

P2-ABX-843

**Deloitte Touche
Tohmatsu**



*Slovak Republic Restructuring
for Privatization Course*

*Module IV: Valuation & Value
Creation: Theory*

Delivery Order No. 40

Contract No. EUR-0014-I-00-1056-00

*Eastern Europe Enterprise Restructuring and
Privatization Project*



*U.S. Agency for International Development
ENI/EUR*

*Bratislava, Slovak Republic
November 6 - 10, 1995*

**Deloitte Touche
Tohmatsu
International**

Restructuring for Privatization:

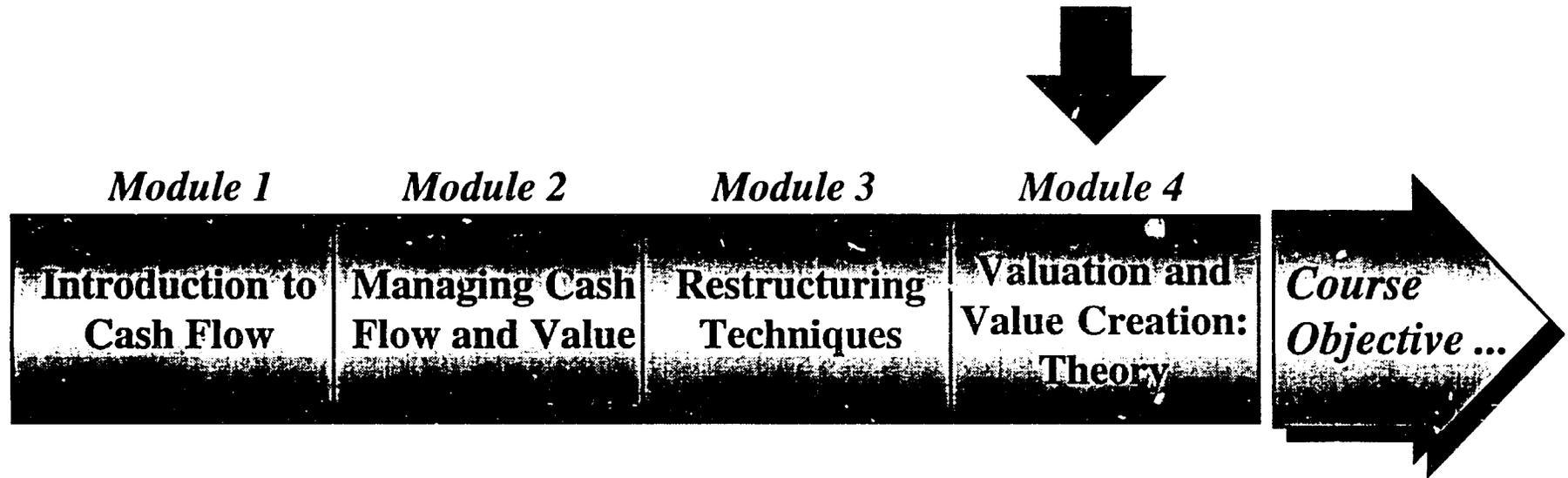
Module IV: Valuation & Value Creation: Theory

*Sponsored by the U.S. Agency for
International Development*

Bratislava, Slovak Republic

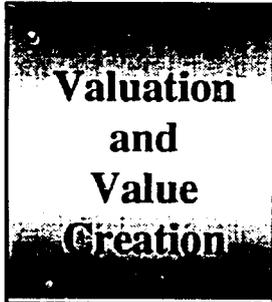
November 6 - 10

Restructuring for Privatization - Courses Offered



... to provide an understanding of the importance of managing cash flow and its impact on value, value creation and restructuring alternatives...

Module 4



Module Objective:

... to provide participants with an understanding of general business valuation theory and concepts as well as how financial and operating decisions can create or destroy value. This module also analyzes and evaluates alternative privatization strategies.

Major Topics Covered

- ✓ **Valuation Theory and Concepts**
- ✓ **Business Enterprise Valuation Theory**
- ✓ **Reaching a Valuation Conclusion**
- ✓ **Analysis and Evaluation of Alternative Privatization Strategies**
- ✓ **Case Study - Using 3 Valuation Approaches to Value a Company for Privatization**

Valuation: Definitions & Concepts

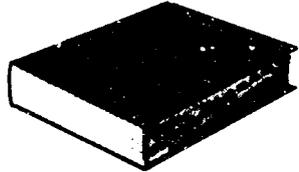
What is a valuation?

- **A valuation of a company involves arriving at an opinion of value for that company as of a given point in time, based on:**
 - **an understanding of the historical, current and future operations of the company;**
 - **an analysis of the economic environment that the company operates in;**
 - **an analysis of the industry in which the company competes in;**
 - **an analysis of the financial information of the company; and**
 - **applying acceptable valuation methods to arrive at a reasonable estimate of value for the company.**



Definitions of value...

- ***Common types of value***
 - Fair market value
 - Investment value
 - Going concern value
 - Liquidation value
 - Book value
- ***The definition of value affects the valuation engagement***



Definition of fair market value (FMV)...

- The price at which property would exchange hands, between a willing buyer and willing seller, neither being under any compulsion to buy or sell, each being aware of the relevant facts, and with equity to both.**
- Assumes a hypothetical sale between two unrelated parties without regard to a specific buyer.**

FMV - further discussion...

- It is intended to be a reasonable estimate of the price at which property would change hands between two willing parties.
- The actual price paid in a transaction may differ from fair market value due to such factors as:
 - the motivation of the parties
 - the negotiation skills of the parties
 - the financial structure of the transaction
- This definition assumes the consideration is paid in cash. Consideration paid in the form of installment payments, seller financing, or contribution of intangible assets by the buyer, could affect the price paid.



Investment value - definition...

- **Represents the value to a specific investor or purchaser of the company. Accordingly, the methods used to value the business in this case consider the investor's know-how, business plans, cost-savings, risk analysis, etc.**
- **Differs from fair market value in that it does not assume a specific buyer.**
- **Often a point of negotiation in a joint venture.**

Going concern value ...

- **Not a definition of value, but rather a concept.**
- **Refers to the intangible elements of a business arising from such factors as:**
 - **having in place a trained, qualified work force;**
 - **a business that is in operation; and**
 - **the required licenses, systems and procedures.**
- **The premise underlying going concern value is that there is no uncertainty (for example, continued losses) about future events that calls into question the fundamental assumption that the entity can continue to operate as a going concern.**
- **If the business is not considered to be a “going concern,” liquidation value may be the appropriate definition of value to consider.**



Liquidation value - definition...

- **Assumes the company's operations are expected to be discontinued and that its assets will be sold on a "piecemeal" basis.**
- **The the "going-concern" assumption no longer exists.**
- **Two levels of liquidation value:**
 - ***Orderly liquidation:*** assumes assets are sold over a reasonable time period (6 months to a year) to obtain the highest price.
 - ***Forced liquidation:*** assumes assets are sold as quickly as possible, perhaps on an auction basis.
- **Liquidation value also considers the costs incurred to sell the assets, such as selling fees.**
- **Typically represents the minimum value for a business.**



Book value - definition...

- **Book value is an accounting term that typically refers to one of the following:**
 - For an asset, its historical cost reduced by any allowances for depreciation.
 - For a business, the excess of total assets over total liabilities. This is the same concept as “stockholder’s equity” or “net asset value.”
- ***It is only a coincidence when book value is the same as fair market value.***



What is a valuation opinion?



- **A valuation opinion should be an independent, objective conclusion based on the facts and circumstances of each company.**
- **A valuation opinion should be based on acceptable methods, which are applied using the data available, along with the appraiser's professional judgment, to arrive at a *reasonable estimate of value*.**

The purpose of the appraisal...

- **The purpose of the appraisal can impact the selection of valuation methods used and the definition of value used.**
- **Various reasons to conduct an appraisal:**
 - **Transaction pricing (mergers, acquisitions)**
 - **Privatization/post privatization**
 - **Financing**
 - **ESOPs**
 - **Management buyouts**
 - **Joint venture investments**
 - **Bankruptcy, reorganization, restructuring**
 - **Allocation of purchase price**
 - **Litigation**

How is a valuation used in a privatization?

- **Valuations are used for the following reasons:**
 - by the foreign buyer to determine a price to offer for the company.
 - by the privatization agency to assist them in determining a reasonable selling price, or to negotiate with bidders.
 - by management of the company, if they are purchasing the company in a privatization.
 - to determine the value of assets (both tangible and intangible) contributed to a joint-venture by either the foreign partner or company being privatized.
 - analyzing restructuring alternatives.

***The objective of the appraisal...
What is being valued, and when?***

• ***Valuation date:***

- As of specific point in time
- Current versus historical date
- Differs from the “report” date
- Valuation opinion is based on information available *only* through the valuation date

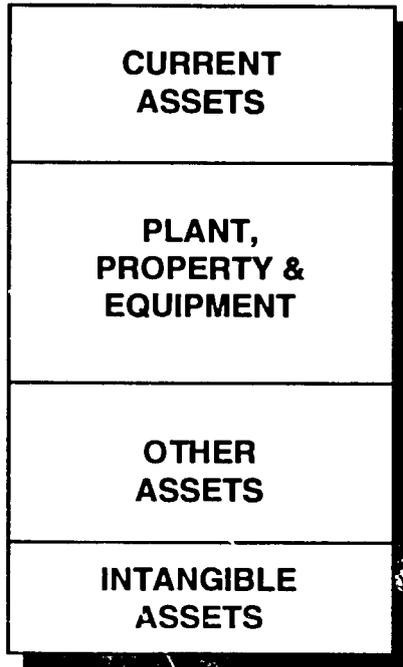
• ***What is being valued?***

- Total assets
- Specific assets
- Invested capital
- Owners’ equity
 - » at a controlling or minority level of ownership

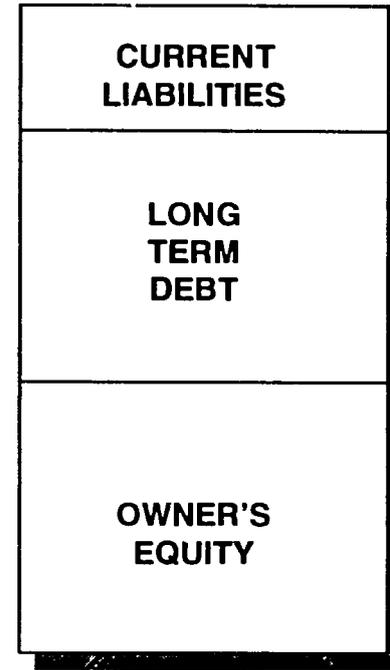
What is being valued?

THE VALUATION BALANCE SHEET

TOTAL ASSETS



INVESTED CAPITAL



EQUITY



CONTROL

MINORITY

Business valuation premises...

- **The value of a business is equal to the present worth of the future benefits of ownership:**
 - ***A rational buyer normally will invest in a company only if the present value of the expected benefits of ownership are at least equal to the purchase price.***
 - ***Conversely, a rational seller normally will not sell if the present value of those expected benefits is more than the selling price.***
- **Value is not a single number:**
 - ***A company's value depends on each potential investor's assessment of the benefits and risks relating to a company. Generally, the valuation consultant's task is to determine the most likely or reasonable value estimate.***
- **Value is based on a specific point in time -- the valuation date.**



Management's responsibility in a valuation...



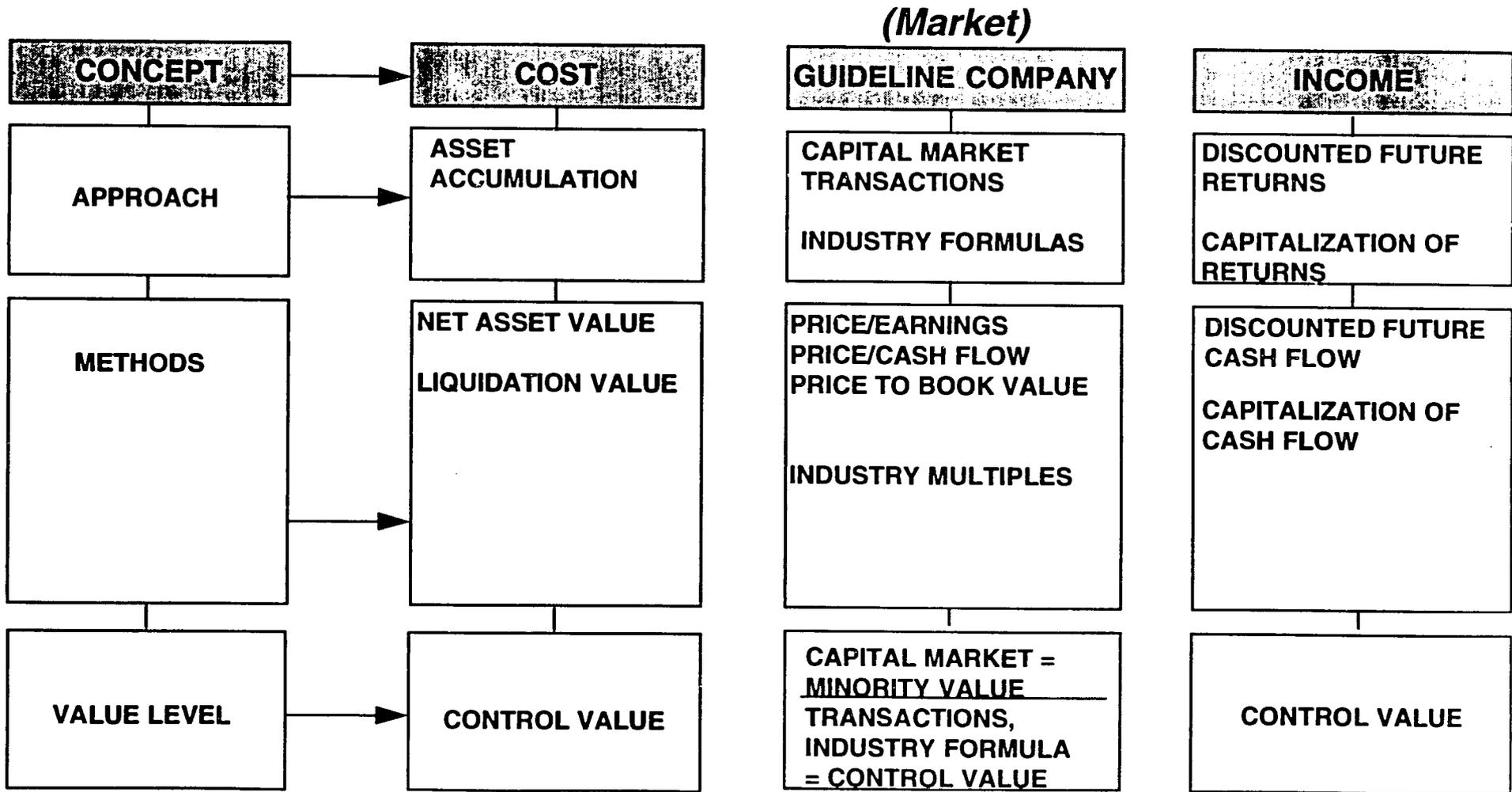
- To assist the valuation team in gathering the data.
- To provide the valuation team with an opportunity to inspect the facilities.
- Answering the valuation team's questions regarding the company and the data provided. This includes providing company experts in operations, finance, marketing, etc.
- Preparing a business plan or forecast for the company.
- Reviewing the valuation report and discussing problems or errors management feels have been made in the valuation.
- To not influence the valuation team in reaching their conclusion.

Valuation Methodologies

***Discounted Cash Flow
Guideline Company
Asset Accumulation***



Overview-Valuation Methodologies

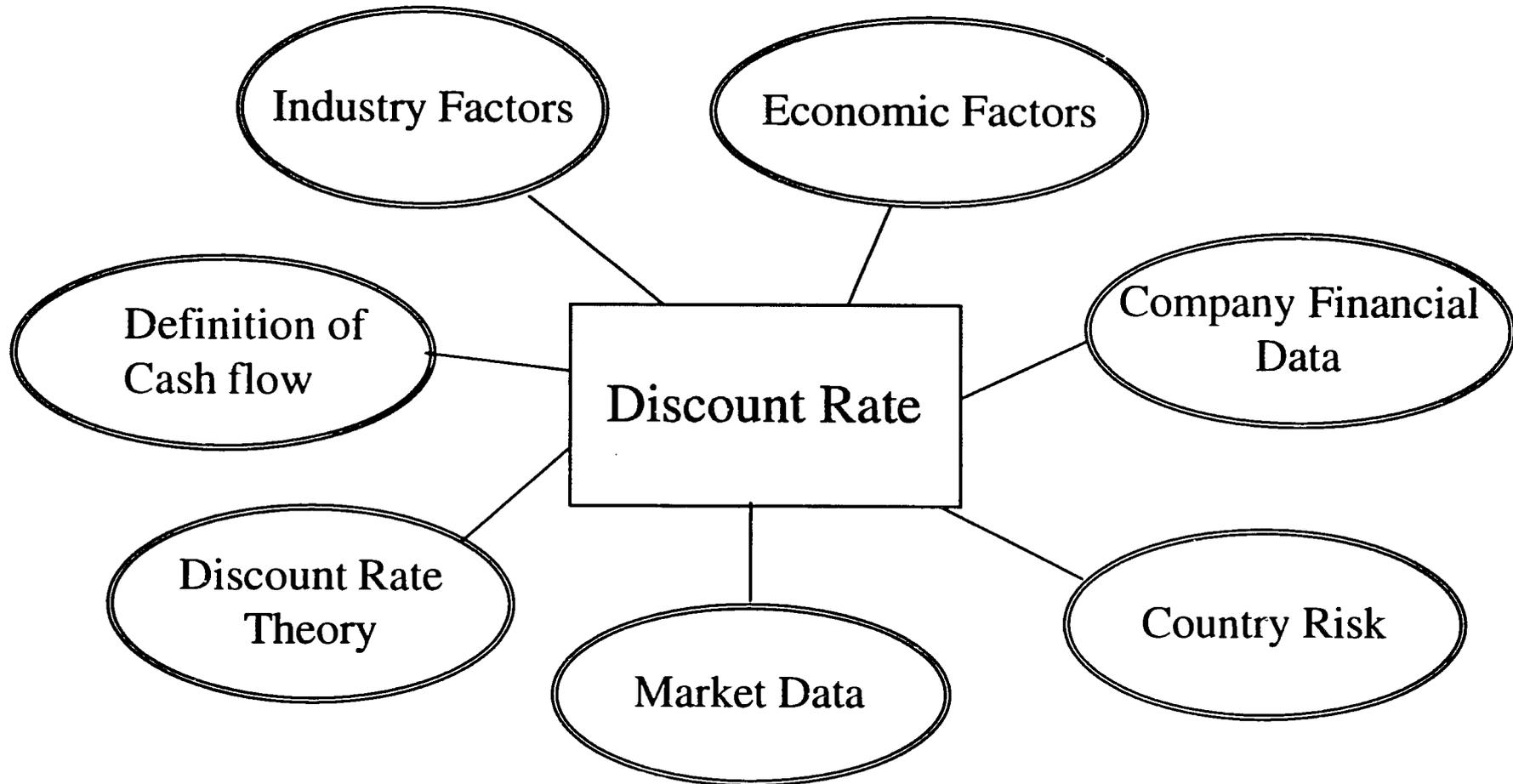


Steps to prepare the DCF Model...

- ① Select the definition of cash flow to be used.**
- ② Analyze revenues and prepare the revenue forecast.**
- ③ Analyze expenses and prepare an expense forecast.**
- ④ Analyze investments and prepare an investment forecast.**
- ⑤ Calculate cash flow for each year.**
- ⑥ Calculate the residual value.**
- ⑦ Determine the appropriate discount rate.**
- ⑧ Calculate the present value of the future cash flows and residual value and sum both values.**
- ⑨ Make any final adjustments.**
- ⑩ Perform review procedures.**

-
- The discounted cash flow method of valuation was presented in Modules I and II. In this part of the course we will focus on the factors considered and methods used to determine the discount rate used in the discounted cash flow valuation model.***
-

The discount rate can be affected by 6 factors...

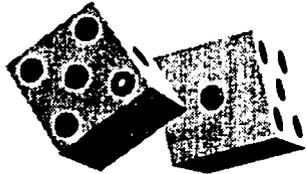


Definition...

The term “discount rate” has been defined by the American Society of Appraisers as:

a rate of return used to convert a monetary sum, payable or receivable in the future, into present value.

- Thus the discount rate is used to determine the amount an investor would pay today (present value) for the right to receive an anticipated stream of payments (e.g., cash flows) in the future.
- Generally, in the context of a business valuation, the discount rate is the rate of return that would be required by an investor to purchase the stream of expected benefits (e.g., future cash flows), *given the risk of achieving those benefits.*



Definition of risk...

- Risk is generally defined as the degree of certainty or uncertainty as to the realization of expected future returns.
- Generally, in the context of a business valuation, the discount rate is the rate of return that would be required by an investor to purchase the stream of expected benefits (e.g., future cash flows), *given the risk of achieving those benefits.*
- Thus, in terms of a discounted cash flow projection, this can be interpreted as the probability and extent to which the future projections will be realized. *In other words, the risk of achieving the projections.*

Discount rate analysis - discussion

- **The basis for the discount rate must match that of the cash flow being used, for example:**
 - **An equity cash flow would use an equity discount rate.**
 - **A debt-free cash flow would use the weighted average cost of capital (WACC) discount rate.**
 - **If the forecast is on a “real” basis (excluding inflation), then the discount rate must be calculated on a real basis.**
- **Two basic methods to estimate the equity discount rate:**
 - **The Capital Asset Pricing Model (CAPM), and**
 - **The Build-up Approach.**

Capital Asset Pricing Model

- **Formula: $R = R_f + b(R_m - R_f)$**
 - **Where:**
 - **R = the investor's required rate of return (equity)**
 - **R_f = the risk free rate**
 - **b = beta**
 - **R_m = return from the equity market**
 - **$R_m - R_f$ = the market premium**
- **In addition to these variables, there are adjustments for applying this method to closely-held companies:**
 - **small company risk**
 - **specific company risk**
 - **country risk**

***Capital Asset Pricing Model:
Discussion of the components...***

- R_f is based on the risk free rate, either nominal or real. It is typically based on the comparative yield from long-term government bonds. It represents an alternative rate of return to the investor that is risk-free and has liquidity.
- Beta is a risk measure that is based on the volatility of the price of the shares of the company compared to the volatility of the market as a whole.
 - A company whose share price is volatile has more risk for an investor since the price can fall quickly.
 - Thus, the higher the beta, the higher the risk. The share prices of a company with a beta of 1.5, on average will increase 50% faster than the market, or decline by 50% more than the market. So if the overall market fell by 10%, one would expect this company's shares to fall by 15%.
 - Betas are typically calculated for an industry to provide a measure of risk for that particular industry.

Capital Asset Pricing Model

Discussion of the components - continued

- Beta can also be estimated by analyzing the economic, industry and financial risk factors of the company.
- R_m , the return from the equity market, is based on historical returns from the shares over a long period.
- $R_m - R_f$ (the market premium) is thus the amount by which the historical equity returns from the market have exceeded the risk free rate in that market.
- Adjustments to the CAPM:
 - Small company premium: the data used in calculating the market returns and beta are based on large, publicly-traded companies. Normally, we are valuing small companies. Studies have shown there is a small company premium. (Investors have priced shares of small companies to provide a higher return than the larger companies).

Capital Asset Pricing Model

Discussion of the components - continued

- **Adjustments to the CAPM (continued):**
 - **Specific company premium**: in some cases the company being valued will have specific risks associated with it that will justify an additional risk premium.
 - **Country risk**: studies of multi-national companies have shown that they add a country risk factor to their required rate of return.
- **CAPM - equation including adjustments:**
$$R = R_f + b(R_m - R_f) + S1 + S2 + C$$

where: S1 = size premium, S2 = specific company risk and C = the country risk.

*Discounted Cash Flow:
Discount Rate Analysis*

**World wide
Risk free
rates...**



Country	10 Year Govt. Bond	Inflation:		Real Rate of Return Based on Inflation	
		1993	1994 Est.	From: 1993	1994 Est.
Australia	6.6%	2.0%	2.8%	4.6%	3.8%
Belgium	6.5%	2.7%	2.6%	3.8%	3.9%
Canada	6.4%	1.8%	2.1%	4.6%	4.3%
France	5.6%	2.1%	1.9%	3.5%	3.7%
Germany	5.6%	4.1%	2.9%	1.5%	2.7%
Holland	5.5%	2.1%	2.0%	3.4%	3.5%
Italy	8.5%	4.2%	3.6%	4.3%	4.9%
Japan	3.8%	1.1%	0.7%	2.7%	3.1%
Spain	7.9%	4.5%	3.3%	3.4%	4.6%
Sweden	6.7%	4.7%	2.8%	2.0%	3.9%
Switzerland	4.1%	3.4%	2.3%	0.7%	1.8%
UK	6.4%	1.6%	3.2%	4.8%	3.2%
USA	5.7%	3.0%	3.1%	2.7%	2.6%
Average	6.1%	2.9%	2.6%	3.2%	3.5%
Median	6.4%	2.7%	2.8%	3.4%	3.7%
Europe only	6.3%	3.3%	2.7%	3.0%	3.6%

Source: The Economist

*Analysis of betas
Selected industries*

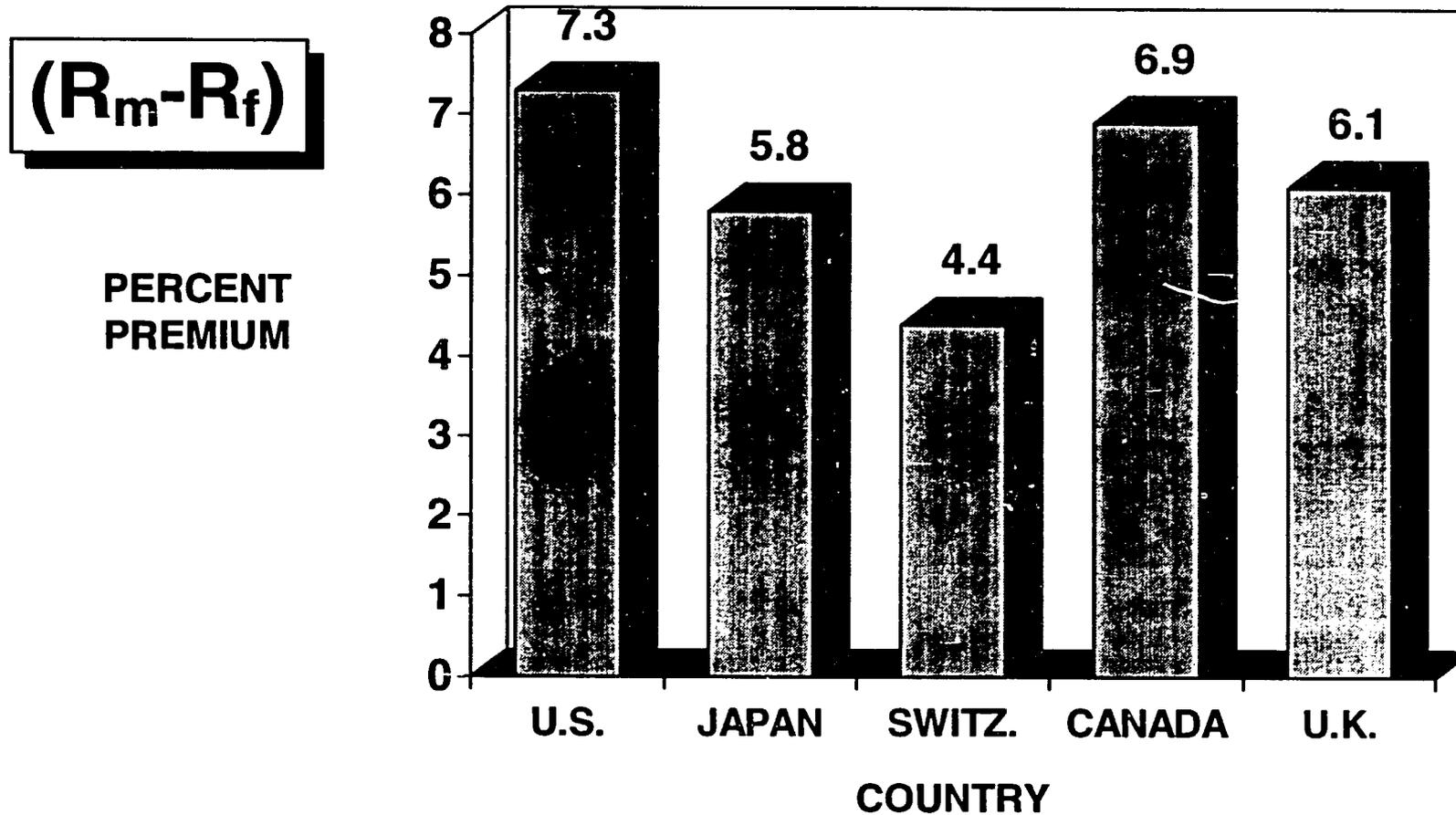
	GENERAL BUILDING CONTRACTORS	ELECTRIC UTILITIES
NUMBER OF COMPANIES	210	156
AVERAGE BETA	1.88	0.75
PERCENT OVER 1.00	85.0%	29.0%
US	1.44	0.51
UK	2.00	NA
EUROPE (EXCLUDING UK)	2.12	1.07
JAPAN	1.78	1.20
OTHER INDUSTRIES:	BETA	
CONCRETE (56 COMPANIES)	1.76	
TELECOMMUNICATIONS (32)	0.79	



Can beta be estimated based on company and financial analysis?

Handout

Equity Risk Premiums



SOURCE: IBBOTSON & ASSOCIATES



*Equity Risk Premiums
Europe Only*

($R_m - R_f$)

COUNTRY	MARKET PREMIUM
U.K.	5.3%
GERMANY	2.1%
ITALY	3.3%
SWITZERLAND	4.3%
FRANCE	4.8%
NETHERLANDS	3.9%
SPAIN	6.1%
AVERAGE	4.3%
AVERAGE (EXCLUDING GERMANY)	4.6%

**BASED ON THE ANNUALIZED MEAN EXCESS RETURN FROM 1988 TO 1993.
EXCESS RETURN COMPARED TO 10 YEAR GOVERNMENT BONDS.**

SOURCE:LEHMAN BROTHERS

Sample equity rate of return calculations using the CAPM...

INDUSTRY RISK	LOW	AVE.	HIGH
RISK FREE RATE	6.5%	6.5%	6.5%
BETA	0.5	0.75	2.00
MARKET PREMIUM	5.0%	5.0%	5.0%
SMALL CO. PREMIUM (1)	5.0%	5.0%	5.0%
NOMINAL COST OF EQUITY	14.0%	16.5%	19.0%
REAL COST OF EQUITY (2)	11.0%	13.5%	16.0%
PLUS: SPECIFIC CO. RISK	?	?	?
PLUS: COUNTRY RISK	?	?	?

(1) The small stock premium in the Ibbotson study was 5.1%, representing the smallest 10% of stocks on the U.S. markets.

(2) Based on a real risk free rate of 3%.

Exercise: calculation a discount rate using CAPM...

Build-up approach...

- **As with the CAPM, the Build-up approach begins with an estimate of the risk-free rate.**
- **A premium for investing in a closely-held business is added to the risk-free rate. The premium represents the amount the investor would demand to invest in the business instead of the risk-free investment.**
- **Guidelines for establishing premiums have been published in appraisal journals.**
- **Examples.**

Build-up approach - risk premium categories

SUGGESTED PREMIUMS FOR SPECIFIC COMPANY RISKS	
SPECIFIC RISK	LIKELY RANGE
Key man; management quality/depth	0-5%
Size of the company	0-5%
Financial structure	0-5%
Product/geographical diversification	0-5%
Customer diversification	0-5%
Earnings: margins and historical predictability	0-5%
Other specific risks	0-5%
<p><i>SOURCE: Business Valuation Review, December, 1992. "The Adjusted Capital Asset Pricing Model for Developing Capitalization Rates: An Extention of Previous Build-Up Methodologies Based Upon the Capital Asset Pricing Model."</i></p>	

Build-up approach - example

FACTOR	AMOUNT	COMMENT
RISK FREE RATE	6.5%	
KEY MAN RISK	2.0%	THE COMPANY IS NOT DEPENDENT ON 1 KEY MAN; HOWEVER THERE IS NO MANAGEMENT DEPTH
COMPANY SIZE	0.0%	THE COMPANY IS VERY LARGE; ENJOYS A MONOPOLY
FINANCIAL STRUCTURE	5.0%	THE COMPANY HAS A HIGH AMOUNT OF DEBT; TWICE THE INDUSTRY AVERAGE.
PRODUCT/GEOGRAPHICAL DIVERSIFICATION	2.0%	THE COMPANY RELIES ON ONE PRODUCT FOR ALL SALES; HOWEVER, IT SELLS ON BOTH THE DOMESTIC AND EXPORT MARKETS.
CUSTOMER DIVERSIFICATION	4.0%	80% OF SALES LAST YEAR WERE TO ONLY 5 CUSTOMERS, WITH THE LARGEST ACCOUNTING FOR 35%.
EARNINGS: MARGINS AND PREDICTABILITY	3.0%	LACK OF A HISTORY BEYOND 2 YEARS OLD MAKES PREDICTABILITY DIFFICULT.
OTHER RISKS	0.0%	NO OTHER SPECIFIC COMPANY RISKS.
ESTIMATED EQUITY DISCOUNT RATE (BEFORE COUNTRY RISK).	22.5%	

Country risk adjustment...

- **If the buyer is from a foreign country, then he faces additional risks, including:**
 - **foreign currency risk**
 - **loss of assets through expropriation/nationalization**
 - **restrictions on flows of capital**
 - **price controls**
 - **and many other factors**
- **The foreign buyer will account for this increased risk by adjusting either:**
 - **cash flow (reduce amount)**
 - **the payback period (shorten)**
 - **the discount rate (increase)**
- **Studies of multi-national companies have provided details regarding the amount of country risk.**
- **Does a local buyer have country risk?**

Country risk adjustment - steps

- 1. Determine the country risk factors.**
 - publications have provided guidelines concerning the important country risk factors.**
- 2. Quantify the country risk factors.**
 - analyze the factors and assign values to arrive at an overall country risk rating.**
- 3. Incorporate the country risk into the discount rate.**
 - studies have provided guidelines as to how much to increase the discount rate based on the riskiness of the country.**
- 4. See discount rate handout.**

Country risk exercise

Handout: discount rate discussion



Guideline Company

**** Capital Market Approach***

**** Transaction Approach***

Industry Pricing Approach



Overview of the three approaches...

- ***GUIDELINE COMPANY - CAPITAL MARKET APPROACH:*** based on prices paid for shares of similar companies on the world stock markets.
- ***GUIDELINE COMPANY - TRANSACTION APPROACH:*** based on prices paid for acquisitions of controlling interests in similar companies.
- ***INDUSTRY PRICING APPROACH:*** based on special formulas or pricing guidelines used in certain industries, based on observations of sales of companies in those industries.

- **Theory**
 - **Data required**
 - **Sources of data**
- **Selection of “guideline” or comparable companies**
 - **Financial analysis and comparison**
 - **Selection and calculation of valuation multiples**
 - **Application to the company being valued**
 - **Result - what value level does the answer represent?**
 - **Final adjustments to consider**

- **Theory:** This approach is based on the market prices of shares of similar companies; an investor, under the principle of substitution (or alternative investment), can invest in these companies, or the company being valued. The publicly-traded companies, therefore, with proper adjustments, should provide a guideline for determining the price of a private company.
- **Data Required:** To apply this method, detailed financial and market pricing information for a comparable group of companies is required.
- **Sources of Data:** Lotus One Source and Disclosure World Scope are examples of computer databases that are available on a subscription basis.

- **Theory**
- **Data required**
- **Sources of data**
- **Selection of “guideline” or comparable companies**
- **Financial analysis and comparison**
- **Selection and calculation of valuation multiples**
- **Application to the company being valued**
- **Result - what value level does the answer represent?**
- **Final adjustments to consider**

- **Selection of Guideline Companies:**
 - Identification
 - Similar industry
 - Similar products
 - Diversification of products/industries
 - Maturity of operations, for example the stage of development
 - Geographic considerations
 - Size considerations
 - Operating strategies
 - Financial characteristics (for example, profitability, growth, etc.)
 - What is an appropriate sample size?



- **Theory**
- **Data required**
- **Sources of data**
- **Selection of “guideline” or comparable companies**
- **Financial analysis and comparison**
- **Selection and calculation of valuation multiples**
- **Application to the company being valued**
- **Result - what value level does the answer represent?**
- **Final adjustments to consider**

- **Financial Analysis and Comparison**
 - is just as important in applying the Capital Market method as in the Discounted Cash Flow method.
 - provides information regarding the riskiness of the business, which in turn helps determine the appropriate value of the valuation multiple.
 - consists of financial analysis focusing on:
 - » leverage ratios (capital structure)
 - » working capital ratios (liquidity)
 - » common size balance sheet comparison
 - » common size income statement comparison
 - » operating ratios (return on assets, return on equity, etc.)
 - » growth expectations
- The financial analysis and comparison must be made giving consideration to the differences in accounting and business practices in Central & Eastern Europe compared to other countries.

- **Theory**
- **Data required**
- **Sources of data**
- **Selection of “guideline” or comparable companies**
- **Financial Analysis and comparison**
- **Selection and calculation of valuation multiples**
- **Application to the company being valued**
- **Result - what value level does the answer represent?**
- **Final adjustments to consider**

- **Selection and calculation of the valuation multiples:**
 - price-to-earnings (P/E) ratio: one of the most common valuation ratios; results in the value of the equity.
 - price-to-cash flow (P/CF) ratio: results in the value of the equity based on the available cash flow (typically measured as net income plus depreciation)
 - price of the invested capital (equity plus interest bearing debt) to earnings before depreciation, interest and tax. (IC/EBDIT). Results in the value of the invested capital. To arrive at equity value, interest bearing debt must be subtracted).
 - the price-to-earnings and price-to-cash flow ratios can be based on pretax levels.
 - price-to-book value: provides the value of the equity, but is based on net asset value rather than earnings or cash flow.
 - *a country risk adjustment to the multiple is usually applied.*
- Discussion of the advantages & disadvantages and application of the common valuation multiples.

Handout: Valuation Multiples

Sample valuation multiple calculations...

Income Statement		
Sales	45,000	
Expenses	<u>35,000</u>	
Operating profit	10,000	
Depreciation	<u>5,600</u>	
Earnings before interest and tax (EBIT)	4,400	
Interest	<u>400</u>	
Earnings before tax	4,000	→ 9.0
Tax	<u>1,600</u>	
Net Earnings	2,400	→ 15.0
Cash flow:		
Net earnings plus depreciation	8,000	→ 4.5
Pretax cash flow:		
Earnings before tax plus depreciation	9,600	→ 3.8

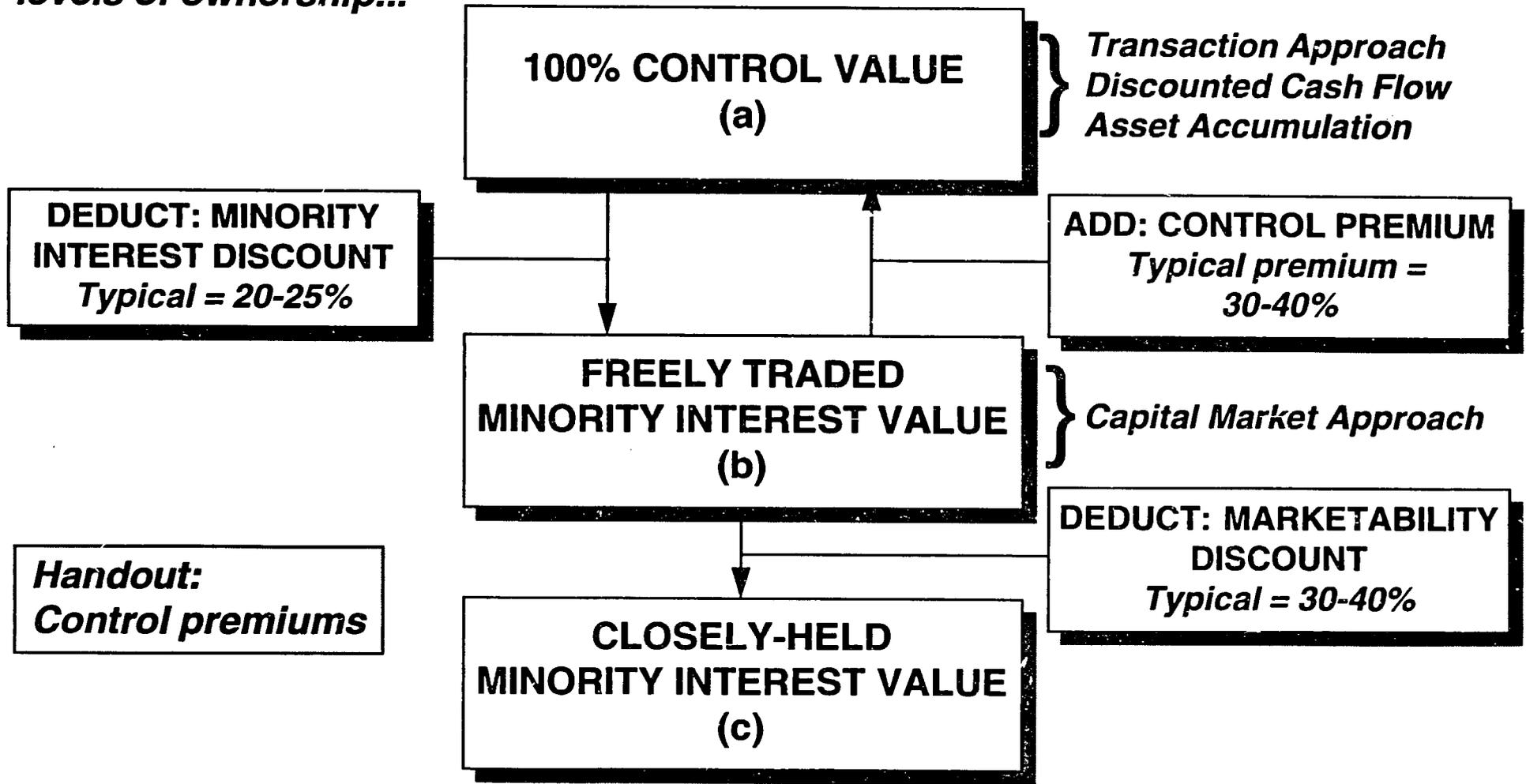
Value of Equity = 36,000

Valuation Multiple =

- **Theory**
- **Data required**
- **Sources of data**
- **Selection of “guideline” or comparable companies**
- **Financial analysis and comparison**
- **Selection and calculation of valuation multiples**
- **Application to the company being valued**
- **Result - what value level does the answer represent?**
- **Final adjustments to consider**

- **Valuation of the Subject Company:** - the selected multiples should be applied to the appropriate financial data of the subject company, on a basis consistent with the way the multiple for the public companies was calculated.
 - for example:
 - » a price-to-pretax earnings ratio should not be applied to the after tax earnings of the company being valued.
 - » in some cases, price-to-earnings ratios are calculated based on an average of several years earnings; the ratio should be applied to the same period of average earnings for the company being valued.
- **Result:**
 - The value reached using the capital market method represents the value of a minority ownership in the business;
 - It also represents a value that is freely marketable
 - Thus a control premium and marketability discount must be applied to arrive at a value for a controlling interest in a private company.

Relationship between minority & control levels of ownership...



- **Theory**
- **Data required**
- **Sources of data**
- **Selection of “guideline” or comparable companies**
- **Financial Analysis and comparison**
- **Selection and calculation of valuation multiples**
- **Application to the company being valued**
- **Result - what value level does the answer represent?**
- **Final adjustments to consider**

- **Final Adjustments:**

- the value of non-operating, or excess assets must be added to the value of the business operations as determined by the cash flow method.
 - » examples include:
 - real estate not in use, or idle facilities
 - social assets (assuming adjustments have been made in the forecasts for costs, if required; and assuming they can be sold).
- any excess working capital should be added; conversely, a working capital deficit would be subtracted.
- consideration should be given to environmental liability, if any

**Price-earnings ratios
selected industries (1993)...**

Industry	P/E Ratio
Motors	27.0
Building materials	24.9
Hotels & leisure	20.3
Electronics	19.4
Brewers & distillers	15.3
Electricity	9.4

•DATA IS FROM THE LONDON STOCK EXCHANGE

Source: London Business School, Risk Management Services

Pricing data from various world markets...

EMERGING MARKETS		MAJOR WORLD MARKETS			EFFECT OF EXPECTED GROWTH		
COUNTRY	P/E RATIOS	COUNTRY	P/E RATIOS	P/CF RATIOS	COUNTRY	P/CF RATIOS	GROWTH (1) 94-96
TAIWAN	24.0	JAPAN	64.6	9.8	FINLAND	13.3	53.3%
INDIA	19.0	ITALY	37.0	4.8	SWEDEN	14.9	29.2%
MALAYSIA	18.0	AUSTRIA	32.1	5.8	JAPAN	9.8	20.5%
INDONESIA	18.0	GERMANY	25.0	5.4	NORWAY	6.5	17.1%
ISRAEL	18.0	FRANCE	23.2	7.6	AUSTRIA	5.8	14.9%
PERU	17.0	US	19.1	8.7	FRANCE	7.6	12.7%
KOREA	16.0	UK	19.0	9.6	BELGIUM	6.6	12.6%
CHILE	15.9	BELGIUM	18.6	6.6	NETHERLANDS	6.5	11.0%
PORTUGAL	15.0	SWITZERLAND	16.4	8.4	SWITZERLAND	8.4	10.7%
THAILAND	15.0	NETHERLANDS	14.9	6.5	DENMARK	9.3	10.7%
SRI LANKA	13.9	SPAIN	13.7	4.9	GERMANY	5.4	10.6%
VENEZUELA	13.3	NORWAY	NA	6.5	UK	9.6	10.3%
BRAZIL	13.0	SWEDEN	NA	14.9	SPAIN	4.9	10.0%
HONG KONG	12.6	FINLAND	NA	13.3	ITALY	4.8	10.0%
PHILIPPINES	12.3	DENMARK	NA	9.3	US	8.7	7.1%
ARGENTINA	12.0						
COLOMBIA	11.0	AVERAGE	25.8	8.1	AVERAGE	8.1	
MEXICO	11.0	MEDIAN	19.1	7.6	MEDIAN	7.6	
PAKISTAN	10.0	AVERAGE					
TURKEY	9.5	(EXCL. JAPAN)	21.9	6.8			(1) FORECASTED GROWTH IN EARNINGS AND DIVIDENDS.
GREECE	9.4						R SQUARE OF ABOUT 50%
AVERAGE	14.5						
MEDIAN	13.9						

Exercise: Valuation using the capital market method

- **Theory:** Based on an analysis of the prices paid for acquisitions of controlling interests in similar companies.
- **Sources of data:** Mergerstat Review, Acquisitions Monthly
- **Selection of comparable companies:** Same as the capital market method; based on similar industry, products, etc.
- **Financial analysis and comparison:** As with the capital market method, the financial analysis should help in determining the appropriate figure for the valuation multiple.
- **Selection and calculation of valuation multiples:** Typically, due to the lack of data, this approach is limited to price/earnings and price/book multiples.
- **Result:** The major difference between this and the capital market method is that the answer provided by the transaction method represents a control level of value, not a minority level.
- **Adjustments:** As with the capital market method, adjustments for non-operating assets, excess assets, working capital surplus or shortage and country risk must be considered.

Example transactions in the cement industry...

SELLING COMPANY	COUNTRY	YEAR	% ACQUIRED	PRICE TO EARNINGS RATIO
AUXILIAR DE LA CONSTRUCCION SA	SPAIN	1990	50.0%	11.1
MINERA, FINANCIERA Y INVERYESO	SPAIN	1990	100.0%	19.4
CH INDUSTRIALS PLC	UK	1990	65.0%	22.3
CIMENTS FRANCAIS SA	FRANCE	1991	100.0%	16.2
CIMENTS D'OBOURG SA	BELGIUM	1991	70.3%	7.9
LARFARGE-COPPEE SA	FRANCE	1991	40.0%	14.4
ORIGNY SA, GROUP	FRANCE	1991	5.0%	9.2
CEMENTIR SPA	FRANCE	1991	10.4%	10.8
CIVIL AND MARINE LTD	ITALY	1992	51.8%	40.3
CEMENTOS DEL MAR SA	UK	1992	100.0%	10.0
AUXILIAR DE LA CONSTRUCCION SA	SPAIN	1992	50.0%	9.4
VALENCIANA DE CEMENTOS PORTLAND SA	SPAIN	1992	92.0%	7.0
NOROESTE SA, CORP.	SPAIN	1992	100.0%	15.8
CALIFORNIA PORTLAND CEMENT CO.	SPAIN	1992	100.0%	25.3
	US	1990	19.0%	28.2
AVERAGE				15.7
MEDIAN				14.4

Selected examples...

- **Advertising agencies - 75% of annual revenues.**
- **Accounting firms - 90% to 150% of annual billings.**
- **New car seller - 50% of annual adjusted earnings, plus inventory, fixtures and equipment.**
- **Auto rental - number of cars times \$1,000**
- **Bakeries - 15% of annual sales plus fixtures, equipment and inventory.**
- **Beer taverns - 1-1.5 times annual adjusted earnings, plus inventory**
- **Coffee shop - 4 times monthly gross sales, plus inventory**
- **Drug store - 75% of annual adjusted earnings, plus fixtures, equipment and inventory**
- **Movie theater - 4 times annual adjusted earnings (<1000 seats)**
- **Pizza shop - 4 times monthly gross sales, plus inventory**
- **Taxi - 80% of annual adjusted earnings**

Source: Handbook of Business Valuation



Asset Accumulation Approach



Steps

- ① Begin with historical balance sheet**
- ② Restate based on accounting adjustments**
- ③ Restate financial assets to net realizable value**
- ④ Appraise tangible property at fair market value**
 - real estate and improvements**
 - machinery and equipment**
- ⑤ Identify and value intangible assets**
- ⑥ Restate liabilities to current value; (and add any unrecorded liabilities)**
- ⑦ Equity value = FMV of total assets less current value of all liabilities**

- ***Accounts Receivable*** - usually are valued by examining an aging schedule, with an amount over a certain number of days past due written off partly or entirely.
- ***Inventory*** - obsolete inventory is written down. Inventory is usually valued at cost. However, in some cases, value is based on expected selling price, less costs to sell, less a profit portion for the seller.
- ***Investments*** - can include stocks, bonds, real estate, etc. Value is based on market; however, in some cases this may require a valuation of the shares of private companies in which the company owns an interest.
- ***Prepaid expenses*** - are generally valued at face value if the associated benefit still exists.
- ***Loans receivable*** - typically valued by discounting future principal and interest payments to their present value, based on a discount rate reflecting the risk of collecting the future payments.

- **Valuation of real estate and improvements**
 - based on cost, market and income approaches
 - considers highest and best use of the property
 - should be performed by a qualified real estate appraiser
- **Valuation of machinery and equipment**
 - based primarily on cost and market approaches
 - in addition to depreciation due to the age of the assets, consideration should also be given to the functional, technical and economic obsolescence that may exist in the business
 - should be performed by a qualified equipment appraiser
- **Assistance provided the business valuation expert by the asset appraisers:**
 - identification of excess capacity, non-operating assets, requirements for capital expenditures -- this data is important for the other business valuation approaches

- **Market approach**: the value is based on a selection of comparable properties that have sold in the area; a price per square meter or hectare is developed from this data to apply to the subject property.
- **Cost approach**: the value is based on the estimated construction costs (based on current costs, or trending historical costs) required to duplicate the buildings and improvements. Depreciation is then applied to reflect the age and utility of the buildings and improvements. The value of the land is then added to determine the total value of the property.
- **Income approach**: based on the expected future revenues, expenses and income that would result from leasing the property to a third party. The conclusion under this approach includes the value of the buildings, improvements and land.

- **Typically valued using the replacement cost approach**
- **Replacement costs new are estimated by trending historical costs, estimating capacity replacement costs, or using secondary market prices**
- **Adjustments are then made for the following:**
 - **physical obsolescence**
 - **functional obsolescence**
 - **technical obsolescence**
 - **economic obsolescence**
- **This is a “value in use” concept, not a market value of all the equipment as if it were sold on an individual basis.**
- **Difference between “replacement cost” and “reproduction cost”**

PHYSICAL OBSOLESCENCE

Physical deterioration is a loss in value of the property brought about by wear and tear, disintegration, use in service and all physical factors that reduce the life and serviceability of the property.

FUNCTIONAL OBSOLESCENCE

Functional obsolescence is a loss in value of the property caused by the inability of the property to adequately perform the function for which it was intended. Functional obsolescence is thus internal to the property and is related to such factors as design or production inefficiencies, excess operating costs, etc.

TECHNOLOGICAL OBSOLESCENCE

Technological obsolescence (a form of functional obsolescence) is a loss in value due to changes in technology which cause the asset to be less productive, more costly to operate, etc.

ECONOMIC OBSOLESCENCE

Economic obsolescence is a loss in value of the asset caused by external forces such as changes in the economics of the operation, reduced demand for the product, increased competition, etc.

Concept of goodwill...

- **Goodwill is created when a company has strong, stable earnings, with an above average return on assets (or equity), so that the value of the business (based on expected earnings or cash flow) exceeds the underlying net asset value.**
 - **Thus goodwill is the amount by which the value of the business exceeds the value of the underlying, tangible assets.**
- **Goodwill value includes: excess earnings, intangible assets and going concern value.**
- **Going concern value is the value of the systems, procedures and trained workforce that brings together the assets in place and creates an operating business. Without a going concern, you would just have a collection of assets not producing a product for a profit.**
- ***A company with no goodwill can still have going concern value.***

***The intangible assets of a company are represented by
a variety of asset types, depending on the type of business...***

**Contracts
Proposals
Favorable leases
Noncompete agreements
Trademarks
Technical libraries
Copyright
Management know-how
Engineering drawings/plans**

**Patents
Going-concern value
Trained workforce
Customer lists
Tradenames
Computer software
Formulas
Access to markets**

As with the valuation of a business, the valuation approaches for intangible assets can be categorized into the cost, income and market approaches...

- ***Cost approach***
 - **cost to reproduce the asset**
- ***Income approach***
 - **projected incremental cash flow**
 - **projected incremental cost savings**
- ***Market approach***
 - **comparable sales transactions**
 - **comparable royalty rates**

Example

Example

-
- **The remaining life of the intangible asset is a key factor in determining its value:**
 - **contractual life**
 - **economic life**

The excess earnings method...

- **The Excess Earnings Method provides a method to estimate the value of goodwill and the underlying intangible assets.**
 - **It is based on the premise that “excess earnings” in a company are due to intangible assets that exist in the company that cause it to earn a rate of return on its assets (or equity) that exceeds the average rate of return on assets (or equity) in the industry.**
-

- **Steps:**

- ① **Revalue tangible assets**
- ② **Calculate normalized earnings**
- ③ **Determine the industry average return on assets (or equity)**
- ④ **Calculate the expected earnings based on the industry average return on assets (or equity); step 3 times step 1**
- ⑤ **Calculate the excess earnings (if any): step 2 minus step 4**
- ⑥ **Value the excess earnings using appropriate capitalization rate**
- ⑦ **Add the value of the goodwill to the net asset value of the company.**

Asset Accumulation Approach
The Excess Earnings Method - Example

SELECTED DATA

1. Balance Sheet Data:

Current assets	2,440
Property	320
Equipment	400
Total Assets	3,160
Total liabilities	1,440
Equity	1,720
Total Liab. & Equity	3,160
Value of tangible assets:	
Property	420
Equipment	320

2. Normalized Earnings:

500

3. Industry Average Return on Equity:

11.0%

4. Capitalization Rate: 35%

Asset Accumulation Approach

The Excess Earnings Method - Example

<u>Revalued Balance Sheet :</u>	
Current assets	2,440
Property	420
Equipment	<u>320</u>
Total Assets	3,180
Total liabilities	1,440
Equity	<u>1,740</u>
Total Liab. & Equity	3,180

<u>Value of Excess Earnings:</u>
$308.6 / 35\% = 882$

<u>Final Revalued Balance Sheet :</u>	
Current assets	2,440
Property	420
Equipment	320
Intangibles	<u>882</u>
Total Assets	4,062
Total liabilities	1,440
Equity	<u>2,622</u>
Total Liab. & Equity	4,062

<u>Expected Earnings:</u>
$1,740 * 11\% = 191.4$

<u>Excess Earnings:</u>
$500 - 191.4 = 308.6$

*Asset Accumulation Approach
Example*

<u>ASSETS</u>	<u>31-12-93</u>	<u>ADJUSTMENTS</u>	<u>FMV BALANCE SHEET</u>
Cash	1,000		1,000
Receivables	7,500	-800	6,700
Current assets	8,500	-800	7,700
Notes receivable	5,000	-500	4,500
Land and buildings	15,000	5,000	20,000
Equipment	20,000	-2,000	18,000
Goodwill/intangibles		4,000	4,000
Total assets	48,500	5,700	54,200
<u>LIABILITIES & EQUITY</u>			
Current liabilities	6,000		6,000
Long-term debt	25,000		25,000
Total liabilities	31,000		31,000
Equity	17,500	5,700	23,200
Total liab. & equity	48,500	5,700	54,200

Exercise: asset accumulation approach...

***Reaching a Conclusion:
Selecting the Appropriate Approaches
and Reconciling Different Values***

Discounted cash flow approach

• ***Advantages:***

- the only method that incorporates future expectations regarding prices, costs, investment, etc.
- does include an aspect of market data through a market derived required rate of return (discount rate).
- provides a measure of economic obsolescence.

• ***Disadvantages:***

- difficulty in developing a forecast.
- speculative in nature.

Guideline company approach

• ***Advantages:***

- the only method based primarily on market data.
- reflects the current actions of buyers and sellers.

• ***Disadvantages:***

- difficulty in obtaining comparable company data.
- a number of adjustments are needed.
- it is historically based -- it does not take into account future expectations.

Asset accumulation approach

• ***Advantages:***

- is based on existing assets, and thus is less speculative in nature.
- it is particularly suited for certain kinds of companies.

• ***Disadvantages:***

- often fails to include value for goodwill and intangible assets.
- is static in nature, that is, it does not consider the future prospects of the business.
- does not consider the earnings levels, return on assets, etc.



- **Two basic methods:**
 - mathematical weighting
 - subjective weighting

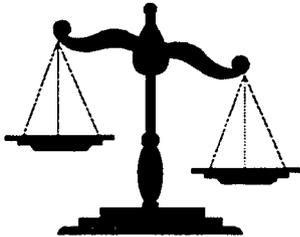
- **Mathematical weighting, example:**

<u>METHOD</u>	<u>VALUE</u>	<u>WEIGHT</u>	<u>WEIGHTED AVERAGE VALUE</u>
DCF	1,000	50%	500
GLC	800	25%	200
ASSET	900	25%	<u>225</u>
Weighted average value =			925

- *In some cases, a simple average of all the approaches is made.*

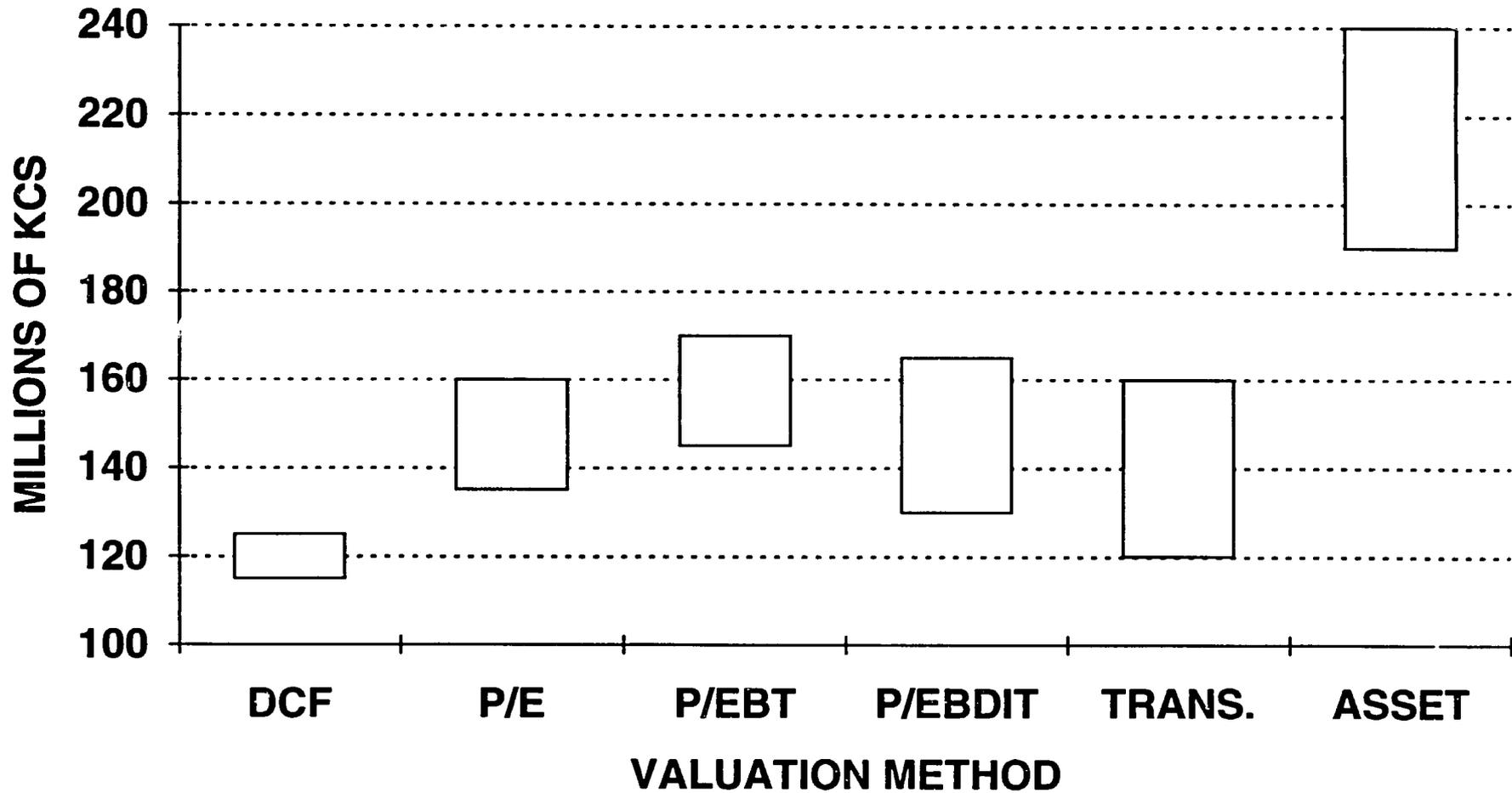


- **Subjective weighting approach**: under this approach, percentage weights are not used. The valuation conclusion is based on the factors of the valuation (advantages and disadvantages of each approach and the quality and quantity of data supporting each approach).
- The conclusion is based on the appraiser's professional experience and judgment.
- Both methods require subjectivity since the weighting approach requires the selection of a mathematical percentage for each approach.

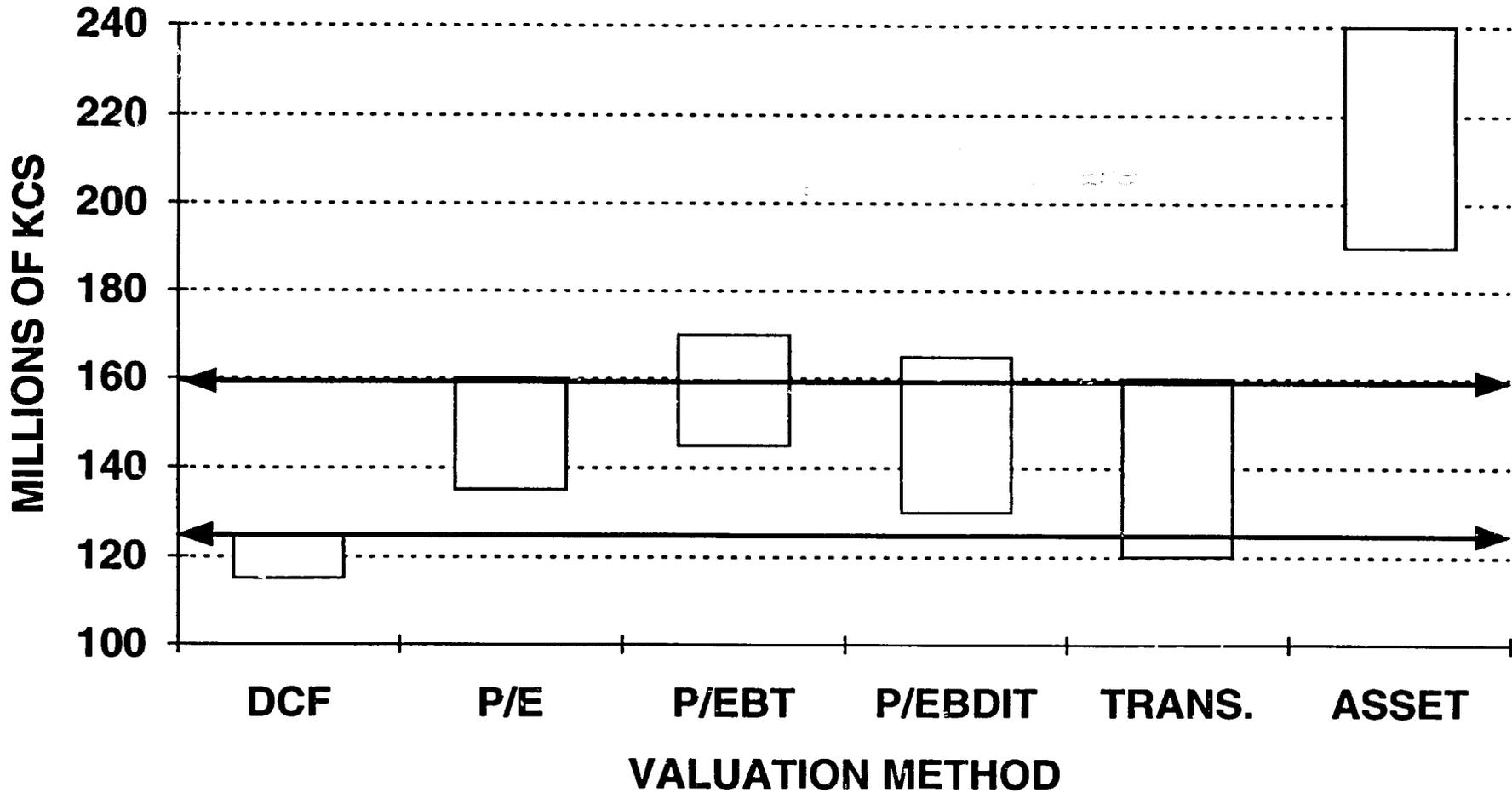


- ✓ **If the approaches based on market and cash flow are well below the asset based approach, this indicates economic obsolescence. Should the valuation conclusion under the asset approach be considered?**
- ✓ **An investor will only pay a price for those assets that will provide him with an adequate return on those assets.**
- ✓ **If the market or income approaches exceed the value based on the replacement value of the tangible assets, this indicates goodwill or intangible value in the business. Should the underlying net asset value be considered in this case?**
- ✓ **In summary, use common sense. Do not include valuation conclusions in your final estimate (whether based on an average or subjective basis) if they do not make sense!**

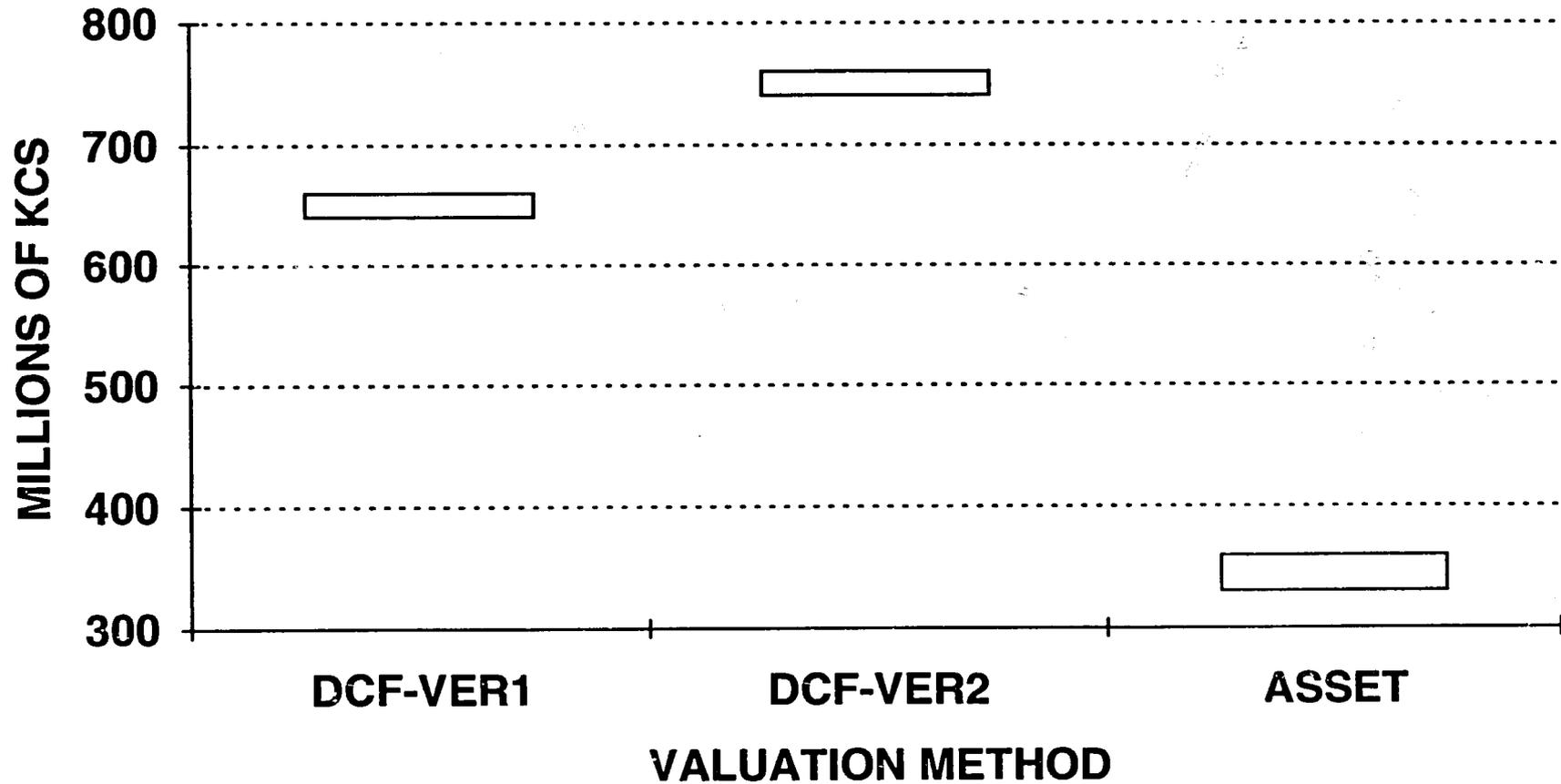
Company 1



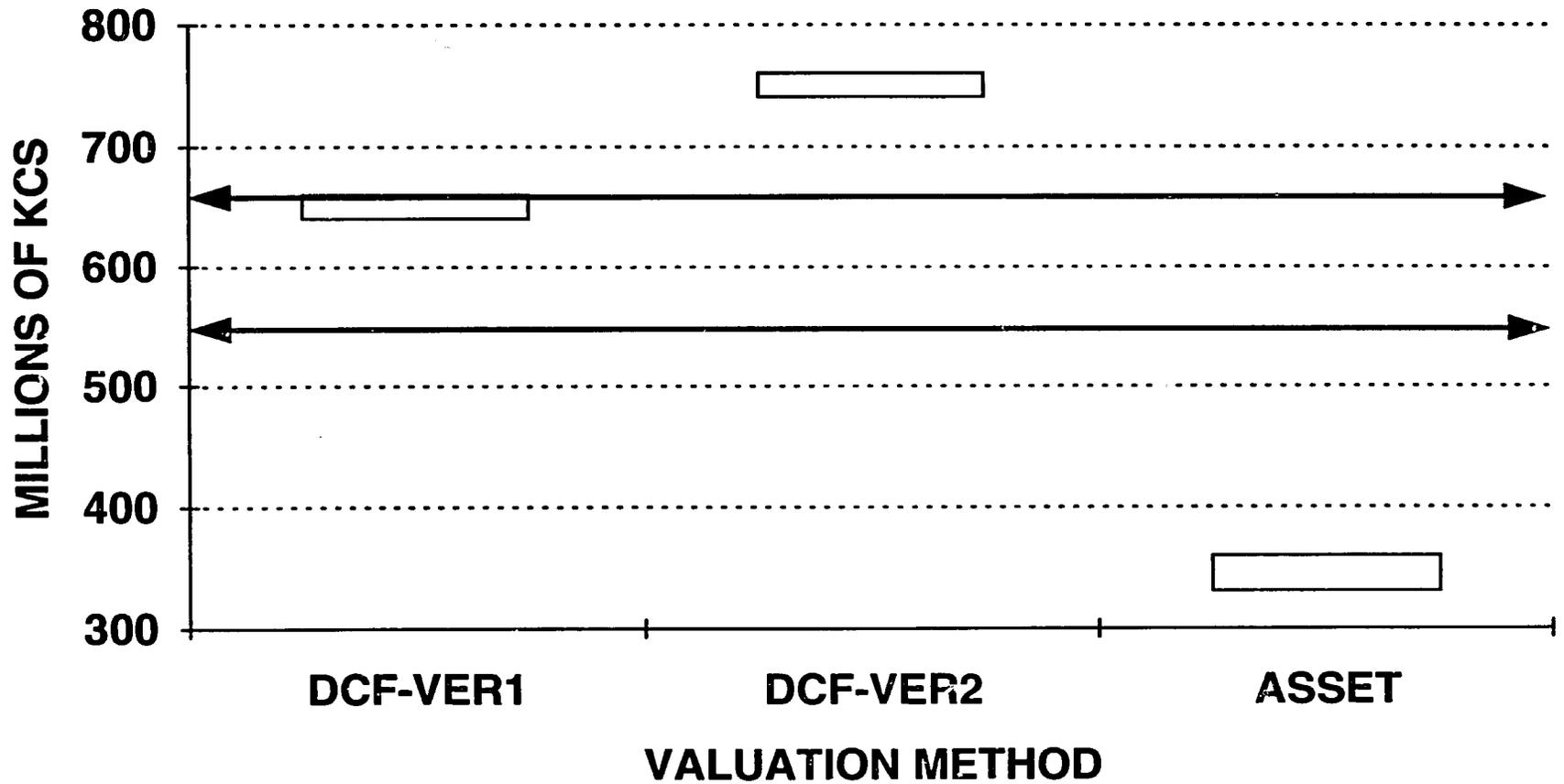
Company 1



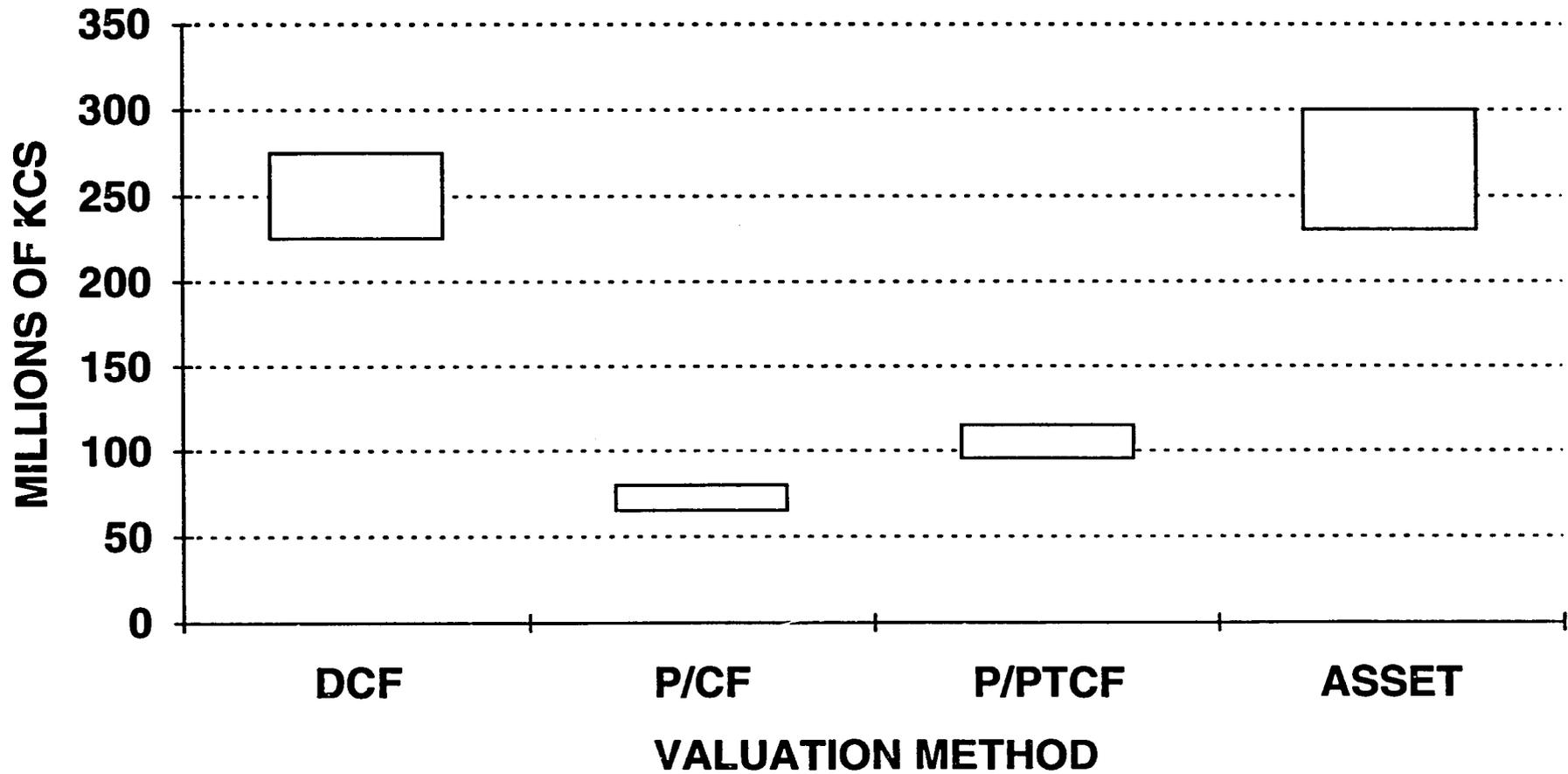
Company 2



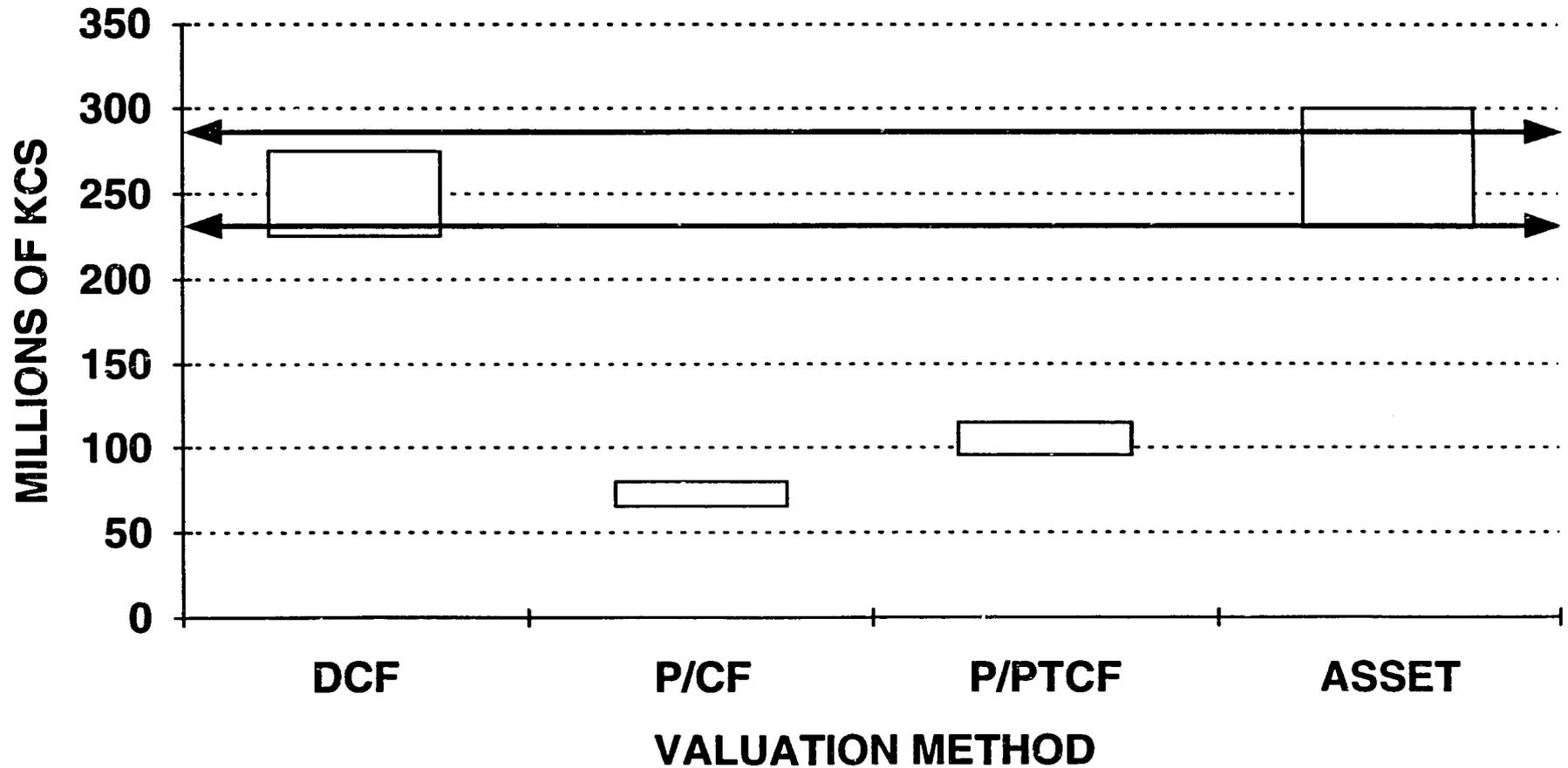
Company 2



Company 3

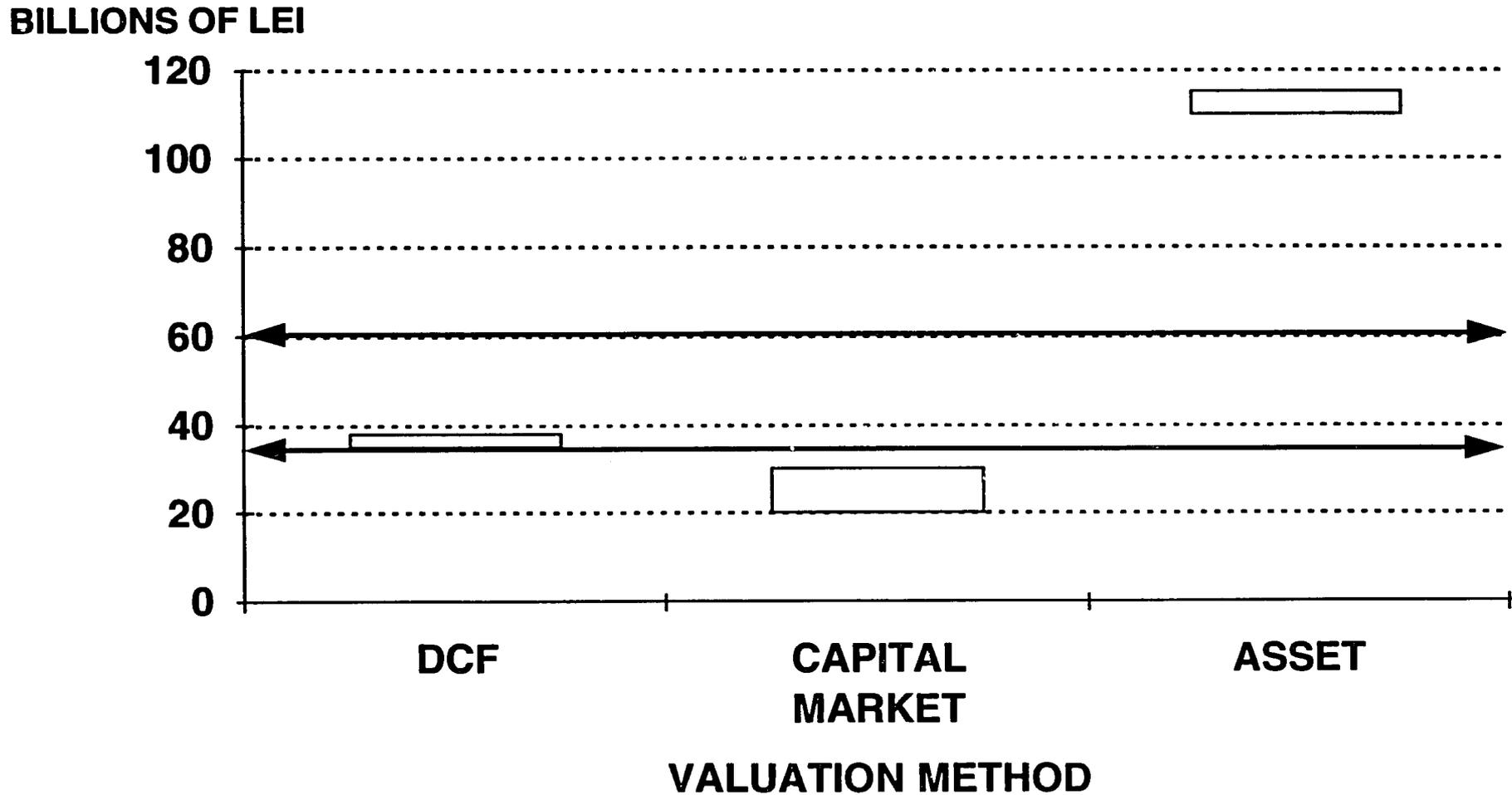


Company 3





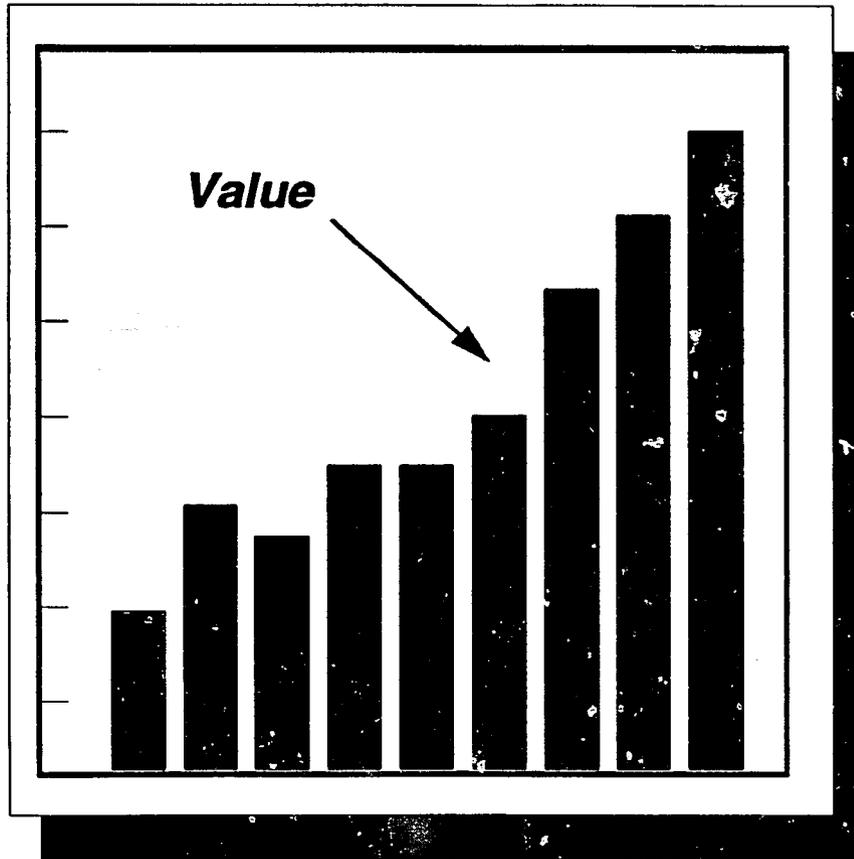
***Reaching a Conclusion:
XYZ Cement Co. Exercise***



*Estimated Rates of Return
From Investing in XYZ Company
At Various Values*

Estimated Rates of Return From Investing in XYZ CEMENT			
Category	Investor Return:		Ind. Median
	Value: Low	Value: High	
Pretax ROE	14.4%	9.9%	17.3%
Cash ROE	15.7	10.8	20.7
Net ROE	10.8	7.4	11.3

- ▷ **Availability of historical company financial and operational data.**
- ▷ **Quality of company operational and financial data.**
- ▷ **Lack of management business plans or forecasts.**
- ▷ **Drastic changes in the economies and markets in which the company operates.**
- ▷ **The impact of hyper-inflation on the valuation methods.**
- ▷ **Foreign exchange considerations.**
- ▷ **Low value based on future cash flows compared to the replacement cost value of the assets.**
- ▷ **Social assets.**



- ✓ **Improve the quality of company accounting data - through an audit or transformation.**
- ✓ **Identify non-operating or excess assets for the appraiser.**
- ✓ **Prepare a well thought out business plan for your company that includes an analysis of revenues, costs, financing and required investment.**
- ✓ **Use the discounted cash flow method to determine which business plan results in the highest value for the company.**

Module 4
Handouts and Exercises

Document	File
XYZ Company - calculating a beta analyzing specific risk factors	modbeta.xls
XXX Company - country risk profile	cntryrsk.xls
Determination of the discount rate - handout	mod4rate.doc
Summary of pricing multiples	mltple.xls
Example market multiple calculation	mktexam.xls
Analysis of control premiums, minority interest discounts and marketability discounts	mod4micp.doc
XYZ Cement - guideline company approach exercise	xyzvalsm.xls
XYZ Cement - guideline company approach exercise	xyzco.xls
Applying the asset accumulation approach and the excess earnings approach	assetexp.xls
Valuation conclusion handout	mod4cem.doc
Hungarian Drilling Company case study	kvscase.doc
Hungarian Drilling Company case study - exhibits	kvaudfin.xls
Hungarian Drilling Company case study - exhibits	kvdcfna2.xls
Hungarian Drilling Company case study - exhibits	kvglc.xls
Hungarian Drilling Company case study - model answers	drillmod.xls

XYZ COMPANY					
SPECIFIC COMPANY RISK ANALYSIS					
RISK FACTOR LEVEL					
COMPANY FINANCIAL RISK FACTORS	0.50	0.75	1.00	1.50	2.00
Liquidity		X			
Level of returns				X	
Stability of returns					X
Profitability			X		
Financial leverage	X				
Operational leverage			X		
Quality and availability of financial data					X
Expected earnings/cash flow growth				X	
Historical variability in earnings/cash flow				X	
Market share			X		
Quality/stability of management			X		
Diversification of customer base		X			
Diversification of products				X	
Geographic diversification		X			
INDUSTRY RISK FACTORS					
Regulation		X			
Competition				X	
Growth in demand				X	
Capital intensity		X			
ECONOMIC RISK FACTORS					
Inflation rate				X	
Interest rates	X				
Economic growth				X	
Exchange rates		X			
Summary Statistics					
Number of observations	2	6	4	8	2
Weight	0.50	0.75	1.00	1.50	2.00
Weighted sum	1	4.5	4	12	4
Total	25.5				
Number of factors	22				
Estimated beta	1.16				

95

XYX Company											
COUNTRY RISK PROFILE	LOW					HIGH					
TYPE OF RISK	1	2	3	4	5	6	7	8	9	10	DEFINITION OF HIGH RISK
ASSET BASED RISKS											
Expropriation/nationalization policy											Possibility of expropriated assets.
Availability of local financing											Lack or high cost of financing.
Security of patent/license agreements/contracts.											Breach of internationally accepted agreements
BUSINESS ENVIRONMENT RISKS											
Political stability											Political instability past & future.
Attitudes toward foreign investment											Poor attitude or acceptance of.
Ownership requirements											Increased requirements/difficulties.
Overall legal environment											Bureaucracy; highly regulated.
Host country participation in management											Involvement in management of company.
Extent of anti-private sector influence											Existence of increases risk.
Availability and cost of local labor											Low supply or high cost.
Relationship with neighboring countries											Threat of conflict; no trade.
Privileged environment for local competition											More favorable for local companies; subsidies.
HUNGARY FINANCIAL BASED RISKS											
Currency convertability											Non-convertable.
Currency stability											Low stability.
Restrictions on capital and trade flows											Restrictions.
Price controls											Existence of price controls.
Size of the economy/market											Smaller economies.
Trend in economy (growth, bal. of pmts, unemployment, ect.)											Low growth to recessionary.
Debt burden											High level of debt.
Taxation rates											High rates; changing tax laws.
Inflation rates											High rates.
Local need for foreign capital											Little need for foreign capital.
Number of observations	0	0	0	0	0	0	0	0	0	0	
Weighted total	0	0	0	0	0	0	0	0	0	0	
Sum	0										
Parameters	22										
Weighted average (ROUNDED)	0										

CASE STUDY
DETERMINATION OF THE DISCOUNT RATE

Introduction

This Appendix will provide a discussion of the appropriate discount rate to be used in the valuation process and how the specific discount rate was calculated for use in the discounted cash flow valuation of XYZ.

Discount Rate - Definition

The term "discount rate" has been defined by the American Society of Appraisers, in Business Valuation Standard I, as "a rate of return used to convert a monetary sum, payable or receivable in the future, into present value."

Thus the discount rate is used to determine the amount an investor would pay today (present value) for the right to receive an anticipated stream of payments (e.g., cash flows) in the future.

Generally, in the context of a business valuation, the discount rate is the rate of return that would be required by an investor to purchase the stream of expected benefits (e.g., future cash flows), given the risk of achieving those benefits.

Since risk is an important factor in determining the appropriate discount rate, the next section will provide a definition of risk in the context of a business valuation.

Definition of Risk

Risk is generally defined as the degree of certainty or uncertainty as to the realization of expected future returns. In terms of a discounted cash flow projection, this can be interpreted as the probability and extent to which the future projections will be realized. In other words, the risk of achieving the projections.

As stated in the valuation report, the discount rate selected must be based on the same definition of cash flow utilized in the valuation model. To review, these various future cash flows, and the appropriate discount rate to use are presented below:

Basis for cash flow
Debt free cash flow

Type of discount rate
Weighted average cost of capital (WACC)

Equity cash flow

Equity cost of capital

Debt free cash flow is defined as net income after tax, plus depreciation and other non-cash charges, less working capital and capital investment requirements. Thus, interest payments and increases or decreases in debt outstanding are ignored.

In arriving at equity cash flow, the only difference is that interest payments are deducted and net increases or decreases in debt outstanding are accounted for in calculating cash flow available to the equity owner.

In either case, the cash flow can be calculated on a pre- or post-tax basis, and on a real or nominal (i.e., including inflation) basis. In either case, the basis for computation of the WACC or equity cost of capital must be the same as the definition of cash flow used.

Since the definition of cash flow utilized in our valuation model is an after tax equity cash flow, we have chosen an equity discount rate to determine the present value of the future cash flows. Furthermore, since the forecast provided by management includes the effects of inflation, the equity discount rate we use is a "nominal" cost of equity, that is, it includes an inflation component in its composition.

Since the estimation of a discount rate is always one of the key components in a valuation, such an estimation takes on added significance. Furthermore, in the Central and Eastern Europe climate of business operations, this estimate becomes even more difficult due to the lack of market data and other problems associated with emerging economies. Accordingly, we will consider several accepted approaches to determining the appropriate equity discount rate to be used in the cash flow projections presented in the valuation analysis section of this report.

These two approaches are the Capital Asset Pricing Model (CAPM) and the "build-up" approach. A brief discussion of each of these methods is provided in the sections below along with the calculations of the equity cost under each approach for XYZ.

The Capital Asset Pricing Model (CAPM)

The CAPM is based on the concept that an investor will require an incremental expected return above the return available from risk free securities such as government bonds. This incremental return is the investors' reward for investing in the riskier asset.

The CAPM attempts to measure the incremental required rate of return for a particular asset based on three components: the risk free rate of return, beta, and the market risk premium.

The equation for the CAPM can be stated as follows:

$$R_e = R_f + b(R_m - R_f)$$

Where: R_e = required return on equity

R_f = the risk free rate

b = beta

R_m = the return on the market

Thus the CAPM attempts to measure the required rate of return for a particular company by measuring the difference between the return on the market as a whole (R_m) and the risk free rate (R_f), applying the beta (b) to this difference, and then adding the risk free rate (R_f).

In order to further describe the CAPM, each of the components are discussed in more detail below.

The Risk Free Rate

The risk free rate is generally based on the returns available from long-term government bonds. These returns are used since they represent a very low default risk, are liquid (freely tradable) and include the expected long-term inflation premium. A long-term period is used to provide a comparative period to the time that investments in equities are generally held by investors.

Risk Measurement - Beta

The CAPM segregates risk into two categories, systematic risk and unsystematic risk. Systematic risk is the risk associated with the movements of the security markets as a

whole, movements which are caused by changes in macroeconomic and political factors, such as interest rates, inflation, changes in government policy, etc. These factors will impact all companies to some extent, since they impact the economic and market environment in which all businesses operate.

Systematic risk is measured in the CAPM by a factor known as beta. Beta measures the volatility of the changes in share prices of a company compared to the changes in the market for all the listed companies that make up that market.

Thus a company with a beta greater than 1 will be more risky than the average company, while a beta of less than 1 indicates less price volatility and therefore, less risk than the market as a whole. For example, a company with a beta of 1.20 can expect its shares to increase 20 percent faster than the market as a whole when the market is rising. Conversely, its shares will decline 20 percent faster than the market during a decline in the market.

Unsystematic risk is associated with the particular financial and operating attributes unique to a particular business. Unsystematic risk can be divided into (a) business risk, the uncertainty for a business to achieve the expected level of return due to revenue and cost factors, competition, management ability, etc. and (b) financial risk which is concerned with the financial structure of the business, (e.g., its liquidity, amount of debt and fixed obligations).

Unsystematic risk is typically measured by adding a specific company risk premium to the equity discount rate calculated using the CAPM. This risk premium is based on the financial analysis of the business.

The Market Premium

The market premium is the additional amount of return over the risk free rate that is required to compensate the investor for the additional risk of investing in the equity of the company. It is typically measured by the amount by which historical returns in the security markets, over a long period of time, have exceeded the returns from risk free investments.

Calculation of the CAPM

The steps involved in deriving the equity cost of capital for XYZ using the CAPM are as follows:

1. Determine the risk free rate (R_f).
2. Determine an estimate of beta (b).
3. Develop an estimate of the market premium ($R_m - R_f$).
4. Calculate the equity discount rate using CAPM.
5. Add or subtract any additional incremental risk factors.

The application of the steps in the specific case of XYZ are provided in the following sections.

Step 1. - Determine the Risk Free Rate

The table below provides an indication of yields and real returns for risk free bonds in various countries as of the valuation date:

Table A-1

WORLD-WIDE RISK FREE AND REAL RATES					
Country	L.T. Govt. Bond Yields	Inflation:		Real rate:	
		Historical 1 Year	Projected 1993	Historical 1 Year	Projected 1993
Australia	6.6%	2.0%	2.8%	4.6%	3.8%
Belgium	6.5%	2.7%	2.6%	3.8%	3.9%
Canada	6.4%	1.8%	2.1%	4.6%	4.3%
France	5.6%	2.1%	1.9%	3.5%	3.7%
Germany	5.6%	4.1%	2.9%	1.5%	2.7%
Holland	5.5%	2.1%	2.0%	3.4%	3.5%
Italy	8.5%	4.2%	3.6%	4.3%	4.9%
Japan	3.8%	1.1%	0.7%	2.7%	3.1%
Spain	7.9%	4.5%	3.3%	3.4%	4.6%
Sweden	6.7%	4.7%	2.8%	2.0%	3.9%
Switzerland	4.1%	3.4%	2.3%	0.7%	1.8%
UK	6.4%	1.6%	3.2%	4.8%	3.2%
USA	5.7%	3.0%	3.1%	2.7%	2.6%
Average	6.1%	2.9%	2.6%	3.2%	3.5%
Median	6.4%	2.7%	2.8%	3.4%	3.7%
Europe only	6.3%	3.3%	2.7%	3.0%	3.6%

The first column represents the actual current government bond yields. The next two columns provide both historical and estimated inflation for each country. The final two columns represent the estimated real risk free rate (first based on last year's inflation, and then based on next year's expected inflation).

Given the typical investor would come from one of these countries, the basis for the risk free rate used in the CAPM would be the risk free rate of his own country. Since we are determining the fair market value of XYZ, without consideration of a particular buyer, we have chosen to use the concept of a "world weighted portfolio of available returns" in our selection of the risk free rate and in determining the other components that go into the development of the CAPM.

As this table shows, the average nominal risk free rate, based on a world market concept, is approximately 6.1 percent. The estimated average real risk free rate of return is 3.2 percent (based on last year's inflation) or 3.5 percent (based on the projected inflation rate for 1994). The rates for the European countries only are similar: 6.3 percent for the nominal risk free rate, with estimated real rates of 3.0 or 3.6 percent. Since we are using a nominal forecast, we will use 6.3 percent as a proxy for the nominal real risk free rate.

Step 2 - Determine an Estimate of Beta

In the CAPM, beta is the measure of systematic risk. To estimate beta, we have utilized two methods. The first method is based on an analysis of betas for specialty mining companies in various world stock markets. This information indicates a median beta of 1.21 for the specialty mining industry on a world-wide basis.

Secondly, we followed a similar method as described in "*Modern Portfolio Theory, the Capital Asset Pricing Model & Arbitrage Pricing Theory: A User's Guide*." This approach is premised on research which has concluded that an estimate of a firm's beta can be made based on an analysis of firm specific variables that are believed to affect its risk. This beta is called a "fundamental" beta. Table A-2 presented on the following page provides an analysis of the key factors that should be considered in determining the risk level of an investment. This table also provides our interpretation of the overall impact each variable has on the risk of investing in XYZ based on the economic and financial analysis presented in the report.

The estimate of the fundamental beta is based on research that indicates a high correlation between betas and the risk measures of a business. These risk measures include (a) financial risk measures which are computed from a company's financial statements and include historical trend analysis and comparative financial ratio analysis; (b) the company's industry risk factors and (c) the effect of changes in the economic environment on the company's operations. Table A-2 on the following page provides an analysis of the financial, industry and economic risk factors considered in our estimation of the fundamental beta for XYZ. A brief explanation of these factors is provided below.

The company financial risk factors are used to determine the riskiness of XYZ both on a stand alone basis, and as compared to the publicly-traded, guideline comparable companies presented in the financial and valuation analysis sections of this report. These factors measure liquidity, leverage, returns and other important risk factors.

The industry risk factors represent the key factors that effect the particular riskiness of the industry in which XYZ operates.

Finally, the economic factors provide an analysis of how a change in these macroeconomic factors will effect the operations of XYZ as compared to other companies, on average.

Based on our analysis of these factors for XYZ the fundamental beta for XYZ was estimated at 1.16.

The results of the two approaches used to calculate beta provided a range of 1.16 to 1.21. Based on this range, we selected 1.20 as an appropriate beta to be used in our development of the CAPM equity discount rate.

Table A-2

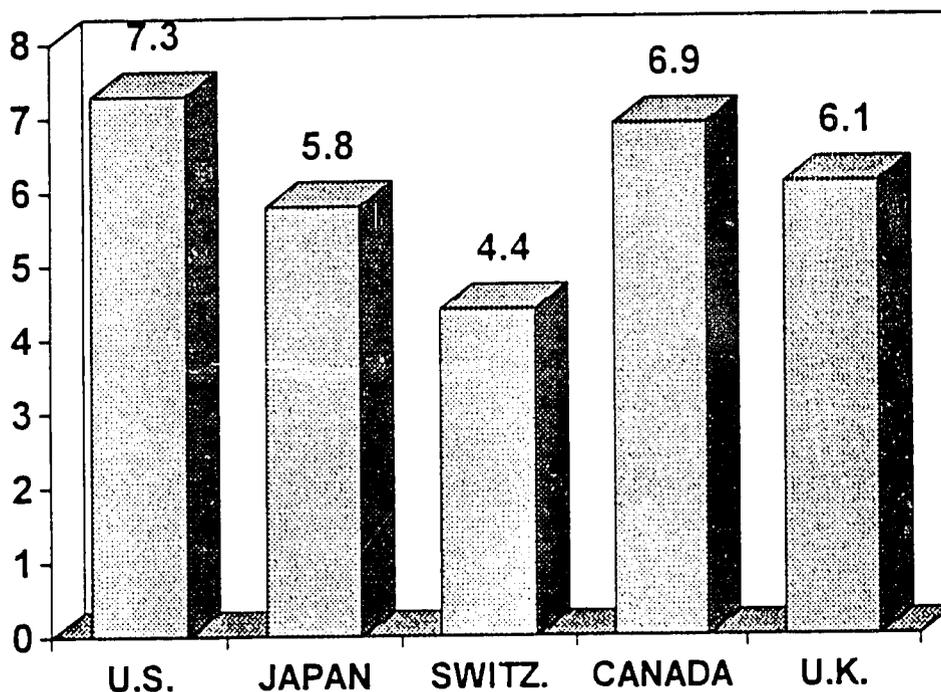
XYZ COMPANY					
SPECIFIC COMPANY RISK ANALYSIS					
	RISK FACTOR LEVEL				
COMPANY FINANCIAL RISK FACTORS	0.50	0.75	1.00	1.50	2.00
Liquidity		X			
Level of returns				X	
Stability of returns					X
Profitability			X		
Financial leverage	X				
Operational leverage			X		
Quality and availability of financial data					X
Expected earnings/cash flow growth				X	
Historical variability in earnings/cash flow				X	
Market share			X		
Quality/stability of management			X		
Diversification of customer base		X			
Diversification of products				X	
Geographic diversification		X			
INDUSTRY RISK FACTORS					
Regulation		X			
Competition				X	
Growth in demand				X	
Capital intensity		X			
ECONOMIC RISK FACTORS					
Inflation rate				X	
Interest rates	X				
Economic growth				X	
Exchange rates		X			
Number of observations	2	6	4	8	2
Weight	0.50	0.75	1.00	1.50	2.00
Weighted sum	1	4.5	4	12	4
Total	25.5				
Number of factors	22				
Estimated beta	1.16				

Step 3. - Develop an Estimate of the Market Premium

The final component of the CAPM is the market premium ($R_M - R_f$), which is defined as the amount by which the returns from equities in the publicly-traded markets have exceeded the risk free rate. There have been numerous studies performed to estimate the market premium.

The most notable of these studies is *Ibbotson and Associates'* work in measuring the market premium. The figures in the graph below provide their findings for five countries. These figures represent the amount by which equity returns have exceeded risk free returns (government bonds) over a long period (typically 20 to 50 years, depending on the study).

EQUITY RISK PREMIUMS



These figures provide the average long term expected premium for investing in equities as opposed to risk free government bonds. As can be seen from this data, with the exception of Switzerland, the range is approximately 6 to 7 percent, with an average of 6.1 percent. Based on this data, we consider 6.1 percent, the average of the countries, to be an appropriate estimate of the market risk for the CAPM calculation.

Step 4 - Calculate the Equity Discount Rate Using CAPM

As a result of the preceding inputs to the equation, the estimated equity cash flow discount rate for XYZ, prior to any incremental risk adjustments, is as follows:

$$R_e = 6.3 + 1.2*(6.1) = \text{approximately } 13.6 \text{ percent.}$$

Step 5 - Add or Subtract any Additional Incremental Risk

The final step in this process is to add or subtract risk differentials for or other factors unique to the company that has not been considered in the analysis to this point. One such factor we must consider in our analysis is the relative size of XYZ compared to the companies in the *Ibbotson* study. The risk premiums provided by *Ibbotson* are for large, publicly-traded companies. Further research and evidence has shown there is an additional premium for small companies compared to the returns from the market as a whole. While this information is limited, *Ibbotson's* research has provided the following small stock return data:

United States	5.1 percent
Japan	6.9 percent
Canada	1.5 percent

While the data is limited, it does provide evidence that investors require an additional premium for investing in smaller public companies. Based on the sales and asset size of XYZ, it falls below the lower range in size of the companies included in these studies (US\$ 80 million in capital), thus requiring the addition of a small company premium.

Based on our analysis of XYZ, it is our opinion the small company premium should be 5 percent.

We feel no other specific company risk factors are appropriate since our beta calculations took specific financial, industry and economic factors into account.

Adding the 5 percent small company premium to the 13.6 percent equity rate of return derived from the CAPM calculation, results in an estimated equity cash flow discount rate of approximately 19 percent.

The Build-up Approach

The build-up method is similar to the CAPM in that it requires a risk free security as its base rate, plus an additional return for the risk of investment in the subject security. Adjustments (up or down) are then made for company specific factors, both quantitative and qualitative in nature.

The figures below provide an insight into the relationship between rates of return and riskier investments and supports the concept of the "build-up" of these rates from low risk (risk free) to high risk investment:

<u>Type of Investment</u>	<u>Return</u>
Long term government bonds	8.31%
Industrial bonds	
AAA	8.93
A	9.75
BB	12.30
S&P 500 Stocks	17.14
Small public stocks	20.41
Venture capital	27.10

While this data was as of the end of 1990, it clearly shows the increased returns required for riskier investments, and the incremental return that exists between each category of investment.

The steps involved in calculating the equity cost of capital using this methodology are:

1. Determine the appropriate risk free rate.
2. Estimate the appropriate specific risk premium for the subject company.

Since we have already established a risk free rate of 6.3 percent in determining the discount rate using the CAPM method, we will focus our discussion on step two of the process.

To estimate the appropriate specific incremental risk premium for XYZ, we utilized a risk estimation method used by professional appraisers. This method was published in the *Business Valuation News* as a guideline to use when estimating the specific company risk premium. This data is provided in Table A-3.

Table A-3

SUGGEST PREMIUMS FOR SPECIFIC COMPANY RISKS	
SPECIFIC RISK	LIKELY RANGE
Key man; management quality/depth	0-5%
Size of the company	0-5%
Financial structure	0-5%
Product/geographical diversification	0-5%
Customer diversification	0-5%
Earnings: margins and historical predictability	0-5%
Other specific risks	0-5%
<p><i>SOURCE: Business Valuation Review, December, 1992.</i></p> <p><i>"The Adjusted Capital Asset Pricing Model for Developing Capitalization Rates: An Extension of Previous Build-Up Methodologies Based Upon the CAPM."</i></p>	

These risk premiums are intended to be added to the risk free rate to arrive at an after tax equity cash flow discount rate. Based on our analysis of XYZ, we have estimated these risk factors as follows:

1. XYZ has adequate management quality and depth. No incremental risk is added.
2. XYZ is a fairly small company by Czech standards and a small company compared to most publicly traded companies. Conclusion: 5 percentage points of incremental risk.
3. XYZ has no long-term debt and thus no incremental risk is added.
4. XYZ has good geographical diversification but little product diversification, for which we add 3 points of incremental risk.
5. XYZ has a small percentage of sales to their biggest customer (about 5 percent), with the top 10 accounting for only 25 percent. Since customer diversification is good, we have not added any incremental risk.
6. XYZ's margins are better than the average found in the industry. However, these margins are subject to being diminished in the future if cost factors increase faster than product prices, as is expected. Historical predictability of earnings and margins is limited due to the availability of only two years of data. Conclusion: 3 points of incremental risk added.
7. There are no other specific risk of major importance facing XYZ that are not already accounted for in the future cash flow projections.

Adding the 11 points of incremental risk from categories 1 through 7 to the risk free rate of 6.3 percent results in an equity cash flow discount rate of approximately 17 percent.

Build Up Rate, Summary

Using the approach suggested in professional appraisal literature to estimate specific company risk results in an estimated after tax equity discount rate per the build up approach of 17 percent

Equity Discount Rate - Summary and Conclusion

The CAPM methodology resulted in a conclusion of 19 percent, while the build up methods resulted in a figure of 17 percent. Accordingly, it is our opinion that an equity discount rate for XYZ, before giving consideration to country risk factors, would range from 17 to 19 percent.

Adjustment for Country Risk

Country risk is defined in *International Risk Management* as "either an outright loss of physical and/or financial assets resident in a country or to an unanticipated lower earnings stream from those assets or from cross-border business, caused by events (economic, financial or socio-political) in a particular country that are not under control of a private enterprise or individual."

Incorporating country risk into the determination of the discount rate is an important process. Country risk analysis is performed by multinational companies (MNCs) analyzing investments in foreign countries. A recent study that surveyed 90 MNCs found that all companies engaged in various methods to estimate investment risks in cross-border transactions.

It is also important to incorporate country risk into our analysis since the discount rate methodologies are based on returns in historically more stable political, business and economic operating environments.

Finally, since the likely investor will be foreign, risks of investment in a different country, even in stable operating environments, must be taken into account.

The steps involved in estimating country risk are as follows:

1. Determine the important factors that contribute to country risk.
2. Establish a method to quantify the country risk for the subject country.
3. Determine how to incorporate the country risk into the valuation process.

Step 1 - Determine Country Risk Factors

The first step in assessing country risk is to establish a method to determine the factors that should be incorporated into country risk analysis.

Country risk factors are typically classified into general categories such as political, operating, financial and economic risk.

Based on surveys of the executives of MNC's, a ranking of important country risk factors considered by MNCs when making an investment in a foreign country was developed. This data is presented in Table A-5 which follows.

Step 2 - Quantify the Country Risk Factors for the Czech Republic

Using the risk factors from the previous step, we have constructed a country risk analysis worksheet, presented in (Table A-6). This schedule provides rankings for country risk factors for the Czech Republic. This chart was completed by consultants in our D&T office trained in finance, accounting and economics. The consensus result was a 4.56 rating for the Czech Republic, which indicates a moderate risk level.

Step 3 - Incorporate the Country Risk into the Valuation

The next step is to determine how to incorporate the country risk into the valuation process. One popular method according to the survey of MNC's was to adjust the discount rate used in discounting cash flows. Other methods included adjusting the level of cash flows, or reducing the required payback period. We have chosen to adjust the discount rate utilized in our valuation analysis to account for the country risk of investing in the Czech Republic.

Case studies of MNC's have provided a limited amount of data regarding adjusting the discount rate. In the study cited often in this section, (*International Risk Management*) suggestions by MNCs included the following: (1) add 5 points of incremental risk for moderate risk countries, and 10 points for high risk countries; (2) add a 30 percent increase over Western European rates for newly emerging industrial countries, and an additional 20 percent for developing countries.

Based on our analysis of the country risk factors provided in step 2, the Czech Republic falls in the moderate risk category, which indicates a 5 percent risk premium.

Using the guidelines above, our country risk adjusted discount rate for XYZ would fall between 22 and 24 percent. Based on our analysis of the preceding facts and circumstances, our recommendation for the appropriate after tax equity cash flow discount rate for XYZ is a range from 22 to 24 percent.

Table A-5

	DESCRIPTION	TYPE OF FACTOR	AVERAGE RATING
1	Probability of radical change in govt. composition or policy	Political	1.2
2	Expropriation policy	Political	1.3
3	Nationalization policy	Political	1.3
4	Attitude toward foreign investment	Political	1.3
5	Local ownership requirements	Political	1.3
6	Currency convertibility	Financial	1.3
7	Restrictions on capital and trade flows	Financial	1.3
8	Host-country participation in management	Political	1.4
9	Price controls	Financial	1.4
10	Real growth of economy	Economic	1.5
11	Extent of anti-private sector influence	Political	1.7
12	Enforceability of legal contracts	Political	1.8
13	Availability and cost of local labor	Operating	1.8
14	Relationship with parent company's home country	Political	1.9
15	Quality of host government management	Political	1.9
16	Size of economy	Economic	1.9
17	Currency stability	Financial	1.9
18	Taxation rates	Financial	1.9
19	Relationship with neighboring countries	Political	2.0
20	Ability to impose unpopular economic policies	Political	2.0
21	Inflation rates	Financial	2.0
22	Availability of local financing	Financial	2.0
23	Local-content requirements	Political	2.0
24	Influence and attitude of labor unions	Political	2.0
25	Privileged environment for local competition	Political	2.0
26	Sociocultural factors	Political	2.1
27	Environment for expatriates	Political	2.1
28	External debt	Financial	2.1
29	Energy dependence	Economic	2.1
30	Bureaucratic red tape	Political	2.2
31	Balance of Payments	Economic	2.2
32	Local cost of funds	Financial	2.3
33	Per capita income	Economic	2.4
34	Reserves/imports ratio	Economic	2.5
SOURCE: INTERNATIONAL RISK MANAGEMENT			

Table A-6

CZECH REPUBLIC - XYZ COMPANY										
COUNTRY RISK PROFILE										
TYPE OF RISK	1	2	3	4	5	6	7	8	9	10
ASSET BASED RISKS										
Expropriation policy			x							
Nationalization policy			x							
Availability of local financing								x		
Security of patent/license agreements/contracts.					x					
BUSINESS ENVIRONMENT RISKS										
Political stability						x				
Attitudes toward foreign investment				x						
Ownership requirements						x				
Overall legal environment						x				
Host country participation in management		x								
Extent of anti-private sector influence		x								
Availability and cost of local labor			x							
Relationship with neighboring countries						x				
Influence and attitudes of labor unions		x								
Privileged environment for local competition					x					
CZECH FINANCIAL BASED RISKS										
Currency convertibility							x			
Currency stability					x					
Restrictions on capital and trade flows					x					
Price controls				x						
Size of the economy/market				x						
Access to EC market					x					
Trend in economy					x					
Debt burden			x							
Taxation rates							x			
Inflation rates						x				
Local need for foreign capital		x								
Number of observations	0	4	4	3	6	5	2	1	0	0
Weighted total	0	8	12	12	30	30	14	8	0	0
Sum	114									
Parameters	25									
Weighted average	4.56									

MLTIPLE.XLS

GUIDELINE COMPANY APPROACH
SUMMARY OF PRICING MULTIPLES

VALUATION MULTIPLE	CALCULATION	COMMENTS
1 PRICE TO EARNINGS (P/E)	MARKET PRICE OF COMPANY LATEST ANNUAL NET INCOME	MOST POPULAR MULTIPLE. HIGHLY INFLUENCED BY ACCOUNTING METHODS. EXPECTED EARNINGS AND GROWTH ARE KEY FACTORS. WILL PROVIDE THE BROADEST RANGE IN THE MARKET FROM LOW TO HIGH.
2 PRICE TO EARNINGS BEFORE TAX (P/EBT)	MARKET PRICE OF COMPANY EARNINGS BEFORE TAXES	CAN BE USED TO OFFSET DIFFERENT TAX POLICIES BETWEEN COUNTRIES.
3 PRICE TO CASH FLOW (P/CF)	MARKET PRICE OF COMPANY NET INCOME + DEPRECIATION & AMORTIZATION	PROVIDES A VALUE INDICATION BASED ON CASH FLOW. THE EFFECTS OF DIFFERENT DEPRECIATION POLICIES BETWEEN COMPANIES ARE REMOVED. TYPICALLY A NARROW RANGE BETWEEN LOW AND HIGH IN THE MARKET. TYPICALLY SIMILAR RANGE OF VALUE ACROSS INDUSTRIES (5-7 TIMES)
4 PRICE TO PRETAX CASH FLOW (P/PTCF)	MARKET PRICE OF COMPANY PRETAX INCOME + DEPRECIATION & AMORTIZATION	SAME AS THE P/CF MULTIPLE, BUT REMOVING THE TAX EFFECTS.
5 INVESTED CAPITAL TO EARNINGS BEFORE INTEREST & TAX (IC/EBIT)	MARKET PRICE OF COMPANY + LONG-TERM DEBT EARNINGS BEFORE INTEREST AND TAX	A MULTIPLE BASED ON REMOVING THE EFFECTS OF DEBT FINANCING. INTEREST BEARING DEBT MUST BE SUBTRACTED TO ARRIVE AT EQUITY VALUE.
6 INVESTED CAPITAL TO EARNINGS BEFORE DEPRECIATION, INTEREST & TAX (IC/EBDIT)	MARKET PRICE OF COMPANY + LONG-TERM DEBT EARNINGS BEFORE DEPRECIATION, INTEREST AND TAX	A CASH FLOW MULTIPLE THAT EQUALIZES COMPANIES IN THE AREA OF TAX AND AMOUNT OF DEBT FINANCING. INTEREST BEARING DEBT MUST BE SUBTRACTED TO ARRIVE AT EQUITY VALUE. TYPICALLY A VERY NARROW RANGE OF MULTIPLES FROM LOW TO HIGH IN THE MARKET.
7 PRICE TO BOOK VALUE (P/BV)	MARKET PRICE OF COMPANY BOOK VALUE PER SHARE	A MULTIPLE BASED ON NET ASSET VALUE RATHER THAN INCOME. A CLOSE CORRELATION TO RETURN ON ASSETS AND RETURN ON EQUITY.

MARKET PRICE OF THE COMPANY REFERS TO THE PRICE PER SHARE TIMES THE NUMBER OF SHARES OUTSTANDING.
THE VALUATION MULTIPLES SHOULD BE APPLIED TO THE ADJUSTED OPERATING DATA FOR THE SUBJECT COMPANY.

EXAMPLE MARKET MULTIPLE CALCULATION

		BALANCE SHEET DATA			INCOME STATEMENT DATA				SHARE DATA				
COMPANY NAME	COUNTRY	ST DEBT & CUR LTD (000S)	LONG TERM DEBT (000S)	EQUITY (000S)	NET SALES (000S)	DEPR. & AMORT. (000S)	INTEREST EXPENSE (000S)	PRETAX INCOME (000S)	INCOME TAXES (000S)	NET INCOME (000S)	CUR MARKET PRICE	NUMBER SHARES (000)	
1	AALBORG PORTLAN	DENMARK	479,714	1,266,128	1,929,090	2,500,198	270,952	214,193	148,904	40,005	104,294	473	2,856
2	ASLAND, S A	SPAIN	1,581,482	1,200,867	94,287,015	51,308,772	2,815,327	1,287,664	15,222,956	4,369,321	10,671,467	1,170	46,227
3	ASLAND CATALUNY	SPAIN	20,399	0	21,853,301	12,731,364	1,333,354	236,596	3,778,677	1,410,053	2,368,624	1,000	28,942
4	CALCESTRUZZI SP	ITALY	473,398,000	63,753,000	414,281,000	1,196,967,000	37,783,000	48,688,000	138,745,000	60,229,000	75,521,000	8,150	37,625
5	CEMENTERIA DI B	ITALY	2,653,000	46,109,000	140,107,000	85,244,000	9,226,000	3,799,000	24,991,000	7,103,000	17,861,000	4,510	13,778
6	CEMENTERIA DI M	ITALY	87,393,036	83,347,225	211,430,756	214,685,647	27,748,367	17,623,255	20,973,207	11,597,604	9,226,393	3,920	69,888
7	CEMENTERIE SICI	ITALY	8,196,000	110,079,000	25,879,000	218,046,000	32,520,000	9,117,000	53,946,000	18,264,000	35,682,000	5,300	31,731
8	CEMENTIA HOLDIN	SWITZERLAND	37,005	251,460	578,440	1,066,514	104,450	36,241	279,005	83,181	76,668	350	1,132
9	CEMENTIR - CEME	ITALY	13,355,000	24,638,000	28,181,000	335,102,000	24,992,000	3,296,000	35,908,000	18,939,000	16,969,000	1,000	170,000
10	CIMENTERIES CBR	BELGIUM	3,590,200	14,619,500	27,013,700	48,363,400	3,602,100	1,658,600	5,131,000	1,292,800	3,635,900	8,270	4,504
11	COMPANIA VALENC	SPAIN	712,410	61,125	34,037,641	19,909,797	1,084,611	24,507	8,368,432	2,393,807	5,974,625	8,920	11,316
12	DYCKERHOFF AG	GERMANY	82,198	85,915	400,710	1,592,175	147,026	19,668	98,458	42,374	48,198	423	2,316
13	ITALCEMENTI SPA	ITALY	156,129,000	219,633,000	2,322,868,000	1,648,740,000	191,951,000	27,558,000	308,210,000	110,030,000	184,474,000	9,231	328,167
14	NORDCEMENT AG	GERMANY	0	0	67,644	149,769	13,054	121	28,550	15,732	12,818	365	799
15	PERLMOOSER ZEMB	AUSTRIA	0	381,371	1,532,675	3,962,476	292,760	36,517	384,047	65,563	317,713	1,100	4,840
16	SOCIETE DES CIM	FRANCE	3,978,000	10,790,000	5,730,000	18,448,000	1,193,000	1,567,000	648,000	233,000	401,000	135	21,594
17	TITAN CEMENT CO	GREECE	5,496,668	6,565,719	22,372,046	49,782,282	2,731,366	3,109,028	6,266,847	1,026,750	5,163,300	7,625	9,461
18	UNICEM SPA	ITALY	47,894,000	209,415,000	639,782,000	786,300,000	64,674,000	23,028,000	139,358,000	49,303,000	73,705,000	6,900	74,622

COMPANY NAME	COUNTRY	P/E	P/EBT	P/CF	P/P/CF	IC/EBIT	IC/EBDIT	P/BV	
1	AALBORG PORTLAN	DENMARK	12.9	9.1	3.8	3.2	7.3	4.2	0.70
2	ASLAND, S A	SPAIN	5.1	3.6	4.0	3.0	3.3	2.9	0.57
3	ASLAND CATALUNY	SPAIN	12.2	7.7	7.8	5.7	7.2	5.4	1.32
4	CALCESTRUZZI SP	ITALY	4.1	2.2	2.7	1.7	2.0	1.6	0.74
5	CEMENTERIA DI B	ITALY	3.5	2.5	2.3	1.8	3.8	2.8	0.44
6	CEMENTERIA DI M	ITALY	29.7	13.1	7.4	5.8	9.3	5.4	1.30
7	CEMENTERIE SICI	ITALY	4.7	3.1	2.5	1.9	4.4	2.9	0.52
8	CEMENTIA HOLDIN	SWITZERLAND	5.2	1.4	2.2	1.0	2.1	1.5	0.69
9	CEMENTIR - CEME	ITALY	15.0	7.1	6.1	4.2	7.1	4.4	0.88
10	CIMENTERIES CBR	BELGIUM	10.2	7.3	5.1	4.3	7.6	5.0	1.38
11	COMPANIA VALENC	SPAIN							
12	DYCKERHOFF AG	GERMANY							
13	ITALCEMENTI SPA	ITALY	16.4	9.8	8.0	6.1	9.7	6.2	1.30
14	NORDCEMENT AG	GERMANY	22.7	10.2	11.3	7.0	10.2	7.0	4.31
15	PERLMOOSER ZEMB	AUSTRIA	16.8	13.9	8.7	7.9	13.6	8.0	3.47
16	SOCIETE DES CIM	FRANCE	7.3	4.5	1.8	1.6	6.2	4.0	0.51
17	TITAN CEMENT CO	GREECE	14.0	11.5	9.1	8.0	8.4	6.5	3.22
18	UNICEM SPA	ITALY	7.0	3.7	3.7	2.5	4.5	3.2	0.80
	AVERAGE		12.4	7.4	5.9	4.5	7.1	4.8	1.5
	MEDIAN		12.6	7.5	5.1	4.1	7.2	4.3	1.1

ANALYSIS OF CONTROL PREMIUMS, MINORITY INTEREST DISCOUNTS AND MARKETABILITY DISCOUNTS

Introduction

Often in performing a business valuation it is necessary to apply premiums or discounts to arrive at the final conclusion of value for a company. The most common of these adjustments are control premiums, minority discounts and marketability discounts.

Whether or not these adjustments are applied in any specific valuation depends on both the level of ownership being valued and the type of valuation methodology being used.

Level of Ownership

The level of ownership being valued can consist of either a minority or controlling interest. A controlling interest is defined as owning a majority of the shares of the company, which is typically defined as having greater than 50 percent ownership in the company. Thus, someone with a 100 percent ownership has complete control of the company. Conversely, a minority interest is defined as an ownership position of less than 50 percent interest in the enterprise. *In the case of XYZ, the objective of the appraisal is to value a 100 percent, controlling interest in the equity (ownership) of the enterprise.*

Type of Valuation Method

The type of valuation method used also determines whether an adjustment is needed to the valuation conclusion reached from using that particular method. The following summary describes the level of ownership that is provided by several common valuation methods.

Discounted Cash Flow - the conclusion reached using this method will result in a controlling value, since: (1) it represents the price an investor would pay for a controlling interest in the business; (2) the cash flows are based on the controlling management or shareholders' future plans, and (3) future cash flows can only be distributed as dividends at the direction of the controlling owner. Since the discounted cash flow results in a value that the controlling interest can realize on sale, no marketability discount is required. *Accordingly, in the case of XYZ, no control premium or marketability discount would be required to convert the value to a controlling, marketable interest.*

Guideline Company Method - when this method is based on the capital markets, it represents the value of a freely-traded, minority interest in the company, since the ratios derived using this method (e.g., price-to-earnings, price-to-book value or price-to-cash flow) are based on shares freely traded at a minority level of ownership on the various world stock markets. *Thus in applying the capital market approach to XYZ, a control premium and marketability discount would be required to convert the value to a controlling, non-freely traded interest.*

When this method is based on a transactions approach, it represents the value at a controlling level since the data is based on acquisitions of controlling interests in the companies acquired. Furthermore, no marketability discount is required since the prices typically represent an acquisition of a closely-held interest and the costs of selling the company have been factored into the negotiated price. *Thus, no adjustments were required when applying the transaction approach in the valuation of XYZ.*

Asset Accumulation Method - this method results in a controlling value. Only in a case where (a) the minority interest can cause the company to sell its assets or (b) the company is a holding company, should this method be used to value a minority interest. Since this method is based on a going concern concept by summing up individual asset values, no marketability discount is required. *Accordingly, no adjustments were required in applying the asset accumulation approach to value XYZ.*

Quantifying Control Premiums and Minority Interest Discounts

Definitions

The term control premium has been defined by the Business Valuation Committee of the ASA in Business Valuation Standard I as "The additional value inherent in the control interest, (as contrasted to a minority interest), that reflects its power of control."

The term minority discount is defined as "the reduction, from the pro rata share of value of the entire business, which reflects the absence of the power of control." Thus, a minority discount is the opposite of a control premium.

Elements of Control

Elements of control that cause a controlling interest to be worth more than a minority interest include the following rights to:

1. Appoint management and determine compensation.
2. Determine company policy and the future direction of the business.
3. Acquire new assets or sell assets of the company.
4. Enter into joint ventures and make acquisitions or enter into mergers with other companies.
5. Sell or liquidate the company.
6. Register the company's shares on a stock exchange.
7. Declare or cancel the payment of dividends.

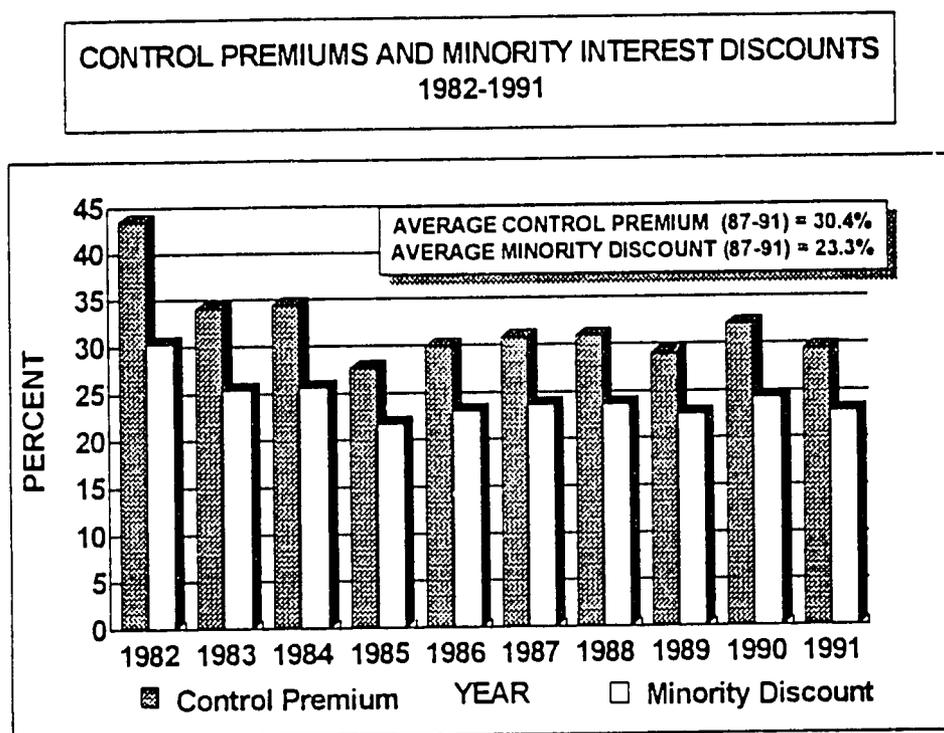
The ability of the controlling owner to benefit from having these rights can be limited by a number of factors. For example, if the company has negative earnings or cash flow which limit the ability to pay dividends, increase salaries, etc. the premium for control would lose some of its value. The facts and circumstance of each case must be examined to determine the appropriate control premium.

Control Premium and Minority Discount Studies

There are several published studies each year that analyze the prices paid for controlling interests in companies whose shares are traded on public stock exchanges. In most cases, the prices paid for the shares in these transactions represent a premium over the market price at which the stock previously traded as a minority interest.

The most widely followed study of control premiums is published each year by Mergerstat Review. The graph below summarizes the median control premium paid (and implied minority interest discount) from the years 1980 through 1991.

Graph B-1



SOURCE: MERGERSTAT REVIEW, 1991

This graph shows the median control premium has ranged from 30 to 45 percent over the period, but recently (over the last 6 years) it has been close to 30 percent each year. The minority discount over the last 6 years has been around 23 percent.

While this data provides evidence of the current level of control premiums and minority discounts for a broad range of industries, it is appropriate to examine the control premiums being paid in the specific industry of the company being valued if the

data is available. However, due to a limited number of transactions, specific control premiums for the cement industry were not available.

Based on the *Mergerstat Review* study, we have selected 30 percent as an appropriate control premium for our valuation of XYZ.

Marketability Discount

The term marketability discount is defined as "an amount or percentage deducted from an equity interest to reflect the lack of marketability." Thus the concept of marketability deals with how easily and quickly the owner can sell his interest and convert it into cash. This discount is not to be confused with the minority discount, which is measured in terms of the relative degree of control a minority owner has over the operations and important decisions of the company.

An ownership interest in a closely-held company is not as easily sold as one whose shares are publicly traded. When valuing a closely-held company using the guideline company approach based on the capital markets a marketability discount is required to reflect this lack of ability to readily sell the shares.

The amount of discount to apply depends on many factors specific to each valuation. Factors that would increase the discount include: small or no dividend payments, poor prospects of offering the company for sale or little or no chance of offering the shares of the company on a stock exchange.

Factors that reduce the discount include high dividends, an impending offering of the shares on a stock exchange, or an option to sell the shares to another shareholder and buy-sell agreements.

Another important factor impacting the marketability discount is the level of ownership being valued. Typically, the marketability discount for a controlling interest is less than that of a minority interest for a number of reasons, including the following:

- (1) only a controlling stockholder can approve the sale of shares in a public offering (minority interests do not have the right to register their shares in a public offering);
- (2) a minority interest is usually harder to sell than a controlling interest; and
- (3) only a controlling owner has the power to approve and actively market the company for sale.

Quantifying a Marketability Discount

There have been a number of studies to determine the average level of marketability discounts. These studies have been based on several methods including:

- (1) the analysis of "restricted" shares in a company that are identical to publicly traded shares in the same company, except they are not allowed to trade on the market for a stated period of time;
- (2) comparison of sales of shares in private transactions to sales of those shares in a public offering at a later date; and
- (3) comparison of discounts for private company price-to-earnings (P/E) ratios compared to public offering P/E ratios.

A summary of the findings of these studies is indicated in graphs B-2 to B-4.

These various studies indicate a range of median observations from 25.8 to 74.4 percent, clearly indicating support for the conclusion that there is a discount for lack of marketability. Most of the observations from the studies fall in the 30 to 50 percent range.

The selection of the discount to be applied in a specific case requires the professional judgement of the appraiser who should consider the facts and circumstance unique to the company being valued and including those specific factors previously discussed that can increase or decrease the discount.

Marketability Discount for XYZ

Since the guideline company (capital market approach) is based on pricing multiples from publicly-traded securities, a marketability discount is required for this approach.

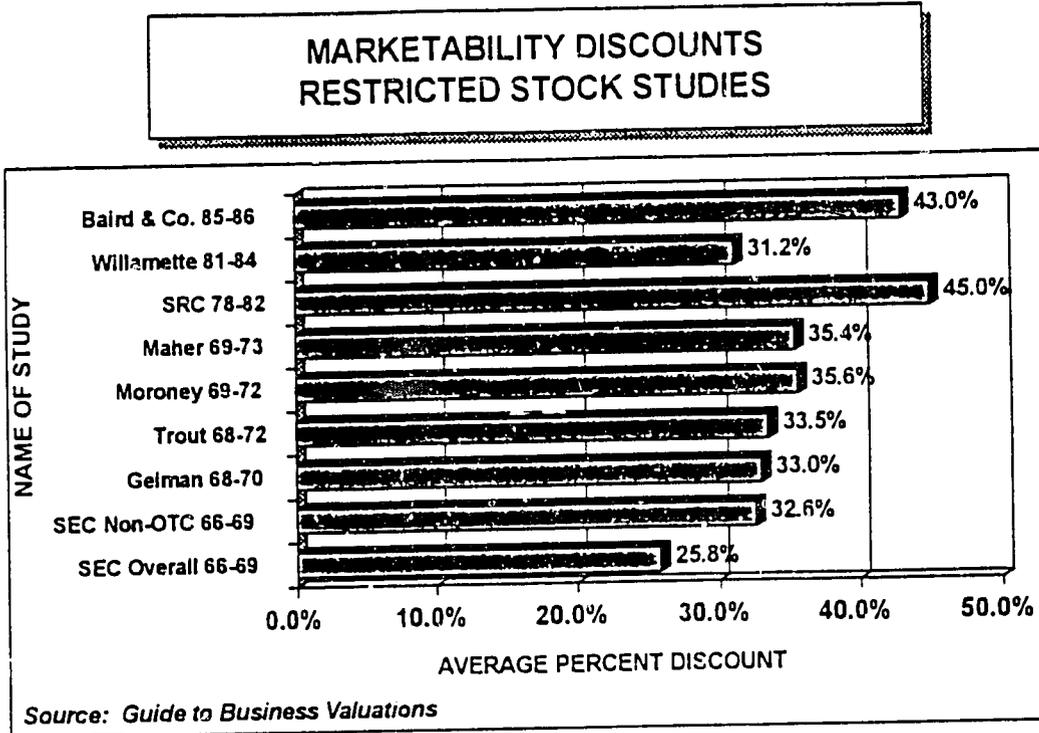
To determine the appropriate marketability discount to apply to the result of the guideline company approaches, we considered the data presented in graphs B-2 to B-4 and the fact that we are valuing a controlling interest in XYZ.

As stated earlier, a controlling interest typically would require a smaller marketability discount than a minority interest.

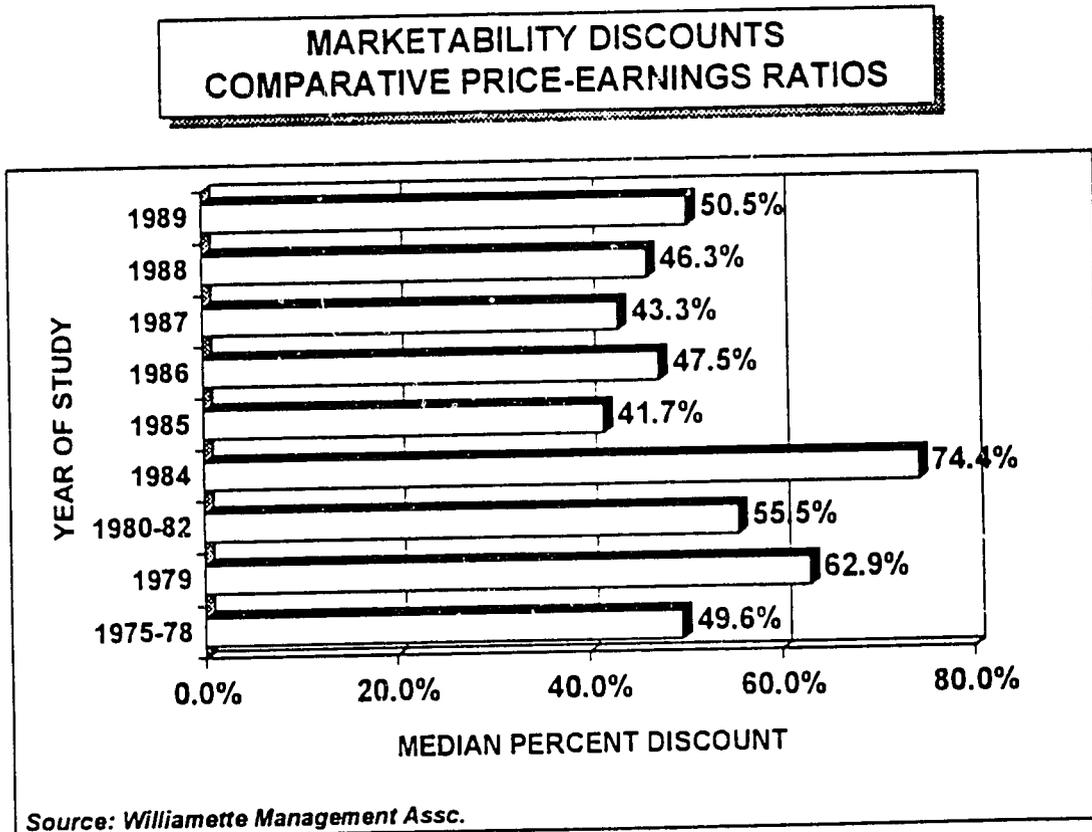
To determine the appropriate marketability discount for a controlling interest, we considered the costs to register the shares of a company on a stock exchange and brokerage fees charged by investment bankers to market a company.

In a study conducted by the Securities and Exchange Commission, various costs of issuing company shares on the stock market were analyzed in 1,599 transactions. Graph B-4 depicts the costs as a percentage of the value of the shares issued.

Graph B-2

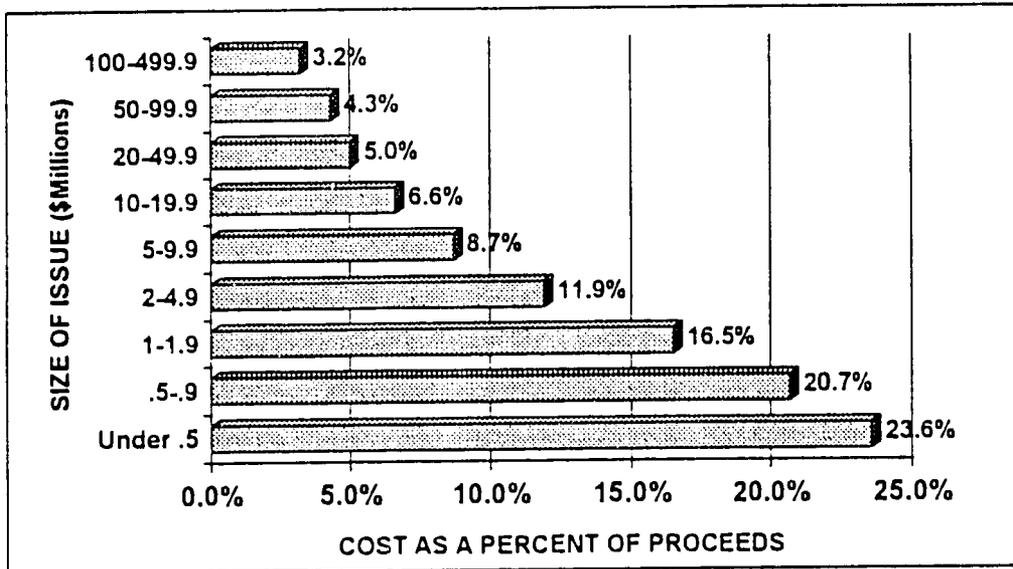


Graph B-3



Graph B-4

**MARKETABILITY DISCOUNTS
BASED ON THE COST OF REGISTERING SHARES**



Source: Securities and Exchange Commission

Based on the preliminary value conclusion of XYZ under the guideline company approach (\$30 million), it appears the cost of registering the shares based on this study would be approximately 5 percent.

Based on the preceding data, it is our opinion that a reasonable marketability discount for XYZ, based on a control level of ownership, would be 5 percent.

Summary and Conclusion

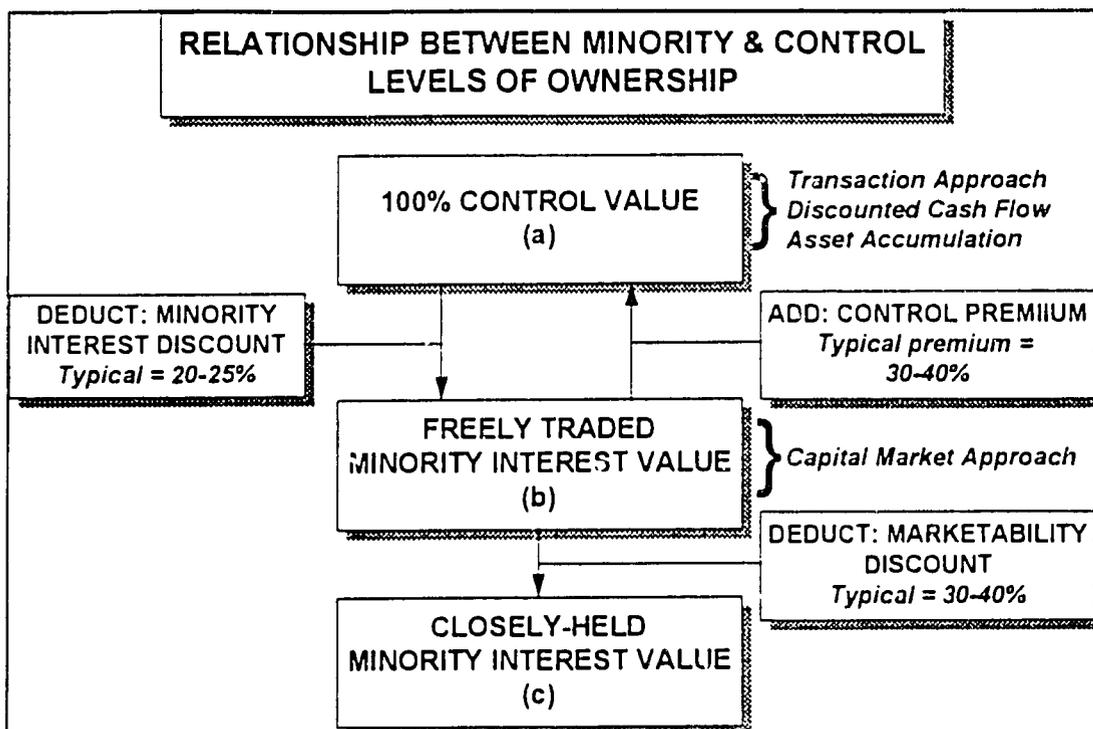
Graph B-5 on the following page summarizes the relationship between control, minority and marketability levels of value discussed in this appendix.

The objective of our appraisal is to value a 100 percent controlling interest in the equity of XYZ. We utilized the discounted cash flow, guideline company and asset valuation methods in our valuation analysis.

Based on the level of value and types of approaches used, we were required to apply a control premium and marketability discount to arrive at our conclusion of value under the guideline company approach based on the capital market method.

Based on our analysis of the data regarding control premiums and marketability discounts and the facts and circumstances of this particular valuation, we determined that a reasonable estimate for the control premium is 30 percent, while a reasonable estimate for the marketability discount is 5 percent.

Graph B-5



- Point a: Represents the value of the entire business as if for sale. Typically derived from:
 - (1) Capital market approach, after adding a control premium
 - (2) Transaction approach
 - (3) Discounted cash flow approach (assuming cash flow is at a control level), or
 - (4) Asset based approaches.
- Point b: Typically arrived at by using the capital market approach. Represents the value of a freely-traded, minority interest in the business. Can also be arrived at by deducting a minority interest discount from the transaction, discounted cash flow and asset based valuation approaches.
- Point c: Represents the value of a non-traded, minority interest in a privately owned company. Derived through the capital market approach less a marketability discount, or through the transaction, discounted cash flow, or asset based approaches less a combined minority and marketability discount.

**XYZ CEMENT
GUIDELINE COMPANY APPROACHES**

CAPITAL MARKET APPROACH**PRICING MULTIPLE:**

		EBT	PRETAX CF	BOOK VALUE
AMOUNT (LEI 000)		2,883,213	3,689,384	60,388,141
VALUATION MULTIPLE				
COUNTRY RISK FACTOR (ROMANIA) MULTIPLE - COUNTRY RISK ADJUSTED	1.40			
PRELIMINARY VALUE				
+ CONTROL PREMIUM	30.0%			
+ NON-OPERATING ASSETS	NONE	0	0	0
+/- WORKING CAPITAL EXCESS/DEFICIENC	(500,000)	0	0	0
FINAL VALUE (LEI 000)				

XYZ CEMENT GUIDELINE COMPANY APPROACH COMPARABLE BALANCE SHEET DATA													
COMPANY NAME	COUNTRY	CASH	ACCTS. REC.	CURRENT ASSETS	GROSS PP&E	NET PP&E	ACCTS. PAY.	ST DEBT & CUR. LTD	CURRENT LIAB.	LONG-TERM DEBT	TOTAL LIAB.	COMMON EQUITY	WORKING CAPITAL
AALBORG PORTLAND HOLDING A/S	DENMARK	12.0%	4.7%	24.7%	73.2%	52.9%	3.5%	9.0%	18.4%	24.1%	50.7%	36.1%	6.2%
ADELAIDE BRIGHTON CEMENT HOLDINGS	AUSTRALIA	3.2%	8.3%	20.0%	70.5%	52.0%	3.0%	2.1%	9.5%	28.9%	43.2%	46.4%	10.5%
ASLAND S.A.	SPAIN	14.8%	10.8%	30.3%	47.7%	31.5%	5.0%	1.2%	13.5%	0.9%	22.7%	70.1%	16.8%
ASLAND CATALUNYA Y DEL MEDITERRANEO SA	SPAIN	9.5%	13.1%	26.7%	33.1%	14.6%	4.8%	0.1%	12.5%	0.0%	13.9%	86.0%	14.2%
CALCESTRUZZI SPA	ITALY	10.8%	45.3%	71.3%	25.1%	13.6%	22.7%	28.9%	66.7%	3.9%	74.1%	25.3%	4.7%
CEMENTERIA DI BARLETTA SPA	ITALY	22.9%	7.5%	34.3%	86.4%	32.6%	4.8%	1.2%	12.8%	20.3%	38.2%	61.7%	21.4%
CEMENTERIA DI MERONE SPA	ITALY	1.8%	19.7%	28.8%	112.0%	61.2%	6.4%	17.6%	32.8%	16.8%	54.4%	42.5%	-6.0%
CEMENTERIE SICILIANE SPA	ITALY	33.2%	7.1%	47.9%	71.7%	28.8%	5.6%	1.5%	16.3%	19.8%	41.3%	58.7%	31.6%
CEMENTIA HOLDING AG	SWITZERLAND	17.3%	10.4%	34.8%	53.0%	33.2%	5.6%	1.6%	15.4%	10.8%	34.1%	24.8%	19.4%
CEMENTIR - CEMENTERIE DEL TIRRENO SPA	ITALY	0.8%	35.3%	44.5%	102.4%	42.0%	16.3%	2.7%	25.4%	5.1%	39.5%	59.3%	19.1%
CHICHIBU CEMENT CO. LTD	JAPAN	18.1%	15.7%	38.7%	131.8%	54.1%	4.7%	20.4%	34.0%	13.1%	53.0%	47.0%	3.9%
CIMENTERIES CBR CEMENTBEDRIJVEN RD	BELGIUM	11.9%	11.5%	33.0%	99.6%	53.0%	4.7%	5.7%	18.5%	23.2%	53.3%	42.9%	14.5%
COMPANIA VALENCIANA DE CEMENTOS PORTLA	SPAIN	19.0%	10.1%	36.5%	78.2%	17.9%	0.7%	1.6%	10.6%	0.1%	24.9%	75.1%	25.8%
DYCKERHOFF AG	GERMANY	5.2%	8.0%	34.2%	162.6%	49.4%	6.7%	5.8%	21.4%	6.1%	65.8%	28.5%	12.8%
ITALCEMENTI SPA	ITALY	24.4%	13.7%	48.8%	87.1%	34.9%	7.4%	4.3%	20.4%	6.0%	32.4%	63.3%	28.4%
LAFARGE CANADA INC.	CANADA	7.7%	18.1%	39.6%	125.5%	54.0%	10.1%	1.5%	12.6%	2.5%	25.8%	64.3%	27.0%
MEDUSA CORP.	UNITED STATES	3.0%	14.4%	39.2%	240.6%	54.0%	6.5%	0.1%	15.6%	35.6%	74.2%	25.8%	23.6%
NORDCEMENT AG	GERMANY	25.5%	2.0%	48.2%	217.4%	44.6%	14.1%		16.8%	0.0%	49.9%	50.1%	31.4%
OBOURG SA	BELGIUM	30.7%	20.3%	64.0%		19.4%	8.5%	24.9%	45.1%	2.6%	54.2%	45.4%	18.9%
PERLMOOSER ZEMENTWERKE AG	AUSTRIA	17.8%	7.7%	45.6%	170.1%	45.2%			15.2%	9.3%	43.8%	37.3%	30.4%
PRETORIA PORTLAND CEMENT COMPANY LTD.	SOUTH AFRICA			29.5%				0.2%	18.3%	0.0%	38.2%	60.7%	11.3%
PUERTO RICAN CEMENT COMPANY INC.	UNITED STATES	6.9%	7.5%	34.6%	87.8%	64.4%	2.7%	2.1%	7.1%	18.0%	38.1%	61.9%	27.5%
SOCIETE DES CIMENTS FRANCAIS SA	FRANCE	1.8%	21.8%	30.6%	68.1%	41.9%	14.7%	12.8%	27.4%	34.7%	69.1%	18.4%	3.2%
ST. LAWRENCE CEMENT INC.	CANADA		18.3%	31.5%	121.2%	60.0%	7.8%	0.4%	8.9%	31.1%	50.1%	49.9%	22.5%
SUMITOMO CEMENT CO. LTD	JAPAN	30.4%	16.4%	51.8%	95.8%	41.1%	8.2%	22.0%	37.5%	29.0%	67.3%	32.4%	14.3%
TITAN CEMENT COMPANY SA	GREECE	10.6%	28.9%	58.9%	103.5%	34.2%	3.7%	11.6%	27.6%	13.8%	50.5%	47.1%	31.3%
UNICEM SPA	ITALY	21.9%	13.1%	45.0%	99.6%	47.2%	11.5%	3.4%	22.4%	15.0%	45.2%	45.7%	22.6%
AVERAGE		14.4%	15.0%	39.7%	102.6%	41.5%	7.6%	7.3%	21.6%	13.7%	46.2%	48.4%	18.0%
MEDIAN		12.0%	13.1%	36.5%	95.8%	43.3%	6.4%	2.7%	18.3%	13.1%	45.2%	47.0%	19.1%
XYZ CEMENT		1.4%	3.3%	13.6%	113.8%	86.2%	5.6%	2.3%	9.2%	0.0%	10.1%	89.9%	4.4%
RANKING		26/27	26/27	28/28	8/26	1/27	14/26	14/26	26/28	28/28	26/28	1/28	25/28

XYZ CEMENT GUIDELINE COMPANY APPROACH COMPARABLE INCOME STATEMENT DATA											
COMPANY NAME	COUNTRY	SALES	DEPR & AMORT	EBIT	INTEREST EXP	PRETAX INC	INCOME TAX	NET INCOME	EBDIT	PRETAX CF	CASH FLOW
AALBORG PORTLAND HOLDING A/S	DENMARK	100.0%	10.8%	14.5%	8.6%	6.0%	1.6%	4.2%	25.4%	16.8%	15.0%
ADELAIDE BRIGHTON CEMENT HOLDINGS	AUSTRALIA	100.0%	6.4%	7.0%	10.8%	-3.8%	0.2%	-4.0%	13.4%	2.6%	2.4%
ASLAND S.A.	SPAIN	100.0%	5.5%	32.2%	2.5%	29.7%	8.5%	20.8%	37.7%	35.2%	26.3%
ASLAND CATALUNYA Y DEL MEDITERRANEO SA	SPAIN	100.0%	10.5%	31.5%	1.9%	29.7%	11.1%	18.6%	42.0%	40.2%	29.1%
CALCESTRUZZI SPA	ITALY	100.0%	3.2%	15.7%	4.1%	11.6%	5.0%	6.3%	18.8%	14.7%	9.5%
CEMENTERIA DI BARLETTA SPA	ITALY	100.0%	10.8%	33.8%	4.5%	29.3%	8.3%	21.0%	44.6%	40.1%	31.8%
CEMENTERIA DI MERONE SPA	ITALY	100.0%	12.9%	18.0%	8.2%	9.8%	5.4%	4.3%	30.9%	22.7%	17.2%
CEMENTERIE SICILIANE SPA	ITALY	100.0%	14.9%	28.9%	4.2%	24.7%	8.4%	16.4%	43.8%	39.7%	31.3%
CEMENTIA HOLDING AG	SWITZERLAND	100.0%	9.8%	29.6%	3.4%	26.2%	7.8%	7.2%	39.4%	36.0%	17.0%
CEMENTIR - CEMENTERIE DEL TIRRENO SPA	ITALY	100.0%	7.5%	11.7%	1.0%	10.7%	5.7%	5.1%	19.2%	18.2%	12.5%
CHICHIBU CEMENT CO. LTD	JAPAN	100.0%	7.3%	8.1%	4.6%	3.5%	1.7%	1.8%	15.4%	10.9%	9.1%
CIMENTERIES CBR CEMENTBEDRIJVEN RD	BELGIUM	100.0%	7.8%	14.6%	3.6%	11.1%	2.8%	7.8%	22.4%	18.8%	15.6%
COMPANIA VALENCIANA DE CEMENTOS PORTLA	SPAIN	100.0%	5.4%	42.2%	0.1%	42.0%	12.0%	30.0%	47.6%	47.5%	35.5%
DYCKERHOFF AG	GERMANY	100.0%	9.2%	7.4%	1.2%	8.2%	2.7%	3.0%	16.7%	15.4%	12.3%
ITALCEMENTI SPA	ITALY	100.0%	11.6%	20.4%	1.7%	18.7%	6.7%	11.2%	32.0%	30.3%	22.8%
LAFARGE CANADA INC.	CANADA	100.0%	6.8%	3.6%	0.3%	3.3%	2.0%	1.0%	10.4%	10.1%	7.9%
MEDUSA CORP.	UNITED STATES	100.0%	7.5%	9.7%	2.7%	7.0%	2.4%	4.7%	17.3%	14.6%	12.2%
NORDCEMENT AG	GERMANY	100.0%	8.7%	19.1%	0.1%	19.1%	10.5%	8.6%	27.9%	27.8%	17.3%
OBOURG SA	BELGIUM	100.0%	12.3%	19.6%	5.4%	14.2%	3.2%	11.0%	31.9%	28.5%	23.3%
PERLMOOSER ZEMENTWERKE AG	AUSTRIA	100.0%	7.4%	10.6%	0.9%	9.7%	1.7%	6.0%	18.0%	17.1%	15.4%
PRETORIA PORTLAND CEMENT COMPANY LTD	SOUTH AFRICA	100.0%		23.9%	0.8%	23.1%	9.8%	12.9%	23.9%	23.1%	12.9%
PUERTO RICAN CEMENT COMPANY INC	UNITED STATES	100.0%	6.4%	20.9%	4.6%	18.8%	5.6%	13.2%	27.3%	25.2%	19.6%
SOCIETE DES CIMENTS FRANCAIS SA	FRANCE	100.0%	7.3%	13.5%	9.5%	3.9%	1.4%	2.4%	20.7%	11.2%	9.7%
ST. LAWRENCE CEMENT INC.	CANADA	100.0%	7.2%	2.3%	3.9%	-1.7%	-0.6%	-1.1%	9.5%	5.5%	6.1%
SUMITOMO CEMENT CO. LTD	JAPAN	100.0%		7.2%	3.8%	3.4%	1.7%	1.7%	7.2%	3.4%	1.7%
TITAN CEMENT COMPANY SA	GREECE	100.0%	5.5%	18.8%	6.2%	12.6%	2.1%	10.4%	24.3%	18.1%	15.9%
UNICEM SPA	ITALY	100.0%	8.1%	20.4%	2.9%	17.5%	6.2%	9.3%	28.5%	25.6%	17.4%
AVERAGE		100.0%	8.4%	18.0%	3.8%	14.3%	5.0%	8.7%	25.8%	22.1%	16.5%
MEDIAN		100.0%	7.5%	18.0%	3.6%	11.6%	5.0%	7.8%	24.3%	18.8%	15.6%
XYZ CEMENT		100.0%	3.7%	13.7%	4.0%	11.1%	2.8%	8.3%	17.5%	14.9%	12.1%
RANKING				18/28		15/28			21/28	20/28	

XYZ CEMENT GUIDELINE COMPANY APPROACH COMPARABLE COMPANY FINANCIAL ANALYSIS										
COMPANY NAME	COUNTRY	CURRENT RATIO	WC/ SALES	LTD/ TOT. CAP	INTEREST COVERAGE	PRETAX ROA	PRETAX ROE	NET ROA	NET ROE	ASSET T/O
AALBORG PORTLAND HOLDING A/S	DENMARK	1.34	13.4%	40.0%	1.7	2.8%	7.7%	2.0%	5.4%	0.47
ADELAIDE BRIGHTON CEMENT HOLDINGS	AUSTRALIA	2.10	24.8%	38.4%	0.6	-1.6%	-3.5%	-1.7%	-3.7%	0.42
ASLAND S.A.	SPAIN	2.24	44.0%	1.3%	12.8	11.3%	16.1%	7.9%	11.3%	0.38
ASLAND CATALUNYA Y DEL MEDITERRANEO SA	SPAIN	2.14	28.4%	0.0%		14.9%	17.3%	9.3%	10.8%	0.50
CALCESTRUZZI SPA	ITALY	1.07	6.4%	13.3%	3.8	8.5%	33.5%	4.6%	18.2%	0.73
CEMENTERIA DI BARLETTA SPA	ITALY	2.67	57.1%	24.8%	7.6	11.0%	17.8%	7.9%	12.7%	0.38
CEMENTERIA DI MERONE SPA	ITALY	0.82	-14.0%	28.3%	2.2	4.2%	9.9%	1.9%	4.4%	0.43
CEMENTERIE SICILIANE SPA	ITALY	2.94	80.5%	25.2%	6.9	9.7%	16.6%	6.4%	10.9%	0.39
CEMENTIA HOLDING AG	SWITZERLAND	2.26	42.5%	30.3%	8.7	11.9%	48.2%	3.3%	13.3%	0.46
CEMENTIR - CEMENTERIE DEL TIRRENO SPA	ITALY	1.75	27.8%	7.9%	11.9	7.4%	12.5%	3.5%	5.9%	0.69
CHICHIBU CEMENT CO. LTD	JAPAN	1.11	6.9%	21.8%	1.8	2.0%	4.2%	1.0%	2.1%	0.56
CIMENTERIES CBR CEMENTBEDRIJVEN RD	BELGIUM	1.78	19.6%	35.1%	4.1	8.1%	19.0%	5.8%	13.5%	0.74
COMPANIA VALENCIANA DE CEMENTOS PORTLAND	SPAIN	3.43	58.8%	0.2%		18.5%	24.6%	13.2%	17.6%	0.44
DYCKERHOFF AG	GERMANY	1.60	11.3%	17.7%	6.0	7.0%	24.6%	3.4%	12.0%	1.13
ITALCEMENTI SPA	ITALY	2.39	63.2%	8.6%	12.2	8.4%	13.3%	5.0%	7.9%	0.45
LAFARGE CANADA INC.	CANADA	3.15	30.6%	3.7%	10.4	2.9%	4.5%	0.9%	1.4%	0.88
MEDUSA CORP.	UNITED STATES	2.51	14.9%	58.0%	3.6	11.2%	43.3%	7.4%	28.7%	1.59
NORDCEMENT AG	GERMANY	2.87	28.3%	0.0%		21.1%	42.2%	9.5%	18.9%	1.11
OBOURG SA	BELGIUM	1.42	29.0%	5.4%	3.6	9.2%	20.2%	7.1%	15.7%	0.65
PERLMOOSER ZEMENTWERKE AG	AUSTRIA	3.00	31.5%	19.9%	11.5	9.4%	25.1%	7.7%	20.7%	0.96
PRETORIA PORTLAND CEMENT COMPANY LTD.	SOUTH AFRICA	1.62	12.4%	0.0%		20.9%	34.4%	11.7%	19.3%	0.91
PUERTO RICAN CEMENT COMPANY INC.	UNITED STATES	4.86	59.3%	22.6%	4.6	8.7%	14.1%	6.1%	9.9%	0.46
SOCIETE DES CIMENTS FRANCAIS SA	FRANCE	1.12	6.0%	65.3%	1.4	2.1%	11.3%	1.3%	7.0%	0.53
ST. LAWRENCE CEMENT INC.	CANADA	3.52	31.8%	38.4%	0.6	-1.2%	-2.4%	-0.8%	-1.6%	0.71
SUMITOMO CEMENT CO. LTD	JAPAN	1.38	23.4%	47.3%	1.9	2.1%	6.4%	1.0%	3.2%	0.61
TITAN CEMENT COMPANY SA	GREECE	2.14	29.9%	22.7%	3.0	13.2%	28.0%	10.9%	23.1%	1.05
UNICEM SPA	ITALY	2.01	39.7%	24.7%	7.1	10.0%	21.8%	5.3%	11.5%	0.57
AVERAGE		2.19	29.9%	22.3%	5.6	8.6%	18.9%	5.2%	11.1%	0.67
MEDIAN		2.14	28.4%	22.6%	4.1	8.7%	17.3%	5.3%	11.3%	0.57
XZY CEMENT		1.48	11.4%	0.0%	3.4	4.3%	4.8%	3.2%	3.6%	0.39
RANKING		21/28	23/28	28/28	16/24	20/28	24/28	20/28	23/28	25/28

XYZ CEMENT GUIDELINE COMPANY APPROACH CAPITAL MARKET DATA						
COMPANY NAME	COUNTRY	BETA	PRICE/ EBIT	PRICE/ EBT	PRICE/ PRETAX CF	PRICE/ BV
AALBORG PORTLAND HOLDING A/S	DENMARK	1.71	3.7	9.1	3.2	0.70
ADELAIDE BRIGHTON CEMENT HOLDINGS	AUSTRALIA	0.45	14.6			0.94
ASLAND S.A.	SPAIN	3.54	3.3	3.6	3.0	0.57
ASLAND CATALUNYA Y DEL MEDITERRANEO SA	SPAIN		7.2	7.7	5.7	1.32
CALCESTRUZZI SPA	ITALY		1.6	2.2	1.7	0.74
CEMENTERIA DI BARLETTA SPA	ITALY		2.2	2.5	1.8	0.44
CEMENTERIA DI MERONE SPA	ITALY		7.1	13.1	5.6	1.30
CEMENTERIE SICILIANE SPA	ITALY	1.48	2.7	3.1	1.9	0.52
CEMENTIA HOLDING AG	SWITZERLAND		1.3	1.4	1.0	0.69
CEMENTIR - CEMENTERIE DEL TIRRENO SPA	ITALY	1.76	6.5	7.1	4.2	0.88
CHICHIBU CEMENT CO. LTD	JAPAN	0.70	8.4		6.3	0.81
CIMENTERIES CBR CEMENTBEDRIJVEN RD	BELGIUM	2.82	5.5	7.3	4.3	1.38
COMPANIA VALENCIANA DE CEMENTOS PORTLAND	SPAIN		12.0	12.1	10.7	2.97
DYCKERHOFF AG	GERMANY		8.3	10.0	4.0	2.44
ITALCEMENTI SPA	ITALY	1.23	9.0	9.8	6.1	1.30
LAFARGE CANADA INC.	CANADA					
MEDUSA CORP.	UNITED STATES	1.24	13.1	18.1	8.8	
NORDCEMENT AG	GERMANY		10.2	10.2	7.0	
OBOURG SA	BELGIUM					
PERLMOOSER ZEMENTWERKE AG	AUSTRIA	2.01	12.7	13.9	7.9	3.47
PRETORIA PORTLAND CEMENT COMPANY LTD.	SOUTH AFRICA	1.12	7.5	7.7		2.66
PUERTO RICAN CEMENT COMPANY INC.	UNITED STATES	0.41	8.3	9.2	6.9	1.30
G:PRCQ:PRCRSCMKT	FRANCE	3.38	1.3	4.5	1.6	0.51
ST. LAWRENCE CEMENT INC.	CANADA	3.30	21.4		8.7	0.68
SUMITOMO CEMENT CO. LTD	JAPAN	2.33	13.6			1.86
TITAN CEMENT COMPANY SA	GREECE		7.7	11.5	8.0	3.22
UNICEM SPA	ITALY	1.57	3.2	3.7	2.5	0.80
AVERAGE		1.82	7.7	8.0	5.0	1.37
MEDIAN		1.64	7.5	7.7	4.9	0.94

EXERCISE IN APPLYING THE ASSET ACCUMULATION APPROACH & EXCESS EARNINGS METHO

FACTS:

10 PERCENT OF RECEIVABLES ARE NON-COLLECTABLE

5 PERCENT OF INVENTORY IS OBSOLETE AND CAN BE LIQUIDATED FOR ONLY 10% OF FACE VALUE

ACCORDING TO THE REAL ESTATE APPRAISER, THE LAND AND BUILDINGS ARE WORTH 2,500.

ACCORDING TO THE EQUIPMENT APPRAISER, THE EQUIPMENT IS WORTH 1,600.

ACCORDING TO A BUSINESS VALUATION PERFORMED, THE VALUE OF THE INVESTMENT IN ABC COMPANY IS 450.

THE INDUSTRY AVERAGE RETURN ON EQUITY IS 14%.

NET INCOME FOR THE COMPANY 600
CAPITALIZATION RATE 30.0%

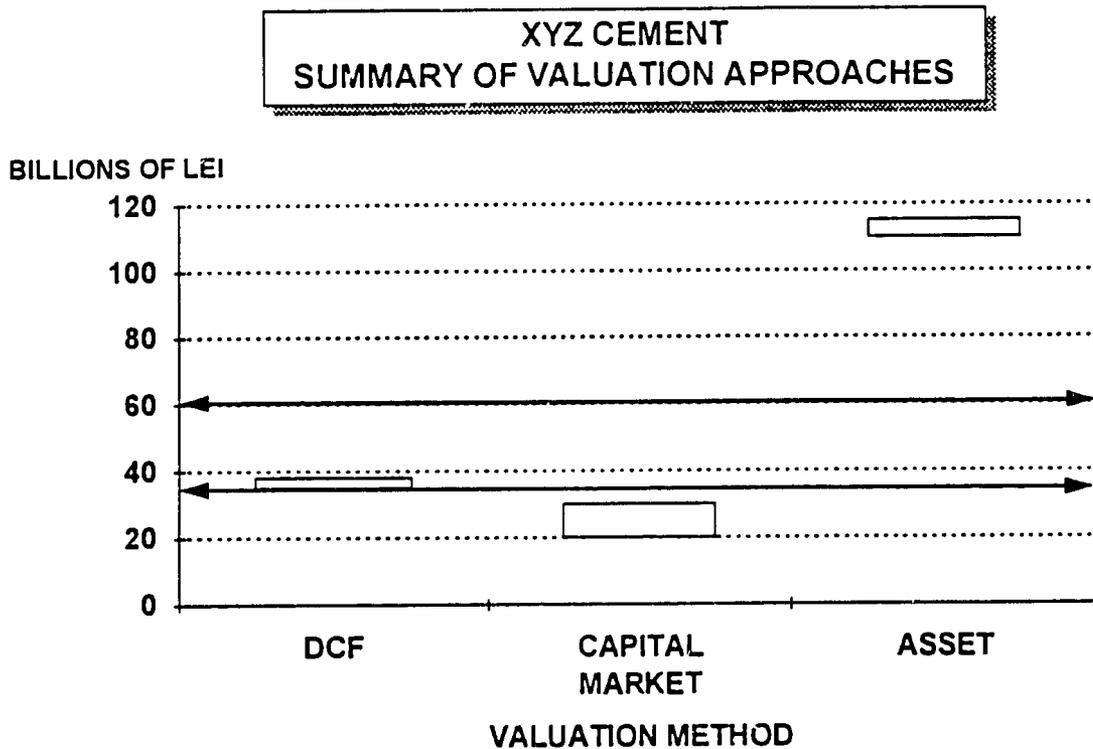
HISTORICAL BALANCE SHEET	Dec. 31	Adjustments	Restated Value	Goodwill	Fair Market Value
					Dec. 31
Cash	375				
Accounts receivable	200				
Inventory	1,000				
Total current assets	0				
Land & buildings	1,900				
Equipment	1,800				
Total fixed assets	3,700				
Investment in ABC Company	300				
Goodwill					
Total assets	4,000				
Total liabilities	3,000				
Equity value	1,000				
Total liab. & equity	4,000				

VALUATION CONCLUSION

To estimate the fair market value of the equity of XYZ CEMENT, we utilized three approaches: the Discounted Cash Flow, Capital Market Approach and Asset Accumulation Approaches. These valuation methods were based on valuing XYZ CEMENT as is, without the influence of an outside investor.

The results of these approaches are summarized in the graph below. Each box represents the range of value for each valuation method, while the two solid black lines equal the recommended range of value for the equity of XYZ CEMENT.

Graph VIII-1



To determine a final value conclusion for XYZ CEMENT, the individual strengths and weaknesses of each of these approaches were considered.

The *discounted cash flow approach* has the advantage of being based on the expected future returns, rather than the past, and takes into account the specific expectations of management regarding revenues, expenses and capital expenditures. It is however, speculative in nature given the difficulty in predicting the future.

This method in this case is based on favorable assumptions, such as strong growth, high margins compared to recent history and the industry and low working capital requirements. The high required rate of equity return is intended to account for these factors, since it inherently represents the risk of achieving the forecast.

Despite these favorable assumptions, this method yields a result well below that indicated by the asset accumulation approach, due primarily to the low utilization of capacity during the term of the forecast.

However, it does typically represent what an investor would be willing to pay based on the future expectations for the business and the investor's required rate of return for investing in that business.

The *capital market approach* is the only approach based on the market, and provides an indication of value based on share prices and transactions involving similar companies around the world. The disadvantage to this approach is the required number of adjustments necessary to apply data from the public markets to a closely-held business and the overall question of comparability of the subject company to the guideline companies. In addition, this approach is based on historical data as well, which excludes the impact of future events which may differ from recent historical financial data. In this case in particular, recent results have been poor compared to management's expectations for the future, which results in this method having the lowest value.

To check the reasonableness of the capital market approach, we calculated the various returns the investor would receive from investing in XYZ CEMENT if he paid the low to high value range (20.0 billion to 29.0 billion Lei) for the equity of XYZ CEMENT. The table below provides a summary of this analysis:

Table VIII-1
Estimated Rates of Return From Investing in XYZ CEMENT

<u>Category</u>	Investor Return:		<u>Ind. Median</u>
	<u>Low</u>	<u>High</u>	
Pretax ROE	14.4%	9.9%	17.3%
Cash ROE	15.7	10.8	20.7
Net ROE	10.8	7.4	11.3

The interpretation of the data can be explained as follows. If the investor were to pay the highest price recommended by this method (29.0 billion Lei), his pretax return on equity (based on the most recent 9 months data annualized) would be only 9.9 percent, his cash ROE would be 10.8 percent and his net ROE would be 7.4 percent. These figures are all well below the industry median returns shown in the far right column. This indicates that an investor would probably not pay this price if he hoped to achieve at least the median returns found in the industry and which he could obtain by selecting one of these companies to invest in as opposed to investing in XYZ CEMENT.

Using the lower value range of 20.0 billion Lei results in returns much closer to the industry medians. The conclusion from this exercise is that based on last year's data, an investor would not pay more than that indicated by this approach.

The *asset accumulation approach* has the advantage of being based on the tangible, existing assets of the business, removing much of the speculation of the other approaches. However, it also does not take into account future earnings, or the level of return those assets can be expected to provide. This method resulted in the highest value estimate.

However, one must question whether an investor would today, based on current market demands and economic expectations, replace the entire capacity of XYZ CEMENT when only a small percentage of that capacity is being used.

As stated earlier, in our opinion an investor would limit the investment in the assets of the company to a price for those assets that would provide him with a sufficient return (based

on the cash flow he expects to receive in the future) to reward him for the risk of investing in that business.

The question as to what the final value range conclusion for XYZ CEMENT would be, based on the results of these approaches, depends on a number of factors:

1. How relevant are recent historical levels of earnings and cash flows compared to the future?
2. Would an investor pay a price based on speculative cash flows with little historical data to base them on?
3. Would an investor pay a higher multiple of pretax earnings or cash flow for XYZ CEMENT versus the price at which he could purchase the shares of a publicly-traded cement company?
4. Would an investor pay for the full capacity of XYZ CEMENT when only a small portion is being used?
5. Does the investor have specific plans for XYZ CEMENT such as utilizing more capacity, introducing new technology, combining some operations or perhaps restructuring the operating plants, any of which would increase the value to the investor over the valuation range based on XYZ CEMENT as it is?
6. Our conclusions do not include the cost of environmental liability or clean up (if any) than may be associated with XYZ CEMENT.

Based on these questions and the preceding analysis, it is our opinion that XYZ CEMENT would sell at a level below that indicated by the asset approach, which would establish the upper end of the valuation range. The lower end of the range is probably indicated by the discounted cash flow approach. Any value above this approach is probably based on an investor's perception of the value of the company utilizing his own internal plans which would enhance the value. A premium over the discounted cash flow method might also be warranted to allow a industry competitor to gain a large amount of capacity in one transaction. Finally, the value cannot fall below the liquidation value of the assets, which we estimated to be approximately 35.0 to 40.0 billion Lei.

As stated in the opinion letter, the conclusion of fair market value reached is a reasonable estimate of the price at which property may change hands between two willing parties. It should be understood that the actual price paid in a transaction involving XYZ CEMENT may differ from the appraised fair market value due to factors such as the motivation of the parties, the negotiating skills of the parties, the structure of the transaction (e.g. financing structure, transition of control, etc.), or other factors unique to the transaction.

Based on the facts, assumptions, and valuation methodologies utilized in the valuation analysis, which have been reviewed with you, it is our recommendation that the fair market value of a 100 percent interest in the equity of XYZ CEMENT, as of December 31, 1992, can be reasonably estimated as a range of:

35,000,000,000 to 60,000,000,000 Lei
(Thirty-five to sixty billion Lei)

This range excludes the value of land. As of December 31, 1992 the company did not own the land where the quarries and plants are situated but had sole right to use the land. It is envisioned that the land, under Law 15 concerning State Owned Enterprise Restructuring, will eventually be sold or given to XYZ CEMENT by the state for each of its facilities.

CASE STUDY: *Hungarian Drilling Company ("HDC")* Using the DCF, Guideline Company, and Asset Accumulation Approaches to Value a Company

Purpose

The purpose of this case study is to analyze and value HDC in order to aid the Hungarian government in discussions with potential investors for the company. Your task will be to value HDC using the discounted cash flow method, the guideline company approach, and the asset accumulation valuation methods.

History

HDC (and its predecessor companies) was a member company of the National Oil and Gas Trust since its formation as the holding structure for the Hungarian oil and gas industry in 1957. In 1991, HDC was one of 13 affiliated companies separated from the National Oil and Gas Trust as an independent company. On July 31, 1992, HDC became a joint stock company, with the State Property Agency holding 98.2 percent of the subscribed capital.

Products and Services

The company is primarily involved in the drilling of onshore, domestic oil and gas wells in both the prospecting and exploration categories, with this segment of the business accounting for about 47 percent of total revenues in 1993. HDC also provides many of the ancillary services to well drilling including casing, cementing and mud services. Other minor drilling activities include water, geothermal and methane wells (about 6 percent of 1993 revenues).

Other services provided by the company included well completion (readying a well for production) and workover services. Workover services include redevelopment activities such as developing new producing zones or enhancing production through stimulation and acidizing services.

While most of the revenues are from domestic services (86 percent in 1993), the company has participated internationally over the past years in Austria, India, Iraq, Greece, France, Tunis, The United Arab Emirates, Kuwait and Russia. Currently, the company has operations (workover and drilling services) in Syria.

Facilities and Equipment

HDC has a rig fleet of 38. However, only 18 rigs are currently used on an active basis. Most of the rigs were manufactured in Austria (29), with the balance made in the USA, CIS, Romania and Hungary. To carry out its ancillary services, the company has two

coiled tubing units (USA), four wireline units (USA), two nitrogen units (Canadian), 27 cementers and 8 bulk transporters.

Competition and Market Share

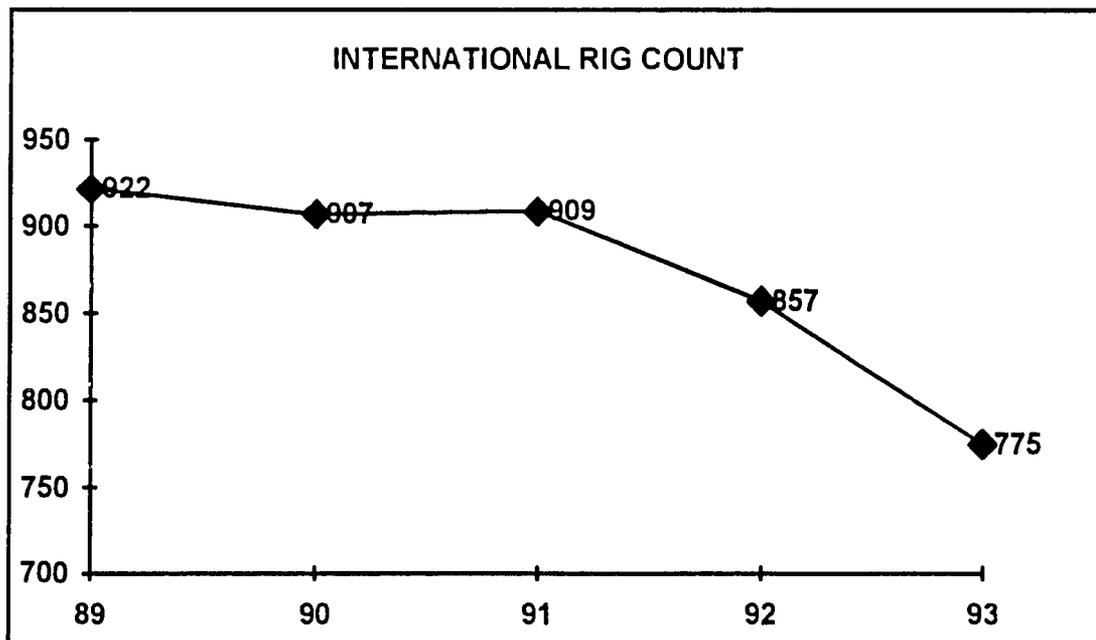
As of this time, the only competitor on the domestic market is Rotary Drilling and Workover, Ltd. (a subsidiary of MOL, the state owned oil and gas company). HDC has an estimated market share in Hungary of 56 percent, with a virtual monopoly in the Eastern part of the country where the majority of the oil and gas reserves are located. All domestic work is offered for tender by MOL, which is the only domestic oil and gas customer of HDC (about 80 percent of 1993 revenues).

Industry Analysis

International drilling activity depends upon expectations for crude oil prices. Prices have fluctuated in the \$15-20 per barrel range since the end of the Gulf War. Beginning in 1993, the average price was \$16.86/barrel. However, prices fell to \$12.72/barrel by the end of 1993. The fall at the end of 1993 was due to weakened worldwide demand and excessive production.

One measure of international drilling activity is the active rig count. The Baker Hughes international rig count (outside US and Canada) shows a steady decline in active rigs since 1989, as captured in the graph below:

Graph IV-1



132

This graph shows a strong decline since the end of 1991, with the active rig count falling 5.7 percent in 1992 and 9.6 percent in 1993. This trend does not bode well for high demand in the international market for idle rigs.

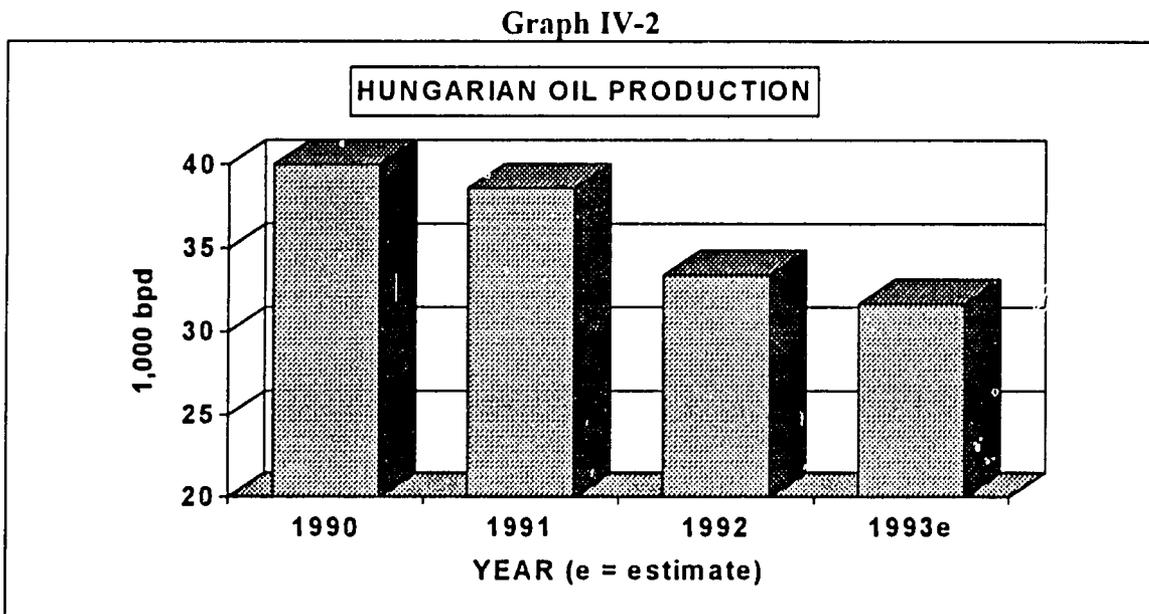
Crude oil prices in 1994 will depend on continued economic recovery in the U.S., Germany and Japan, and political and economic developments in EE and CIS. Other factors impacting prices will be the available supply from the CIS, the uncertainty regarding the Iraq supply (under embargo), and the growth of production capacity in the OPEC countries.

Regarding the outlook for the future, the Oil & Gas Journal (October 25, 1993) forecasts worldwide petroleum product demand to grow by an annual compound rate of 2.2 percent through 1996. For the CIS and Eastern Europe however, a decline of about 1 percent in demand is expected over the same period. Forecasts for the international drilling rig count are for an increase back to 840 by the end of 1996. Prices are projected to average \$17.60 in 1994, \$18.25 in 1995, \$17.85 in 1996.

Hungarian Energy Analysis

The Hungarian oil and gas industry is in a mature stage of production with most of the major production areas discovered and producing. Exploration activity peaked in 1986 and has declined steadily since then. Wells drilled in Hungary have fallen from 76 in 1991 to 64 in 1992. 62 wells are estimated to have been drilled in 1993.

Domestic oil production in Hungary has matched the drop in exploration activity, having declined continuously between 1989 and 1993 as is shown in the graph below (bpd represents barrels per day):

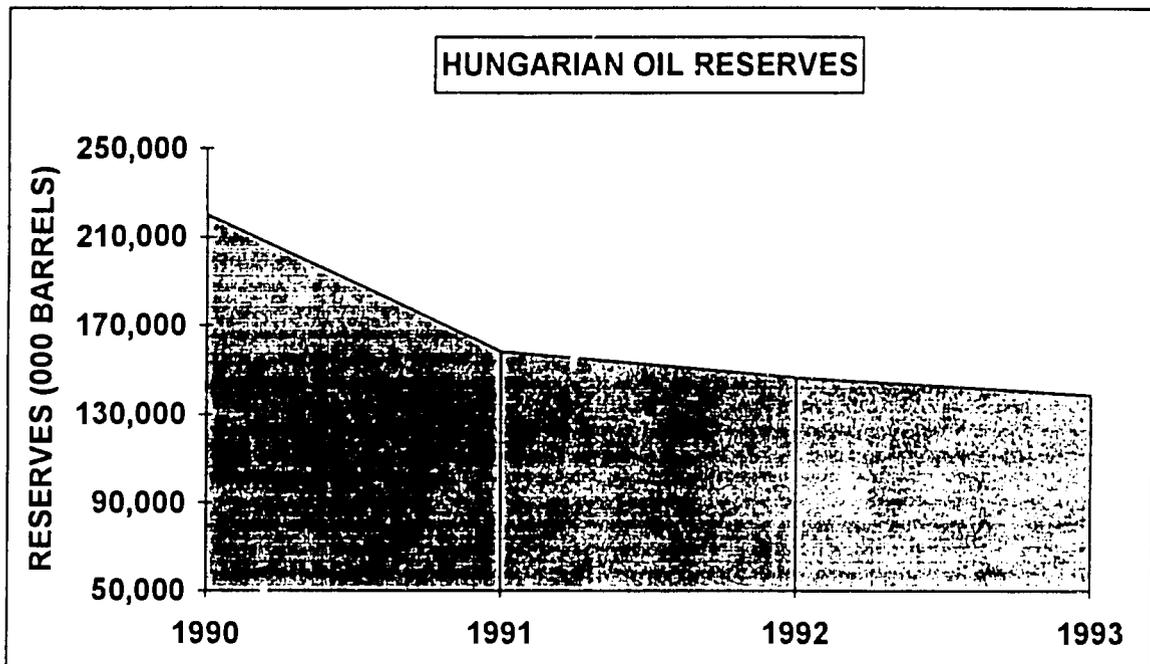


133

While annual Hungarian production has ranged between 1.75 to 2.03 million metric tons over the last two decades, it is estimated that production will fall by about 14 percent (to 1.5 million metric tons) by the year 2000 and another 47 percent (to .8 million metric tons) by the year 2010.

The graph below shows the decline in Hungary's oil reserves over the past few years, from 200 million barrels in 1990 to approximately 140 million barrels in 1993. The reserves to production ratio is estimated to range from 8 to 11 years.

Graph IV-3



Part A: Discounted Cash Flow Method

1. Using the following information, calculate an appropriate cost of equity using the capital asset pricing model (Note: it is your task to determine an appropriate specific company risk premium, if any, attributable to the company based on the provided information):
 - The average European long-term government bond rate is 6.3 percent.
 - The worldwide industry average beta for comparable companies is 1.03.
 - The equity risk premium for European countries is 4.3 percent.
 - Based on your analysis of HDC relative to companies in international public markets, you believe a small stock risk premium of 5.0 percent is warranted.
 - Based upon your analysis of the country risk (Hungary), you attribute a country risk premium of 4 percent.

134

2. Using your equity discount rate conclusions in Part 1 and the information provided in Exhibits 1 and 2, determine the value of the company's equity using the discounted cash flow model.

Part B: Guideline Company Method

Using the information in Exhibits 3 and 4 complete the guideline company approach using the worksheet provided in Exhibit 5.

Part C: Asset Accumulation Method and Value Conclusion

You are provided with the book and market values of the company's assets in Exhibit 6. Using this information as well as your conclusions in Parts A and B, conclude a value indication for the company's equity.

Exhibit 1
Hungarian Drilling Company
Historical Balance Sheets (000 HUF)

Assets	As of		Common Size:		Comparable Data:	
	Dec. 31:		1992	1993	RMA	GLC's
	1992	1993			SIC 1381	
Current Assets						
Cash	540,358	274,940	12.1%	6.5%	8.5%	14.8%
Receivables	650,109	483,228	14.5%	11.4%		
Inventories	1,073,185	825,582	23.9%	19.4%		
Total current assets	2,263,652	1,583,750	50.5%	37.3%	45.6%	50.2%
Other Assets						
Intangible fixed assets	1,306	6,434	0.0%	0.2%		
Tangible fixed assets	2,083,796	2,591,554	46.5%	61.0%	44.9%	47.4%
Investments	64,750	9,460	1.4%	0.2%		
Receivables	69,635	56,798	1.6%	1.3%		
Total other assets	2,219,487	2,664,246	49.5%	62.7%		
Total Assets	4,483,139	4,247,996	100.0%	100.0%	100.0%	100.0%
Liabilities & Equity						
Current Liabilities						
Short term loan	168,340	0	3.8%	0.0%		
Payables	668,891	575,098	14.9%	13.5%		
Taxes payable	86,700	78,202	1.9%	1.8%		
Total current liabilities	923,931	653,300	20.6%	15.4%	33.4%	21.2%
Non current liabilities	244,590	270,198	5.5%	6.4%		
Provisions	166,498	166,887	3.7%	3.9%		
Total liabilities	1,335,019	1,090,385	29.8%	25.7%	59.7%	38.5%
Equity						
Share capital	1,000,000	1,000,000	22.3%	23.5%		
Capital reserve	1,881,261	1,881,251	42.0%	44.3%		
Retained earnings	266,859	276,350	6.0%	6.5%		
Total equity	3,148,120	3,157,611	70.2%	74.3%	40.3%	61.5%
Total liabilities & equity	4,483,139	4,247,996	100.0%	100.0%	100.0%	100.0%

1,000,000 shares outstanding

EXHIBIT 2
HUNGARIAN DRILLING COMPANY
DISCOUNTED CASH FLOW
BASED ON THE NABORS-WESTERN MODEL

Assumptions:					
Working capital to sales	18.0%	Interest rate	1994	18.0%	
1993 revenues	5,173,034	(new loans)	1995	13.0%	
Working capital, Dec. 31, 1993	930,450		1996	11.0%	
Residual growth	2.0%		1997-1998	8.0%	
Tax rate	40.0%	Direct costs	68.9%	percent of sales	
Depreciable years, tangible fixed assets	17	Maintenance costs	4.7%	percent of sales	
Non-operating assets	66,258	Supervision	9.8%	percent growth	
		Insurance	6.2%	percent growth	
		Other costs	12.0%	percent of sales	

(000s)	Actual 1993	Forecasted 1994	1995	1996	1997	1998
Gross Revenues	5,173,034	5,374,782	5,659,646	5,982,246	6,759,938	7,402,132
Direct costs	3,636,562	3,703,225	3,899,496	4,121,767	4,657,597	5,100,069
Gross contribution	1,536,472	1,671,557	1,760,150	1,860,478	2,102,341	2,302,063
Year to year gain in sales		3.9%	5.3%	5.7%	13.0%	9.5%
Maintenance costs	243,133	252,615	266,003	281,166	317,717	347,900
Contribution margin	1,293,339	1,418,943	1,494,146	1,579,313	1,784,624	1,954,163
Fixed expenses						
Supervision	261,020	286,600	314,687	345,526	379,388	416,568
Insurance	18,682	19,840	21,070	22,377	23,764	25,237
Operation income	1,013,637	1,112,502	1,158,389	1,211,410	1,381,472	1,512,358
Other costs	620,764	644,974	679,157	717,869	811,193	888,756
Earnings before depr., interest & tax	392,873	467,528	479,232	493,541	570,279	624,102
Interest expense	11,601	30,780	42,326	54,859	39,897	39,897
Depreciation - existing assets	152,444	152,444	152,444	152,444	152,444	152,444
Depreciation - from investment	10,000	10,059	19,152	29,337	40,641	53,189
Total depreciation	162,444	162,503	171,596	181,781	193,085	205,633
Earnings before taxes	218,828	274,245	265,310	256,901	337,297	378,571
Taxes	87,531	109,698	106,124	102,760	134,919	151,429
Net income	131,297	164,547	159,186	154,140	202,378	227,143
Net income		164,547	159,186	154,140	202,378	227,143
+ depreciation		162,503	171,596	181,781	193,085	205,633
+ new loans		171,000	154,584	173,134		
- working capital		36,315	51,275	58,068	139,985	115,595
- capital investment		171,000	154,584	173,134	192,179	213,318
- loan payments						
Cash flow		290,736	279,507	277,853	63,300	103,863

EXHIBIT 3 GUIDELINE COMPANY APPROACH FINANCIAL ANALYSIS AND COMPARISON		LIQUIDITY		LEVERAGE		RETURNS		EFFICIENCY
COMPANY	COUNTRY	CURRENT RATIO	WORKING CAPITAL/ SALES	LONG-TERM DEBT/ TOTAL CAP.	TIMES INTEREST EARNED	PRETAX CF RETURN ON ASSETS (1)	PRETAX CF RETURN ON EQUITY (1)	SALES/ ASSETS
AUSTRALIAN OIL & GAS CORP LIMITED	AUSTRALIA	2.9	67.3%	0.0%		10.7%	12.7%	0.60
BAROID CORPORATION	UNITED STATES	1.5	16.2%	31.4%	2.0	9.8%	22.4%	1.10
COMPUTALOG GEARHART LTD.	CANADA	2.0	27.8%	16.5%		-2.1%	-3.4%	0.88
NABORS INDUSTRIES, INC.	UNITED STATES	2.3	30.7%	20.5%	3.9	9.9%	15.8%	0.82
NEW LONDON PLC	UNITED KINGDOM	1.4	24.2%	27.3%	0.2	1.5%	3.8%	0.76
PARKER DRILLING COMPANY	UNITED STATES	3.9	59.8%	0.0%		3.4%	3.8%	0.43
WESTERN COMPANY OF NORTH AMERICA (T	UNITED STATES	1.9	16.1%	51.5%	1.1	6.6%	16.3%	0.73
AVERAGE		2.3	34.6%	21.0%	1.6	5.7%	10.2%	0.76
MEDIAN		2.0	27.8%	20.5%	1.5	6.6%	12.7%	0.76
RMA-OIL & GAS WELL DRILLING (23 COMPANIES)		1.4	8.1%	32.3%	3.9	#N/A	#N/A	
HUNGARIAN DRILLING COMPANY		2.4	18.0%	0.0%	19.9	9.0%	12.1%	1.22

EXHIBIT 4 GUIDELINE COMPANY APPROACH MARKET DATA					
COMPANY	COUNTRY	BETA	PRICE TO EARNINGS	PRICE TO 5Y AVG CF	PRICE TO CF
AUSTRALIAN OIL & GAS CORP LIMITED	AUSTRALIA	-0.07	5.7	3.3	4.4
BAROID CORPORATION	UNITED STATES	1.42		9.3	7.2
COMPUTALOG GEARHART LTD.	CANADA	3.41	9.4		
NABORS INDUSTRIES, INC.	UNITED STATES	1.03	13.5	12.6	10.8
NEW LONDON PLC	UNITED KINGDOM	0.70		5.3	
PARKER DRILLING COMPANY	UNITED STATES	0.81			
WESTERN COMPANY OF NORTH AMERICA (T	UNITED STATES	1.56	5.4	2.3	3.6
MEDIAN		1.03	7.5	5.3	5.8

**EXHIBIT 5
GUIDELINE COMPANY APPROACH
HUNGARIAN DRILLING COMPANY
(000s)**

		Price to: Net Income	Price to: Cash Flow
Amount		131,297	293,741
Multiple value		7.00	5.00
Country risk adjusted multiple value	1.25	5.60	4.00
Minority, marketable value			
Control premium	30.0%		
Value of operations			
Plus: non-operating assets			
Estimated value of the equity			
Rounded			

170

EXHIBIT 5
GUIDELINE COMPANY APPROACH
HUNGARIAN DRILLING COMPANY
(000s)

		Price to:	Price to:
		Net Income	Cash Flow
Amount		131,297	293,741
Multiple value		7.00	5.00
Country risk adjusted multiple value	1.25	5.60	4.00
Minority, marketable value		735,263	1,174,964
Control premium	30.0%	220,579	352,489
Value of operations		955,842	1,527,453
Plus: non-operating assets		66,258	66,258
Estimated value of the equity		1,022,100	1,593,711
Rounded		1,022,000	1,594,000

Exhibit 6
Hungarian Drilling Company
Market Value Adjusted Balance Sheet

(000s)		
Assets	1993	Market Value
Current Assets		
Cash	274,940	274,940
Receivables	483,228	483,228
Inventories	825,582	825,582
Total current assets	1,583,750	1,583,750
Other Assets		
Intangible fixed assets	6,434	0
Tangible fixed assets	2,591,554	2,000,000
Investments	9,460	9,460
Receivables	56,798	0
Total other assets	2,664,246	2,009,460
Total Assets	4,247,996	3,593,210
Liabilities & Equity		
Current Liabilities		
Short term loan	0	0
Payables	575,098	575,098
Taxes payable	78,202	78,202
Total current liabilities	653,300	653,300
Non current liabilities	270,198	270,198
Provisions	166,887	166,887
Total liabilities	1,090,385	437,085
Total equity	3,157,611	2,502,825
Total liabilities & equity	4,247,996	3,593,210

Hungarian Drilling Company
Outside Investor Analysis
As of December 31, 1993

Step 1. INPUTS for Product Sales and Gross Margin FORECASTS	Current year 1993	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998
A INPUT Current year	1993					
B Forecast TOTAL SALES or UNIT SALES (T or U)?	T	(If T is selected, proceed to #1C. If U is selected, proceed to #1D)				
C INPUTS for TOTAL SALES (T) forecast						
INPUT Current year sales	5,173,034					
INPUT Current year cost of goods sold (or cost of service)	3,636,562					
INPUT Sales growth rates for years 1-5		3.9%	5.3%	5.7%	13.0%	9.5%
INPUT Cost of goods sold (or cost of service) as a percent of sales for years 1-5		68.9%	68.9%	68.9%	68.9%	68.9%
D INPUTS for UNIT SALES (U) forecast						
INPUT Product Names and Forecasted Unit Production:						
Product #1	0	0	0	0	0	0
Product #2	0	0	0	0	0	0
Product #3	0	0	0	0	0	0
INPUT Product Groups-Unit Capacity						
Product #1	0	0	0	0	0	0
Product #2	0	0	0	0	0	0
Product #3	0	0	0	0	0	0
INPUT Unit Sales Prices						
Product #1	0	0.0%	0.0%	0.0%	0.0%	0.0%
Product #2	0	0.0%	0.0%	0.0%	0.0%	0.0%
Product #3	0	0.0%	0.0%	0.0%	0.0%	0.0%
INPUT Product Cost per Unit						
Product #1	0	0.0%	0.0%	0.0%	0.0%	0.0%
Product #2	0	0.0%	0.0%	0.0%	0.0%	0.0%
Product #3	0	0.0%	0.0%	0.0%	0.0%	0.0%

Step 2. INPUTS for Variable and Fixed Costs and Taxation FORECASTS	Current year 1993	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998
A INPUT Variable Cost forecasts						
Maintenance	243,133	4.7%	4.7%	4.7%	4.7%	4.7%
Other costs	620,764	12.0%	12.0%	12.0%	12.0%	12.0%
Insurance	0	0.0%	0.0%	0.0%	0.0%	0.0%
Legal and auditing	0	0.0%	0.0%	0.0%	0.0%	0.0%
Utilities	0	0.0%	0.0%	0.0%	0.0%	0.0%
Miscellaneous	0	0.0%	0.0%	0.0%	0.0%	0.0%
Other #1	0	0.0%	0.0%	0.0%	0.0%	0.0%
Other #2	0	0.0%	0.0%	0.0%	0.0%	0.0%
OPTIONAL: INPUT TOTAL VARIABLE COSTS	0	0.0%	0.0%	0.0%	0.0%	0.0%
B INPUT for Fixed Cost forecasts						
Supervision	261,020	9.8%	9.8%	9.8%	9.8%	9.8%
Insurance	18,682	6.2%	6.2%	6.2%	6.2%	6.2%
Maintenance	0	0.0%	0.0%	0.0%	0.0%	0.0%
Other #1	0	0.0%	0.0%	0.0%	0.0%	0.0%
Other #2	0	0.0%	0.0%	0.0%	0.0%	0.0%
OPTIONAL: INPUT TOTAL FIXED COSTS	0	0.0%	0.0%	0.0%	0.0%	0.0%
C INPUT Current Year Taxes and Forecasted Tax Rates						
Tax Rate	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%

INPUT SECTION

Hungarian Drilling Company
 Outside Investor Analysis
 As of December 31, 1993

Step 3. INPUTS for FORECASTED Depreciation and Capital Expenditures

A. INPUT Current Year Depreciation Expense		162,444																																			
B. INPUT Current Depreciable Assets			<table border="1"> <tr> <td>INPUT Current Year Existing Net Fixed Assets</td> <td>INPUT Depreciable Year</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Short depreciable life (1-5 years)</td> <td></td> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>Medium depreciable life (6-19 years)</td> <td></td> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>Long depreciable life (20+)</td> <td></td> <td>2,591,534</td> <td>17</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td>2,591,534</td> <td></td> <td></td> <td></td> </tr> </table>					INPUT Current Year Existing Net Fixed Assets	INPUT Depreciable Year					Short depreciable life (1-5 years)		0	0			Medium depreciable life (6-19 years)		0	0			Long depreciable life (20+)		2,591,534	17			Total		2,591,534			
INPUT Current Year Existing Net Fixed Assets	INPUT Depreciable Year																																				
Short depreciable life (1-5 years)		0	0																																		
Medium depreciable life (6-19 years)		0	0																																		
Long depreciable life (20+)		2,591,534	17																																		
Total		2,591,534																																			
C. INPUT Capital Expenditures in			<table border="1"> <tr> <td rowspan="2">INPUT Depreciable Year</td> <td colspan="5">INPUT Forecasted Capital Expenditures</td> </tr> <tr> <td>Year 1 1994</td> <td>Year 2 1995</td> <td>Year 3 1996</td> <td>Year 4 1997</td> <td>Year 5 1998</td> </tr> <tr> <td>Short depreciable life (1-5 years)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Medium depreciable life (6-19 years)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Long depreciable life (20+)</td> <td>17</td> <td>171,000</td> <td>154,584</td> <td>173,134</td> <td>192,179</td> <td>213,318</td> </tr> </table>					INPUT Depreciable Year	INPUT Forecasted Capital Expenditures					Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998	Short depreciable life (1-5 years)	0	0	0	0	0	Medium depreciable life (6-19 years)	0	0	0	0	0	Long depreciable life (20+)	17	171,000	154,584	173,134	192,179	213,318
INPUT Depreciable Year	INPUT Forecasted Capital Expenditures																																				
	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998																																
Short depreciable life (1-5 years)	0	0	0	0	0																																
Medium depreciable life (6-19 years)	0	0	0	0	0																																
Long depreciable life (20+)	17	171,000	154,584	173,134	192,179	213,318																															

Step 4. INPUTS for FORECASTED Long Term Financing

A. INPUTS for Current and Forecasted Long Term Debt Financing		11,601																																															
INPUT Current Year Interest Expense (In Currency)			<table border="1"> <tr> <td></td> <td>Year 1 1994</td> <td>Year 2 1995</td> <td>Year 3 1996</td> <td>Year 4 1997</td> <td>Year 5 1998</td> </tr> <tr> <td>Debt Instrument #1</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998	Debt Instrument #1																																			
	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998																																												
Debt Instrument #1																																																	
INPUT Fixed or Variable Interest Rate (F or V)		V																																															
INPUT Fixed Interest Rate (F)		0.0%	<table border="1"> <tr> <td colspan="6">INPUT Forecasted Variable Interest Rates</td> </tr> <tr> <td></td> <td>18.0%</td> <td>13.0%</td> <td>11.0%</td> <td>8.0%</td> <td>8.0%</td> </tr> <tr> <td>INPUT Forecasted Variable Interest Rates (V)</td> <td>0</td> <td>171,000</td> <td>325,584</td> <td>498,718</td> <td>498,718</td> </tr> <tr> <td>INPUT Beginning of Year Debt Balance (Year 1 only)</td> <td>171,000</td> <td>154,584</td> <td>173,134</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Additional Debt</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Principal Payments</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Ending Debt Balance</td> <td>171,000</td> <td>325,584</td> <td>498,718</td> <td>498,718</td> <td>498,718</td> </tr> </table>					INPUT Forecasted Variable Interest Rates							18.0%	13.0%	11.0%	8.0%	8.0%	INPUT Forecasted Variable Interest Rates (V)	0	171,000	325,584	498,718	498,718	INPUT Beginning of Year Debt Balance (Year 1 only)	171,000	154,584	173,134	0	0	INPUT Additional Debt	0	0	0	0	0	INPUT Principal Payments	0	0	0	0	0	Ending Debt Balance	171,000	325,584	498,718	498,718	498,718
INPUT Forecasted Variable Interest Rates																																																	
	18.0%	13.0%	11.0%	8.0%	8.0%																																												
INPUT Forecasted Variable Interest Rates (V)	0	171,000	325,584	498,718	498,718																																												
INPUT Beginning of Year Debt Balance (Year 1 only)	171,000	154,584	173,134	0	0																																												
INPUT Additional Debt	0	0	0	0	0																																												
INPUT Principal Payments	0	0	0	0	0																																												
Ending Debt Balance	171,000	325,584	498,718	498,718	498,718																																												
Debt Instrument #2																																																	
INPUT Fixed or Variable Interest Rate (F or V)		F																																															
INPUT Fixed Interest Rate (F)		0.0%	<table border="1"> <tr> <td colspan="6">INPUT Forecasted Variable Interest Rates</td> </tr> <tr> <td></td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> </tr> <tr> <td>INPUT Forecasted Variable Interest Rates (V)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Beginning of Year Debt Balance (Year 1 only)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Additional Debt</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Principal Payments</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Ending Debt Balance</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>					INPUT Forecasted Variable Interest Rates							0.0%	0.0%	0.0%	0.0%	0.0%	INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0	INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0	INPUT Additional Debt	0	0	0	0	0	INPUT Principal Payments	0	0	0	0	0	Ending Debt Balance	0	0	0	0	0
INPUT Forecasted Variable Interest Rates																																																	
	0.0%	0.0%	0.0%	0.0%	0.0%																																												
INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0																																												
INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0																																												
INPUT Additional Debt	0	0	0	0	0																																												
INPUT Principal Payments	0	0	0	0	0																																												
Ending Debt Balance	0	0	0	0	0																																												
Debt Instrument #3																																																	
INPUT Fixed or Variable Interest Rate (F or V)		F																																															
INPUT Fixed Interest Rate (F)		0.0%	<table border="1"> <tr> <td colspan="6">INPUT Forecasted Variable Interest Rates</td> </tr> <tr> <td></td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> </tr> <tr> <td>INPUT Forecasted Variable Interest Rates (V)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Beginning of Year Debt Balance (Year 1 only)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Additional Debt</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Principal Payments</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Ending Debt Balance</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>					INPUT Forecasted Variable Interest Rates							0.0%	0.0%	0.0%	0.0%	0.0%	INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0	INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0	INPUT Additional Debt	0	0	0	0	0	INPUT Principal Payments	0	0	0	0	0	Ending Debt Balance	0	0	0	0	0
INPUT Forecasted Variable Interest Rates																																																	
	0.0%	0.0%	0.0%	0.0%	0.0%																																												
INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0																																												
INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0																																												
INPUT Additional Debt	0	0	0	0	0																																												
INPUT Principal Payments	0	0	0	0	0																																												
Ending Debt Balance	0	0	0	0	0																																												
Debt Instrument #4																																																	
INPUT Fixed or Variable Interest Rate (F or V)		F																																															
INPUT Fixed Interest Rate (F)		0.0%	<table border="1"> <tr> <td colspan="6">INPUT Forecasted Variable Interest Rates</td> </tr> <tr> <td></td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> </tr> <tr> <td>INPUT Forecasted Variable Interest Rates (V)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Beginning of Year Debt Balance (Year 1 only)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Additional Debt</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Principal Payments</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Ending Debt Balance</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>					INPUT Forecasted Variable Interest Rates							0.0%	0.0%	0.0%	0.0%	0.0%	INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0	INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0	INPUT Additional Debt	0	0	0	0	0	INPUT Principal Payments	0	0	0	0	0	Ending Debt Balance	0	0	0	0	0
INPUT Forecasted Variable Interest Rates																																																	
	0.0%	0.0%	0.0%	0.0%	0.0%																																												
INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0																																												
INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0																																												
INPUT Additional Debt	0	0	0	0	0																																												
INPUT Principal Payments	0	0	0	0	0																																												
Ending Debt Balance	0	0	0	0	0																																												
Debt Instrument #5																																																	
INPUT Fixed or Variable Interest Rate (F or V)		F																																															
INPUT Fixed Interest Rate (F)		0.0%	<table border="1"> <tr> <td colspan="6">INPUT Forecasted Variable Interest Rates</td> </tr> <tr> <td></td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> <td>0.0%</td> </tr> <tr> <td>INPUT Forecasted Variable Interest Rates (V)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Beginning of Year Debt Balance (Year 1 only)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Additional Debt</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Principal Payments</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Ending Debt Balance</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>					INPUT Forecasted Variable Interest Rates							0.0%	0.0%	0.0%	0.0%	0.0%	INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0	INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0	INPUT Additional Debt	0	0	0	0	0	INPUT Principal Payments	0	0	0	0	0	Ending Debt Balance	0	0	0	0	0
INPUT Forecasted Variable Interest Rates																																																	
	0.0%	0.0%	0.0%	0.0%	0.0%																																												
INPUT Forecasted Variable Interest Rates (V)	0	0	0	0	0																																												
INPUT Beginning of Year Debt Balance (Year 1 only)	0	0	0	0	0																																												
INPUT Additional Debt	0	0	0	0	0																																												
INPUT Principal Payments	0	0	0	0	0																																												
Ending Debt Balance	0	0	0	0	0																																												
B. INPUTS for Forecasted Equity Financing			<table border="1"> <tr> <td colspan="6">INPUT Dividend Equity Issues/Repurchases</td> </tr> <tr> <td></td> <td>Year 1 1994</td> <td>Year 2 1995</td> <td>Year 3 1996</td> <td>Year 4 1997</td> <td>Year 5 1998</td> </tr> <tr> <td>INPUT New Equity Issues (In Currency)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Equity Repurchases (In Currency)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Total Shares Issued (Repurchased)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>INPUT Current Shares Outstanding</td> <td>1,000,000</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					INPUT Dividend Equity Issues/Repurchases							Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998	INPUT New Equity Issues (In Currency)	0	0	0	0	0	INPUT Equity Repurchases (In Currency)	0	0	0	0	0	INPUT Total Shares Issued (Repurchased)	0	0	0	0	0	INPUT Current Shares Outstanding	1,000,000										
INPUT Dividend Equity Issues/Repurchases																																																	
	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998																																												
INPUT New Equity Issues (In Currency)	0	0	0	0	0																																												
INPUT Equity Repurchases (In Currency)	0	0	0	0	0																																												
INPUT Total Shares Issued (Repurchased)	0	0	0	0	0																																												
INPUT Current Shares Outstanding	1,000,000																																																

Step 5. INPUT Valuation Assumptions

Working capital/sales	18.0%	Cost of Equity	20.0%
Current year working capital	930,430	Fair Market Value of Non-operating assets	66,258
Residual Growth Rate	2.0%		

144

Discounted Net Cash Flow Model

Hungarian Drilling Company
 Outside Investor Analysis
 As of December 31, 1993

OUTPUT SECTION PAGE 1

	Current year 1993	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998
Discounted Net Cash Flow						
Total Sales (PAGE 2)	5,173,034	5,374,782	5,659,646	5,982,246	6,759,938	7,402,132
Cost of Goods Sold (Cost of Service) (PAGE 2)	3,636,562 70.3%	3,703,225 69.0%	3,899,496 69.0%	4,121,767 68.9%	4,657,597 69.0%	5,100,069 69.0%
Gross Margin	1,536,472 29.7%	1,671,557 31.1%	1,760,150 31.1%	1,860,478 31.1%	2,102,341 31.1%	2,302,063 31.1%
Variable and Fixed Costs (PAGE 3)						
Total variable costs	863,897	897,589	945,161	999,035	1,128,910	1,236,156
Total fixed costs	279,702	306,440	335,757	367,903	403,152	441,805
Total variable and fixed costs	1,143,599 22.1%	1,204,029 22.4%	1,280,918 22.6%	1,366,938 22.5%	1,532,061 22.7%	1,677,961 22.7%
Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA)	392,873 7.6%	467,528 8.7%	479,232 8.5%	493,541 8.3%	570,279 8.4%	624,102 8.4%
Depreciation (PAGE 5)	162,444	162,503	171,596	181,781	193,085	205,633
Earnings Before Interest and Taxes (EBIT)	230,429	305,025	307,636	311,760	377,194	418,468
Interest Expense (PAGE 4)	11,601	30,780	42,326	54,859	39,897	39,897
Profit Before Tax	218,828 4.2%	274,245 5.1%	265,310 4.7%	256,901 4.3%	337,296 5.0%	378,571 5.1%
Tax Provision	87,531	109,698	106,124	102,760	134,919	151,428
Profit After Tax	131,297 2.5%	164,547 3.1%	159,186 2.9%	154,141 2.6%	202,378 3.0%	227,143 3.1%
Free Cash Flow						
Profit After Tax		164,547	159,186	154,141	202,378	227,143
Depreciation		162,503	171,596	181,781	193,085	205,633
Additional working capital requirements		(36,315)	(51,275)	(58,068)	(139,985)	(115,595)
Capital investment		(171,000)	(154,584)	(173,134)	(192,179)	(213,318)
Additional Debt Financing		171,000	154,584	173,134	0	0
Principal Payments		0	0	0	0	0
Changes in Equity Financing		0	0	0	0	0
Free Cash Flow		290,736	279,507	277,853	63,300	103,863
Present Value Factor		0.9129	0.7607	0.6339	0.5283	0.4402
Present Value of Cash Flow		265,404	212,628	176,142	33,440	45,724
				Residual Value		632,103
Sum of Present Value of Cash Flows	733,338					
Present Value of Residual	278,274					
Preliminary Value	1,011,612					
Working capital (deficiency) surplus	(696)					
Non-operating assets	66,258					
Equity value indication	1,077,174					
Total shares outstanding	1,000,000					
Equity value per share	1.08					

145

Discounted Net Cash Flow Model
Hungarian Drilling Company
Outside Investor Analysis
As of December 31, 1993

OUTPUT SECTION PAGE 2

SALES AND COST OF GOODS SOLD (COST OF SERVICE) ANALYSIS	Current year 1994	Year 1 1995	Year 2 1996	Year 3 1997	Year 4 1998	Year 5 1999
Unit Production						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Unit Capacity						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Percent of Capacity						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Price per Unit						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Total Sales by Product						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Cost per Unit						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Total Costs by Product						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Profit per Unit						
Product #1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Product #3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
TOTAL SALES	5,173,034	5,374,782	5,659,646	5,982,246	6,759,938	7,402,132
TOTAL COSTS OF GOODS SOLD (COST OF SERVICE)	3,636,562	3,703,225	3,899,496	4,121,767	4,657,597	5,100,069

VARIABLE AND FIXED COST ANALYSIS	Current year 1993	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998
<u>Variable Costs</u>						
Administrative	243,133	252,615	266,003	281,166	317,717	347,900
Marketing	620,764	644,974	679,157	717,869	811,193	888,256
Insurance	0	0	0	0	0	0
Legal and auditing	0	0	0	0	0	0
Utilities	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0
Other #1	0	0	0	0	0	0
Other #2	0	0	0	0	0	0
<i>TOTAL VARIABLE COSTS</i>	0	0	0	0	0	0
Total Variable Costs	863,897	897,589	945,161	999,035	1,128,910	1,236,156
<u>Fixed Costs</u>						
Rent	261,020	286,600	314,687	345,526	379,388	416,568
Salaries	18,682	19,840	21,070	22,377	23,764	25,237
Maintenance	0	0	0	0	0	0
Other #1	0	0	0	0	0	0
Other #2	0	0	0	0	0	0
<i>TOTAL FIXED COSTS</i>	0	0	0	0	0	0
Total Fixed Costs	279,702	306,440	335,757	367,903	403,152	441,805
<u>Variable Costs (as a percent of sales)</u>						
Administrative	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%
Marketing	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Insurance	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Legal and auditing	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Utilities	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Miscellaneous	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other #1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other #2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<i>TOTAL VARIABLE COSTS</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Variable Costs	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%
<u>Fixed Costs (percent growth)</u>						
Rent		9.8%	9.8%	9.8%	9.8%	9.8%
Salaries		6.2%	6.2%	6.2%	6.2%	6.2%
Maintenance		0.0%	0.0%	0.0%	0.0%	0.0%
Other #1		0.0%	0.0%	0.0%	0.0%	0.0%
Other #2		0.0%	0.0%	0.0%	0.0%	0.0%
<i>TOTAL FIXED COSTS</i>		0.0%	0.0%	0.0%	0.0%	0.0%
Total Fixed Costs		9.6%	9.6%	9.6%	9.6%	9.6%
TOTAL VARIABLE COSTS	863,897	897,589	945,161	999,035	1,128,910	1,236,156
TOTAL FIXED COSTS	279,702	306,440	335,757	367,903	403,152	441,805

FORECASTED INTEREST PAYMENTS AND NET CHANGES IN LONG TERM FINANCING REQUIREMENTS

A. INPUTS for Current and Forecasted Long Term Debt Financing					
--	--	--	--	--	--

TOTAL INTEREST PAYMENTS	Year 1	Year 2	Year 3	Year 4	Year 5
	1994	1995	1996	1997	1998

Debt Instrument #1	30,780	42,326	54,859	39,897	39,897
Debt Instrument #2	0	0	0	0	0
Debt Instrument #3	0	0	0	0	0
Debt Instrument #4	0	0	0	0	0
Debt Instrument #5	0	0	0	0	0

TOTAL INTEREST PAYMENTS	30,780	42,326	54,859	39,897	39,897
--------------------------------	---------------	---------------	---------------	---------------	---------------

TOTAL ADDITIONAL DEBT FINANCING					
--	--	--	--	--	--

Debt Instrument #1	171,000	154,584	173,134	0	0
Debt Instrument #2	0	0	0	0	0
Debt Instrument #3	0	0	0	0	0
Debt Instrument #4	0	0	0	0	0
Debt Instrument #5	0	0	0	0	0

TOTAL ADDITIONAL DEBT FINANCING	171,000	154,584	173,134	0	0
--	----------------	----------------	----------------	----------	----------

TOTAL PRINCIPAL PAYMENTS					
---------------------------------	--	--	--	--	--

Debt Instrument #1	0	0	0	0	0
Debt Instrument #2	0	0	0	0	0
Debt Instrument #3	0	0	0	0	0
Debt Instrument #4	0	0	0	0	0
Debt Instrument #5	0	0	0	0	0

TOTAL PRINCIPAL PAYMENTS	0	0	0	0	0
---------------------------------	----------	----------	----------	----------	----------

TOTAL ENDING DEBT	171,000	325,584	498,718	498,718	498,718
--------------------------	----------------	----------------	----------------	----------------	----------------

TOTAL CHANGE IN EQUITY FINANCING					
---	--	--	--	--	--

New Equity Issues	0	0	0	0	0
Additional shares issued	0	0	0	0	0
Equity Repurchases	0	0	0	0	0

TOTAL CHANGE IN EQUITY FINANCING	0	0	0	0	0
---	----------	----------	----------	----------	----------

EBIT to INTEREST	9.91	7.27	5.68	9.45	10.49
-------------------------	-------------	-------------	-------------	-------------	--------------

Discounted Net Cash Flow Model

Hungarian Drilling Company

Outside Investor Analysis

As of December 31, 1993

OUTPUT SECTION PAGE 5

FIXED ASSET AND CAPITAL EXPENDITURE DEPRECIATION	Current year 1993	Year 1 1994	Year 2 1995	Year 3 1996	Year 4 1997	Year 5 1998
	Net Fixed Assets					
<u>Fixed Asset Depreciation - Existing Assets</u>						
Depreciation for short term depreciable assets	0	0	0	0	0	0
Depreciation for medium term depreciable assets	0	0	0	0	0	0
Depreciation for long term depreciable assets	2,591,554	152,444	152,444	152,444	152,444	152,444
<u>Capital Expenditure Depreciation</u>						
Depreciation for short term depreciable assets		0	0	0	0	0
			0		0	0
				0		0
					0	0
						0
Depreciation for medium term depreciable assets		0	0	0	0	0
			0		0	0
			0		0	0
				0		0
					0	0
Depreciation for long term depreciable assets		10,059	10,059	10,059	10,059	10,059
			9,093	9,093	9,093	9,093
				10,184	10,184	10,184
					11,305	11,305
						12,548
TOTAL DEPRECIATION EXPENSE		162,503	171,596	181,781	193,085	205,633

144