses.

2. Adjusted Book Value

With this technique fixed assets are adjusted for obvious large discrepancies between the book and actual market values of these tangible assets. In addition, intangible assets are usually adjusted to zero and liabilities are subtracted from the new total asset estimate that results from these adjustments.

This technique suffers from the same problems as the book value method as no "fine" adjustments can be made and experience indicates that this approach does not provide an accurate estimate of the market value of either large or small businesses.

3. Liquidation Value

With this technique an estimate of the net cash amount that could be realized from a "quick sale" of the firm's assets is made. If accurate appraisals can't be made, valuators use the following factors for reducing assets and they are based on average recovery rates of business liquidators:

a. 55% of accounts receivable
b. 40% of machinery, equipment, and fixtures
c. 20% of inventory book value and slightly below book value of real estate

This approach only provides an indication of the "floor" value of a business and is usually not of importance to either a buyer or seller except as a reference point. This technique does not provide an accurate estimate of the value of a business except for those that are totally dependent on the current owner for their continuation.

4. The CIBB Method

Experience with valuation has shown that this technique provides the best estimate of the "fair market value" of very small owner-operated companies. To determine the value using this method, real estate, equipment, and fixtures are included at their appraised market value. In addition, inventory is included in the value of the business at the seller's cost and any leasehold improvements are listed at estimated market value. Combined with this asset total is the most current year's after-tax income, owner's compensation (including any fringe benefits or tax benefits that accrue to the owner), and any other benefits such as trade use for personal consumption.

This technique is realistic in that it includes the obvious market value of assets and considers that an appropriate "goodwill" figure is the sum of one year's net income and the cash value of compensation in benefits to the owner. It is rationalized that it will take a purchaser one year to generate new buyers and their own clientele base. The approach provides a technique for valuing the advantage of an ongoing business over a new startup.

5. Replacement Value

With this technique, an estimate is made of the current cost of reproducing the assets of a business. This calculation is usually made for a buyer as this may be an alternative for ownership. However, the valuation is only a reference point and it is not usually related to the "fair market value" of a business. This technique does not accurately predict the selling price of either large or small firms.

These first five methods of business valuation are primarily based on the historical performance of a firm and their accumulated assets. These techniques are not appropriate for valuing larger businesses, especially those that have earnings growth potential.

To fairly value these firms, capitalizing earnings is a method most commonly employed. However, there is a disagreement about the appropriate techniques for selecting a realistic discount rate and a meaningful Price/Earnings Ratio. In addition, the question of what earnings to use must be determined before a valuation is made.

Some professionals prefer to use historical earnings to project future earnings potential. It is felt that past earnings provide a "guide to the future" and add a degree of "realism" to what otherwise would be only a best guess. This is sometimes referred to as the "lost horse" method of forecasting--that is, when the horse was lost, it was seen running in a particular direction and it's assumed that it continued running in the same direction.

There is no direct "logic" behind looking at past earnings as they don't take into consideration future market conditions or random, non-recurring items, owner's compensation levels, etc. For this reason, historical earnings should only be used to gauge the realism of earnings projections.

As past earnings may not be very good indicators of future earnings, it is important to use forecasting techniques that provide a realistic view of the likely future performance of a business. When projections are made under present ownership, this provides an indication of the operation's value of a firm based on the operating policies and strategies of management. When new ownership is in place, the calculation is made based on the policies and strategies of the new management team. The latter approach is used with startups, turn-arounds, and reinvigoration of management that occurs through "leveraged buyouts." These techniques are difficult to use as forecasts must be made with less than complete information.

After future projections have been calculated, the earnings period to be used for valuation must be considered. Individuals experienced in business valuation typically use earnings in a single year between three to seven years into the future with the fifth year of earnings being customary for valuation calculations. Most valuation techniques use new or after-tax earnings before extraordinary items. It is extremely important to be consistent with earnings definitions when valuations are made and to "normalize" financial statements before the process begins.

After earnings and the valuation period have been selected, a Price/Earnings multiple must be agreed upon. That is, an estimate must be made as to what prices are paid, in terms of a multiple of earnings, for firms with similar records and histories. The best technique is to find the earnings multiple for similar companies in the same geographic location and business sector. However, if this data is not available, the public stock market can be consulted for this estimate. The average Price/Earnings (P/E) multiple for the industry for the company being valuated should be determined. If the public stock market P/E multiple is used, it is customary to reduce this ratio liquidity of privately-held businesses.

When an appropriate P/E has been determined, a discount rate must be calculated for the business to reduce the future earnings and value of a business to the present. The discount rate incorporates the valuer's opinion of the time value of money after an adjustment has been made for risk. In practice, most valuers use

the "opportunity cost" of money, that is the current risk-free (government security) interest rate plus a risk factor of 5%. There are many complex models for projecting an appropriate discount rate and a risk factor and the use of one of these may be appropriate for valuing firms, especially those that are very large.

With these issues in mind, the following techniques rely on earnings as a basis for valuation and represent the methods most commonly used by business valuers for larger firms.

6. Capitalization of Earnings

This method attempts to calculate the present value of the current "earnings stream" of a business. This is the common "textbook" approach to valuation and the current earnings estimate is divided by the discount rate less the projected growth rate for the business. This technique does not accurately predict "fair market value" and it has been criticized for assuming a constant growth rate and that the firm will be held or owned to infinitly. However, the technique is valuable in determining appropriate levels of key partner or owner life insurance to protect the future earnings of a business that is dependent on current management.

7. Holding Period Method

This technique is used when a current owner intends to hold a firm for a fixed period of time and wants to know the value of the firm over this period and at its sale. The firm's value is then determined by calculating the present value of the earnings stream for the holding period by using the risk adjusted discount rate plus the selling price. The selling price represents the present value of the future earnings at the future sales state. To calculate the selling price, you multiply the projected earnings at the sale date by a P/E estimate. This technique is not intended to estimate "fair market value" but it is a useful tool for decision-making especially when a business owner is looking at several different options in terms of the time for the sale of a business.

8. Traditional Valuation Method

When used by knowledgeable valuators, this technique provides the best estimate of the "fair market value" of all but very small businesses. To make this calculation, a future year is selected for the earning projection that represents the best estimate of the future earnings growth potential of the firm. This future year's earnings is multiplied by the selected PE to calculate the future value of the business. The future value is reduced to a present value by using the risk-adjusted discount rate. This is the most frequently used valuation technique by venture capitalists and it consistently provides the most accurate estimate of the actual selling price of businesses.

9. The Fundamental Pricing Method

This is another technique that is used by venture capitalists and values a business based on an earnings flow. With this method, the valuator assumes that the investment in a firm should return a "range" of income that is compounded annually. The sum of the compounded earnings of the business for a defined period of time is divided by the total pre-tax projected earnings for the

-50

firm for an equivalent period of time. This technique does not provide an accurate estimate of actual business selling prices even though its use has become very popular.

The asset in earnings base valuation approaches are used by accountants, lawyers, business consultants, and bankers. Real estate brokers tend to use different techniques and the following two illustrate the many variations that are in practice.

10. Price-to-Book Value Method

This technique simply takes a multiple of the book value of a business to determine the fair market value of the firm. The most common multiple used is 1.8, and surveys have shown that there is no relation between this method and the actual selling price of businesses.

11. Combination Technique

This method takes the liquidation value of a firm and adds three times net or afer-tax income. Even though this and similar techniques are frequently used, they do not accurately estimate the fair market value of a firm.

Most business valuators find it difficult to estimate an appropriate risk factor to use in calculating the discount rate that is applied in the capitalization of earnings formulas. For this reason, probabilistic models are beginning to be used and it appears that they will be the standard valuing technique in the future. An example of these new techniques is the model being used by a sophisticated venture capital firm.

12. The Probabilistic Fixed Horizon Method

With this method, it is assumed that a business can take three distinctly different directions in terms of earnings in the future. The firm can be very profitable to the point of eventually providing a significant capital gain to the owner. It is also possible that the firm will only be marginally profitable in the future with limited growth and that it will not build significant value to return a capital gain to ownership. The third possible result is failure and liquidation of the business with significant loss of the owner's investment in the firm. The cash flow for each of these three alternatives is calculated for a fixed horizon. The three projected cash flows are then compared for the period of time selected.

After the cash flows have been projected, the probability of each of the three options occurring are established using a review of the unique characteristics of each business and of each situation. The sum of the probabilities must equal 1.0, and the weighting of probability can be changed to assume different market conditions in the future.

When probabillties have been selected, an appropriate discount rate excluding risk is determined. The discount rate reflects the necessary return on the owner' investment in time and money but does not include a risk weighting as this has been calculated in the assignment of probabilities to the three potential outcomes. The selected discount factor is applied to the three potential cash flows previously calculated.

When the discounted cash flow has been computed for each of the three possible outcomes, these cash flows are individually totaled. The value of the firm is then determined by multiplying the probability of each occurrency by that occurrence's cash flow in summing the resulting totals. In other words, a weighted average of the possible cash flows is calculated.

The preceding techniques provide an overview of the valuation methods commonly used by business valuators today. It is important to select the technique that provides the information most appropriate for the use of your business valuation.

CONCLUSION

Accountants and other professionals are frequently called on to make business valuations and the technique selected should fit each particular situation. The book value method will be used for traditional bankers and lenders and the adjusted book value technique may be acceptable to them as it will provide a more realistic view of the asset base of a firm.

The liquidation method may be appropriate in valuations used for estates or when the future of a firm dependent on the personality of a particular owner. The replacement value method is used with buyers to calculate an alternative for ownership without the purchase of an existing business and for insurance appraisal purposes.

The CIBB method is useful in predicting the "fair market value" of very small businesses. On the other hand, the price-to-book value and combination techniques even though widely used by real estate brokers have little practical application even for smaller firms.

Capitalization of earnings techniques will usually provide the highest value for any firm with earnings potential and it can be used for key partner and owner life insurance purposes. It also can be used to calculate the present value of the future earnings stream of business for an owner that does not intend to sell. The traditional pricing approach provides the best estimate of the "fair market value" of all but very small businesses. This technique should be used by both buyers and sellers for any firm that has a potential for future earnings growth.

The holding period method is appropriate to use when an owner plans to sell but wants to consider several options in terms of the time of the sale. The fundamental pricing method, even though it is used frequently, does not consistently provide an estimate of actual firm values at time of sale.

The new probabilistic models will most likely become the most wide-spread techniques employed for determining "fair market value" as they take into consideration multiple possibilities of a firm's performance and place a value on the probability of the combined occurrences. This method overcomes the difficulty in assigning risk factors to discount rates and the method appears to provide a sound basis for rationalizing predicted value. Preliminary use of this model suggests that it provides a good predictor of the actual selling price of businesses in the marketplace.

Business owners have many occurrences where they need to value their firms. The selection of an appropriate valuation method is the first step in this process.

VALUATION PROCESS

For your business, the following valuation process should be followed:

Your business occupies an important place in its industry and markets. In order to assess the value of the business, you must study its history and development. The current position of the company in its markets must be assessed and an understanding of the prospects for its growth established. You will need to use industry and government publications as well as the firm's own forecasts to establish an estimate of future economic activity for the business, and therefore, future earnings and cash flows.

Value for your client's firm will be derived from both the assets the company owns and controls and from the earnings and cash flows that its assets generate. Both the asset and earnings values must be carefully determined to generate a realistic value for the company.

To begin your calculation of value:

1. Normalize financial statements.

2. Evaluate industry and market data.

3. Calculate and review financial operating ratios. Compare ratios with Robert Morris.

4. Discuss company and financials with key employees of the company.

5. Adjust balance sheet: Look for over or under valued tangible assets; review accounts receivable and inventory; look for unused assets or excessive cash; review intangible assets, (remove those with limited value, add value where it exists). A comprehensive review is required. Ask if an appraisal of any tangible assets has been made, etc.

6. Project financials for five years based on your understanding of the firm.

7. Select five comparable companies that are publicly traded. Care should be given to select firms that match your client's business as closely as possible. While the selected firms will not exactly match your company in line of business, size, operating performance or financial condition, they will provide a market measure of value.

8. Determine the number of shares outstanding for each of the comparable companies.

9. Calculate the market equity value for each comparable by multiplying the <u>average</u> selling price per share by the number of shares outstanding.

10. Add interest bearing debt to the market equity value for each of the comparables. This equals the <u>Market Asset Value</u> for the comparables.

11. Add the Net Income and Interest Expense for each of the comparables. This equals the Unlevered Net Income for each comparable.

12. **Calculate the multiple of income to value by dividing the Market Asset Value of each comparable by its Unlevered Net Income.**

13. **Select the most appropriate multiple from the comparables, or an average of the multiples, to be used in valuing your client's company.**

14. **Add your client's Net Income and Interest Expense to arrive at the Unlevered Net Income for the company.**

15. **Multiply the Unlevered Net Income of the company by the selected multiple, (step 13), to calculate the market asset value of the company.**

16. **Subtract the interest-bearing debt of the company from their market asset value to arrive at the estimated MARKET EQUITY VALUE for the firm.**

581

AREAS OF DISTINCTIVE COMPETENCE

1. QUALITY
2. SERVICE
3. LOCATION
4. FILLING A SPECIAL NICHE
5. FLEXIBILITY AND ADAPTABILITY
6. STRONG CONSUMER ORIENTATION
7. REPUTATION AND IMAGE
8. PERSONNEL
9. COMFORT/ENJOYMENT
10. PRICE/CREDIT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

THE PROFESSIONAL MANAGER PROGRAM
STRATEGY
Budapest, Hungary

PLEASE USE PENCIL

	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly Disagree 5
1. The objectives of this course were clear to me.	1	2	3	4	5
2. The course exceeded my expectations.	1	2	3	4	5
3. The instructor(s) communicated effectively.	1	2	3	4	5
4. The instructor(s) made the subject matter more meaningful through the use of examples.	1	2	3	4	5
5. The instructor(s) encouraged participants to be involved in discussions.	1	2	3	4	5
6. The instructor(s) presented up-to-date material and information.	1	2	3	4	5
7. The instructor(s) was(were) well prepared and organized.	1	2	3	4	5
8. The instructor(s) did a good job of relating this course with other parts of the program.	1	2	3	4	5
9. The quantity and depth of material covered were appropriate for the allotted time.	1	2	3	4	5
10. I feel that I have a good understanding of the topics covered in this course.	1	2	3	4	5
11. This course helped me gain useful knowledge and/or skills.	1	2	3	4	5
12. I was pleased with the amount of interaction I had with the faculty in the course.	1	2	3	4	5
13. The participants enriched the course by sharing their ideas and experiences.	1	2	3	4	5
14. Overall, I would rate this course as an outstanding educational experience.	1	2	3	4	5
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