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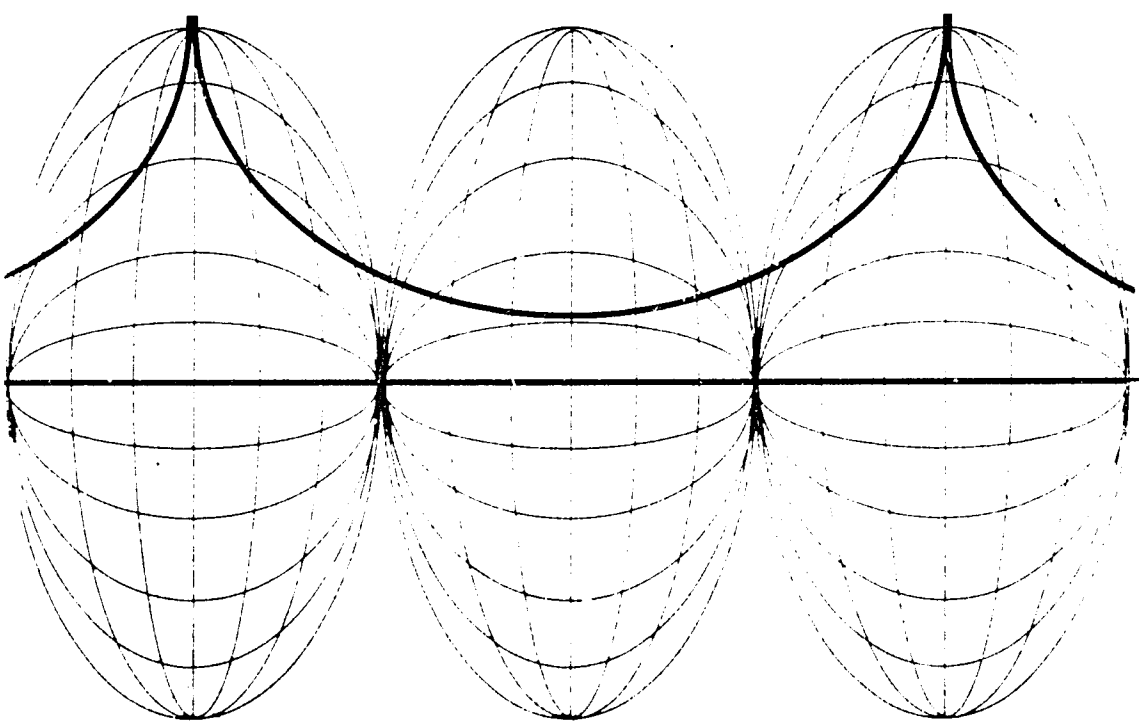

B • R • I • D • G • E • S

Basic Research and Implementation
in DevelopinG Education Systems

CASUAL PAPERS

Paper not formally reviewed.

EDUCATIONAL PLANNING AND THE PRIVATE SECTOR IN BURUNDI: A PILOT STUDY OF TWENTY-FIVE FIRMS

- Final Report -

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EXECUTIVE SUMMARY

This paper addresses the relationship between the Burundi education and training system, and private modern sector employment in Bujumbura. The study described in the report was designed in response to a request from the Government of Burundi to examine the fit between education and jobs available in the private sector, and was part of a larger, worldwide effort to identify innovative educational policy options and methods.

The method employed in this research attempts to refine the more traditional employer survey by soliciting employer cooperation and backing up instrumentation by site visits, and closer involvement of educational planners in the questionnaire design and data analysis. In addition, a Burundi agency was contracted to perform the data collection, as well as some of the data entry and analysis on-site in Bujumbura.

The purpose of the project was twofold. Extensive concerns related to graduate unemployment, the effects of structural adjustment on the education sector, and employer dissatisfaction with skill levels of entry-level employees make better information about the linkages between schooling and work essential. Mechanisms for such linkages must go beyond merely vocational education, and be capable of sensing and responding constructively to mismatches throughout the educational system. Private sector employment characteristics such as skills composition of firms, hiring practices, and perceived occupational shortages/surpluses were therefore examined from the perspective of education and training policy. Just as importantly however, given the disenchantment with methods but continuing fascination with the substance of traditional manpower planning, the study served as a pilot test for a wider effort to more routinely 'scan' the employment environment. Thus much of the discussion in the report is methodological, with future iterations of the scanning technology in mind. In general however, the study focused on a better understanding of those employment variables, such as skill levels, which affect productivity, and lend themselves to effective policy intervention.

Twenty five firms were selected varying by industrial sector (manufacturing and nonmanufacturing) and establishment size. Firm variables such as employment size (permanent and non-permanent), firm type, longevity, stability, product type, level of technology, markets and outputs were used to differentiate firms in the sample. Productivity, as a function of some of these variables, and other human resources variables such as educational level were examined preliminarily through prototype modeling approaches, although the small sample yielded little in the way of stable relationships. Occupational hiring procedures were tabulated across firms, and difficulties in recruitment identified by occupation.

A set of fifteen priority occupations was selected for more detailed analysis. Activities/equipment in each occupation were

identified, and major variations within occupational title documented. Employers' perceptions were sought as to perceived adequacy of current and future occupational supply, with focus on skills levels rather than just numbers of jobs. Actual skills levels of current employees contrasted with employer's statements concerning preferred skills levels by occupation, with employers expressing preference for higher qualifications. Finally, specific reasons were documented for employer dissatisfaction with public education and training for selected occupations.

The paper concludes with recommendations for generalizing aspects of the tested approach into more routine and formalized scans of the employment environment. Closer ties are needed between industrial employers, labor market information system activities, and education and training planners. This project has provided some practical guidance in operationalizing such coordination, and in the process has also yielded empirical information on existing mismatches in the Burundi employment environment.

CHAPTER I

INTRODUCTION AND BACKGROUND

This report describes a pilot test of a method to examine formal private sector employment in Burundi from the perspective of education and training planning in the Burundi government (GOB). This research is part of a larger worldwide project entitled Basic Research and Implementation in Developing Education Systems (BRIDGES), which seeks to develop tools for educational planning and policy analysis in Third World countries.

The initial Project BRIDGES visit to Burundi took place in the Spring of 1986, during which interest was expressed by GOB in participating in the project. Subsequently, between August 1986 and July 1988, six further visits were made by BRIDGES team members. The first of these in the fall of 1986 elaborated on policy issues of mutual interest, with the GOB identifying its most important priority as improving the fit between education and work.

GOB initially however wanted to expand the scope of our efforts beyond what was feasible with our resource constraints, and some prolonged negotiations followed throughout 1987. As discussions continued, it became clear that GOB was keenly interested in stimulating innovations in educational planning, particularly in the arena of improving occupational information made available to planners. This interest was shared at both technical and policy levels, making it not only a mainstream administrative issue, but also one in which government technicians (statisticians/planners in Ministries of Education and Labor) shared in examinations of alternative strategies. This pragmatic interest, endorsed by both traditional producers and potential users of occupational information was unique in our experience, and enabled us to focus both our study method and content on areas of mutual concern to both groups of agencies.

We ultimately settled on two studies, to be conducted jointly between BRIDGES staff and a Burundi firm to be selected to coordinate the work under contract. The first study consists of case studies of three rural primary schools and a survey of 120 surrounding households to examine how, and how well agricultural production skills are taught and then subsequently practiced in the communities. This study is reported in a series of related documents by both Burundi and BRIDGES authors.

The other study is reported on in this paper, and describes an approach to examining current occupational employment in the modern sector in Burundi, from the perspective of providing information

on general occupational skills needs to educational planners (e.g. diagnosis of major skills gaps in those currently employed, or shortages of qualified applicants for new positions).

Our approach in this private sector study is to build on earlier efforts by the Ministère du Travail (the Burundi Labor Ministry) to collect data on employees by occupation and education level. These data are obtained through a combination of mailed survey instruments and personal follow-up contacts with the known universe of private sector firms in Burundi. The resulting statistical series is a combination of manually compiled and computerized information reported periodically in documents (see for example Ministère du Travail 1984; 1987).

The Ministère D' Education Nationale (the Burundi Education Ministry) staff indicated in discussions with BRIDGES staff that they were interested in examining the relationships between education, training and formal private sector skills development. They suggested that the Labor Ministry data were incomplete for educational planning purposes, particularly in the areas of occupational structure, and educational levels of the workforce by firm and subsector. It was felt by these staff that a study providing better information on employment profiles of firms, occupational skills needs, and employment opportunities would help them target educational resources more effectively.

BRIDGES staff, for their part, concurred with the general need to have better general occupational information on the private sector workforce (ideally both formal and informal, although this study was limited only to formal sector enterprises). However, in our discussions with other GOB agencies, notably Labor, we had determined that several generic difficulties had been encountered before in describing workforce structure in Burundi, not the least of which were problems with low response rates to government surveys, and technical problems with the occupational classification system in use at the time. We suggested therefore a broader overall strategy within which this study might be lodged, going beyond merely the traditional bounds of vocational education planning in bridging the gap between education and work.

We proposed a more global, long term approach to information collection and analysis by which all of education and training, from primary through higher education, could be potentially more sensitive to shifts in occupational employment demand. This does not mean that the educational system necessarily becomes more directly involved in job skills preparation, since there is fairly wide agreement that many job-specific skills are learned best on the job (World Bank, 1988). It does mean however, that educational policy and planning are developed in the context of current knowledge of employment trends in the private sector, and especially which broad aptitudes and skills are perceived by employers as inadequate across occupations.

In this strategy, occupational information, therefore, instead of being the subject of sporadic special studies to supplement government surveys, would become more routinized as one of a number of labor market signals continually "sensed" by educational planners. Thus a new 'diagnostic' capacity would eventually become available to the Burundi Government to enable education and training systems to become more responsive to shifts in skills demand. Such signals might be, for example, follow-up surveys of institutional graduates, direct formal/informal contacts with employers and employer associations, and the findings of special studies or advisory groups to monitor and advise on educational programming and offerings in particular disciplines or areas. The core of such a national human resources policy however would rely occupational information, gathered eventually from both public and private sector employers, using standard occupational definitions, and descriptive of various aspects of technology, employment, and skills shifts in national and regional labor markets.

The rationale for seeking a better understanding of the formal modern sector composition and characteristics is simply that good information can reduce uncertainty. The structure of the modern sector while still embryonic, is not well known in Burundi. Even in highly industralized nations there are substantial disagreements as to the relationship between skills acquisition process and workforce productivity in our modern economy, particularly in view of new technologies which are transforming whole sectors of industry (Burke and Rumberger, 1987). In subSaharan Africa, while the pace of technology infusion and change may be slower, the pressures of extraordinary labor force expansion, urgent demand for extension of secondary and postsecondary educational opportunities, and increased under- and unemployment are forcing radical reappraisal of past educational policies (Work Bank, 1988). Links between educational and private sector productivity improvement and growth must be explored. Better information, it is proposed, can encourage sensitivity to labor market needs in educational investment strategies by providing the basis for identifying broad skills similarities and differences across occupations, and flagging the characteristics that are changing within these broad skill patterns.

Since targeting education and training systems more closely to occupational demand is an explicit policy of the Burundi Government, better information on the characteristics of that demand should help policy makers. In addition, improved occupational information is associated in industrialized countries with more informed occupational choice, and infrastructures for receiving and sorting this kind of information for dissemination to job seekers through such mechanisms as guidance and counseling, or employment services (McKee and Froeschle, 1985). In the African context, labor market information on both formal and informal sectors is generally incomplete, depriving government policy

processes of their critical diagnostic components, and building undesirable dependencies upon outside consultants or organizations for such services.

Consequently, we developed a working document entitled a Plan Globale, subsequently translated into French, covering both study areas. In the domain of which the second (private sector) study was a part, the following activities were envisaged:

analysis of existing data, and design of complementary studies relating to the fit between education and work;

study of job description and personnel classification methods;

improvement of occupational classification approaches;

updating of existing data bases to reflect improved occupational classification;

employment projections by occupation;

tuning of educational/training program planning in light of labor market signals; and

determining educational supply for public institutions.

It was within the context of this overall strategy that the current private sector study was designed and conducted. Two goals were to be accomplished by the study: (1) it was to provide an initial "scan" for occupational information of direct utility to education and training planners in Burundi, and therefore personnel from both Education and Labor Ministries were involved in the study design, and (2) it was to explore and develop methodologies by which public sector agencies might continue such occupational scanning in the future. In view of resource constraints, it was decided to limit the BRIDGES involvement in this instance only to research on private sector firms, although it is hoped that methods developed and refined in this phase may be subsequently generalized to public sector agencies where appropriate.

The study was designed is in two parts, the first a pilot test of our approach on a preliminary sample of 25 firms, and the second a more complete survey of 150 firms. Only the first (pilot test) is described in this report.

The remainder of this paper presents a brief summary of relevant macroeconomic, demographic and other information about Burundi, followed by a description of our method and procedures used in the pilot test, our findings, preliminary conclusions and perceived implications for the next phase of the study.

CHAPTER II

BURUNDI CONTEXT

According to the World Bank 1985 and 1986 World Development Reports, supplemented by three other World Bank publications (Social Indicators of Development 1987; Burundi Education Sector Staff Appraisal Report 1988, and the 1988 SubSaharan African Education Report) and finally, the African Employment Report (ILO/JASPA 1988), the following comparative facts are available on Burundi:

GNP per capita: in 1984 dollars, per capita GNP for Burundi was $220, higher than the weighted mean for sub-Saharan Africa ($210) and approaching the median ($260) for the 29 low income economies indexed by the Bank for this measure; ten countries were ranked lower, and the range is from $110 (Ethiopia) to $380 (Senegal); GNP per capita in 1986 was $240 in 1986 US dollars with an average annual growth rate estimated at 2.4% from 1965-80, (which dropped to a negative growth rate 1980-86);

Official development assistance: net disbursements to Burundi as a percent of GNP in 1984 was 15%, as compared with 1% weighted average across the 28 low income countries indexed, and 9% for other subSaharan African countries;

Urbanization: urban population has remained almost unchanged as a percent (2-3%) of total population from 1965-86; this is unique among the 34 low-income economies indexed by the Bank, and in striking contrast to the trend in other African low-income countries, all of which have increased their proportion of urban to total population;

Employment: in 1986, 93% of the labor force was estimated to be in agriculture; in company only with Ruanda and Nepal, Burundi has thus the highest proportion of labor force in agriculture among the 34 low income countries indexed; in addition, 1980 data suggested that less than 2% of the labor force were estimated to be employed in industry, in comparison to an average of about 8% in sub-Saharan Africa, and 15% across the 34 low income

economies in general; 6% of the labor force was estimated to work in services, as compared to 13% in subSaharan Africa and 15% in the specified low income economies;

Education: Burundi's formal educational system is 6-4-4-5, that is six years of primary school, four years of junior secondary, three to four years senior secondary, and up to five years of postsecondary. Specialization into general and technical begins in secondary school, with a third stream (normal, or teaching) beginning in senior secondary. Postsecondary specialization is provided through the University of Burundi, and a number of institutions (e.g. police/judiciary, commerce, journalism). Recent reforms have stressed agricultural technical development, necessitating use of the Kirundi language for instruction in primary schools, and increased emphasis on medium term development needs, with specific orientation towards labor market requirements. While Burundi's enrollments are still well short of the UPE goal planned to be reached in 1995/6, improvements have been noticeable; in 1983, 45% of the primary school age group were enrolled, by 1985/6 this percentage had risen to over 50%. However, at the secondary level, in 1985/6 only 4% of school age children were enrolled in school. Total education expenditures as percent of GNP were 2.6 in 1985 which is relatively low among low income economies. Gross enrollment ratios at the primary level were 68% for males and only 50% for females in 1984-6, and the corresponding net ratios were 46% and 37% respectively.

The economic and social problems facing Burundi are complex, and include persistent deficits and increasing inflation, but can be summarized as "the food/population dilemma" (USAID Regional Reconnaissance 1982). Average annual growth rate in GDP has declined from 4.8% (1965-73) to 3.6% (1973-84). Average annual population growth was estimated at 2.2% 1973-84, and is projected to be 3.0% 1980-2000. Population density (mid-1984) was 164 per square kilometer, the second highest in mainland Africa. Dependency on the agricultural sector which provided 58% of GDP in 1984, is threatened by deforestation, loss of topsoil, and corresponding shortage of agricultural land.

Coffee is the country's main cash crop, accounting for 84% of total export earnings in 1984. To a much lesser extent, tea (7.3%), cotton (0.7%) sugar, hides and fish are additional export commodities. Minerals have provided export income in the past, particularly bastnaesite and cassiterite, but are currently insignificant to the national economy. Nickel deposits, estimated at 5% of world reserves are currently being assessed for extraction. According to one report (Alan Rake, in "Africa South of the Sahara", 1987) vanadium deposits believed to be the richest in the world, as well as uranium deposits, are being surveyed. In addition, oil was discovered under Lake Tanganyika and in the Ruzizi valley, and its potential for extraction is under investigation.

Limited infrastru (roads, sealinks) has restricted the growth of industrial a vity in Burundi. Manufacturing for example accounted for les than 9% of GDP in 1982. Five Year Plans however call for increase industrial diversification. The Fourth Plan (1983-7) proposes tal expenditures of BF107,000 million, almost twice the previo Plan, and seeks increased attention to the industrial, min and services sectors.

The need for indus l/commercial expansion, and the problem of "sous emploi" comb to shape the major policy priority that we are required to dress in our project, i.e. better understanding the rela onships between education and employment. First steps in this rstanding are clearly an examination of educational offering light of the occupational structure of the country, as wel nalysis of the structure of employment in each sector.

Fro stere du avail Revues de Statistiques du Travail, sectoral emp ment ir Burundi in 1980 was as follows: Of the 4,140,000 population, 32,000 (59%) were in the labor force, and 1,918,000 (79% of the l or force) were employed. 114,000 persons were employed in the fo nal, and 1,804,000 in the informal sector. Thus, according to these data formal sector employment accounts for about 6% of total employment.

The formal sector was broken out as follows:

S SECTOR	PERMANENT (Thousands)	NON PERMANENT (Thousands)	TOTAL (Thousands)
Urban	32	5	37
Rural Ag	10	33	43
Non Ag	27	7	34
TOTAL	69	45	114

As indicated above, total permanent employment in this sector is almost 70,000 persons, with 37% in the private sector, 26% in parastatal organizations, and the remainder in public agencies, as illustrated below:

M O D E R N S E C T O R

Branch of Activity	Permanent Employees			
	Private	Parastatal	State	Total
%				
Agriculture	229	5235	4284	11812
0.170				
Mining	39	258	294	945
0.014				
Manufacturing	3510	1406	0	4976
0.072				
Energy		547	34	583
0.008				
Construction	608	4161	1675	11920
0.172				
Commercial	429	407	58	4758
0.069				
Transport/Comms	91	595	617	2125
0.031				
Banking	561	1070	398	2029
0.029				
Service	5862	3655	13251	22768
0.328				
Other	1727	950	4720	7397
0.107				
TOTAL	25698	18284	25331	69313
1.00				
%	0.371	0.264	0.365	1.00

We do not have reliable data on trends in private sector employment, but it is clear from the above that the sector constitutes a major employer in Burundi. As reported above, it also currently offers proportionally less employment opportunities than other countries. Little is known about the relationships between formal schooling and work in the firms which make up the

private enterprises in Burundi. Our study seeks therefore improved knowledge of how employment is configured in this sector, what is the schooling of employees, how occupational requirements may be changing, and what employers perceive to be essential adjustments in the education/training systems' role in preparation of Burundians for productive involvement.

CHAPTER III

METHOD AND PROCEDURES

A. Study Objectives

Within the context of the Global Plan outlined above, the private sector study was designed to examine the skills composition of firms in the private sector, employer needs, and implications for public education and training policy. In addition, there has been substantial dissaffection in the American and European literature for the discontinuities and imprecision associated with traditional manpower planning (Celestin, 1983; Richter, 1984; Braddy,1987). Accordingly, during the design as well as the conduct of data collection activities and subsequent analyses, major emphasis has been placed on producing a generalizable method for continuing to scan private sector labor markets once the study itself is completed. The ILO has noted the importance of attending to a variety of labor market "signals" in developing country human resources planning (Richter, 1984; 1989). The World Bank, in its recent study of educational policies in SubSaharan Africa (World Bank, 1988) notes the need for flexibility and adaptability in national human resources policies, in face of rising populations and increased demand for educational services at all levels. Following Richter's model, new and comprehensive methods are needed to identify, sort and analyze signals, composed of both qualitative as well as quantitative labor market information, in determining appropriate directions in which to adapt and redefine human resources policy response.

Thus it was an explicit goal of this study, as we conducted the project, to work with the relevant Ministries to shape longer term strategies specifically for occupational information collection and analysis. As already indicated in Chapter I, the overall objectives of the private sector project are to provide occupational information at a given point in time to GOB on a sample of firms, and also to develop methods for more regular collection of similar information in the future. The project was designed as having two phases, the first to review relevant literature, design and pilot test instrumentation on a small sample of firms, and report results; and the second to extend the method to the larger sample of 150 firms. The first phase was completed in September 1988, forming the subject of this report.

B. Project Organization

It was consistent with project objectives that Burundi counterparts be involved in the research to the maximum extent possible. It was decided that the BRIDGES team, in coordination with the relevant Ministry staff, prepare a request for proposals (RFP) specifying the work to be performed, levels of effort, and time schedules. The RFP was completed and released, and three bids received by November 1987. The contract was awarded to the Centre de Perfectionnement et de Formation en Cours d'Emploi (CPF) in January 1988. The CPF and BRIDGES teams then worked together to review literature, finalize project plans and begin interviewer training and data collection by March 1988. Data analysis commenced in June 1988, with responsibilities for substantive analysis of pilot study data resting mostly with BRIDGES, and methodological analyses with the CPF team, as detailed below.

Occupational information is defined as a subset of labor market information, and is confined to information that can be directly related to actual jobs in the economy, as contrasted with more general labor market data on for example, regional industrial productivity (see Lawrence, 1988).

C. Review of Literature

Resource constraints limited the literature review in this first phase to two activities, both completed by CPF. One activity examined publications in Burundi relevant to the fit between education and work. The other described the appropriate public data sources from which the teams might obtain information helpful in activities such as sample selection. A separate project report presents the results of these activities (CPF 1988a).

D. Selection of Sample Firms

The pilot study sample consisted of 25 firms and 25 occupations within those firms. Construction of this sample necessitated deriving initial occupational profiles of all firms from data collected previously by the Labor Ministry to determine whether firms selected employed persons in the occupations to be studied. A working paper was prepared by CPF on sampling issues, and rationale for sample selection (CPF 1988b). Selection criteria for firms included type (industrial classification), employment size, and occupational staffing pattern. Sampling was primarily purposive, in that the pilot instrumentation, methods and procedures had to be exposed to as many different kinds of sites/subjects as possible. Representativeness however was sought in terms of the distribution of firms within industrial sectors in Burundi, so that all major sectors in the industrial economy would be present in the sample. For example, no firms were considered from either the Mining or the Energy classification,

since their employment share was so small. Manufacturing firms were oversampled to permit some analytical comparison between manufacturing and nonmanufacturing firms. Approximately half the sample consisted of firms with 100 or less employees to ensure coverage of the smaller to medium size establishments. For ease of transportation of interviewers to and from sites, only firms in the immediate area of Bujumbura, the capital city, were considered for selection.

Occupations were selected after discussion with staff in the Education Ministry to determine which occupations were of particular concern to planners. An original list of 21 occupations was drawn up which reflected decision-makers interest in:

the perceived criticality of the occupation to sector functioning (e.g. financial officers in the Banking industry);

reputed shortfalls or surpluses in numbers of skilled persons available for existing jobs; or

the extent of public investment (planned or actual) in pre-service education and training in relation to the occupation.

A table was constructed with occupations as rows and firms as columns, with occupational employment from the most recent (1985) Ministry of Labor survey as cells. Final selection of firms was then completed to ensure distribution of sample occupations across two or more firms. This procedure also permitted preliminary specification of which occupations to study in detail in which firms in the sample.

In view of known discrepancies in the Burundi occupational classification system in current use, it was necessary develop a procedure for comparing occupational titles across firms in some way. We wanted to establish where possible that occupational titles constituted approximately similar work in the different worksites they were to be found. Two criteria were used for this determination:

the same or similar occupational title was used in each firm; as interpreted by GOB statistical agencies, and

the range of occupational skill levels from the 1985 data were comparable across firms: the skill levels are classified in broad occupational categories I through VI. These categories are predetermined by GOB, and signify more or less standard personnel classifications by levels of qualifications, with I being low and VI being high.

Since participation in the study was voluntary, initial contact with the firms to secure permission to place interviewers on site necessitated adjustment of the sample to include four replacement firms. The final sample consisted of nine Manufacturing firms, as well as two from the Agricultural sector, one Construction firm,

three from Commerce (wholesale/retail trade), three Transportation, two Banking and four Service firms. Assurances of confidentiality were given to participating enterprises, thus identification of individual firms is avoided in this report.

E. Instrumentation

The employer questionnaire (see Appendix A) contained an introductory section and three substantive sections. The introductory pages dealt with basic identification and coding, of interviewers, firms, and respondents, and included also the instructions to the interviewers. The first section consisted of questions on firm-level characteristics, such as age, type of establishment, business evolution, principal products, sales volume, technology, markets, and organizational structure.

The second part addressed human resources aspects of the firm, such as employment patterns, staffing by category, educational levels of employees by category and occupation, hiring practices, and skills needs by occupation.

The final section examined selected occupations in more detail, requesting job descriptions, skills levels, and employer perceptions regarding adequacy of public sector education and training preparation for work in these occupations.

In addition, because of our need to assess the feasibility of our approach to employers, beside each question on the questionnaire were two response codes to be recorded by interviewers. The first identified the type of respondent answering the question. The purpose of this information was to describe the types and distribution within the firm of different respondents to firm-level vs human resources questions. In future data collection efforts, such knowledge will assist in directing certain kinds of questions to those most likely to be able to answer them. The second code signified a three point scale of difficulty in responding to the question, and was intended to flag those questions where a) the data might be problematical as a function of response difficulty, and b) where adjustments might be needed in subsequent instrumentation. CPF prepared a companion report to this one on the results of these analyses.

F. Interviewer Training and Instrument Pre-test

In early 1988, experienced interviewers were hired by CPF. A one week training session was jointly designed and conducted by CPF and BRIDGES staff.

Three firms, one manufacturing and two non-manufacturing, were selected for instrument pre-test and interviewer training. The three firms were not included in the eventual sample of 25 participating firms. As a result of the pretest, adjustments were

made to the instrument, and the data collection was commenced.

G. Data Collection and Analysis

Data collection commenced in March 1988, and was concluded in May 1988.

Two codebooks were completed, one for Question 3.2 which addressed educational level of all employees in the firm, and one for all remaining questions.

Responses were coded during a field visit by BRIDGES staff to Burundi in May 1988, and data entered into a microcomputer data base for analysis. CPF took responsibility for reporting on the effectiveness of the study design, data collection methodology, and instrumentation, and BRIDGES staff at the Research Triangle Institute conducted the analyses of firm and occupational data.

CHAPTER IV

FINDINGS

This chapter reviews the findings from the pilot study. The chapter is in three sections. The first presents the results of the firm level analyses, establishing essential characteristics of the firms studied, and comparing them where possible to what is known about Burundi firms in general. The second section reports analyses of characteristics of human resources, such as skill levels within and between occupations, hiring practices of firms, and employers' perceptions of shortages or surpluses in certain occupations. The third describes findings from analysis of 15 selected occupations, including activities, equipment used, adequacy of supply, and actual and preferred qualifications of incumbents.

The small size of our pilot test sample restricts both the type of analyses to be conducted, and the generalizeability of the findings. The major purpose of the analyses in this phase of the study are of course to direct the next phase through the necessary adjustments to sampling procedures and the instrument. However, we report both the descriptive findings and the results of our preliminary model building, with due caution, since they illustrate the kinds of information that can potentially be drawn from a larger and more representative sample with more assurance.

A. Firm Level Analyses

The purpose of the firm-level analyses was to describe the sample in enough detail to establish that there was adequate variability in measures relevant to human resources considerations, and to provide the basis for the preliminary modeling efforts presented in Chapter V.

1. Employment Size

The final sample consisted of 25 firms, ranging in total employment size (permanent and non-permanent employees) from over 1700 hundred persons in the largest (nonmanufacturing) firm, to ten in the smallest (see Figure 1).

The figure separates firms by sector only into manufacturing/nonmanufacturing, since displaying data by size and by actual sector (Banking, Transportation) facilitates identification of individual firms, something we have tried to avoid.

Figure 1

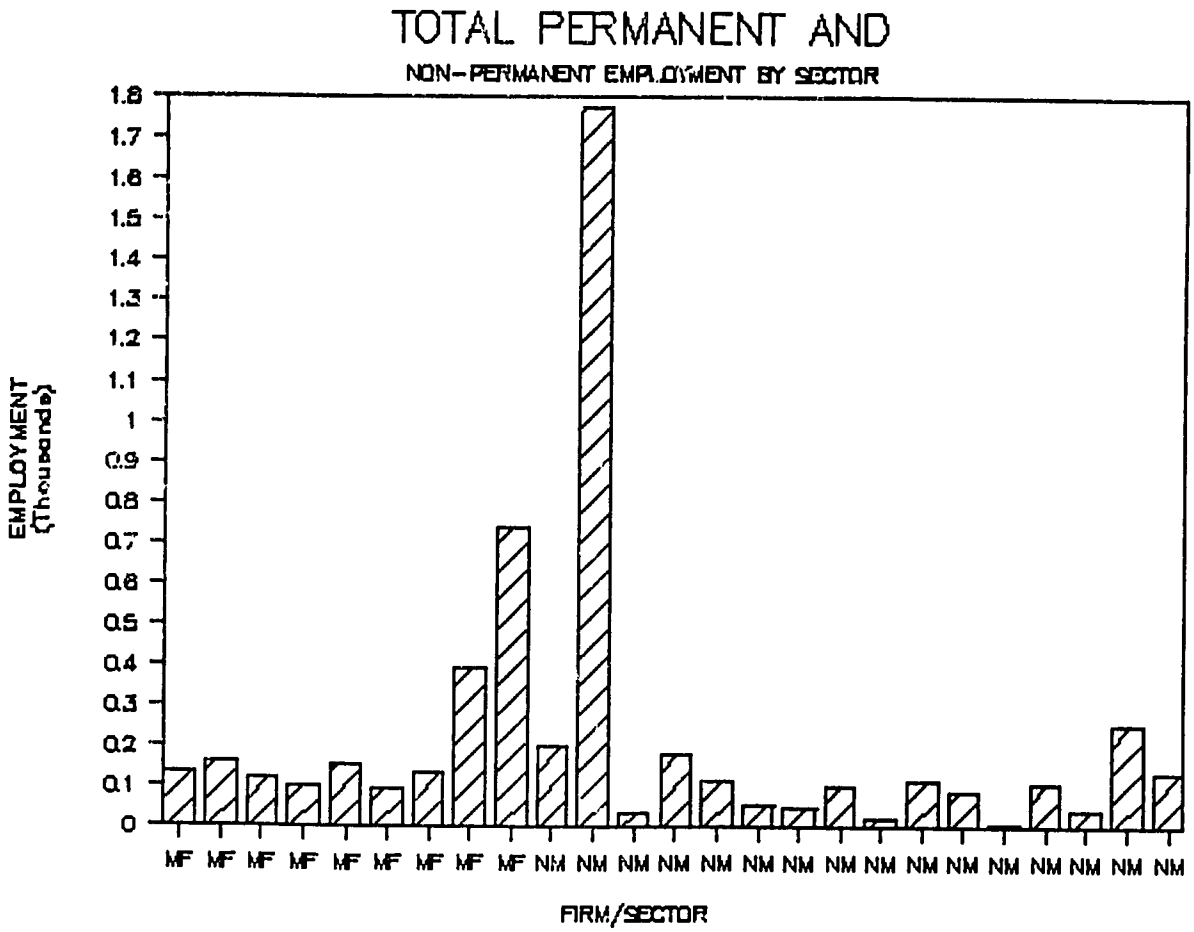

TOTAL PERMANENT AND
NON-PERMANENT EMPLOYMENT BY SECTOR
EMPLOYMENT (Thousands)
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
MF MF MF MF MF MF MF MF MF NM NM NM NM NM NM NM NM NM NM NM NM NM NM NM NM
FIRM/SECTOR

Figure 2 displays employment size by permanent employment only. Using this measure, the largest firm is now in the manufacturing sector, and the range shifts from 716 employees to 10 employees. While non-permanent employment was recorded in about half of our firms for 1988, the major focus of our study is the education and training requirements of full time employment. It was this measure therefore which was used in all subsequent analyses relevant to employment size.

2. Firm Type

The distribution of the sample across sectors and subsectors was as shown in Table 1. From 1988 National Institute of Social Security (INSS) data, CPF enumerated a preliminary listing of 721 private sector firms in the Bujumbura Province (CPF 1988b). The percent distribution by industrial sector is as follows:

SECTOR	%
AG	4
MIN	< 1
MF	13
UTIL	1
CONSTR	7
TRADE	35
TPT	17
BNK	1
SVC	22
TOTAL	100

Three firms were chosen for our sample in: Subsector 310 because Food Drink and Tobacco industries account for 23% of all manufacturing employment; in Subsectors 610/620 because Wholesale/Retail Trade and Hotels account for the largest percent share of enterprises; in subsector 710, because although it has only about 4% of the total employment, it accounts for 17% of the enterprises; and 950 because Garages/Repairs has the largest employment share of the Service sector.

All firms in the sample except four (2 Commerce, 1 Banking and 1 Manufacturing firm) were sole establishments, as contrasted with having or constituting a branch(es) or division(s).

Figure 2

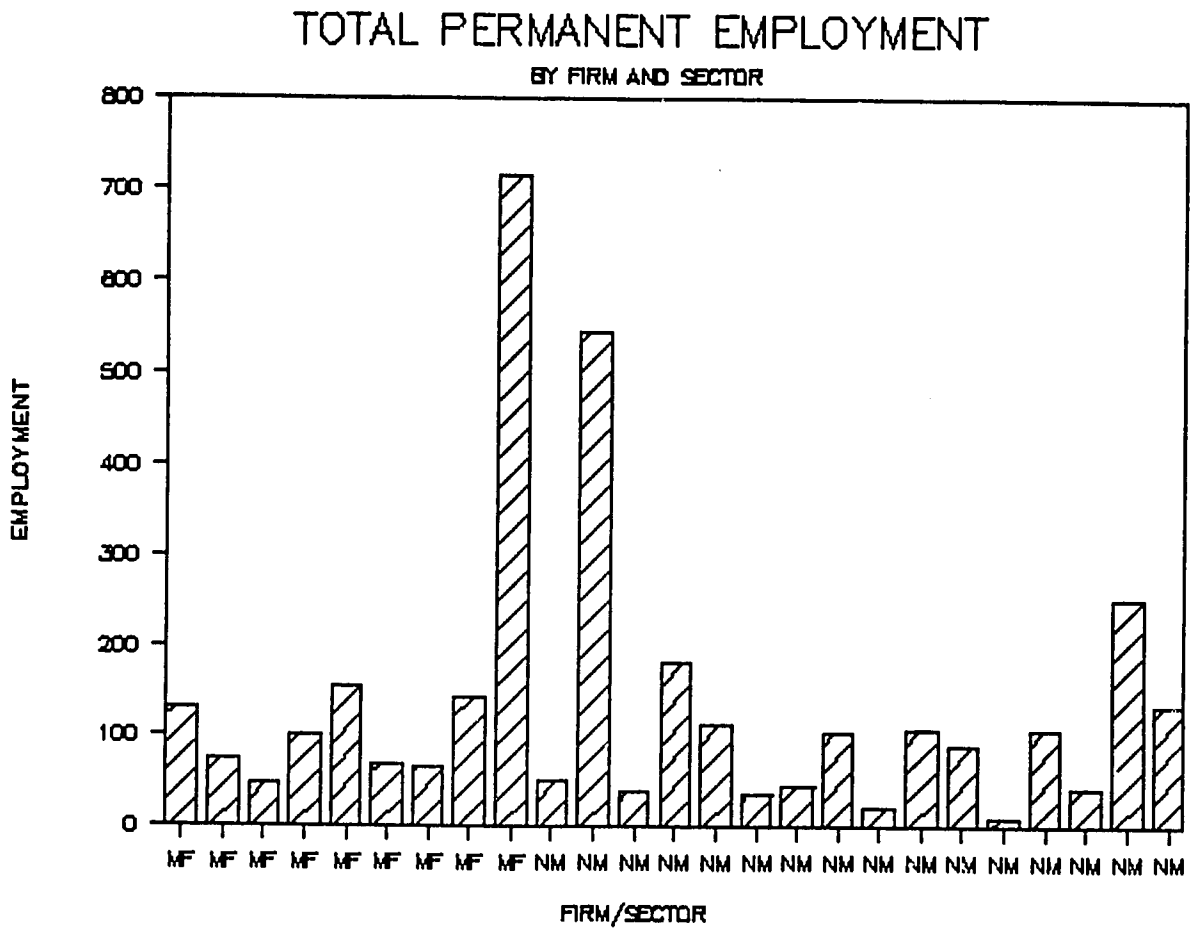

TOTAL PERMANENT EMPLOYMENT
BY FIRM AND SECTOR
EMPLOYMENT
800
700
600
500
400
300
200
100
0
MF MF MF MF MF MF MF MF MF NM NM NM NM NM NM NM NM NM NM NM NM NM NM NM
FIRM/SECTOR

TABLE 1. DISTRIBUTION OF SAMPLE FIRMS BY SECTOR/SUBSECTOR

SECTOR	SUBSECTOR No	SUBSECTOR	No FIRMS
AG	100	AG PROD	2
MF	310	FOOD/DRINK/TBCO	3
	320	TEXT/APP	1
	330	WOOD PRODS	1
	350	CHEMICALS	1
	360	METAL PRODS	1
	380	FURNITURE	1
	390	OTHER	1
CONSTR	500	BUILDING CNSTR	1
COMMERCE	610/620	WHLS/RET TRADE	3
	630	HOTEL	1
TPT/COMMS	710	TPT	3
BNK/INS/F	810	BNK	1
	820	INS	1
SERVICES	930	MED/DENTAL	1
	950	GARAGES/REPAIRS	3
		TOTAL =	25

3. Number of Years in Operation

Age of firm varied considerably, as shown in Figure 3. Average age was 22 years, (sd = 15.31), with the youngest firms (N = 3) being seven years old, and the oldest sixty six. However the sample is strongly skewed towards the younger firms. The frequency distribution for ten year incremental categories was as follows

< 10	7
11 - 20	6
21 - 30	6
31 - 40	4
41 - 50	0
51 - 60	1
61 - 70	1
TOTAL	25

with a mode of ten years old or less.

4. Firm Stability and Product Type

The evolution, and production or service continuity of firms was characterized as normal/continuous by almost all firms. In addition, firms were asked to list their principal services or products to serve as validation for their industrial classification category. No misclassification was apparent in our sample. These product data were useful also in later detailed occupational analyses, where descriptions of occupational tasks could be lodged within the context of the output of the firm.

5. Technology Type

For modeling purposes, as detailed in Chapter V, we were interested in obtaining data on capital and labor inputs, as well as gross outputs. A major concern underlying the design of the instrumentation for the study however was that eventually only mailed questionnaires be used. An important criterion for inclusion of items on the questionnaire was therefore that questions be few, and simple to answer. Thus, as a proxy for capital inputs, we used a single question (2.7) which addressed the dominant technology of the firm.

Figure 4 shows the distribution of each firm (see Section 2 above for codes) by four classes of technology type. The first signifies primarily automated or computerized, the second mechanized, the third predominantly manual labor, and the fourth, "other" (Five firms originally responded "other", and we were able to code four of them into one of the first three categories).

Despite the expected emphasis on mechanization and manual labor, the results are surprising, and lead us to conclude that

Figure 3

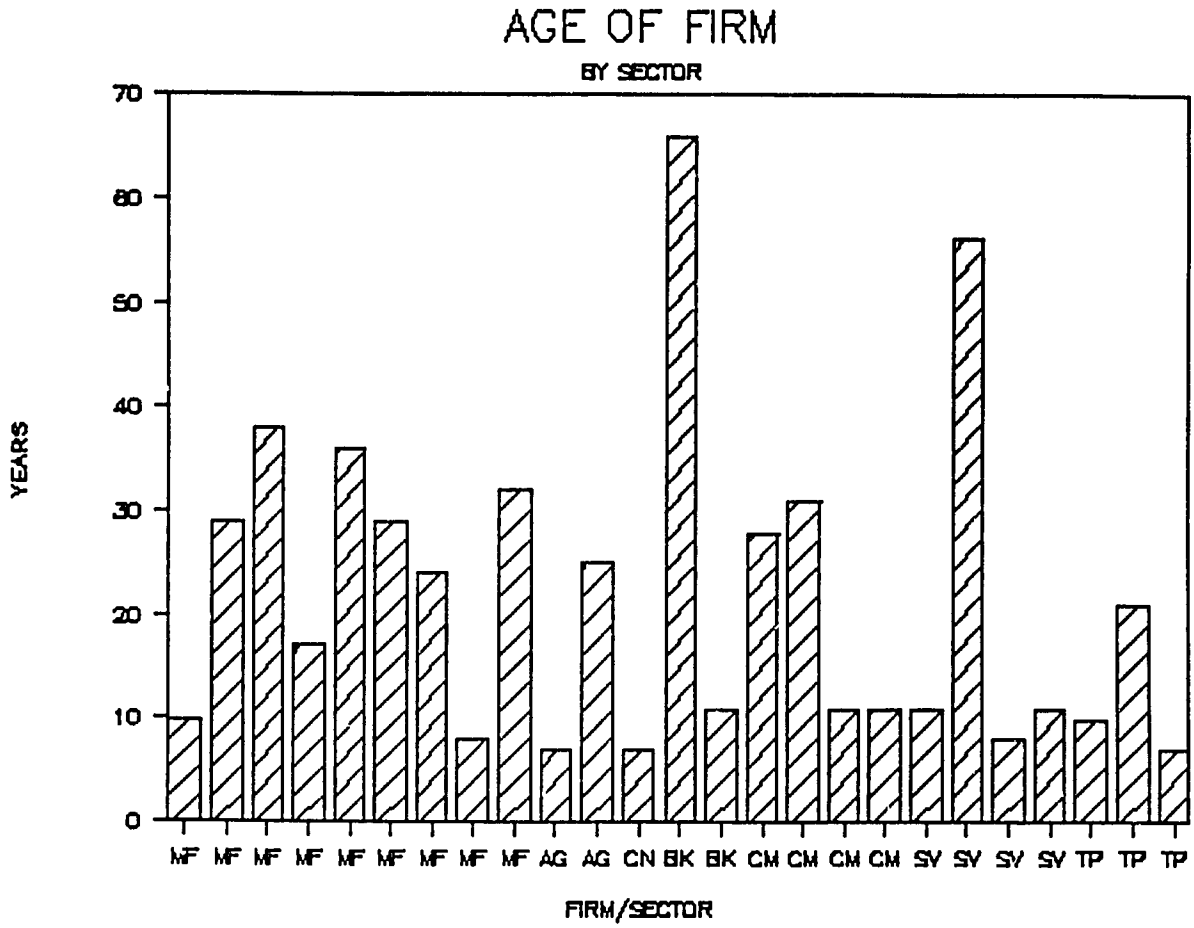
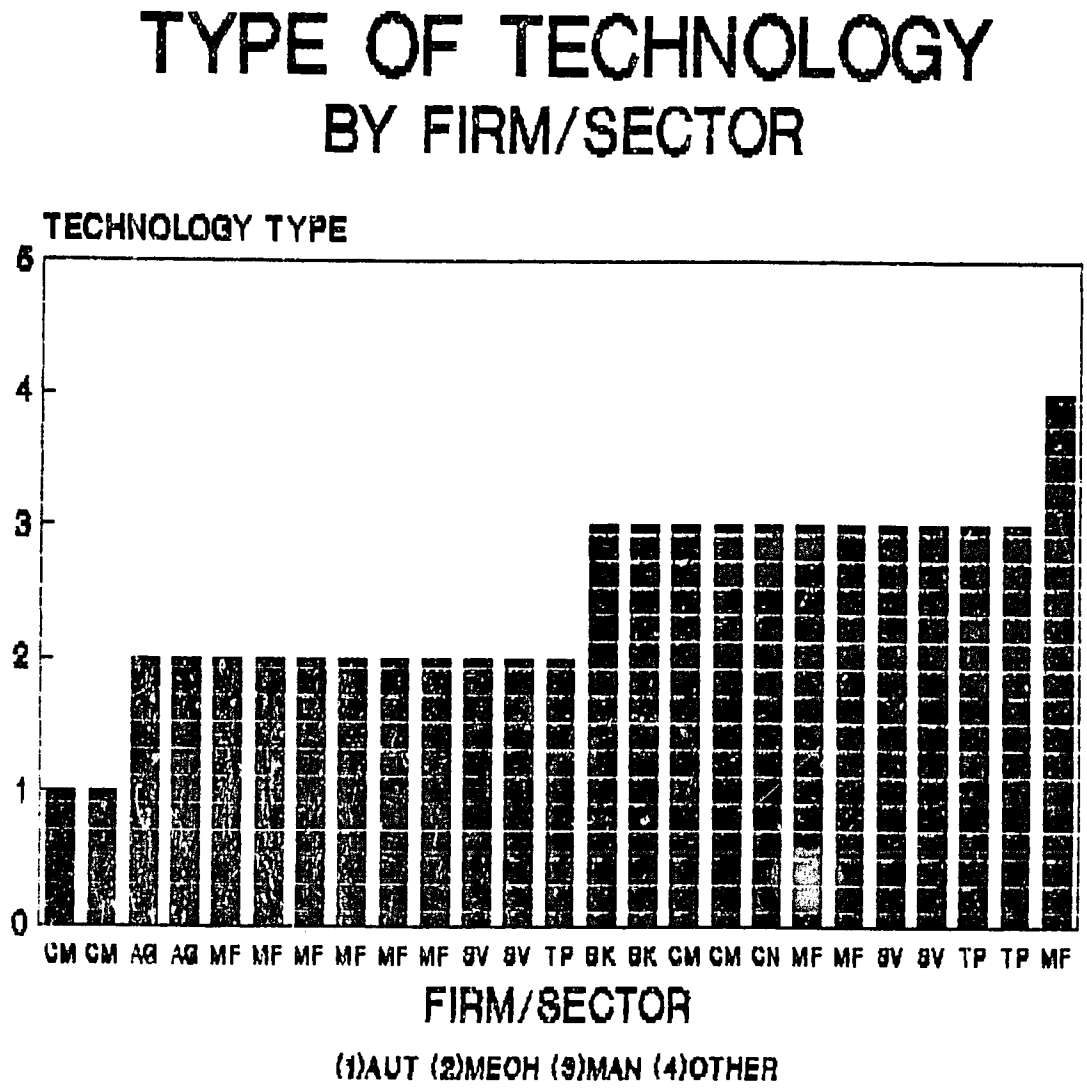

AGE OF FIRM
BY SECTOR
YEARS
70
60
50
40
30
20
10
0
MF MF MF MF MF MF MF MF MF AG AG CN BK BK CM CM CM CM SV SV SV SV TP TP TP
FIRM/SECTOR

Figure 4


TYPE OF TECHNOLOGY
BY FIRM/SECTOR
TECHNOLOGY TYPE
0
1
2
3
4
5
CM CM AG AG MF MF MF MF MF MF SV SV TP BK BK CM CM CN MF MF SV SV TP TP MF
FIRM/SECTOR
(1)AUT (2)MEOH (3)MAN (4)OTHER

this measure needs some adjustment in subsequent studies. The two firms with the 'highest' technology are both in the Commerce sector. One is a small wholesale firm selling industrial machinery, which responded that its processes were primarily computerized. The other is a vegetable supplier to restaurants, which described its processes as automated. Further evidence of this level of technology was provided by examination of occupational tasks in this firm which included use of computers. The non-manufacturing companies rated themselves in general as primarily manual, suggesting that different measures should be used for manufacturing and non-manufacturing firms in the future, since manual/manufacturing has different connotations from manual/non-manufacturing.

6. Firm Markets and Outputs

The markets for firms in our sample were predominantly local/urban, i.e. Bujumbura and its immediate environs (N = 15). Six firms either served a combination of urban/rural or merely local markets outside Bujumbura. Only two firms were exporters, and two did not respond.

We asked two questions on annual gross outputs. The first asked for gross annual volume of products/services for each of four years, 1984-8, and the second asked for "chiffres d'affaires" or total sales volume for the same years in Burundi Francs (FBU). Five firms indicated some level of difficulty in responding to these questions, but provided some or all of the data anyway. Three firms did not respond, and partial responses were received from fourteen of the firms. Obtaining these data, even during quite extended on-site visits, is difficult.

Because considerably more firms (N = 21) responded to the second of the two questions, total sales, we constructed an index of mean labor productivity based on this measure, as follows:

$$\text{MEANPROD} = [(84\ \text{SALES}/84\text{Pe}) + (86\ \text{SALES}/86\text{Pe})]/2$$

where

84 SALES and 86 SALES were the chiffres d'affaires in BFU for 1984 and 1986 respectively, and

84Pe and 86Pe were the total permanent employment for the firms for each of those years respectively.

This is only a partial measure of productivity, as discussed in Chapter V, but is reasonable in firms where the level of technology, and therefore the investments in capital, may be relatively low. The averaging over two recent years reduces somewhat the effects of short term cyclical fluctuations in output or personnel turnovers.

The index permits examination of firms by comparative productivity by major sector, and by other variables such as size, age and human resource characteristics. Figure 5 shows what appear to be differences in productivity levels between manufacturing and non-manufacturing firms, although these differences were not statistically significant, even at the .10 level. Figures 6 and 7 present productivity by size, and by age respectively. The N of firms is eighteen for the Size variable, because we used 1986 total permanent employment for firm size, to maintain consistency with the productivity measure, and we had to drop three firms for lack of data.

7. Organizational Structure

Finally, we asked respondents if they possessed organizational charts for their firms, to assist us in understanding their management structures. Only seven of the twenty five firms were unable to provide us with this information. However, debriefing of interviewers and CPF staff led us to believe that in general, this was not a normal procedure for management, and that interviewers had to provide substantial assistance to respondents in most cases to produce even rudimentary charts. Thus these data were not considered for further analysis.

Figure 5

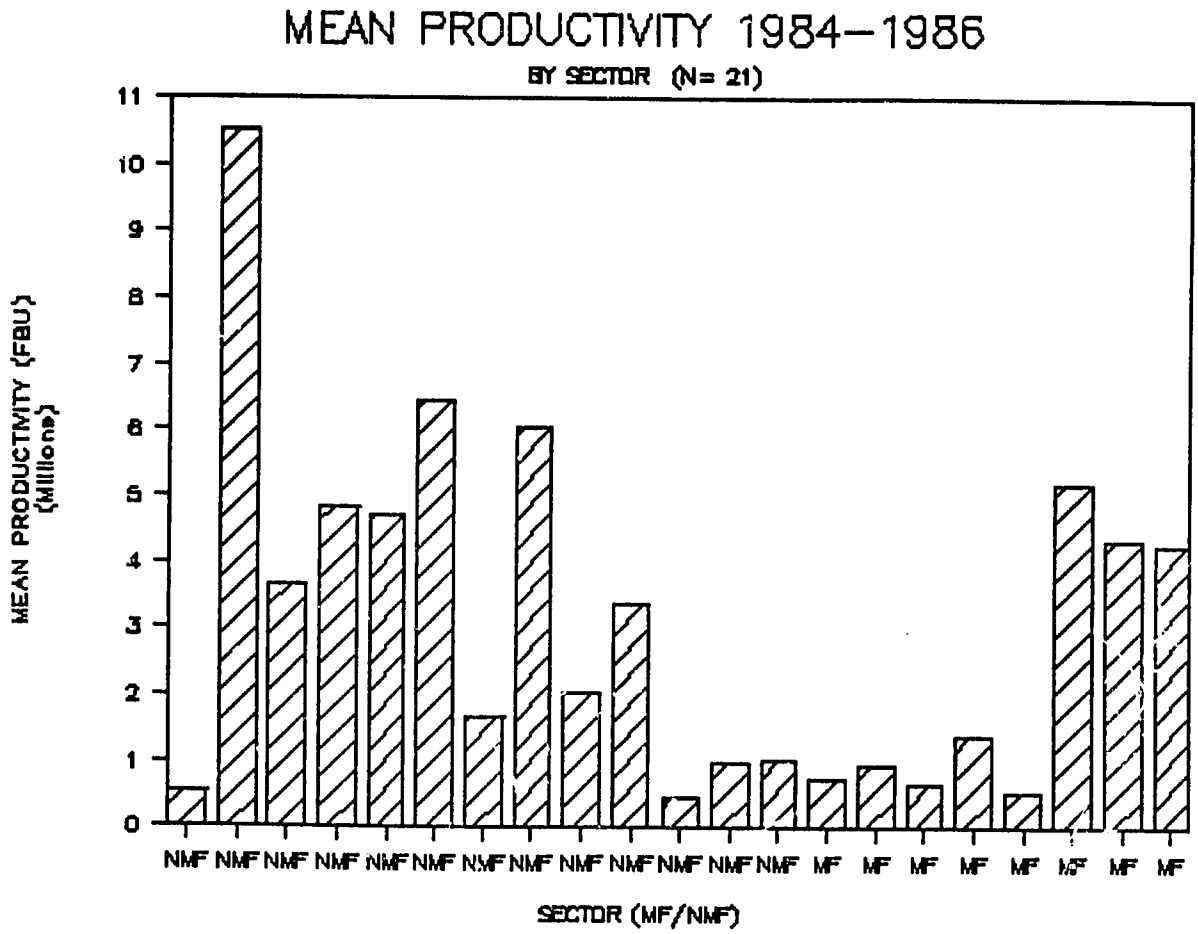

MEAN PRODUCTIVITY 1984–1986
BY SECTOR (N= 21)
MEAN PRODUCTIVITY (FBU)
(Millions)
0
1
2
3
4
5
6
7
8
9
10
11
NMF NMF NMF NMF NMF NMF NMF NMF NMF NMF NMF NMF NMF MF MF MF MF MF MF MF MF
SECTOR (MF/NMF)

Figure 6

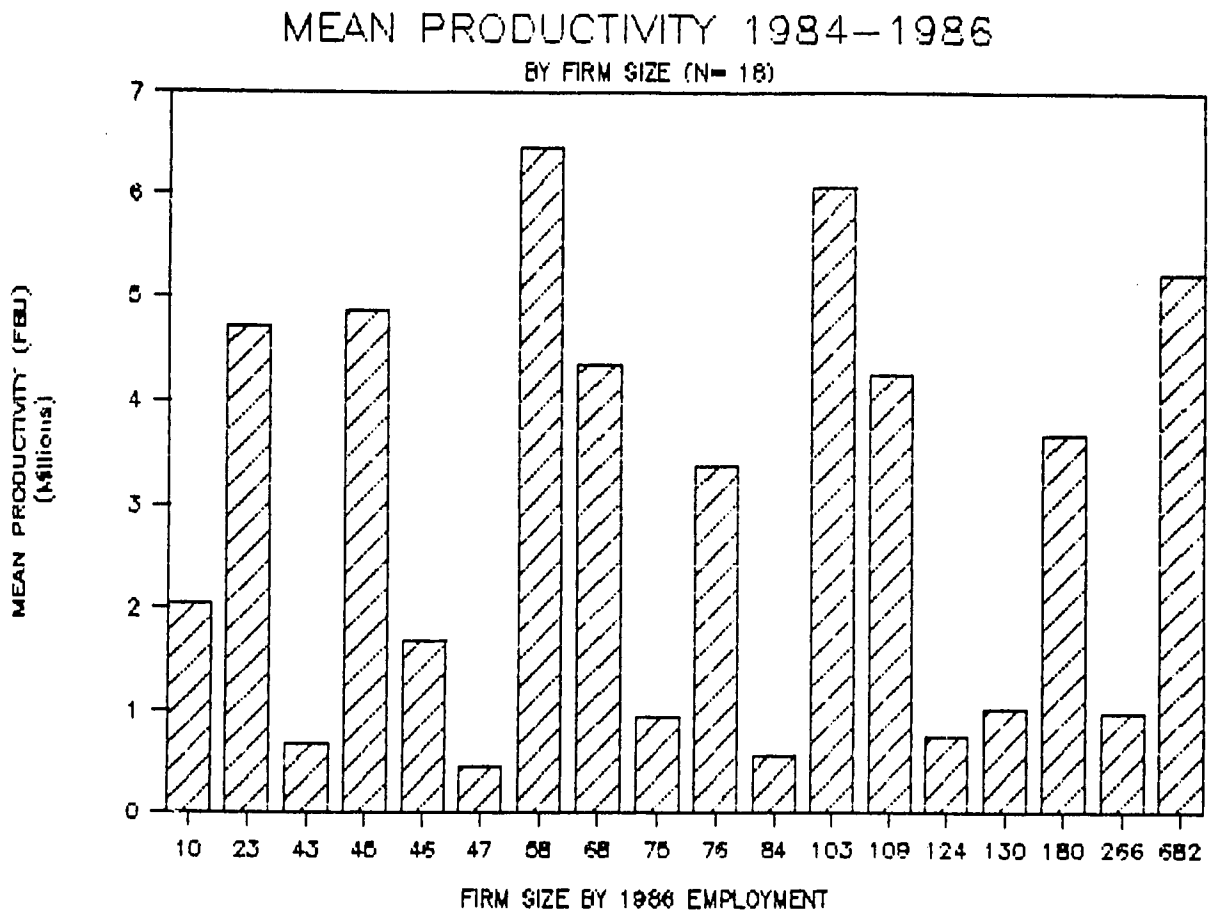
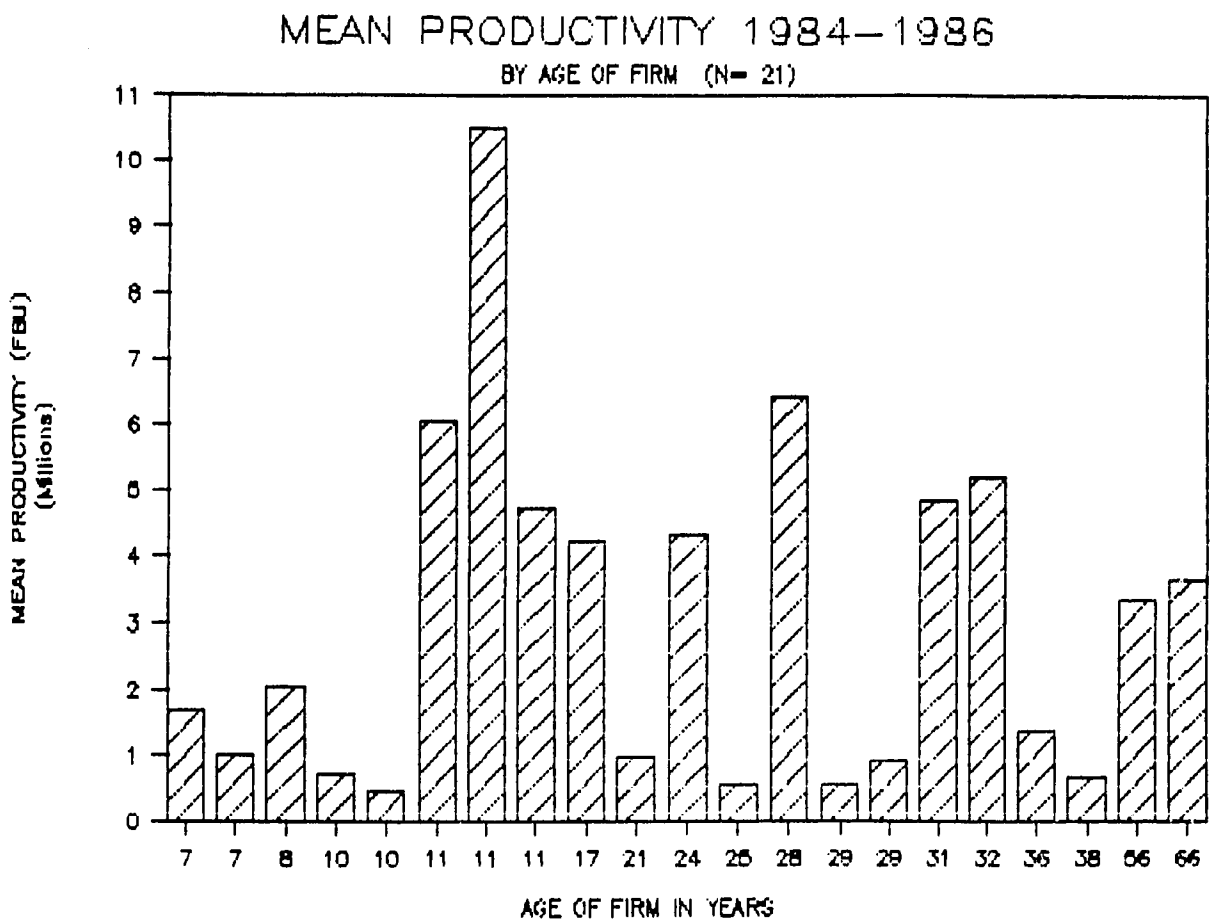

MEAN PRODUCTIVITY 1984-1986
BY FIRM SIZE (N= 18)
MEAN PRODUCTIVITY (FBU)
(k$Millions)
0
1
2
3
4
5
6
7
10
23
43
46
46
47
58
68
75
76
84
103
109
124
130
180
266
682
FIRM SIZE BY 1986 EMPLOYMENT

Figure 7


MEAN PRODUCTIVITY 1984–1986
BY AGE OF FIRM (N= 21)
MEAN PRODUCTIVITY (FBU)
(Millions)
0
1
2
3
4
5
6
7
8
9
10
11
7 7 8 10 10 11 11 11 17 21 24 26 28 29 29 31 32 36 38 66 66
AGE OF FIRM IN YEARS

B. Human Resources Analyses

An important part of our research was to determine some basic facts about the employment composition of the firm by occupation and educational level, anticipated employment growth/decline, hiring practices, and occupations in which training or skills levels were perceived by employers to be particularly problematical.

1. Employment

Firms were asked for total numbers of permanent and nonpermanent employees at startup, and for 1984, 1986 and 1988. We had hoped to obtain a measure of employment growth since the origin of the firm. No firm however was able to provide adequate data on employment at startup.

Employment growth 1984 to 1988 was computed, but showed no significant relationship with any of the firm variables. Six firms had experienced declines in employment in the four year period, and five firms no growth. When asked to anticipate future employment growth over the next 12 months, 15 firms indicated no change expected. Four firms anticipated decline, three of which were non-manufacturing. Of the six firms which anticipated growth, those anticipating the most growth were in the Banking and Services sector. The range of new jobs, calculated by applying the low and high percent responses from Question 3.3 to 1988 total permanent employment, is between 17 (low estimate) and 39 (high estimate) jobs within the next twelve months. Each firm was further asked to describe its 1988 permanent employment by occupation. This resulted in an occupational staffing pattern for each firm, from which, with larger samples, sector specific staffing patterns can be developed.

For confidentiality reasons we are not publishing individual firm staffing patterns, although these have been tabulated and proportions (of occupational employment to total employment) calculated for each occupation in the firm. These proportions can be used to compare against other firms' proportional employment by occupation from the same subsector in the next phase. From these comparisons, it will be possible to develop partial sector industry/occupational matrices showing current employment by occupation by industrial sector. Such matrices then could be used to describe occupational employment at a given point in time, and over time can also be useful in projecting occupational employment for planning purposes.

2. Educational Level

In addition to employment by occupation, respondents provided data on the educational level of employees within the structure of six skill categories that are standard within the Government of Burundi labor statistical reporting system. Category I is the lowest skilled group, consisting of manual and unskilled labor. Category VI is the highest skilled group, consisting of top management, and the most senior technical and administrative personnel.

For this study, we have developed aggregate measures of employment by skill category, and have analyzed the educational levels within category for each firm. To accomplish this, we first developed a taxonomy of educational levels for coding individual firm responses, drawing on existing classification schemes used within the Labor Department and by the World Bank. The former classifies educational level by stage, years of schooling, and major stream (general, normal, technical). The latter adds an organizational dimension to secondary/postsecondary education, specifying institutions at each major educational pathway. Our taxonomy merged both these approaches into a scheme which permitted 183 separate educational levels into which responses were coded. As we learned from the coding, only 71 of the 183 were needed to code the responses from this study. The possibility exists therefore that, with careful use of "other" (write-in) lines at each major level, this question can largely be precoded for the next and subsequent studies.

Table 2 shows the 71 educational levels used, with their frequencies by category across all responding firms (N = 22). Frequency in this case refers to the number of discrete occupations (not employees) reported at that level in that category. Thus if one firm reported, for example, carpenters and masons at level 2, and all other firms reported the same, the frequency for level 2 would be (22 x 2) = 44. The measure does not give any indication of the amount of employment at that level, but does indicate the occupational variation, by educational level within firm. While we could have taken employees by educational level as the measure, the unit of analysis here is the occupation, since we are attempting to establish systematic ways of categorizing and interpreting occupational information.

These data were examined separately for manufacturing and non-manufacturing firms, and showed similar patterns for both. The data provide some support for the use of Category (I through VI) as a proxy for educational level, since each category seems to add more occupations at higher levels. Tables 3 through 5 summarize this information by aggregating frequencies into seven summary educational levels. The twelve "other" levels at the end of Table 2 (following "Evening Courses") were assigned to one of the seven

TABLE 2. EDUCATIONAL LEVELS BY CATEGORY FOR SAMPLE FIRMS (N = 22)

	EDUCATIONAL LEVEL	LEVEL No	CAT I	CAT II	CAT III	CAT IV	CAT V	CAT V
PRIMAIRE	=(2 YRS PRIM	1	36	37	36	9	1	
	3-4 YRS PRIM	2	6	4	3	4	0	
	5-6 YRS PRIM (-CERT)	3	6	17	12	3	0	
	6 YRS PRIM (+CERT)	4	5	7	10	1	0	
	OTHER PRIMARY (IMPRECISE)	5	18	37	11	6	3	
1SEC	S1 FIRST YR SEC (GENERAL)	6	3	11	7	3	2	
	S2 SECOND YR SEC (GENERAL)	7	5	18	13	8	2	
	S3 THIRD YR SEC (GENERAL)	8	0	10	42	14	5	
	S4 FOURTH YR SEC (GENERAL)	9	0	3	20	4	9	
	CFC (CERT FIRST CYCLE SEC)	10	0	0	6	2	0	
	PN (FIRST YR TEACHER TRG)	11	0	0	1	0	0	
	D4 (ELEMENTARY TEACHER DIPLOMA)	12	0	0	4	2	0	
	P1 FIRST YR SEC (TECHNICAL)	13	0	2	2	1	1	
	P2 SECOND YR SEC (TECHNICAL)	14	0	2	6	0	0	
	P3 THIRD YR SEC (TECHNICAL)	15	0	0	4	0	1	
	A4 PROFESSIONAL DIPLOMA (3 YRS)	16	0	4	18	4	2	
	P4 FOURTH YR SEC (TECHNICAL)	17	0	0	2	1	0	
	A3 TECHNICAL DIPLOMA (4 YRS)	18	0	1	9	1	1	
	OTHER GENERAL SEC	19	0	1	0	0	0	
2SEC	S5 FIFTH YR SEC (GENERAL)	23	0	2	8	2	2	
	S6 SIXTH YR SEC (GENERAL)	24	0	0	16	3	3	
	S7 SEVENTH YR SEC (GENERAL)	25	0	0	1	1	1	
	N1 FIFTH YR SEC (TEACHER TRG)	27	0	0	2	2	0	
	N2 SIXTH YR SEC (TEACHER TRG)	28	0	0	0	0	1	
	D6 COMPLETION OF TEACHER TRG COLLEGE	29	0	0	1	0	0	
	N4 EIGHTH YR SEC (TEACHER TRG)	31	0	0	0	0	1	0
	B7 DIPLOMA IN INSTRUCTION	32	0	0	0	3	0	0
	T3 SEVENTH YR SEC (SOCIAL WK)	35	0	0	0	0	1	0
	EIGHTH YR SEC WITH DIPLOMA IN SOCIAL WK	37	0	0	1	0	0	0
	EIGHTH YR SEC WITH DIPL IN PUBLIC WRKS	49	0	0	1	0	0	0
	SIXTH YR SEC (TECHNICAL)	52	0	0	0	1	0	
	SEVENTH YR SEC (TECHNICAL)	53	0	0	1	1	0	
	SEVENTH YR SEC (TECHNICAL) WITH DIPLOMA	54	0	0	2	3	0	
	SEVENTH YR SEC (PUBL ADM)	58	0	0	0	1	0	
	SEVENTH YR SEC (PUBL ADM) WITH DIPLOMA	59	0	0	0	8	1	
	SEVENTH YR SEC (MANAGEMENT)	64	0	0	0	4	1	
	SEVENTH YEAR SEC (MGMT) WITH DIPLOMA	69	0	0	0	1	1	
	EIGHTH YR SEC (AG TECH) WITH DIPLOMA	75	0	0	0	1	1	
	EIGHTH YR SEC (MED INSTITUTE) WITH DIPLOMA	81	0	0	0	4	2	
ENS SUP	FIRST YR CANDIDATURE, LAW (UB)	104	0	0	1	1	0	
	FIRST YR CANDIDATURE, ECONOMICS (UB)	106	0	0	0	1	0	
	FIRST YR CANDIDATURE WITH DIPLOMA, SCIENCE (UB)	111	0	0	0	0	0	
	SEC YR CANDIDATURE, ECONOMICS (UB)	114	0	0	0	0	0	
	SEC YR CANDIDATURE WITH DIPLOMA, LAW (UB)	116	0	0	0	0	1	
	SEC YR CANDIDATURE WITH DIPLOMA, ECONOMICS (UB)	118	0	0	0	0	0	
	FIRST YR LICENTIATE, ECONOMICS (UB)	122	0	0	0	1	0	
	SECOND YR WITH LICENSE, LAW (UB)	128	0	0	0	0	0	

Table 2 (continued)

	SECOND YR WITH LICENSE,LIT HUM (UB)	129	0	0	0	0	0
	SECOND YR WITH LICENSE, ECONOMICS (UB)	130	0	0	0	0	0
	SECOND YR WITH LICENSE, SCIENCE (UB)	131	0	0	0	0	0
	ENGINEER WITH DIPLOMA (UB)	135	0	0	0	0	1
	2 YRS ESCO	148	0	0	0	3	4
	OTHER HIGHER ED	156	0	0	0	4	6
ENS SUP ETR	DIPLOMA, LAW (OVERSEAS)	162	0	0	0	0	0
	DIPLOMA, LIT HUM (OVERSEAS)	163	0	0	0	0	0
	DIPLOMA, ECONOMICS (OVERSEAS)	164	0	0	0	0	0
	DIPLOMA, SCIENCE (OVERSEAS)	165	0	0	0	0	0
	DPLM + OTHER HIGHER ED (OVERSEAS)	166	0	0	0	0	1
COURS DE SOIR	EVENING COURSES, SCIENCE)	169	0	0	4	3	4
OTHER	FOURTH YR SEC (TECHNICAL) DIPLOMA (SHORT CYCLE)	601	0	0	3	2	1
	OTHER SEC (IMPRECISE)	2201	0	0	11	9	0
	OTHER HUMANITIES (SEC)	2601	0	0	5	8	4
	OTHER A4 DIPLOMA, TECHNICAL (IMPRECISE)	10301	0	0	4	22	6
	OTHER A3 DIPLOMA, TECHNICAL (IMPRECISE)	10351	0	0	7	10	3
	OTHER T3 (SEVENTH YR SEC TECH)	10356	0	0	1	0	1
	OTHER T4 (EIGHTH YR SEC TECH)	10358	0	0	1	3	1
	OTHER TECHNICAL (IMPRECISE)	10361	0	0	2	2	0
	OTHER A4	10371	0	0	7	1	1
	1ST YR HIGHER ED (IMPRECISE)	10701	0	0	0	0	1
	2ND YR HIGHER ED (IMPRECISE)	10751	0	0	0	3	2
	OTHER HIGHER ED DIPL	13101	0	0	0	0	0
		TOTAL	79	156	285	171	79
		COUNT	71 LEVELS				

TABLE 3. SUMMARY OF EDUCATIONAL LEVELS BY CATEGORY FOR ALL FIRMS

EDUCATIONAL LEVEL	CAT I	PROP	CAT II	PROP	CAT III	PROP	CAT IV	PROP	CAT V	PROP	CAT VI	PROP
UP TO AND INCLUDING TWO YEARS PRIMARY SCHOOL	36	0.46	37	0.24	36	0.13	9	0.05	1	0.01	0	
OTHER PRIMARY	35	0.44	65	0.42	36	0.13	14	0.08	3	0.04	0	
FIRST CYCLE SECONDARY (1-4 YRS)	8	0.10	52	0.33	166	0.58	84	0.49	34	0.43	23	0.19
SECOND CYCLE SECONDARY (5-8 YRS)	0		2	0.01	42	0.15	48	0.28	21	0.27	12	0.10
HIGHER EDUCATION	0		0		1	0.00	13	0.08	15	0.19	61	0.51
ADDITIONAL HIGHER ED OVERSEAS	0		0		0		0		1	0.01	15	0.13
EVENING COURSES	0		0		4	0.01	3	0.02	4	0.05	8	0.07
TOTAL	79	1	156	1	285	1	171	1	79	1	119	1

TABLE 4. SUMMARY OF EDUCATIONAL LEVELS BY CATEGORY FOR MANUFACTURING FIRMS

EDUCATIONAL LEVEL	CAT I	PROP	CAT II	PROP	CAT III	PROP	CAT IV	PROP	CAT V	PROP	CAT VI	PROP
UP TO AND INCLUDING TWO YEARS PRIMARY SCHOOL	20	0.43	21	0.24	25	0.20	4	0.05	0		0	
OTHER PRIMARY	25	0.53	43	0.50	20	0.16	4	0.05	3	0.11	0	
FIRST CYCLE SECONDARY (1-4 YRS)	2	0.04	22	0.26	77	0.60	49	0.62	12	0.43	8	0.20
SECOND CYCLE SECONDARY (5-8 YRS)	0		0		6	0.05	16	0.20	5	0.18	4	0.10
HIGHER EDUCATION	0		0		0		6	0.08	8	0.29	24	0.59
ADDITIONAL HIGHER ED OVERSEAS	0		0		0		0		0		3	0.07
EVENING COURSES	0		0		0		0		0		2	0.05
TOTAL	47	1	86	1	128	1	79	1	28	1	41	1

TABLE 5. SUMMARY OF EDUCATIONAL LEVELS BY CATEGORY FOR NONMANUFACTURING FIRMS

EDUCATIONAL LEVEL	CAT I	PROP	CAT II	PROP	CAT III	PROP	CAT IV	PROP	CAT V	PROP	CAT VI	PROP
UP TO AND INCLUDING TWO YEARS PRIMARY SCHOOL	16	0.50	16	0.23	11	0.07	5	0.05	1	0.02	0	
OTHER PRIMARY	10	0.31	22	0.31	16	0.10	10	0.11	0	0.00	0	
FIRST CYCLE SECONDARY (1-4 YRS)	6	0.19	30	0.43	89	0.57	35	0.38	22	0.43	15	0.19
SECOND CYCLE SECONDARY (5-8 YRS)	0		2	0.03	36	0.23	32	0.35	16	0.31	8	0.10
HIGHER EDUCATION	0		0		1	0.01	7	0.08	7	0.14	37	0.47
ADDITIONAL HIGHER ED OVERSEAS	0		0		0		0		1	0.02	12	0.15
EVENING COURSES	0		0		4	0.03	3	0.03	4	0.08	6	0.08
TOTAL	32	1	70	1	157	1	92	1	51	1	78	1

summary levels. As Table 3 shows, the mode shifts steadily from primary school in Categories I and II, to secondary school in Categories III through V with increasing proportions in higher levels of secondary school in each category, to higher education in Category VI.

Tables 4 and 5 show these same data broken out for manufacturing and non-manufacturing firms (N = 9, 13) respectively. There is a tendency for educational levels to be somewhat higher in the lower categories in non-manufacturing firms, evidenced by the appearance of occupations containing employees with higher education in Category III for example. In view of the small numbers in the sample, these associations were not tested statistically. In subsequent studies however, they will be.

3. Hiring Practices

It is required of all private sector firms in Burundi that all job openings be listed with the national employment exchange of the Labor Ministry. We sought information on supplementary methods of recruitment and hiring from respondents, such as advertisements, professional or personal contacts, to examine differences across sectors. We used three categories of skills classifications, cadres suprieurs, cadres moyens, and main d'oeuvre qualifie (roughly, high medium and low skills) in an effort to distinguish hiring patterns by qualifications of hirees.

Firms in our sample reported that they scarcely ever recruit either high or lower level personnel through means other than the Ministry of Labor recruitment system. About one third of the firms, approximately evenly divided between manufacturing and nonmanufacturing, reported that they either "sometimes" or "often" used outside recruitment methods for medium level personnel. Methods used by these firms included press and radio appeals, professional recommendations, as well as personal contacts. Interviewers' comments suggested however that there may have been some misunderstanding of this question. Respondents may have interpreted the question, despite its actual phrasing, as attempting to determine alternatives rather than supplements to the mandated recruiting practices through the Labor Ministry. This may have tended to suppress responses in some firms. Respondents were also asked what kinds of screening mechanisms they applied to new entrants. The majority of firms use qualifications as the major screening device at the high and medium levels, but less with the lower level. Curiously, the sample was split in terms of the use of written tests for senior level hirees. Approximately half the sample, including most of the manufacturing firms said they used work tests for higher level new entrants either "often" or "sometimes". Ten firms however including two manufacturing firms, said they never used work tests for their higher skilled hirees. Most firms used interviews for higher and medium skilled new hires, although five firms said they never interviewed at either of

these levels, and ten firms said they never interviewed for the lower skilled categories. Almost all firms indicated they relied on a probationary period for determining the suitability of new hires at all levels.

5. Occupational Hiring

A list of eighteen occupations was derived through a process described earlier in Chapter III. These were the priority occupations which were important to the Education Ministry according to predetermined criteria.

Occupations are referred to in this report by their French names, since translations into English are not always effective and can be misleading. The occupations are the following:

AGENT INFORMATICIEN
CHEF DU PERSONNEL
COMPTABLE
CONDUCTEUR DE TRAVAUX
CONDUCTEUR D'ENGIN
CONTROL DE QUALITE
DACTYLO
ELECTRICIEN
ELECTRONICIEN
INFIRMIER
INFORMATICIEN
MAGASINIER
MECANICIEN
PLOMBIER
RESPONSABLE DES APPROVISIONS
SECRETAIRE DE DIRECTION
SOUDEUR
TECHNICIEN D'INSTALLATION & MAINTENANCE

We asked respondents whether they had experienced difficulties recruiting in these occupations, and the reasons for any problems they had encountered.

Table 6 illustrates the distribution of problems by type of difficulty and firm/sector. Six manufacturing and eleven of the nonmanufacturing firms indicated one or more of the priority occupations had presented some kind of recruitment problems.

The most common concern is with lack of appropriate training of those being hired into occupations. More than one firm identified this problem with électronicien and installation/maintenance techniciens. Occupations for which the most concern was expressed were mécanicien and électricien, where the predominant difficulty was lack of technical aptitude. Notably, no firm suggested that salaries were a problem. The only occupation in which a serious personnel shortage was identified was

TABLE 6. PRIORITY OCCUPATIONS FOR WHICH RECRUITMENT PROBLEMS WERE IDENTIFIED. BY PROBLEM AND TYPE OF FIRM

OCCUPATIONS	MF	MF	MF	MF	MF	MF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	TOT FIRMS BY OCC
	FIRM TYPE																	
CONDUCTEUR D'ENGIN							1											1
MECANICIEN					3	3	3										1	4
ELECTRICIEN		3				3			3		1							4
SEC DE DIRECTION									3							1		2
AGENT INFORMAT	3									1						3		3
ELECTRONICIEN										1		1						2
INFIRMIER	5													5				2
IMT	1			1									1					3
INFORMATICIEN		1																1
CONTROL DE QUALITE		1																1
CONDUCTEUR DE TRAV			6												6			2
COMPTABLE			1		7													2
MAGASINIER						1					2					3		3
DACTYLO														3				1
SOUDEUR					1													1
PLOMBIER															1			1
RESP DES APPROVS															6			1
CHEF DU PERSONNEL								2										1
TOTAL OCCS BY FIRM	3	3	2	1	3	3	2	1	2	2	2	1	1	2	3	3	1	

KEY:	CAT	no firms
LACK OF APPROP TRAINING	1	16
" PROF EXPERIENCE	2	2
" TECH APTITUDE	3	11
SALARY DEMANDED	4	0
UNAVAIL/NATIONAL SHORTAGE	5	2
LACK OF INIT/APPREC	6	3
NO TRAINING AVAILABLE	7	1

nursing (infirmier), which in these private sector firms signifies a trained paramedical person who is responsible for primary health care at the work site.

We also asked respondents whether they would like to identify other occupations with which they have encountered similar difficulties in recruiting. Table 7 illustrates the responses to this question. Nineteen occupations were identified, four of which were on our priority list. The reason for this is that we were only able to present each firm with a selected subset of the priority occupations because of time constraints. Thus, firms selecting the priority occupation in Table 7 had not been given a prior chance to respond to that occupation, but generated this occupation as a "problem" occupation independently. Except for mécaniciens, which were independently identified by three firms, all occupations in Table 7 were only identified uniquely by one firm, for the reasons given in the table. The lack of experience and aptitudes encountered by employers among mécaniciens is evidenced by the responses of both manufacturing and nonmanufacturing respondents.

Finally, we asked firms if any of these occupations were perceived as continuing to pose recruitment problems into the future. Table 8 presents the responses to this question. Twenty five of the occupations were identified as likely to be associated with one or other of the previously noted difficulties in the future. Six of these occupations were flagged by two or more firms.

Again, mécaniciens appeared the most problematic, for reasons which included lack of appropriate training, experience or aptitudes. Electriciens were identified by three firms as lacking the appropriate experience or aptitudes.

Table 9 summarizes the last three tables across manufacturing and nonmanufacturing sectors, with the number of firms in each sector identifying problems with each occupation, by type of problem. The predominance of insufficient training and aptitudes, and the almost complete absence of salary problems are the most striking findings.

C. Detailed Occupational Analyses

In addition to the above exploration of occupational problems of employers, we examined fifteen occupations in somewhat greater detail. We developed a separate section of the questionnaire for asking these questions, which addressed employment opportunities, skills levels (actual and preferred), and levels of job experience required by employers in these occupations.

Because concern was expressed about current occupational

TABLE 7. OCCUPATIONS FOR WHICH FIRMS IDENTIFIED RECRUITMENT PROBLEMS, BY PROBLEM AND TYPE OF FIRM

OCCUPATIONS	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	MF	MF	MF	MF	MF	MF	TOTAL
agent air freight	1															1
chef comptable	1															1
chef d'atelier				3												1
cuisinier							7									1
electricien											4					1
electronicien									8							1
frigoriste				1												1
ingen agron										5						1
ingenieur civil			1													1
machiniste													3			1
magasinier						6										1
mecaniciens					9					6		3				3
navigant		1														1
repar de bateau		1														1
secret de dir								3								1
serveur							7									1
ticketing agent	1															1
tisserand														7		1
tourneau															1	1
TOTAL FIRMS	3	2	1	2	1	1	2	1	1	2	1	1	1	1	1	21

KEY	CAT	No Firms
LACK OF APPROP TRAINING	1	8
" PROF EXPERIENCE	2	0
" TECH APTITUDE	3	4
SALARY DEMANDED	4	1
TAKEN BY GOVT	5	1
INSUFFICIENT COMBS OF SKILLS	6	2
NO TRAINING AVAILABLE	7	3
GENERAL SHORTAGE	8	1
BOTH 2 AND 3 ABOVE	9	1

TABLE 8. OCCUPATIONS IN WHICH FIRMS ANTICIPATE DIFFICULTIES IN RECRUITMENT, BY TYPE OF DIFFICULTY

OCCUPATIONS	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	MF	MF	MF	MF	MF	TOTAL
AGENT AIR/FREIGHT		1																	1
AGENT INFORMATICIEN				1															1
CHEF COMPTABLE		2																	1
CHEF DU PERSONNEL		2					3												2
CHEF D'ATEL					3														1
COMPTABLE																4			1
CONDUCTEUR DES TRAVAUX											8					6			2
CONDUCTEUR D'ENGIN	1																		1
CONTROL QUALITE														1					1
CUISINIER									7										1
ELECTRICIEN						11	3									2			3
ELECTRONICIEN				1								9							2
FRIGORISTE					1														1
IMT							3										1		2
INFIRMIER														9					1
INGEN AGRON															10				1
MAGASINIER						11		12											2
MECANICIEN	3					11				2			1		1			3	6
NAVIGANT			1																1
REPAR DE BATEAU			1																1
RESP D'APPROV											8								1
SEC DE DIRECTION			3								8								2
SERVEUR									7										1
TICKETING AGENT		1																	1
TISSERAND																		7	1
TOTAL	2	4	3	2	2	3	3	1	2	1	3	1	1	1	3	3	1	2	38

KEY:	CAT	No
LACK OF APPROP TRAININ	1	12
" PROF EXPERIENC	2	4
" TECH APTITUDE	3	7
SALARY DEMANDED	4	1
PREF FOR OFFC WRK	6	1
NO TRAINING AVAILABLE	7	3
LACK OF APT/INIT/INTRS	8	3
GENERAL SHORTAGE	9	2
TAKEN BY GOVT	10	1
BOTH 2 AND 3 ABOVE	11	3
INSUFFICIENT COMBS OF	12	1

TABLE 9. SUMMARY OF PERCEIVED DIFFICULTIES IN RECRUITMENT BY PROBLEM TYPE, OCCUPATION AND SECTOR

OCCUPATION	SECTOR MF	SECTOR NMF
AGENT AIR/FREIGHT		A(1)
AGENT INFORMATICIEN	C(1)	A,C(2)
CHEF COMPTABLE		A,B(1)
CHEF DU PERSONNEL		B,C(2)
CHEF D'ATELIER		C(1)
COMPTABLE	A,D,G(2)	
CONDUCTEUR DES TRAVAUX	E,F(1)	E(1)
CONDUCTEUR D'ENGIN		A(1)
CONTROL DE QUALITE	A(1)	
CUISINIER		G(1)
DACTYLO		C(1)
ELECTRICIEN	B,C,D(3)	A,C(3)
ELECTRONICIEN		A,H(3)
FRIGORISTE		A(1)
IMT	A(2)	A,C(2)
INFIRMIER	H(1)	H(1)
INFORMATICIEN	A(1)	
INGENIEUR AGRON	I(1)	
INGENIEUR CIVIL		A(1)
MACHINISTE	C(1)	
MAGASINIER	A(1)	B,C,K(3)
MECANICIEN	A,C,K(4)	A,B,C(4)
NAVIGANT		A(1)
PLOMBIER		A(1)
REPAR DE BATEAU		A(1)
RESP DES APPROVS		E(1)
SEC DE DIRECTION		A,C,E(3)
SERVEUR		G(1)
SOUDEUR	A(1)	
TICKETING AGENT		A(1)
TISSERAND	G(1)	
TOURNEAU	A(1)	

KEY:

LACK OF APPROP TRAINING	A
" PROF EXPERIENCE	B
" TECH APTITUDE	C
SALARY DEMANDED	D
LACK OF APT/INIT/INTRST	E
PREF FOR OFFC WRK	F
NO TRAINING AVAILABLE	G
GENERAL SHORTAGE	H
TAKEN BY GOVT	I
BOTH B AND C ABOVE	J
INSUFFICIENT COMBS OF SKILLS	K

NOTE: NUMBER OF FIRMS IN PARENTHESIS

classifications used by the Labor Ministry and others, we also sought data on establishment job descriptions. Furthermore we asked employers to describe briefly the principal activities, equipment and products/services provided as the outputs of each job we studied. The purpose of this effort was to be able to make general qualitative comparisons across jobs/firms within the same occupational title. A central assumption of occupational classification systems is that similar jobs can be grouped under a single occupational title, such as carpenter (menuisier). Yet some carpenters may be involved in relatively skilled work, involving complex mortising/joining, for example, while others may simply be nailing or sawing during construction framing. Obtaining formal job descriptions, or employers' accounts of principal job activities therefore would permit us to detect where broad differences/similarities exist within similar occupation titles.

1. Selected Occupations

The list of the 15 detailed occupations was as follows, with the number of firms by sector in which they were examined:

Occupation	MF	NMF
COMPTABLE	1	6
DACTYLO	0	6
ELECTRICIEN	4	2
INFIRMIER	2	2
LABORANTIN	1	1
MACON	2	2
MAGASINIER	3	4
MECANICIEN	3	4
MENUISIER	4	1
RESP FINANCE	3	2
SEC DE DIRECTION	0	5
SOUDEUR	2	3
TECHN AGRICOLE	1	2
TOLIER	1	2
TOURNEUR	4	1

This distribution of occupations by firms reflects our goal of field testing this approach where possible in both manufacturing and non-manufacturing firms.

2. Activities and Equipment/tools

Table 10 summarizes in note form the activities recorded for each occupation. Table 11 compiles the information, by firm and firm type, on equipment used in each occupation. Analysis of the difficulty ratings for Questions 4.1 and 4.2 established that respondents had varying levels of difficulties answering these inquiries. Only eight firms indicated that they had written job descriptions, and not one firm gave us a copy. The majority of firms were perceived by interviewers as having moderate difficulty with the questions regarding activities/equipment, and especially the approximate percent time spent on primary and secondary activities. Interviewers had exhibited some trepidation in posing these questions in the training and instrument pretest. We decided however to go ahead with the approach in the first phase of the study, and adjust it if necessary in the second phase with the larger number of firms.

The data on time spent on each activity was of poor quality, and was not included in our analyses. The information on equipment type, and activities however is useful for two purposes. Firstly, the data may contain clues as to how the occupational classification scheme may need to be reconfigured.

Heterogeneity of stated activities within occupational titles, such as "maintaining the books" or "control/supervision of accounts" suggests the functional/management division which is presently implicit in most occupational categorization schemes.

Doing the work as opposed to supervising others doing the work requires different skills. Individuals may be hired to perform the work, but may be rewarded/promoted for their abilities to manage others. Thus the treatment of "comptable" as a single job title may need reappraisal to reflect a supervisory/functional dimension. The second way in which these data can be helpful is in identifying particular equipment in use in the private sector for which shorter term special skills development programs may be appropriate. The extent of computer use by comptables, and telex and telefax by secretaires de direction for example can be surfaced, and monitored across sectors.

3. Number Employed and Number of Hires Experienced and Anticipated

Employers were asked (Question 4.3) the number of persons actually employed in the occupation. Examination of these data showed some variability between the total numbers reported, and the

TABLE 10. TASKS PERFORMED IN OCCUPATION BY FIRM

FIRM	OCCUPATION	ACTIVITY 1	ACTIVITY 2	ACTIVITY 3
TPT	comptable	control/spvsn of accounts	accounts receivable	budget preparation
SVC	comptable	maintaining the books	assuring correct entries	balancing books
MF	comptable	keeping the books	recording movements of accounts	accounts receivable
CMC	comptable	maintaining documentation	preparing budgets	monthly balances
SVC	comptable	maintaining accounts	accounts receivable	
CNSTR	comptable	maintaining accounts	documents/ balancing the books	docs/financial situation/client accounts
SVC	comptable	keeping the books/accounts	keeping the ledger	declarations to various agencies
AG	dactylo	typing	filing	
TPT	dactylo	typing	filing	telephone
AG	dactylo	typing documents		
BNK	dactylo	typing/correspondence		
CMC	dactylo	setting up invoices	correspondence/typing	orders, declarations, and import licences
CMC	dactylo	typing		
MF	electricien	motor maintenance	repair	new installations
MF	electricien	electrical repairs	electrical installation	
MF	electricien	maintenance of electrcl eqpmt	electrical installation	
MF	electricien	motor maintenance		
CMC	electricien	repair of electrical units	maintenance of central units	maintenance of a/c
SVC	electricien	maintenance/survlince of installations	electrical service for autos	
BNK	infirmier	laboratory examinations/report prep	locating/distributing medicaments	
MF	infirmier	handling prescriptions	increasing medical stock	meet with and assist doctors
MF	infirmier	consultation and maint of records	medical analysis	
BK	infirmier	conducting consultations	distribution of medicaments	
MF	laborantin	production control and analysis		
SVC	laborantin	medical analysis		
MF	macon	preparing foundations	making tiles	laying tiles
CMC	macon	a/c installation	supporting installation of a/c	
MF	macon	mixing sand and cement	correct positioning of wall structures	general carpentry
CNSTR	macon	assembling elements for building		
TPT	magasinier	preparing orders	receiving merchandize	keep stock, maintain files
MF	magasinier	accounting for incoming/outgoing mrchndze	keeping daily stock inventories	
CMC	magasinier	accounting for sales	preparing requisitions	reception and classification of medcmts
SVC	magasinier	maintaining files	selling spare parts	
MF	magasinier	registering incoming/outgoing materials	keeping stock of products	
CMC	magasinier	reception of merchandize	keeping files on ongoing/outgoing stock	monthly inventory
MF	magasinier	keeping files on spare parts	maintaining inventory	

TABLE 10 (CONT)

FIRM	OCCUPATION	ACTIVITY 1	ACTIVITY 2	ACTIVITY 3
TPT	mecanicien	check motors	repair	tune motors
MF	mecanicien	reparing equipment	ckecking machine functions	verify production quantities
MF	mecanicien	maintenance of factory motors	maintenance/repair of vehicles	
SVC	mecanicien	auto mechanics		
SVC	mecanicien	vehicle maintenance	vehicle repair	
MF	mecanicien	equipment maintenance		
AG	mecanicien	maintnce/repr of vehicles & engines		
MF	menuisier	cutting up, planing, laying out wood	machining, assembling, finishing	
MF	menuisier	maintenance/repair	making molds	fabricate pallets
MF	menuisier	fabrctng spec prods for textl mf	repairs	
MF	menuisier	cutting up, planing, laying out wood		
CNSTR	menuisier	boxes	making doors, windows	general carpentry
MF	resp fin	finacial services	supervising accounts	
BNK	resp fin	supervision/accounting	supervision of fin mgmt and invstmt	
TPT	responsable financier	accounting	preparing orders for suppliers	
MF	responsable financier	accounting	assessing expenditures vs revenues	prepare import/export license appls
MF	responsable financier	preparing and accounting for the budget	supervision of accounting and cash flow	computerization of adm functions
CMC	sec de direction	message transmission via telex/courier	filing/correspondence	
BNK	sec de direction	typing	correspondance	supervise filing
SVC	sec de direction	taking letters/sending telexes	preparing proposals	analyse bids
BNK	secretaire de dir	steno-typing	filing	transmit correspondence by fax/phone
TPT	secretaire de direction	correspondence/preparing meetings	typing	filing
TPT	soudeur	pipe welding	flat and upright welding	prepare pieces for welding
CMC	soudeur	welding	mechanical work	
SVC	soudeur	welding work		
MF	soudeur	preparing materials for welding	assembling materials for welding	
MF	soudeur	welding pieces		
AG	techn agric	supervising upkeep of fields	directing planting and replanting of coffee	
MF	technicien agric	recruitment of tobacco workers	assigning tasks to monitors	distribute materials/make report
AG	technicien agricole	supervising ag works	preparation of the land, mechanized production	look at seeds and cuttings
SVC	tolier	metal work (auto)		
MF	tolier	cutting and preparing sheet metal	shaping sheet metal	
SVC	tolier	panel beating (vehicles)	welding	
CMC	tourneur	fabricating spare parts		
MF	tourneur	fabricating spare parts	machine repair	replace spare parts
MF	tourneur	fabricating spare parts	making bolts, rollers	make door hinges
MF	tourneur	making parts		

TABLE 11. TYPE OF EQUIPMENT USED IN OCCUPATION BY FIRM TYPE

FIRM TYPE	OCCUPATION	EQUIPMENT 1	EQUIPMENT 2	EQUIPMENT 3
TPT	comptable	calculator		
SVC	comptable	registers	files	
MF	comptable	calculator	files of accounts	books
CMC	comptable	machine NSR 32	NSR 42	computer
SVC	comotable	calculator	filas of accounts	
CNSTR	comptable	calculator	files	registers
SVC	comptable	calculator	files of accounts	
AG	dactylo	typewriter		
TPT	dactylo		files	
AG	dactylo	typowriter		
BNK	dactylo	typewriter		
CMC	dactylo	typewriter	calculator	
CMC	dactylo	typewriter		
MF	electricien	complete tools		
MF	electricien	voltmeter	vice	pliers and testers
MF	electricien	complete tools		
MF	electricien	multimeter	multitester	ohmmetre
CMC	electricien	electrical tools		
SVC	electricien	complete tools		
BNK	infirmier	microscope	stethoscope	tensiometer
MF	infirmier	thermometer	tensiometer	siringes
MF	infirmier	microscope;syringes; tensiometer;		chemical products
BK	infirmier	syringes	balance	
MF	laborantin	densimetre		
SVC	laborantin	spectophotometer	microscope	
MF	macon	level,square	engraving needle	
CMC	macon	trowel	level	
MF	macon	trowel	level	
CNSTR	macon	level	trowel	
TPT	magasinier	calculator	files	
MF	magasinier	files for stock	calculator	
CMC	magasinier	register	stock files	
SVC	magasinier	catalogues	files	
MF	magasinier	balance	metre	
CMC	magasinier	stock files	calculator	
MF	magasinier	stock files	calculator	

TABLE 11 (CONT)

FIRM TYPE	OCCUPATION	EQUIPMENT 1	EQUIPMENT 2	EQUIPMENT 3
TPT	mecanicien	manometers	thermometres	
MF	mecanicien	complete tools		
MF	mecanicien	complete tools		
SVC	mecanicien	complete tools		
SVC	mecanicien	complete tools		
MF	mecanicien	extractor	complete tools	
AG	mecanicien	complete tools		
MF	menuisier	saws	plane; meter	joint mold
MF	menuisier	complete tools		
MF	menuisier	complete tools		
MF	menuisier	power saw	jig	joint jigs, pliers
CNSTR	menuisier	manual and machine tools		
MF	resp fin	calculator	interphone	telephone
BNK	resp fin	calculator	telephone	
TPT	responsable financier	calculator	telephone	
MF	responsable financier	computers	calculator	
MF	responsable financier	computer	calculator	
CMC	sec de direction	mach telex	typewriter	calculator
BNK	sec de direction	typewriter		
SVC	sec de direction	typewriter	telex	
BNK	secretaire de dir	typewriter	photocopier	phone
TPT	secretaire de direction	typewriter	telex	telefax
TPT	soudeur	pipe	electric welder	
CMC	soudeur	soldering equipment		
SVC	soudeur	soldering equipment		
MF	soudeur	soldering equipment	mask	gloves
MF	soudeur	welding rod/mask	welding equipment	safety glasses
AG	techn agric	tractors	agricultural tools	
MF	technicien agric			
AG	technicien agricole	boots	gloves	mask
SVC	tolier	metalworking tools		
MF	tolier		pliers	cutter, riveter
SVC	tolier	soldering equipment	mask	mask, hammer
CMC	tourneur	lathe		
MF	tourneur	lathe	calipers	
MF	tourneur	lathe		
MF	tourneur	lathe	pieces of steel/bronze	
MF	tourneur	lathe	file	

sum of permanent employees for the occupation in response to Question 3.2. Since the way Question 4.3 was phrased does not specify permanent employees, it is not possible to determine whether variation is due to this confusion, or to lack of recall by respondents. It will be necessary to include the word "permanent" in this question in the next version of the questionnaire. Table 12 shows that 41 persons have been hired into these occupations in the last twelve months, 14 in maufacturing, and 27 in nonmanufacturing firms.

The single occupation experiencing the most hires was mécanicien. Seventeen more persons are expected to be hired in these occupations in the next twelve months, with the majority of jobs being in the tourneur and mécanicien occupations. While employer forecasts of this kind have often been shown to be unreliable (Goldstein, 1981), the data on numbers previously hired can be validated, and are presumed to be more reliable. In addition, more routine assessments such as this survey would permit the repeated validation of previous years' prognoses by firms, and would also provide time series data on actual hires by occupation from which quantitative projections could be derived.

4. Adequacy of Occupational Supply

Tables 13 and 14 summarize perceived shortages and surpluses by selected occupation. Table 13 presents retrospective perceptions over the last three years, by four categories, severe shortage, shortage, adequate numbers and surplus of applicants. This table is organized by groups of occupations for which firms show disagreement or consensus on the perceived adequacy or inadequacy of occupational supply. The first five occupations, soudeur, comptable, magasinier, maron and technicien agricole illustrate some disagreement across sectors, but no disagreement within sectors. That is, Service and Transportation firms perceived a shortage of soudeurs, while one manufacturing respondent perceived a surplus over the last three years.

The four occupations tourneur, mécanicien, tolier and électricien exhibit disagreements among firms even within sector and type of firm. The last five occupations however either share some degree of consensus, or display no contradictory results (e.g. responsable finance).

Table 14 shows a similar organization of occupations by consensus or disagreement over the perceived adequacy of occupational supply in the immediate future (next twelve months). Here the evidence is more contradictory. The first six occupations exhibit some disagreement across, but not within sectors, except soudeur, where two manufacturing firms perceived either "enough" or a "surplus".

TABLE 12. NUMBER OF HIRES IN SELECTED OCCUPATIONS BY SECTOR

OCCUPATION	HIRED IN LAST 12 MONTHS		EXPECT TO HIRE IN NEXT 12 MONTHS	
	MF	NMF	MF	NMF
comptable	1(1)	1(1)		1(1)
dactyl		2(2)		3(1)
electricien	6(3)			
infirmier		3(1)		
laborantin	1(1)			
magasinier		3(2)		
mecanicien	2(1)	9(2)	1(1)	4(2)
resp fin	'(1)			
secretaire de direction		1(1)		
soudeur	1(1)	2(1)		2(1)
technicien agricole		2(2)		
tolier		3(1)		
tourneur	2(1)	1(1)		6(2)
total	14(9)	27(14)	1(1)	16(7)

Note: Number of persons hired followed by number of firms hiring in parentheses

TABLE 13. PERCEIVED OCCUPATIONAL SURPLUSES AND SHORTAGES BY OCCUPATIONS AND NUMBERS OF FIRMS BY TYPE

OCCUPATIONS	SEVERE SHORTAGE	SHORTAGE	ENOUGH	SURPLUS
soudeur	SVC (1)	TPT (1)	CMC (1)	MF (1)
comptable	MF (1)		CNSTR (1) CMC (1)	
magasinier	SVC(1)		MF (1) TPT (1)	
macon		CNSTR (1)	CMC (1)	
techn agric		MF (1)	AG (2)	
tourneur	MF (1)	CMC (1)	MF (1)	
mecanicien	SVC (1)	MF (2) TPT (1) AG (1)	SVC (1)	
tolier	SVC (1)		SVC (1)	
electricien		MF (2)	CMC (1)	MF (1)
laborantin		MF (1) SVC (1)		
menuisier		MF (1) CNSTR (1)		
sec de direction			BNK (1) SVC (1)	TPT (1)
responsable finance			TPT (1)	
dactylo			CMC (2) AG (1) TPT (1) BNK (1)	

TABLE 14. PERCEIVED OCCUPATIONAL SHORTAGES AND SURPLUSES IN THE IMMEDIATE FUTURE
BY SELECTED OCCUPATIONS AND NUMBER OF FIRMS BY TYPE

OCCUPATIONS	SEVERE SHORTAGE	SHORTAGE	ENOUGH	SURPLUS
techn agricole		MF(1)	AG(2)	
macon		CNSTR(1)	MF(2)	CMC(1)
menuisier		CNSTR(1)	MF(4)	
soudeur		SVC(1) TPT9(1)	MF(1) CMC(1)	MF(1)
sec de direction	CMC(1)	SVC(1)	BNK(2)	TPT(1)
resp finance		MF(1)	TPT(1) MF(2) BNK(1)	
mecanicien	SVC(1) AG(1) MF(1)	TPT(1) MF(2)	SVC(1)	
magasinier		TPT(1) CMC(1)	CMC(1) MF(3) SVC(1)	
comptable		SVC(1)	MF(1) CNSTR(1) TPT(2) CMC(1) SVC(1)	
electricien		MF(1)	CMC(1) MF(2) SVC(1)	MF(1)
tolier	SVC(1)	MF(1)	SVC(1)	
tourneur	MF(2) CMC(1)		MF(2)	
dactylo			AG(1) CMC(2) TPT(2)	AG(1)
infirmier		MF(2)	BNK(2)	
laborantin	SVC(1)	MF(1)		

The next seven occupations, responsable financier through tourneur, exhibit disagreements within sector, and even in some cases, within type of firm. Only the last two occupations, dactylo and laborantin, are agreed upon to be in adequate and short supply, respectively.

We would expect employers' perceptions of the future employment situation to vary somewhat across, and even within sectors. Furthermore, conclusions drawn from such a small sample of firms are likely to be misleading. Data from more firms in a later study phase should provide a clearer picture of these differences.

5. Qualifications of Occupational Supply

Analysis of the actual vs preferred educational and job experience levels of incumbents in these occupations reveals the expectations of employers for higher skilled workers. We asked employers what the qualifications were of employees currently working in each occupation (Question 4.8), and also, if they were to hire currently into the post, what would be the minimum level of qualifications required (Question 4.9).

Table 15 illustrates the difference between these two measures by occupation and firm, for thirteen categories of education/training. Numbers in parenthesis represent actual levels of training. It is clear from this table that employers are asking for more, or different kind of skills from employees. The scale is not strictly ordinal (although most categories are superior to the one lower), so findings should be interpreted with caution. In general however, preferred levels are higher. This is consistent with most employer surveys, which illustrate employers' tendencies to require more for less in terms of human capital stock. What is striking however is that only two firms indicated no differences between what they required as minimum qualifications and what they actually had hired. These firms are in Commerce and Transportation sectors, and are identified in Table 15 by no occupation with an educational level in parenthesis, (which would signify disagreement between preferred and actual).

Another way of looking at this disparity between actual and preferred skills levels is to analyse the educational level data from question 3.2 to determine what were the recorded educational levels for these occupations in the staffing patterns of responding firms. Table 16 presents these data.

As with previous presentations of these data, the numbers in the cells represent the numbers of firms employing persons at that educational level in that occupation. It should be noted that these counts may include the same firm more than once, since the educational categories have been aggregated.

TABLE 15. PREFERRED AND ACTUAL LEVELS OF EDUCATION/TRAINING BY TYPE OF FIRM AND OCCUPATION

OCCUPATION	AG	TPT	TPT	BNK	MF	MF	CMC	MF	MF	SVC	CMC	F I R M S SVC	MF	CMC	CMC	SVC	MF	MF	MF	AG	MF	BNK	CNSTR	SVC	TPT
COMPTABLE		10										8	8	8(7)		8							8(7)		8
DACTYLO	7(5)		7(12)								7			7						5(4)					2
ELECTRICIEN					7			7(12)	7(12)				7	7										7(5)	
INFIRMIER			7(5)			7											7(5)					9(7)			
LABORANTIN				7(12)												9(13)									
MACON					1		1	3(12)															5(12)		
MAGASINIER			7(13)						4(12)		7	7(5)	7		7(13)		7(5)								
MECANICIEN			5			7			7(12)	7(5)		5	5(7)							7(12)					
MENUISIER								5(3)	5(3)								5	5					5(12)		
RESP FINANCE		10			10	10													8			10			
SEC DE DIRECTION		8(7)		7											7(13)							8(5)	8(5)		8
SOUDEUR			5				5			7								7(12)	7(12)						
TECHN AGRICOLE	7				6(13)															7					
TOLIER										7(5)								7(12)						5	
TOURNEUR							7(5)										7(5)	7(12)	8(5)		7(5)				

Note: numbers not in parenthesis indicate preferred minimum requirements as stated by employers while numbers in parentheses reflect actual levels of education/training of current employees, where they now differ from employers' preferred minimum requirements

LEVELS

1. Primary School only
2. Up to four years secondary school (general)
3. Up to three years secondary vocational education
4. Certificate from first secondary cycle, and up to three years additional general secondary humanities
5. Professional diploma and/or 4 to 6 years sec. vocational education
6. Five to eight years general secondary humanities
7. Seven to eight years secondary vocational education
8. First year university
9. Some postsecondary technical education
10. More than one year of university
11. Engineer
12. On the job training
13. Other

TABLE 16. NUMBER OF FIRMS WITH EMPLOYEES IN SELECTED OCCUPATIONS BY ACTUAL AND PREFERRED LEVELS OF EDUCATION

EDUCATIONAL LEVEL	OCCUPATION													
	COMPTBL	DACTYLO	ELECTRCN	INFRMR	LBRNTN	MACON	MAGSNR	MECNCN	MNSR	RESP FIN	SEC DE DIR	SOUDR	TCHN	AGRIC	TOLIER	TOUR
UP TO AND INCLUDING TWO YEARS PRIMARY SCHOOL			2			*5	2	6							1	
OTHER PRIMARY		4	2			*2	2	5	5			2			2	
FIRST CYCLE SECONDARY (1-4 YRS)	5	23	13	2	3	2	18	24	*5		2	8			2	
SECOND CYCLE SECONDARY (5-8 YRS)	9	*5	*3	*6	*		*2	*4			4	*		*2	*	
HIGHER EDUCATION	*3						1			*1	*3					
ADDITIONAL HIGHER FD OVERSEAS					1											
EVENING COURSES	1	2														
TOTAL	18	34	20	8	4	9	25	39	10	1	9	10		2	5	

Note: asterisk denotes educational level preferred by employers

Asterisks represent the mode of the preferred educational level across those firms that responded for that occupation. In most of the occupations, the majority of instances of occupational employment are at a lower level than the preferred level of education/training.

Equally important in the assessment of "employers needs" is the perception of adequacy of job experience in new hires. While not of such direct concern for educational policy as preservice educational requirements, it is useful for designers of in-service education and training programs to know where they can supplement lack of prior job experience. Table 17 presents employers' minimum requirements for job experience by occupation. The frequency distribution of responses is bimodal, with employers either requiring no prior job experience, particularly for comptables, or more than two years, particularly for infirmier.

We also asked whether employers perceived these qualifications, (both educational and on-the-job experience) as increasing, staying the same or decreasing in the future. Educational qualifications were perceived as increasing in more than one firm in only two occupations, secretaire de direction (3 firms) and mécanicien (5 firms). In the first case, the level of employees currently employed was seven to eight years secondary vocational education. In the second, levels of those already employed as mécaniciens varied from no more than on-the job training to four to six years vocational education (secondary) with professional diploma. We did not ask employers to estimate how much these qualifications were expected to increase by, only whether or not they were expected to increase. The next phase of the study will address this dimension of the question by requiring respondents to assess the amount/level of increase.

Two occupations were expected by more than one firm to increase in job experience required. Magasinier was perceived as requiring more prior experience by two firms, and comptable by three. In the case of comptable, two firms which had indicated that no previous experience was necessary (see Table 17) expected that to change in the direction of more required job experience in the future.

Finally, since the public sector education and training system is primarily responsible in Burundi for providing entry level work skills at all levels, employers were asked to express their opinion as to the effectiveness of the preparation received by employees in the selected occupations. Respondents registered dissatisfaction relative to nine of the fifteen occupations. Table 18 illustrates the occupations, number of firms expressing concern, and reasons for dissatisfaction. Even from such a small sample of firms, these concerns show some consistency across subsectors in themes, especially since the answers to these questions were open ended. There is an emphasis on the lack of practicality and low levels of knowledge and mastery of the necessary subject matter.

TABLE 17. REQUIRED MINIMUM LEVELS OF JOB EXPERIENCE BY TYPE OF FIRM AND OCCUPATION

OCCUPATION	AG	TPT	TPT	BNK	MF	MF	CMC	MF	MF	SVC	CMC	F SVC	I MF	R CMC	M CMC	S CMC	SVC	MF	MF	MF	AG	MF	BNK	CNSTR	SVC	TPT
COMPTABLE		1											1	6		1		5						1		1
DACTYLO	4			1							5					1					4					6
ELECTRICIEN					6			6	3					6		1									6	
INFIRMIER				6		6												6					6			
LABORANTIN					1												5									
MACON					6		6	6																1		
MAGASINIER			1						1		5		6	6			6		1							
MECANICIEN			6			1			1	1			6	6							6					
MENUISIER								5	1										1	6				5		
RESP FINANCE		1			6	6															5		6			
SEC DE DIRECTION		1		6													5						6		6	
SOUDEUR			4				1			1										6	6					
TECHN AGRICOLE	6					1															6					
TOLIER										1										6					6	
TOURNEUR							6												1	6	6		5			

LEVELS	
NONE	1
UP TO THREE MONTHS	2
THREE TO SIX MONTHS	3
SEVEN MONTHS TO A YEAR	4
BETWEEN ONE AND TWO YEARS	5
MORE THAN TWO YEARS	6

TABLE 18. REASONS FOR DISSATISFACTION WITH PUBLIC EDUCATION AND TRAINING FOR SELECTED OCCUPATIONS

OCCUPATION	FIRMS	REASONS
TECHN AGRIC	MF(1); AG(1)	TRG TOO THEORETICAL; CANDIDATES DO NOT SEEK CHALLENGING WORK;
SEC DE DIRECTION	BNK(1);	TOO LOW LEVEL OF TRG;
ELECTRICIEN	CMC(1); MF(1);	INSUFFICIENT TECHNICAL SKILLS;
LABORANTIN	SVC(1);	NO SPECIALIZED TRG AVAILABLE;
SOUDEUR	MF(1); CMC(1); TPT(1);	NOT WELL PREPARED/CONDITIONED; NOT ENOUGH PRACTICAL EXPERIENCE;
MAGASINIER	TPT(1); MF(1);	LACK OF AVAILABLE TRG; LACK OF MASTERY;
DACTYLO	AG(1); TPT(1);	LACK OF MASTERY; LOW LEVELS OF KNOWLEDGE;
MACON	CNSTR(1);	INSUFFICIENT PRACTICAL EXPERIENCE;
MECANICIEN	AG(1); MF(1);	TRG TOO THEORETICAL; INSUFFICIENT COMPETENCIES; LACK OF MASTERY; LEVEL SEVEN NOT ENOUGH;

NOTE: NUMBER OF FIRMS IN PARENTHESES

CHAPTER V

PRELIMINARY MODELING APPROACHES

A. Factors Affecting the Productivity of Firms

Private sector productivity is clearly of interest to the Government of Burundi, in that GOB seeks to promote economic growth through generally sound public policy. Most of the literature on education and productivity suggests a direct and positive relationship between the two, despite disagreements as to how or why this is so (Levin, 1984). However we are concerned in this study with specific ways in which education and training policy can be usefully informed through current knowledge of private sector functioning.

Previous sections of this report have described our pretest sample of firms in detail, their characteristics, occupational staffing patterns, education levels of employees, perceived skill shortages, and "problem" occupations. These descriptive human resource data are potentially valuable to educational planners for a variety of reasons, such as identification of occupational skills needs. Since Burundi education/training institutions are providing most of the skilled labor for the private sector, it will be equally important to determine the relationship between Burundi schooling and productivity, and in particular, the extent to which increments in educational level contribute to the success of private firms.

To examine these relationships, we attempted some preliminary model building with our mean productivity measure (Y) as the dependent variable, and a number of empirical and derived independent variables, as follows:

A = age of firm

T = type (manufacturing/non-manufacturing)

E = educational level (PI through PVI)

as well as derived variables in the form of interaction terms (e.g. T x E), and a number of transformations (logs and square roots) of the original variables. While comprehensive multiple regression models can of course be constructed from these kinds of data, the small number of observations and high correlation between some of the explanatory variables (e.g. Age and E) constrained our approaches to models with only one or two independent variables.

With more data in later phases of the study, some of the relationships we could only partially examine with the pretest

sample can be explored more fully.

The general hypothesis is that higher levels of education and training in the private sector workforce will impact directly and positively on productivity. Higher skilled workers are expected to realize better benefits from equipment, so that capital investments become potentially more productive. In addition, higher skilled management should allocate resources more efficiently. Thus, given precise information on private sector skills needs, public sector resources can be targeted towards those priority occupational areas where such inputs can make the most difference in productivity.

As already noted, many of our measures were exploratory during this pretest. Moreover, the size of our sample, especially after elision for missing data, is not large enough to produce much in the way of stable behavior of model coefficients. Thus we report the following highly tentative results for two reasons: 1) to indicate the kinds of questions that can asked of these data given larger and well-balanced samples, thus guiding future hypotheses and study design; and 2) to show possible relationships emerging from these preliminary data.

Two assumptions underlie these modeling efforts. Firstly, it was presumed that our derived measure of productivity was a reasonable index in these relatively labor intensive industrial enterprises. Burundi firms in our sample, as described by our technology variable, tend toward the "manual labor" and mechanized end of the industrial technology spectrum. Thus the definition of productivity as outputs/labor is used. As already noted, the concept of productivity is complex. Measurements are neither standard nor unambiguous, especially when used across different kinds of production processes (e.g. manufacturing and service industries).

Defined in general terms, productivity is the ratio of outputs to inputs, or more specifically the efficiency with which output is produced by the resources utilized (US Bureau of Labor Statistics, 1983). Single factor measures typically include ratios of real output to labor, or real output to capital inputs. Total factor measures weight labor and capital inputs in computing a productivity index. Multi factor measures are based on more than two inputs.

These indices are reviewed elsewhere in relation to productivity measurement and technological change in recent studies of U.S. manufacturing and non-manufacturing firms (Ramachandran and Lawrence, 1986; Lawrence et al. 1986). The single factor measures of labor productivity were used in these studies, and are commonly relied on in human resource research (Milkovich and Glueck, 1985). One such measure is (Q/L) where Q is total sales (chiffres d'affaires) and L is total employment. In the present case we used

[(Q1/L1)+(Q2/L2)]/2, where Q1, L1 were total sales and total employment for 1984, and Q2, L2 were the same indices for 1986, respectively. The resulting mean productivity measure will be adjusted for inflation in subsequent analyses, although for this report, this adjustment has not been made.

Secondly, our variables P I through P VI are only proxies for educational level. Administrative cadres such as these may be subject to several forces (e.g. promotion, appointments) which reduce the overall relationship between amount of education and occupational location of employees in categories I through VI. Yet the data we gathered on educational level within each category supports the central assumption. Furthermore refinements in subsequent collection of educational level data may make it possible to substitute direct measures of educational level in future models.

Thirdly we assumed that the Y variable (mean productivity) moves in a logarithmic relationship to inputs, and it was the natural logarithm which demonstrated the best fit in least squares linear models.

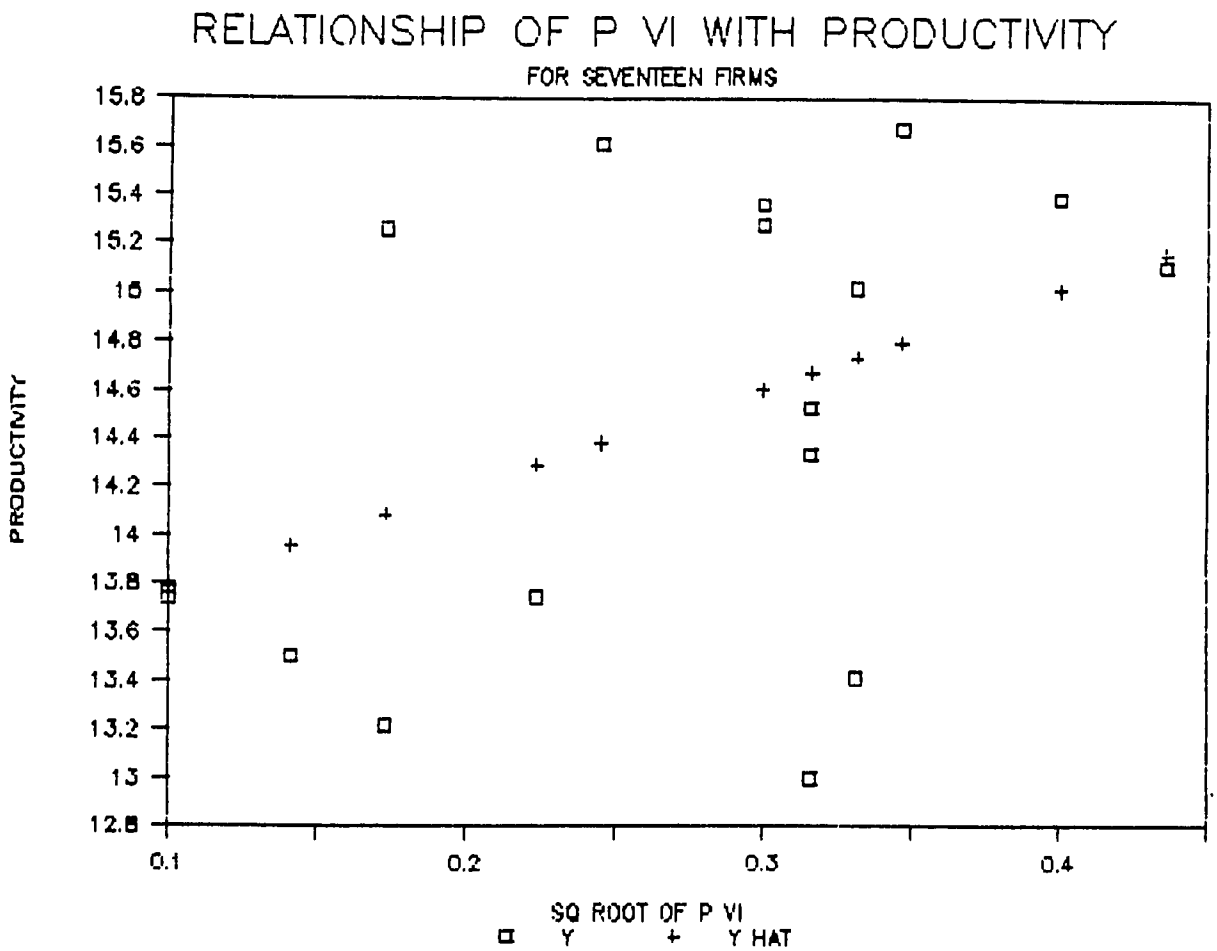
Using this approach, Ln(Y) = a + b(V P VI) showed a positive relationship between the proportion of highest level personnel and productivity (R2= .201; df = 15; p < .068; see Figure 8). This was the only positive relationship approaching significance, but it offers some support for the hypothesis. However the R2 is small, pointing perhaps to the need for more variables in the model.

Even though simple linear regression on type (mf/non MF) was not significant, when other variables, such as Age, (P I x P VI), were introduced, the p value for Type was .088, with a negative effect associated with manufacturing firms. The pattern of correlations for manufacturing and non-manufacturing firms, respectively, were as follows:

Manufacturing	Age	P I	P VI
P I	-0.5562		
P VI	0.7070	-0.1780	
Y	-0.3310	0.9130	0.1102

Non-Manufacturing	Age	P I	P VI
P I	-0.3218		
P VI	0.6244	-0.7466	
Y	0.3688	-0.3924	0.4576

Figure 8


RELATIONSHIP OF P VI WITH PRODUCTIVITY
FOR SEVENTEEN FIRMS
PRODUCTIVITY
15.8
15.6
15.4
15.2
15
14.8
14.6
14.4
14.2
14
13.8
13.6
13.4
13.2
13
12.8
0.1
0.2
0.3
0.4
SQ ROOT OF P VI
Y
Y HAT

Analyses of these two correlation matrices suggested some differences between manufacturing and non-manufacturing firms in the associations between these independent variables and productivity. In manufacturing firms, some evidence of a significant positive relationship appeared between P I and Productivity in the regression analysis, but the low degrees of freedom (df=5) render this finding quite speculative. The same regression for the non-manufacturing firms yielded no significant results in relation to productivity. In the nonmanufacturing firms, the closest to significance was a positive relationship between P VI and productivity, ($p = .13$). It was interesting to note, however, that Age and P VI were positively correlated ($p = .097$).

The pattern which emerges here, which must, at this stage be considered only hypothetical in view of the possible influence of one or two observations, is the following. Higher levels of skilled personnel, as represented by proportions of P VI employees, appear to be associated with higher productivity in general across all types of firm in our sample. Yet for manufacturing firms, higher proportions of the lowest labor category of manual labor are quite strongly associated with higher productivity, reflecting the reliance of manufacturing processes on relatively unskilled labor. Older, non-manufacturing firms have higher proportions of level VI labor, suggesting perhaps either that older firms have managed to remain competitive by increasing their higher level management, or conversely, that administrative efficiencies may be operating to reduce numbers of higher level administrators in newer firms.

The extent to which specific management skills are needed in addition to (as short, in service training courses) or as part of formal, substantive (pre-service) education and training requires further attention, since the choice of responsive solutions to demonstrated occupational demand is clearly a matter of educational policy.

While these conclusions are essentially exploratory, they indicate the kinds of information potentially available from these data. They also imply that manufacturing and non-manufacturing firms should be well represented in the sample, and clearly distinguishable in future analyses. In addition, since it is possible that the effects of educational level on productivity may vary depending upon the age of the firm, it will be necessary to consider age of firm as one criterion in selecting firms for future study.

A further methodological consideration concerns the productivity measure we selected. The models used in these analyses demonstrated that the Y intercept stays approximately constant at a positive value of between +12 and +15. This suggests that other factors yet unmeasured are contributing to the observed levels of productivity. Furthermore theoretical considerations

require attention to the other (non labor) factors in productivity, such as capital inputs. Our variable for technology type (Tech) was intended to distinguish firms on a continuum of higher to lower technology as a proxy for capital investments by the firm. As already reported, it failed to discriminate adequately on this measure. In our models, (Tech) did not demonstrate the effects we expected theoretically, necessitating some adjustment to the definition of this variable in future studies. We should expand the definition and range of possible responses to capture more variability, particularly in the manufacturing firms.

One finding was especially striking. Examination of the residuals for most of the models yielded a remarkably consistent pattern. Low values of productivity were overestimated, and high values underestimated. Figure 9 illustrates this pattern for the model Ln (Y) = 13.371 + 4.1298 (VP VI). Such symmetrical behavior of the residuals could be due to a number of causes such as the influence of outliers in a small sample, the omission of important variables in the models, interactions, or a different functional relationship among the variables already studied, or a combination of all of these.

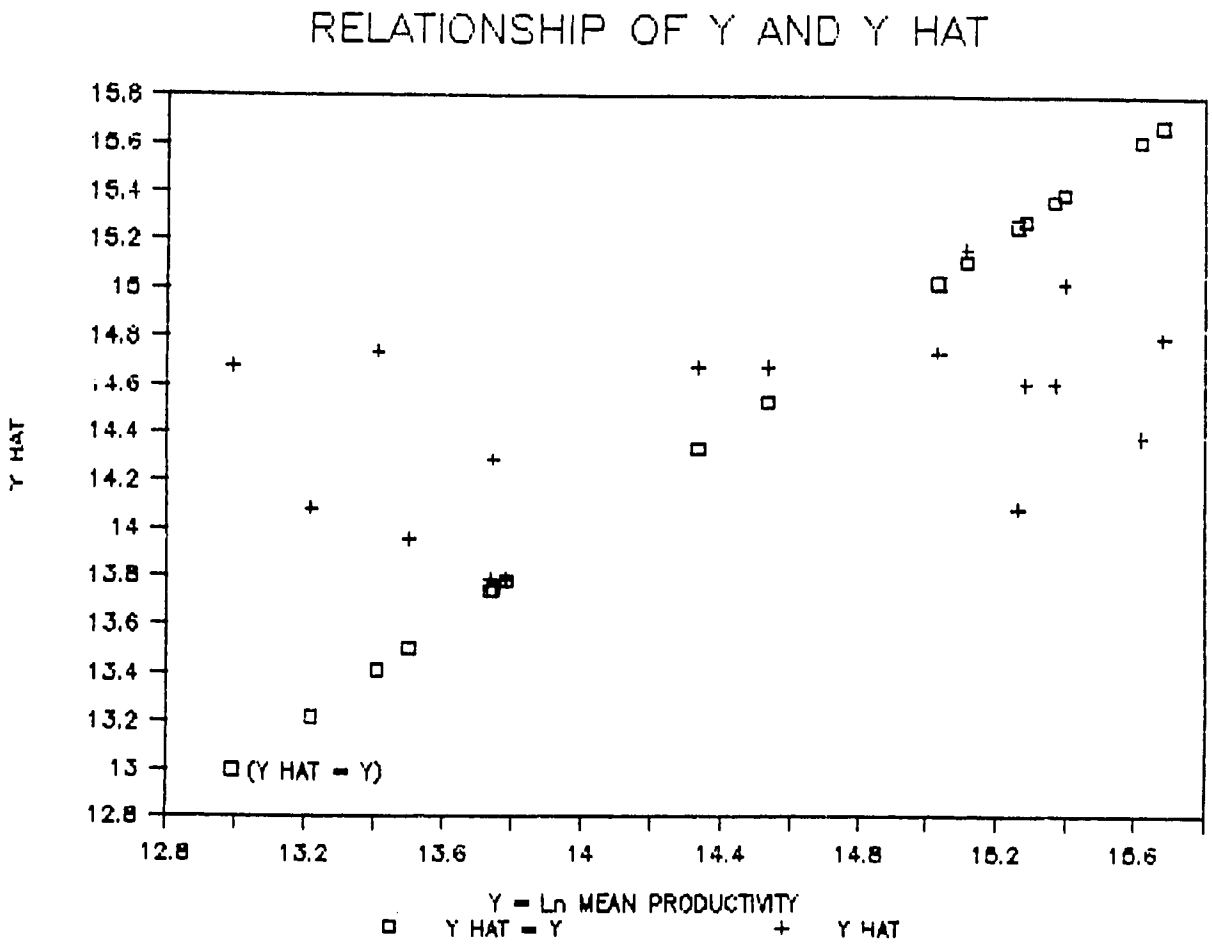
The implications for these analyses however were that high productivity firms were different from low productivity firms in important ways that are not tapped with these models using this small a sample. We do not, and will not know until subsequent analyses have been conducted with a much larger sample, whether our preliminary speculations hold. But when we split the data using the median of our productivity measure, for the higher group, the model

$$Ln\ (Y) = a + b1(Age) + b2(P\ V)$$

gave some indication that Age was negatively, and P V positively associated with higher productivity. Again, speculatively, because of the small sample, we suggest that these firms may be at a higher level of productivity because despite the apparently negative effect of age, they have survived for a period of time in a competitive market, perhaps by employing somewhat greater proportions of personnel in higher technical skills categories.

In addition, P VI was positively correlated with Age in these firms, implying the older the firm, the higher the proportional distribution of top management employees. We believe on the basis of these preliminary data, that there may be an interaction between Age and Educational level, possibly as a function of promotion which may confound the categorical proxy for educational level. This should guide future analyses, and prompts us to seek for revised and improved measures of educational level. None of these relationships held in the lower productivity firms.

Figure 9


RELATIONSHIP OF Y AND Y HAT
15.8
15.6
15.4
15.2
15
14.8
14.6
14.4
14.2
14
13.8
13.6
13.4
13.2
13
12.8
Y HAT
(Y HAT = Y)
12.8
13.2
13.6
14
14.4
14.8
15.2
15.6
Y = Ln MEAN PRODUCTIVITY
Y HAT = Y
Y HAT

In conclusion, we propose that no definitive relationships be inferred from these preliminary analyses. The advantage of these modelling efforts is to only demonstrate what can be done with more data, and to provide direction for data collection protocols in later surveys. If stable relationships emerge, for example, between educational levels P III to P VI and productivity, then depending on the sectors, and occupational structure of firms within that structure by category, public education and training policy can be informed relative to targeting scarce resources. Further analysis needs to be performed on the educational levels within the personnel categories I through VI, to determine whether "category creep" is functioning to reduce the validity of these employment categories as proxies for skills levels. We also need measures of job experience by employee if we are to measure job skills adequately.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The paper has described a preliminary study of private sector employment in Burundi from the perspective of public sector human resources development policy and practice. Using a combined method of mail survey and on-site visitation, project staff collected information on firm, employment and employee characteristics from twenty five firms in Bujumbura.

Three considerations were uppermost in the design and conduct of this study. Firstly, the necessary diagnostic capability for determining how employer needs are changing in the Burundi private sector must be located within Burundi. Such capability can not rest with outside agencies or international consultants. Thus the design of the study, its instrumentation, data collection and some of the analyses were completed in Bujumbura by Burundi agencies and personnel.

Secondly, traditional manpower planning techniques have in the past often focused on periodic one-shot frames, instead of attempting a 'moving picture' of employment characteristics relevant to human resources policies (such as employer perceptions of employee skills adequacies). This study aimed therefore at building on existing employment data methods and series in search of longer term and more continuous diagnostics on private sector labor markets.

Finally, the phase of the study reported on in this paper was the first, or pilot stage. At the time of the study design, a further stage was envisioned, expanding sample size to 150 firms, and refining instruments and data collection techniques on the basis of findings from the earlier stage. Thus one of our key objectives was to construct a methodology that could be continuously refined and applied within existing labor market information series, as a component in a kind of human resources 'radar' system for guiding more responsive public policy.

In light of the small number of firms in the pilot sample, we report the findings primarily from a methodological perspective, that is, to yield information for improved instruments and procedures for subsequent applications of the proposed approach.

However, since there is not much information available on private sector occupational structure in the country, these data may be useful as indicators in themselves.

A. Summary of findings

Analyses were conducted at three levels, at the level of the firm, employees within the firm, and by occupation.

1. Firm level analyses

Basic data on firm size, age, type, stability, productivity and technology were used in these analyses. The 25 firms ranged in size from more than 1700 to less than ten employees, and included non-manufacturing as well as manufacturing establishments. Age of firm was considered an important variable in view of the changes facing the Burundi industrial economy. The average age of firms studied was 22 years, although age varied in the sample from seven to sixty six years, and the mode was ten years or less. Continuity in production or service functions was generally reported as stable in most firms. More than half the firms characterized themselves as either automated or mechanized, with one commercial firm for example using computers in its vegetable vending process. The majority of firms marketed within Bujumbura and its immediate environs, and only two firms exported outside Burundi. Using a partial measure of productivity (roughly, volume of sales per employee, adjusted for time), there appeared to be some difference in productivity between manufacturing (less productive) and nonmanufacturing firms (more productive). These differences nevertheless are not statistically significant.

2. Employment/Employee analyses

We examined some basic aspects of employment composition, occupational distribution within the firm, previous or anticipated employment growth/decline, and particular problems related to occupational skills levels.

We developed fairly detailed occupational staffing patterns which for obvious confidentiality reasons we are not publishing. However, it was possible to construct from these data preliminary industry/occupation employment matrices, which because of the small number of firms in the sample, cannot be shared, but which indicate the type of staffing ratios common to a sector and size-class. More routine data collection on larger samples can thus provide not only important information on current employment, but also projected staffing needs by sector and occupation.

Eleven of the firms in the sample experienced stagnant or declining employment in the four year period 1984-88. Fifteen anticipated no

employment growth over the next 12 months. Detailed data on 71 educational levels by employee/occupation were obtained. The reason for the large number of levels was to provide raw data from which to justify empirically a reduced number of categories for future use. The data show similar patterns for both manufacturing and nonmanufacturing firms, and provide support for the categorization into six levels currently in use in Burundi government statistics as follows: primary schooling (Levels I and II) secondary schooling (Levels III through V) and higher education (Level VI). There was an interesting tendency for educational qualifications of employees to be somewhat higher in lower educational categories in the non-manufacturing firms, indicating perhaps some evidence of a 'qualifications-creep' upward in some non-product oriented, and in some cases, newer firms.

Qualifications were seen as particularly important in hiring procedures of most firms, especially at higher occupational levels. Work tests, interviews and probationary periods of initial employment were predominant in hiring of new employees. When we asked respondents to identify recruitment problems, they most often referred to the lack of appropriate training and technical aptitude for those being hired into occupations, particularly in technical occupations such as mécanicien and électricien. Notably, no employers indicated wages or salaries as a problem. Serious shortages were identified in nursing specialties in some firms.

3. Detailed occupational analyses

Fifteen occupations were selected as priority for the study, and were examined in greater detail. Job descriptions were sought where available, and the questionnaire asked respondents for brief verbal descriptions of key activities, responsibilities, equipment used, and percent time on key activities.

Only eight firms indicated use of job descriptions, and we were unable to get a single copy from any respondent. Questions on proportion of time spent per activity were difficult to pose, and produced poor data, and thus were not used in the analyses. Descriptive information on activities was more useful however, and helped to distinguish previously implicit distinctions within a single occupational title. Functional/supervisory differences, for example are not typically differentiated within a title such as comptable (roughly,accountant). Actually maintaining the books is one thing, but being <u>responsible</u> for their maintenance may be another, both of which are usually wrapped up in the title 'comptable'. This is one of the many problems inherent in occupational classification systems which depend on some degree of aggregation for their utility. Detailed information such as these, on representative samples of firms within sector, could in future help to identify major discrepancies in titles, and suggest new and more useful aggregative schemes. In similar ways, the use of associated equipment information by job within title can help to

track both occupational differences, as well as skill needs as they change.

The majority of job openings anticipated to occur in the immediate future (next 12 months) relative to the fifteen occupations studied was in two occupations (tourneur, mécanicien). While there was agreement within sectors about shortages/surpluses in some occupations, there were also inconsistencies both within and across across sectors. For example, Service and Transportation firms perceived a shortage of soudeurs (roughly, welders), but a manufacturing firm percieved a surplus over the last three years. In other occupations there was disagreement as to availability even between firms within the same sector. With a larger sample, these differences might be expected to stabilize, that is take on some central tendency by firm type or characteristic.

Examination of actual versus preferred level of qualifications for employees in these occupations indicated that employers are looking for different, usually higher levels of qualifications than are actually possessed by current employees in that occupation. While this is characteristic of employer needs studies, it must also be understood in the context of the preliminary evidence of 'qualifications creep' in the non-manufacturing firms mentioned earlier. The finding that employers seek more qualified applicants is consistent across almost all sectors. Another element of job qualification is experience. This seems to be an 'all or nothing' requirement in the firms and occupations studied. Employers either required little or no job experience at all, or two years or more.

When asked to express a general opinion (through an open-ended question) as to the effectiveness of the preparation received by employees in the priority occupations, employers showed fairly consistent dissatisfaction. Lack of practicality of preparatory programs, and resulting low levels of knowledge and mastery of the necssary subject matter were paramount in these responses.

Finally, some modelling approaches were derived using least squares regression for examining, for example the relationship between educational levels and productivity. With the small sample, and high correlations between explanatory variables (e.g. Age of Firm and Educational Level), we could only use one or two-variable models. Thus this section of the report is more exploratory than explanatory. However it serves to illustrate some of the diagnostics that can be attempted once data from a larger sample can be collected.

B. Conclusions

As already indicated above, the conclusions to be drawn from this study are mainly methodological. Substantive findings are limited by the quite small sample size, and the preliminary nature of the approach. We however can make several suggestions on the basis of this first phase.

As a result of the response rate (all firms responded) and the evidence from site visits, it is clear that there is a serious concern about the quality of skills available in labor market supply in firms and occupations examined in the study. Furthermore, employers in the firms we visited seem ready to work with the public sector to improve the situation. We found almost no negative attitudes to our questions, in fact the opposite was most often the case. If employers have the purposes of the questionnaire explained to them, and on-site visits are possible to back up and work through the questionnaire, the private sector community is willing and able to provide useful information, particularly if sectoral averages and aggregate data can be provided back to them, so they can see where their own firms fit into a general profile. The education sector, not ordinarily involved directly in the design of routine labor market surveys of these firms, stands also ready as a partner in this effort. We have noticed therefore an underlying consensus between the essential actors in the collection and use of these data, which is that the data are important, potentially useful, and should generate further practical discussion as to how public education and training can become more responsive to actual labour market needs.

The approach proposed here is labor intensive, and too expensive and time consuming to be applied routinely to all firms in the private sector. Representative sampling within industrial sector, by size class and product type however should reduce costs and yield good information. In particular, we strongly recommend further refinement of the examination of the relationship between education and productivity, as begun in our modelling efforts in the last chapter of this report. The need to capture even rudimentary job activity data along with educational level, such as we obtained in the study, is essential to track 'qualifications creep', as well as to maintain updates in occupational classification systems.

The Economic Commission for Africa, in two recent reports (ECA 1988, 1989) has stressed the need to attend to the social consequences of structural adjustment. African governments are exhorted to assign a higher priority to human resources planning, which includes of course, but is not limited to employment planning. A major component in such capabilities must be improved information, and the capacity not only to collect, but also to

analyse the data in such a way as to provide timely interpretations for policy purposes. It is this diagnostic ability which is so important, and there is a growing awareness of this fact in Burundi. New alliances are possible between education, labor and employers to facilitate the flow of information, as this study has shown.

Any future phase(s) of this approach should capitalize on the in-country expertise generated both inside and outside of government in understanding the nature of the skills gap in Burundi, and building mechanisms for overcoming that gap. Subsequent information-gathering methods should extend also to employment opportunities outside the formal modern sector, where the majority of future employment lies for young Burundi men and women. The ILO/JASPA report estimates that 45% of the urban labor force were employed in the informal sector in 1985. This is not especially high by African standards, but is only likely to increase in the next decade. In view of the youth unemployment problems facing Burundi, it is recommended that future survey methods augment our approach by including age distributions of employment by occupation in private sector firms.

REFERENCES

Braddy B.A.
1987 Notes on Recent Trends and Practices in Manpower Planning. Project BRIDGES Working Paper. Research Triangle Institute.

Burke, G. and Rumberger, R.W.
1987 The Future Impact of Technology on Work and Education. The Falmer Press, London.

Celestin J.B.
1983 Manpower Planning and labor market information in French Speaking Africa. International Labor Review. 122 (4) 507- 521.

Centre de Perfectionnement et de Formation en Cours d'Emploi.
1988a Etudes (1) sur l'Adequation Formation-Emploi au Burundi. Bujumbura.

Centre de Perfectionnement et de Formation en Cours d'Emploi.
1988b Etudes (2) sur l'Adequation Formation-Emploi au Burundi. Bujumbura.

Economic Commission for Africa.
1989 African Alternative Framework to Structural Adjustment Programmes for Socioeconomic Recovery and Transformation. Addis Ababa, Ethiopia.

Economic Commission for Africa.
1988 Human Resources Management in Africa. Addis Ababa, Ethiopia

Goldstein H.
1981 Occupational Employment Projections for Labor Market Areas: An Analysis of Alternative Approaches. R&D Monograph 80. US Department of Labor. Employment and Training Administration.

International Labour Office. Jobs and Skills Programme for Africa.
1988 African Employment Report. Addis Ababa, Ethiopia.

Lawrence J.E.S.
1988 Occupational Information: Status and Sources. In Gael S. (Ed). The Job Analysis Handbook for Business, Industry and Government. John Wiley. New York, pp. 369-388.

Lawrence J.E.S., Drewes D.W., Braddy, B.A., Spetz, S.H. and Ramachandran, V.
1987 Implications of trends in the occupational structure. Final Project Report submitted to the Social Security Administration, Division of Disability Studies. Research Triangle Institute.

Levin, H.M.
1984 Improving Productivity Through Education and Technology. Institute for Research on Education, Finance and Governance. School of Education, Stamford University. Palo Alto, California.

Milkovich G. T. and Glueck W.F.
1985 Personnel: Human Resource Management; a Diagnostic Approach. Business Publications Inc., Plano, Texas.

Ramachandran V. and Lawrence J. E.S.
1986 Measurement of technological change. Working Paper to the Social Security Administration. Research Triangle Institute.

Richter L.
1984 Manpower Planning in Developing Countries.: changing emphases and approaches. International Labor Review. 121, (4) 417-434.

Richter L.
1989 Upgrading Labour Market Information in Developing Countries: Problems, Progress and Prospects. International Labor Office, Geneva.

United Nations Economic Commission for Africa.
1988 Human Resources Management in Africa. Addis Ababa. Ethiopia.

U.S. Department of Labor, Bureau of Labor Statistics.
1983 A BLS Reader on Productivity. Washington D.C. Bulletin 2171.

World Bank Education in SubSaharan Africa
1988 Policies for Adjustment, Revitalization and Expansion. Washington, D.C.