ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

RETURNS TO SCHOOLING IN NON-FARM SELF-EMPLOYMENT

(THE CASE OF SELECTED URBAN CENTERS IN ETHIOPIA)

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JULY 2002

RETURNS TO SCHOOLING IN NON-FARM SELF-EMPLOYMENT
(THE CASE OF SELECTED URBAN CENTERS IN ETHIOPIA)

BY

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A thesis submitted to the School of Graduate Studies of Addis Ababa University in partial fulfilment of the requirements for the degree of Master of Science in Human Resource Economics

ACKNOWLEDGMENT

First of all, I want to give thanks and praises to the Almighty creator who gave me all the blessings to make this a reality. Then, I would like to extend my gratitude to my thesis advisor, Ato Getachew Yoseph, for his useful and constructive comments and suggestions in the writing of this thesis. I am also grateful to the Economics Department of Addis Ababa University, for providing me the 2000 Ethiopian urban household socio-economic survey results.

I am totally indebted to my family and friends (particularly special appreciation goes to Yetnayet Ejigu, Kidist Kefyalew and Ahemdin Yimam) who supported me materially for this study.

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ABSTRACT

Investment in human capital has long stirred an interest geared towards investigating whether or not it is profitable. Among such human capital variables, education has been recognized as the most important investment in human capital for a long time. The main objective of this study is to examine and estimate the returns to schooling in connection with self-employment in selected urban centers in Ethiopia. Using a Mincerian earning function and correcting for sample selection bias, the paper shows that (a) the private average returns to a one-year increase in schooling is about 5.6%. This figure is smaller than the global average (as estimate by Psacharopolous, 1993) by 5.4% and even by 9.4% from the average of some developing countries. This could partially be explained by the overall low quality of education in Ethiopia; (b) the Mincerian rates of return to primary, secondary and higher education are 6.9%, 7.9% and 17.2%, respectively. As is apparent from these coefficients, the highest return is derived from higher education and the lowest return for primary education. This indicates the existence of substantial productivity differential between college graduates and those who comes from the lower level of education; (c) educating females is marginally more profitable than educating males. This implies that expanding the provision of school places to cover women is not only equitable but also economically efficient as well; (d) the coefficient of start-up capital in the earning equation is positive and significant. It indicates that those household heads who put higher start-up capital earn more than others. The coefficient of dummy for service sector is also positive and significant. This implies that those household heads who run their business in the service sector earn more than others.

CHAPTER ONE

BACKGROUND

EDUCATION IN ETHIOPIA: AN OVERVIEW

1.1. INTRODUCTION

Retrogression or progression of the development of Ethiopian educational system was and is interwined with the nature of the governance of the alternating Ethiopian ruling circles; the evolutionary development of the socio-economic structure as well as with the external interaction and influence the country had or underwent in the long dark past.

Almost ninety years ago Emperor Menelik II established the first modern government school in 1908 in the country. By 1994/95, there were 10,730 primary and secondary schools with a total enrollment of about 3.5 million (MOE, 1994:7). In hindsight this appears to be a quantum leap. Nonetheless, as a close scrutiny of the education system shows, it has been plagued by numerous complex problems since its inception. The criticisms that had been leveled at it are legion. It had been indicted on several counts. For one thing, it was charged being elitist, formalistic, rigid and highly bureaucratic (Seyoum, 1996).

With a view of throwing some light on these issues, this chapter discuses the education sector in Ethiopia.

1.2. HISTORICAL DEVELOPMENT OF EDUCATION IN ETHIOPIA AND ITS PRESENT STATUS

In traditional Ethiopia, the Orthodox Church and the Mosque were the two major institutions that were responsible for the dissemination of religious education. Even though the role played by these two centers of learning in the cultural development of the nation cannot be underestimated, it is important to note that in traditional Ethiopia there was no popular or public education either for boys or girls. Instead, the church as well as the mosque provided religious education mainly for promoting their respective doctrines. The church enabled the country to develop her own written script that made her the only country in Sub-Saharan Africa to have a written script of her own. Paradoxically, however, it remained for so long the "Land of the Thumb Print" (NL CCC, 1984:3)

It was, therefore, against this backdrop that modern education was introduced by the government at the turn of the twentieth century. In fact, its introduction was not at all welcomed with enthusiasm by the clergy as well as by the aristocracy. There was a fear that it could serve as a vehicle for the penetration of alien religion as well as for the introduction of sinister ideas to rock the 'statuesque'. Consequently, its development was cautious, and gradual, particularly with regard to the education of women. Even though a school for girls was established by Empress Menen in 1931, the number of students was not more than a token.

At the outbreak of the Italo-Ethiopian war, in 1935, the total number of pupils in the entire country did not exceed five thousand, and those sent abroad for further study numbered about two hundred (Pankhurst, 1962: 272-72). The modest attempt that was initiated by Emperor Menelik, and embraied by Emperor Haileselassie, to modernize the

country through western education was thus disrupted by the Italian occupation. The occupation was short lived; however, it did a lot of harm. The few existing schools were closed down and the few educated Ethiopia were liquidated. In general fascist Italy's educational policy aimed at providing native education that makes Ethiopians merely loyal servants of their fascist Italian masters. By the time the five-year occupation ended, the enrollment of Ethiopian pupils dwindled to about 1500 (Teshome, 1979: 50).

The liberation of the country in 1942 ushered into a period of reconstruction that lasted to the mid-fifties. The government, during this period, seemed to have painfully and embarrassingly realized that the defeat of the county at the hands of Fascist Italy was partly due to its backwardness. Therefore, it appeared that the government resolved to do every effort to make to promote the development of education. Consequently, schools started mushrooming in some urban centers of the country. The British, as partners in the liberation of the country, started to make their influence felt in the organization of the educational system. In fact, the structure of the educational system had a British touch. It constituted of a three-tier system (4+4+4) four years of primary, followed by another four years of intermediate culminating in four years of secondary. It is worth noting here that during all this period, as observed by Tekeste (1990:4), no serious educational issues were addressed by those concerned, despite the fact that almost everything in the school was foreign. An expatriate educator at that time observed that there was nothing Ethiopian in the classroom except the children. It is true that modern education in Ethiopia is imported and alien.

By 1955, the total student enrollment had reached the 95,000 mark (Bjenkan, 1972:169). By this time, the British influence in Ethiopia waned and the Americans started to shape Ethiopian educational Policy. At the same time, the government set up what was known as the Long Term Planning Committee. The committee, interlia, advocated that educational objectives be geared towards the speedy promotion of universal fundamental education, as well as the relevance of the curriculum to the needs of the student. In addition, in the country's First (1957-62) and Second (1962-67) five-year development plan reveals, the achievement was far below of what was expected.

At the same time, some piecemeal approaches were made to bring about change in the educational system. For instance, in 1963/64 an attempt to change the grade structure from the two-tier system (8+4) to 6+2+4 system was introduced. This combination meant that a student had to go through six years of primary education, and two years of junior high school education and four years of senior high school education. The change was not fundamental as such but was given an American touch. Further more, another notable step had been taken in 1963 to make Amharic the medium of instruction at the primary school level. In fact, one scholar (Tekeste, 1990:8) has characterized it as "the most significant reform of the decade"

After the 1974 take-over by the military regime, the education system was in confusion and suffered a setback because of the long-drawn-out war. One of the immediate measures taken by the revolutionary regime was to address the issue of primary education. Accordingly, in a policy directive issued on December 20th, 1974 it was proclaimed that, "under the banner of education for all, citizens shall have the right to

free fundamental education" (PMAC, 1974). On the basis of this declaration, the Ministry of education took a step to reconcile its educational priorities so as to advance, "universal primary education within the shortest period of time commensurate with available resources" (MOE, 1977: 1). This measure, therefore, set down the trend for the prompts an expansion of primary education during the Derg regime. Furthermore, the educational system was to be overhauled with socialist overtone. Proclamation No.54 0f 1975 was issued to provide for the public ownership of private schools. Another proclamation No.103 of 1976 gave administration and control of schools to the people. Above all, quite a vigorous national campaign was launched in 1979 against illiteracy. By July 1990, which marked the eleventh Anniversary of the Literacy campaign, a 75.3 percent national literacy rate was reported. According to Tilahun (1994:235) "the reduction of the illiteracy rate from 93 percent set forth as the baseline percentage figure at the start of the ENLC (Ethiopian National Literacy Campaign) to 24.7 percent is certainly an outstanding literacy achievement". At the same time, however, Tekeste (1990:12) reminds us that its impact on national development still needed to be assessed. He argues that although such a linear expansion of the educational system on face value appears to be quite impressive, it does not, however, tell the problems that lie behind the figures. In the first place, it was not possible to make education equitably accessible to all regions. Secondly, the quality of education has gradually started to deteriorate, due to various factors. For one thing, the meager educational resources had to be thinly spread, because of the uncontrolled expansion of schools. In fact, despite the expansion, the educational budget, as a percentage of the national budget, had declined from 17.2 per cent in 1974 to 9.5 percent in the 1980s (Destefano, 1992:12). Consequently, per student expenditure, both at primary and secondary levels had drastically dropped. As a result, basic

educational materials such as textbooks were in short supply: it is reported that the national student-to-book ratio was 4:1(Destefano 1992:22). Above all, there was a dire shortage of qualified teachers; both at primary and secondary levels.

Following the change of government in 1991,a new education and training policy was introduced which emphasized the following: -

- Universal primary education_ the expansion of the overall education system, as envisaged in the current five-year education sector program, aims at the attainment of basic education by all Ethiopians by the year 2015.

- Civic education_ orientation of the schooling system to bring up citizens respecting human rights, equality, justice and peace and valuing a democratic culture and discipline.

- Skill formation_ promotion of practical skills through relevant and appropriate primary education and training e.g. formal and informal programs for all.

- Language of instruction_ recognition of the rights of nations and nationalities to be taught in their own languages and provision of support to promote teaching in these languages.

- Development Orientation_ making education a supportive tool for developing traditional technology and utilizing modern technology.

(Source: TGE, Education and Training Policy; 1994)

The new educational structure shall constitute of basic, general, higher and specialized on a formal and non-formal basis.

The components will be (Since 1995):

a) A kindergarten system for children aged 4-6 years
b) A primary education from grades 1-8 subdivided in to two cycles of basic (1-4) and general (5-8) education
c) A general secondary education from 9-10
d) A preparatory senior secondary education of two years (11-12)
e) Higher education of 2-3 years for diploma and 4-5 years for undergraduate and an additional 1-3 years of post graduate
f) A system of vocational and technical training in parallel with the academic education is coordinated and interlinked with it.

Some major problems that still need to be addressed in the education sector are: -

* **Extremely low participation rate_** seventy-five percent of children in Ethiopia are not attending primary school. The current level of primary school enrollment is more or less the same as ten years ago. The prevailing low enrollment rate is an issue that needs to be investigated through further research.

* **Language barriers_** the introduction of local nationality languages, as a medium of instruction at primary school level, has not been matched by a commensurate increase in the number of teachers capable of speaking local languages. The change in medium of instruction to local languages has also meant that textbooks and basic school references, which were previously prepared in Amharic, were no longer of use to many regions, and were now restricted to Amharic speaking areas. In addition to lacking access to already available Amharic speakers in many regions face the challenge of developing such textbooks in their own local languages. The existence of ethnic minorities who do not speak the more widely spoken local language, selected as a medium of instruction at local schools, has further added to the problem. A mechanism is, therefore, required to address the particular needs of minority children speaking different languages within localities with one major local language.

* **Barriers to continuity of education_** school drop out rates still remain high, especially for girls. Repetition rates are also high for both boys and girls, especially at lower levels of schooling. The problem of continuing education at tertiary level is also very serious. The capacity of existing universities and colleges to accommodate new entrants remains low and only a small proportion of high school completers are able to reach the tertiary level, the majority of them ending up joining the ranks of the unemployed.

(Source: Getahun, 1998)

1.3 EDUCATION INDICATORS

Education indicators play an important role in providing a clear picture of the education system and the tangible changes that have occurred as a result of the system and other interventions.

Education indicators could be single statistics (For-example: number of qualified female teachers, number of teachers with university degree, etc) or composite statistics (gross enrollment ratio, pupil-teacher ratio, etc.). Each indicator can be used individually or in relationship to one another. A single indicator will not give a full picture, but the use of combinations will maximize the power of the indicators.

Table 1.1. Key Performance Education Indicators

No.	Indicators	Base-Year 1995/96	Status of 2000/01	2001/02 Target
1	**Budgetary and Expenditure Indicators**			
	• Education's Share of the total budget (current FY)	13.7%	13.75%	19.0%
	• Primary education share of the total education budget	46.2%	50.12%	65.0%

2	**Access Indicators**			
	• Total number of primary schools	9,670	11,780	12,595
	• Total primary (grade 1-8) enrollments ('000)	3,788	7,401	7,000
3	**Quality Indicators**			
	• Share of lower primary (grades 1-4) teachers who are qualified	85%	96.6%	95%
	• Total number of upper primary (grades 5-8) teachers	27,381	43,526	36,777
	• Number of qualified upper primary teachers	5,729	10,400	20,000
	• Total number of secondary teachers	12,143	14,029	17,463
	• Number of qualified secondary teachers	4,910	5,127	10,760
	• Number of core primary textbooks in school	2,273,000	20,160,150	51,000,000
	• Grade 8 examination pass rate	61.7%	N.A.	80.0%
	• Grade 4 sample assessment of learning achievements	N.A.	N.A.	N.A.
4	**Efficiency indicators**			
	• Primary school student: section ratio	52	70	50
	• Secondary school: section ratio	63	78	50
	• Grade 1 dropout rate	28.5%	27.9%	14.2%
	• Total primary school dropout	8.4%	17.8%	4.2%
	• Average grade 4 to 8 repetition rate	12.8%	10.3%	6.4%
	• Average grade 4 to 8 repetition rate for girls	16.2%	13.4%	8.1%
	• Coefficient of primary school efficiency	60%	31.8%	80.0%
5	**Equity Indicators**			
	• Gross primary enrollment ratio in the two most under-served areas	16.2%	10.8%	25.0%
	• Share of girls in primary school enrollment (grades 1-6)	38.0%	40.6%	45.0%

Source: Annual Basic Education Statistics (2002)

The paper is structured as follows: The first chapter briefly presents an overview of the Ethiopian educational sector, its present status and associated problems. This chapter is

used as background information for the subsequent chapters. Chapter two discusses the objectives, data and methodology of the study. Chapter three is devoted to a review of the theoretical and empirical works done in the area of education and earning. The fourth chapter deals with the empirical findings of the study and the results are analyzed in the light of the literature review. Finally, chapter five provides summary and conclusion.

CHAPTER TWO

INTRODUCTION

2.1. ECONOMIC AND SOCIAL OBJECTIVES OF EDUCATION AND TRAINING

Economic growth has been one of the primary goals of economic policy in virtually every country of the world, whether developed or developing. The argument that human capital (particularly education) is essential for economic growth is intuitively obvious. This has been pronounced since the time of Adam Smith and more strongly in the 1960s (See: Solow (1956), Schultz (1961), Denison (1962)). The various possible ways through which education can affect economic growth have been outlined by Lau, et. al (1991). First, education enhances the ability of an individual to perform standard tasks and to learn to perform new tasks. Second, education enhances the ability of individuals to receive and process new information. Third, education enhances the ability of individuals to communicate and therefore to coordinate activities with one another. Fourth, education enhances the ability of an individual to evaluate and adjust to changing circumstances. Fifth, education helps reduce subjective uncertainty and unnecessary anxiety as well as fatalistic acceptance of the status quo and thereby enhances the probability of adoption of new technology or practices by an individual. Finally, at higher levels, education also facilitates to bring about innovation in production technology.

Besides the above, Weale (1992) mentioned other beneficial effects of education. The most important of these is the effect of education on fertility, whereby educated families usually have lower fertility rates. A higher level of education is also associated with a higher standard of health. These effects then feedback into productivity, i.e., a healthier work force is more productive. And a lower fertility is likely to lead to more healthy children who may learn through school to be healthier and more productive adults. Thus, education also contributes to economic growth through its indirect and positive effects on fertility and health.

Based on the above premises, a number of efforts have been made to quantify the impact of education in expediting economic development in different parts of the world since the 1950s. Some of the results of these efforts are summarized in Table 2.1.

Table 2.1. Role of Education on the Growth of per capita GNP or Income

Researcher/Author	**Year**	**Country**	**Contribution of Education**
Denison	**1909-29**	**USA**	**23%**
	1929-57	**USA**	**42%**
	1948-73	**USA**	**21%**
Kendricks &Jorgenson	**1945-76**	**USA**	**15-25%**
Psacharopoulous	**1950s & 1960s**	**Africa**	**17.2%**
		Asia	**11.2%**
		Latin America	**5.1%**
		North America	**20.0%**
		Europe	**6.5%**

Source: Tilak (1992)

All this empirical evidence strongly verifies the pivotal role played by education in economic development and suggests that a certain proportion of social wealth must be allotted for expanding education. A country that has failed to do so is liable to remain underdeveloped.

The low level of human capital investment in Africa suggests that this is one reason why the continent presents a general picture of poor technological mastery and dynamism. Rodrik (1994), in emphasizing the importance of schooling and educational attainment as initial conditions for growth in East Asia, had said "once initial levels of schooling is taken into account, there appears to be nothing miraculous about the high performing Asian Economies' growth experiences". This again confirms how important schooling is in influencing productivity and growth. While this is generally accepted, some controversies have arisen in recent years about the value of education. Such controversy surrounds "*the screening hypothesis*" which argues that, although education raises workers' productivity, employers use it as a screening device for valued attitudes, abilities, social and communication skills which are indirectly fostered by education, rather than as a means of acquiring required skills directly imparted by education. Some critics go even further than the "screening hypothesis" and argue that, in developing countries, education has become a "diploma disease" (Woodhall, 1987).

A study of self-employed workers may therefore shed light on this controversy due to the fact that the income of the self-employed is not administratively tied to credentials or pay scales. This paper attempts to address the question of whether or not education contributes to improved earnings in connection with self-employment in Ethiopia, which has not been the subject of much analysis.

2.2. THE CONCERN OF THIS THESIS

The main objectives of the study are to examine the impact of education and other related variables on earnings of individuals who are self-employed in selected urban centers in Ethiopia. An understanding of the differences in earnings, which stems from productivity endowments such as, education, is critical to achieving both the goals of income growth and distribution. The empirical investigation focuses on explaining to what extent the earning of the individual is sensitive to productivity endowments.

The specific objectives of the study are: -

- To estimate the private returns to schooling in connection with self-employment in selected urban centers in Ethiopia.
- To assess the profitability of investment in women versus men education.
- To analyze empirically the impact of other factors such as start-up capital and sectors of business activity on earnings of households.

2.3. THE DATA

2.3.1 SOURCES OF DATA AND AREA OF THE STUDY

The data set used in this study is from the Ethiopian urban household socio-economic survey jointly undertaken by the Department of Economics of Addis Ababa University and Gothenburg University in 2000. The survey consists of a sample of 1500 households in seven major urban centers of the country. The urban centers, namely, Addis Ababa in the center, Mekele and Dessie in the North, Bahir Dar in the Northwest, Dire Dawa in the East, Awassa in the south and Jimma in the south west were selected to reflect the different socio-economic characteristics of the urban setting in Ethiopia.

Systematic sampling technique was used in selecting the sample households in each urban center. The sample size in each town was proportional to the population of the respective urban center based on the projections of Central Statistics Authority (CSA, 1992). Correspondingly, 900 households in Addis Ababa, 125 in Dire Dawa, 75 in Awassa and 100 in each of the other four towns were selected. The survey was not specifically designed to produce extensive data on self-employment. As a result, it is not possible to get detailed information in some important aspects of this sector of the economy. In spite of this, the survey provides a wide range of data on household demographics, rural-urban migration, employment and income, consumption and expenditures, health status and other welfare indicators.

The data shows that a total of 357 household heads are engaged in business activities as employer or own account workers. This study is therefore based on these households.

2.3.2. DESCRIPTIVE ANALYSIS OF THE VARIABLES

Descriptive analysis of some of the variables are described as follows:

A. INCOME GROUP BY CITY

As we can see from the Table 2.2, around 54% of the sample had a monthly income between 100 and 449 Birr. Only 7% of them got a monthly income of over 1500 Birr. The maximum amount of monthly income was 4,000 Birr with minimum of 20 Birr.

Table 2.2 Income group by city and their percentage distributions

Monthly Income	A.A		Awassa		Bahir Dar		Dessie		Dire Dawa		Jimma		Mekelle		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	
<50	2	0.90	2	9.09	-	-	-	-	-		-	-	-	-	4	1
50-99	14	6.30	3	13.63	5	21.7	1	6.25	1	-	-	-	1	4.34	25	7
100-199	54	24.32	2	9.09	-	-	2	12.50	3	3.70	5	20.00	4	17.39	70	1
200-299	34	15.31	1	4.54	8	34.78	3	18.78	5	11.11	2	8.00	5	21.73	58	1
300-449	37	16.66	3	13.63	5	21.7	6	37.50	8	18.51	2	8.00	3	13.04	64	1
450-599	24	10.81	2	9.09	3	13.04	1	6.25	5	29.62	1	4.00	3	13.04	39	1
600-799	20	9.00	2	9.09	-	-	-	-	2	18.51	7	28.00	3	13.04	34	9
800-1499	22	9,90	4	18.18	1	4.34										

Table 2.3 Summary statistics for monthly income by city

City	Maximum	Minimum	Mean	Standard Deviation
Addis Ababa	4000.00	30.00	493.93	603.79
Awassa	3000.00	20.00	597.95	706.31
Bahir Dar	1500.00	62.00	355.26	387.12
Dessie	1500.00	60.00	461.25	423.39
Dire Dawa	1500.00	60.00	430.74	310.13
Jimma	2000.00	100.00	639.42	495.14
Mekelle	3000.00	60.00	493.18	605.44
For the entire sample	4000.00	20.00	496.33	566.74

B. MONTHLY INCOME BY SEX

From the whole sample, females accounted 28% and the rest 72% were males. From this, females (around 22%) had a monthly income between 300-449 Birr whereas males (around 23%) earned a monthly income between 100 and 199 Birr. This is best reflected in Table 2.4.

Table 2.4 Monthly income by Sex

Monthly income	Sex				Total	
	Male		Female			
	No	%	No	%	No	%
<50	2	O.78	1	0.99	3	0.84
50-99	15	5.85	10	9.90	25	7.00
100-199	58	22.65	12	11.88	70	19.60
200-299	46	17.96	13	12.87	59	16.52
300-449	42	16.40	22	21.78	64	17.92
450-599	26	10.15	13	12.87	39	10.92
600-799	25	9.76	9	8.91	34	9.52

800-1499	25	9.76	13	12.87	38	10.64
1500+	17	6.64	8	7.92	25	7.00
Total	256		101		357	

C. AGE GROUP BY SEX

From the entire sample, around 26% of household heads were aged between 20 and 29. If we look at the distribution in terms of the sexes, a significant proportion of males and females (around 25% and 28% respectively) were aged between 20 and 29. The average age for females and males is 38 and 42 respectively. Please refer to Table 2.5

Table 2.5 Age group by Sex

Age group	Male		Female		Total	
	No	%	No	%	No	%
12-19	8	3.12	5	4.95	13	3.64
20-29	64	25	28	27.7	92	25.77
30-39	43	16.79	24	23.76	67	18.76
40-49	59	23.04	23	22.77	82	22.96
50-59	35	9.76	11	10.89	46	12.88
60+	47	18.35	10	9.90	57	15.96
Total	256		101		357	

As we can see from Table 2.6, the average age for the entire sample were 41 and with the maximum and minimum were 81 and 12 respectively.

Table 2.6 Summary statistics for age

Age	Maximum	Minimum	Mean	Standard deviation

	81	12	41.15	15.96

D. LEVEL OF SCHOOLING

As indicated in Table 2.7, about 19% of household heads included in the sample were with no formal education. Those who completed primary, junior secondary and senior secondary schools accounted for 5.6%, 4.76% and 18.76% respectively. Around 25% of males managed to complete secondary school unlike the females counterpart (around 19%) had no formal education. Around 6.63% of males and 6.72% of females had college diploma or degree.

Table 2.7 Highest level of schooling by sex

Level of schooling	Male		Female		Total	
	No	%	No	%	No	%
Illiterate	40	15.62	29	28.71	69	19.32
Traditional/religious	4	1.56	1	0.99	5	1.40
Adult literacy programme	21	8.20	8	7.92	29	8.12
Primary Incomplete	41	16.01	12	11.88	53	14.84
Primary complete	16	6.25	4	3.96	20	5.60
Junior secondary incomplete	17	6.64	4	3.96	21	5.88
Junior secondary complete	11	4.29	6	5.94	17	4.76
Secondary school incomplete	30	11.71	12	11.88	42	11.76
Secondary school complete	52	24.89	15	14.85	67	18.76
Technical/ vocational	7	2.73	2	1.98	9	2.52
College diploma	11	4.29	4	3,96	15	4.20
Above diploma	6	2.34	4	3.96	10	2.80

E. TYPE OF BUSINESSES ACTIVITY

Household heads considered in the sample were engaged in various types of small business activities. These include manufacturing (food preparing, beverage preparing, textile preparing, leather preparing etc), furniture making, grain milling, construction, service giving (bar, hotel, transport and communication, kiosk, guillit, shop) etc.

A report by ACORD (1996) pointed out that the most striking feature of small towns in Ethiopia is the predominance of service functions, mainly retail trades and 'Buna bets' (bars) and complete absence of production related activities. Most of the individuals in the sample with their own businesses were engaged in two major activities: retail trade (29.13%) and food and beverage preparation (16.24%) as indicated in Table 2.8.

Table 2.8 Type of Businesses and their percentage distribution.

Type of Businesses	No	%
Grain milling, Food and Beverage preparation	58	16.24
Textile and Leather products	48	13.44
Furniture Making and Handicrafts	30	8.40
Transport/communication services	18	5.04
Retail trade	104	29.3
Construction and Repairs	16	4.48
Professional Services	20	5.60
Other	63	17.64

Source: own computation

F. START-UP CAPITAL

As indicated in Table 2.9 below, over 67 percent of households covered in this study had an initial capital less than 1000 Birr. Only 3.92 percent of them had a start up capital of more than 50,000 Birr. The maximum amount of start up capital was 200,000 with a minimum of 3 Birr. The average start-up capital for the entire sample was around 6,757.23 Birr.

Table 2.9 Start-up capital

Start-up capital (in Birr)	Number	Percent
100 or less	76	21.28
101-1000	162	45.37
1001-5000	67	18.76
5001-10,000	16	4.48
10,001-50,000	22	6.16
Over 50,000	14	3.92
Total	357	100

2.4 METHODOLOGY

Estimates of the profitability of investment in education can be arrived at using two different basic methods which, in theory at least, should give very similar results: (a) The "full" or "elaborate" method, and (b) The "earnings function" method, which has two

variants. The method adopted by various researchers is often dictated by the nature of the available data.

The *elaborate method* amounts to working with detailed age-earnings profiles by level of education and finding the discount rate that equates a stream of education benefits to a steam of education costs at a given point in time. The annual stream of benefits are typically measured by the earnings advantage of a graduate of the educational level to which the rate of return is calculated, and the earnings of a control group of graduates of a lower educational level .The stream of costs consists of the forgone earnings of the individual while in school in a private rate of return calculation, augmented by the true resource cost of schooling in a social rate of return calculation. But this method is very thirsty in terms of data_one must have a sufficient number of observations in a given age-educational level cell for constructing "well–behaved" age–earnings profiles, (i.e. non-crossing) and concave to the horizontal axis. This is still a luxury in many empirical investigations. Hence, I found it convenient to estimate returns to education based on the Mincerian earnings function method.

The *basic earning function method* is due to Mincer (1974) and involves the fitting of a semi-log ordinary least squares regression using the natural logarithm of earnings as the dependent variable, and years of schooling and potential years of labor market experience and its square as independent variables. In this semi-log earnings function specification the coefficient on years of schooling can be interpreted as the average private rate of return to one additional year of education, regardless of the educational level to which this year to schooling refers to.

The *extended earning function method* can be used to estimate returns to education at different levels by converting the continuous years of schooling variable in to a series of

dummy variables referring to the completion of the main schooling cycles, i.e. primary, secondary and higher education, compared to the base level (no education). Mincer (1974) being the first to have used the semi-log earning function in his analysis of the returns to formal schooling, the earning function is sometimes described as the "Mincerian function". Mincerian returns to education per year are usually adjusted for the opportunity cost of attending school by dividing estimated changes in earnings by the number of years spent in each cycle of schooling (4 years in primary[1], 4 years in secondary and 4 years for higher education).

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[1]primary school children, mostly aged 6 to 14 years, do not forego earnings during the entire length of their studies. Hence it would be a mistake to mechanically assign to them eight years of foregone earnings as part of the cost of their education.

As in other studies, the choice of the functional form for the earning function, in this study, is a matter of flexibility, computational ease, relevance to purpose, and comparability with previous studies.

The ordinary Mincerian earnings equation is specified as:

$$\mathbf{Ln\ Y_i = \alpha_o + \alpha_1 S_i + \alpha_2 E_i + \alpha_3 E_i^2 + u_i} \quad \text{---------} \ (1)$$

Where: -

Ln Y_i is the natural logarithm of monthly earning for individual i.

S_i is the number of years of schooling (either continuous or dummy) for individual i.

E_i is the number of years of labor market experience for individual i

α_o is a constant

α_1, α_2 and α_3 are coefficients.

u is the error term

Estimation of equation (1) by ordinary least squares (OLS) method is likely to yield biased estimates of the returns to education for several reasons. The first reason is that it ignores the problem of selectivity that arises if those in self- employment have different characteristics from those dependent employments. The second and related problem is that selection into sectors of work differs also. The self-employed might be utterly unlike the public or private sector worker i.e. our analysis must take into account the prior decision of a household head to be self-employed or not. In general, the earning functions estimated on selected samples do not estimate population (i.e. random sample) earning functions.

This problem of selectivity can be corrected using Heckman's (1979) two-step estimation procedure. Accordingly, the following two-equation model can be specified as:

$$\mathbf{Ln\ Y_i = \beta' X_i + \varepsilon_i} \text{ .... } \mathbf{(2)}$$

$$\mathbf{C^*_i = Z' W_i + \eta_i} \text{ .... } \mathbf{(3)}$$

Where: -

β' = a 1 x k vector of parameters of the earnings equation,

X_i = a k x 1 vector of explanatory variables of the earnings equation (i=1, …k)

C_i = dependent variable of self-employment equation (selection model)

Z = a 1 x k vector of parameters of the self-employment equation.

W_i =a 1 x k vector of explanatory variables of the self-employment equation.

ε_i is error term of the earnings equation; and

η_i is error term of the self-employment equation

Equation (2) is the basic earnings equation including such other variables as sex, start-up capital, and sector of business activity. Equation (3) is the self-employment (selection model) model.

Ln Y_i is observed only when $C_i = 1$

$C_i = 1$ if $C_i^* > 0$ (i.e. individual i is self-employed) and $C_i = 0$ otherwise.

ε_i and η_i have a bivariate normal distribution with zero mean and correlation ρ [i.e.(ε_i , η_i) ~ bivariate normal [0, 0,1 σ_e ,ρ] .

Prob ($C_i = 1$) = Ø ($Z' W_i$)

Prob ($C_i = 0$) = 1- Ø ($Z' W_i$)

$\mathbf{E [Yi / S_i = 1] = \beta X + \rho \sigma \lambda (Z' W_i);}$

$$\lambda_i = \varnothing (Z' W_i) / \Phi (Z' W_i)$$

Where: -

λ_i is a selectivity correction term

$\varnothing$ (.) is the standard normal density function

Φ (.) is the normal distribution function

σ is the standard deviation of the error term

By introducing λ, also called inverse Mill's ratio, in the earnings function, will look like:-

$$Ln\, Y_i = \beta' X_i + \theta\lambda_i + \epsilon_i \quad \text{-------} \quad (4)$$

Where: -

θ is the coefficient of the lambda term λ and is measure of the bias due to non-random sample selection,

ϵ_i is the error term.

Thus, the probability of selection into self-employment is first estimated by fitting a model of equation (3) (employing probit estimation) and computing the selectivity term (λ) from these probabilities. Second, λ is used as an additional regressor in the earnings equation with a view to controlling for selectivity bias. The bias due to non-random sample selection will be measured by the coefficient of λ. If the coefficient is statistically significant, the null hypothesis of 'no bias' will be rejected. Apart from being used as a selectivity correction term, λ is said to be heteroscadastic when introduced as an

additional regressor in an equation of primary interest, the earnings equation in this case. There is, therefore, a need to report heteroscedasticity consistent estimates.

The variables used for the estimations are specified below: -

Table 2.10. Specification of Variables

		Applicable Equation	
Variable	**Measurement**	**Earning Function**	**Self-employment (selection model)**
Natural log of monthly earning	**Continuous**	**X**	
Education	**Continuous**	**X**	**X**
Education *** Primary (1-8)** ***Secondary (9-12)** *** Higher (>12)**	**Dummy** **1 if primary, 0 otherwise** **1 if secondary, 0 otherwise** **1 if above secondary, 0 otherwise**	**X**	
Sex	**Dummy** **1 if male, 0 otherwise**	**X**	**X**
Age	**Continuous**	**X**	**X**
Age square	**Continuous**	**X**	**X**
Start-up capital	**Continuous**	**X**	
Main activity	**Dummy** **1 if self-employed, otherwise**		**X**
Sectors of business activity	**Dummy** **1 if manufacturing, 0 otherwise** **1 if service-giving, 0 otherwise**	**X**	
Having a start-up capital?	**Dummy** **1 if yes, 0 otherwise**		**X**

As is apparent from the table above, the sub-categories excluded from the estimation are: for education, illiterate; for sex, female; for main activity, dependent employment (public or private); for sectors of business activity, construction.

CHAPTER THREE

REVIEW OF LITERATURE

3.1. THE CONCEPTUAL FRAMEWORK

3.1.1. THE THEORY OF HUMAN CAPITAL

The terms "Skill", "labor quality”, and "human capital" are often used interchangeably. Accumulated skill is, indeed, a commonly used definition for human capital. Capital is defined as any asset that gives rise to an income stream. Accumulated human work capacity qualifies as a capital asset in the same sense that physical capital does, even if it cannot be bought and sold (it is, of course, rented), and even though investment in such capital often involve non market activities, such as education.

The idea that education is a form of investment is not new and traces back (at least) to Adam Smith (1776, P.101) who noted that

> *A man educated at the expense of much labor and time.... may be compared to one.... expensive machine.... The work which he learns to perform... over and above the usual wages of common labor will replace the whole expense of his education.*

In this respect the theory of human capital can be seen as an extension of investment theory in the sphere of human resources. The reason is that one may be willing to incur costs in the short run in return for higher benefits in the long run.

It is actually in the early 1960s that much of the debates on investment in human capital took place (See, for example, Writings by Schultz (1961), Shaffer (1961), Becker (1964) and Bowman (1966)). The central idea in these debates is that investments can and are being made in human beings (in much the same way as in physical assets such as buildings, new production technologies etc), and that difference in the rates of these investments account for much of the wage or income differentials observed in practice.

Investment in 'people' (human capital) is a much broader concept than simply staying on in the formal education system at the age of 16 or 18.More precisely; investment in people occurs from the time they are born and covers their whole life. One type of such an investment is expenditure on health: the cost of preventing or treating disease can in many cases be offset by lower labor market absenteeism rates due to ill health and subsequently a greater level of production (for the economy) and higher earnings (for the individual). It is therefore obvious that investment in human capital can take many forms (such as in education and health) and has both a 'social' dimension and a 'private' (individual) dimension.

The improvement or the maintenance of human capital (intellectual and physical well-being) is not, of course, simply an investment decision. It can be also seen as a consumption decision: for example, individuals may prefer to pay for the sake of learning, even though the expected economic returns from such a decision are not sufficient to cover present costs. The

consumption aspect of education has been traditionally labeled 'Social' demand for education, that is, people may want to pursue education simply because it is an activity (service) which gives them greater utility vis-a-vis other consumption alternatives. In contrast, the 'economic' demand for education is seen as reflecting people's decision to undertake education with a view to maximizing their lifetime earnings. However, the literature on education as an investment has always occupied a central role in economics because of its implications for both individual and social welfare.

3.1.2. SCREENING, SIGNALING AND OTHER CRITICISMS OF HUMAN CAPITAL THEORY

A number of criticisms have been made against the human capital theory and its applications. The screening/signaling hypothesis challenges the human capital interpretation of the function of education. This hypothesis suggests that education affects earnings, not primarily by altering the labor market productivity of students but by grading and labeling students in such a way as to determine their job placement and thereby their earnings (Spence, 1973). Employers are held to screen potential employees using educational qualifications as a guide to potential productivity. The employer is faced with making a hiring decision under conditions of uncertainty about the productivity of applicants. Job seekers use their educational achievements to signal their productivity potential to employers.

Employer screening and worker signaling can be viewed as a means of sorting the most able people into the most demanding jobs. Or it can be seen as a way of ensuring that the already better off continue to get the best jobs, what Bowles and Gintis (1975) describe as

"legitimizing the intergenerational transfer of inequality". Whether education has a social benefit associated with an efficient sorting process depends upon educational success being related to certain productivity enhancing abilities. Yet, education has strong connection with social stratification.

Viewed from a private perspective, screening should have no effect on returns to education. Whether one is admitted to a higher-paying position because of the knowledge and skills acquired in college or because one possesses the necessary credential (a college degree), the fact remains that having attended college typically results in higher earnings. But from a social perspective, the screening hypothesis, if valid, is very important. One might well question the expenditure of millions of Birr on elementary, secondary, and higher education if the payoff is merely to signal employers that certain workers are above-average in terms of intelligence, motivation, and self-discipline.

Among the other criticisms leveled at human capital theory are the following:

- By failing to recognize that a part of the expenditures on education are consumption rather than investment, empirical studies understate the rate of return on education.

- It is a supply-side theory in which demand only influences earnings differentials in the short term, as opposed to the screening/signaling hypothesis which stressed the factors influencing the demand for educational qualification.

- Individuals may be more varied than human capital theory allows, in that they may well have different productivities after they have successfully completed the same course at the same institution at the same time.

- By measuring education in terms of years it does not take account of the possible differences in education quality, although 'quality' may be a proxy for ability or institutional factors like social class and family background.

Yet none of these criticisms threaten the viability of human capital theory, which do not strike at the heart of what Blaug (1976) called the 'hard core of the human capital research programme ' (P.829). It is a progressive research programme in the sense that it has grown to encompass 'health, education, job search, information retrieval, migration, and in-service training.... as investment/consumption, whether undertaken by individuals on their own behalf or undertaken by society....' (P.829). Earnings functions of the Mincer type have proved themselves to be empirically robust. As Willis (1986) attests, 'the initial insights of Becker and Mincer who first developed human capital theory have been repeatedly confirmed with data from around the world' (P.598). The concept of human capital has also come to play a crucial role in the new theories of economic growth, most closely associated with Romer (1986, 1990).

3.2. EMPIRICAL LITERATURE REVIEW

3.2.1. INTERNATIONAL EXPERIENCE

Estimates of the Profitability of Investment in human capital have proliferated since the field took a firm grounding in the early 1960s. Such estimates have been used to illuminate a number of key developmental issues, like the explanation of past economic growth rates (Schultz, 1961), the optimality of resource allocation within education and between education and other sectors (Dougherty and Psacharopoulos, 1977), the determinants of income distribution (Chiswick and Mincer, 1972), and the behavior of students and their families as investors and consumers of education (Freeman, 1976).

One of the earliest questions following the human capital revolution in economic thought was: If education is a form of capital, what is the rate of return to it? This led to a related

question: How does the profitability of investment in education compare to investment in physical capital? Such comparisons, it was thought, would serve as ex ante signals to guide resource allocation between two forms of capital in developmental planning. They have also been used ex post to explain a great part of "the residual" that puzzled scholars examining economic growth in the 1950s.

Other questions follow: What priority should be given to primary versus university education? Allocative decisions have to be made within education, and rates of return have been used as guides to such decisions. Furthermore, a given level of education can offer various types of curricula_ for example: secondary general versus secondary technical_ and estimates of the profitability of investment by type of schooling can illuminate decisions on where the relative emphasis should lie.

If human capital investment is like any other type of investment, diminishing returns should apply to it. Hence, another major issue in the early days was whether and by how much the yield on human capital investment would decline following the expansion of education. When the human investment revolution began, there were no time series estimates of the rate of return.

The contrast between the social and private rate of return could highlight the extent of public subsidization of education. The size of the private returns could also explain the individual demand for certain types of schooling. And since the private rate of return is the price one receives on his or her human resource endowments, it could further explain personal income distribution.

For all the above reasons researchers around the world began estimating the returns to investment in education. This is best reflected in the surveys by Siebert (1985), Willis (1986) and Psacharopoulos (1973, 1981, 1985 and 1993).

A strong relationship between schooling and labor income has been observed repeatedly in empirical studies. In the seminal study of this relationship, Jacob Mincer (1958) estimated log-linear earnings equations on cross-sectional data from the census and found that an additional year of schooling yields a net increase of 11.5 percent in annual earnings. In his classic work Becker (1975) estimated the rate of return to education to be 14.5, 13.0, and 14.8 percent in 1939, 1949, and 1958, respectively. Hanoch (1967) calculated a 9.6 percent return in 1959. Similarly, Mattila (1982) has estimated rates of return to males on the order of 10 to 13 percent for the entire 1956–1979 period. Subsequent investigators have explored the relationship between earnings and education with a variety of data sources and analytic techniques and have consistently found the same strong positive correlation (Mincer, 1970).

Focusing on the case of private rates of return to education, the following generalizations apply with reference to Table 3.1. First, rates of return to education decline with additional schooling. In other words, the rate of return to primary education is greater than the rate of return to secondary education which is inturn greater than the rate of return to tertiary education.

Second, and as a natural extension of the previous finding, rates of return to education are higher in developing countries. Both this and the previous finding are in line with the standard predictions of the economic theory: additional investment yields lower returns at least after some point (the principle of eventually diminishing marginal productivity).

Table 3.1. Average private returns to education by country group and level of schooling*.

Country group	Education level (*percent*)		
	Primary	**Secondary**	**Higher**
Developing:			
• **Africa (16)**	**45**	**26**	**32**
• **Asia (10)**	**31**	**15**	**18**
• **Latin America (10)**	**32**	**23**	**23**
Middle – income (10)	**17**	**13**	**13**
Advanced (15)	**--***	**12**	**12**

* *Undifferentiated by the type of employment.*

***Not available because of lack of control group (illiterates).*

Note: Numbers in parentheses refer to the number of countries in each sample group.

Source: Psacharopoulos, (1988)

Table 3.2 gives means of the regression coefficient on years of schooling in a semi-log (Mincer–type) earnings function in which log earnings is a function of years of schooling, years of experience, and years of experience squared. The figures are interpreted as private returns to the typical year of education (that is, undifferentiated by level). Again, the declining pattern of the returns across country type is largely maintained.

Table 3.2. Mincer – Type returns to Education by country Type

Region/Country Type	Coefficient on years of Schooling (Percent)

Africa	13
Asia	11
Latin America	14
Middle Income	8
Advanced	9

Source: Adapted from Psachropoulos (1985)

Note: *The following countries were included in each region*: **Africa*****:*** *Ethiopia, Kenya, Morocco, Tanzania;* **Asia***: Hong Kong, Malaysia, Pakistan, Singapore, South Korea, Vietnam, Srilanka, Taiwan, Thailand*; **Latin America***: Brazil, Chile, Colombia, Cost Rica, El Salvador, Guatemala, Mexico, Venezuela;* **Middle Income*****:*** *Cyprus, Greece, Iran, Portugal;* **Advanced*****:*** *Australia, Canada, France, Germany, Japan, Sweden, United Kingdom, United States.*

Turning now to the social returns to education, they behave very much like the private returns (see Table 3.3). However, social rates are, in general, lower than the private rates of return to education is due to public subsidies.

Table 3.3. Average social returns to education by country group and level of schooling:

Country group	Education level *(percent)*		
	Primary	**Secondary**	**Higher**
Developing:			
• **Africa**	**26**	**17**	**13**
• **Asia**	**27**	**15**	**13**
• **Latin America**	**13**	**18**	**16**
Middle – income	**13**	**10**	**8**
Advanced	**--***	**11**	**9**

**Not available because of lack of control group (illiterates).*

Source: same as Table 3.1.

For variety of reasons, women in all countries earn on average substantially less than men. Because the rate of return is a relative concept, it should not be surprising if the profitability of investment in women's education is greater than that of men. This is, indeed, the case, as shown in Table 3.4*,* where in developing countries the Mincer – type average rate of return for women exceeds that for men by four percentage points.

Table 3.4. Average Returns to Education *(Percent*) by Gender

Country Group	Education level	Men	Women
All Countries	**Primary**	**19**	**15**
	Secondary	**16**	**21**
	Higher	**15**	**14**
Developing countries	**Overall**	**11**	**15**

Source: same as Table 3.2.

One issue in the literature regarding the returns to education for men relative to women is whether female estimates have been adjusted for selectivity bias, i.e. by taking into account the prior decision of a woman on whether to participate or not in the labor force (See: Heckman, 1979). As summarized in Table 3.5 (based on 22 case studies in Latin American countries using the standard correction methodology, Psacharopoulos and Tzannatos, 1992a, 1992b), selectivity correction doesn't in fact influence much the rate of return estimate for females, and the returns experienced by males.

Table 3.5 Selectivity Corrections on the Returns to Education by Gender

Selectivity Correction	Males	Females
No	11.3	12.7
Yes	11.3	12.6

Source: Psacharopoulos (1993)

Rate of return estimates in recent years have been refined in the sense that they are increasingly based on the earnings of those employed in the competitive sector of the economy where the benefits of education better reflect the worker's productivity. Table 3.6 shows that in studies where the returns have been differentiated by economic sector, the returns in the competitive setting exceed those in the non-competitive sector by three percentage points. This means that previous estimates based on the earnings of workers in all sectors have in fact under estimated the returns to education. The inclusion of public sector earnings in particular, because of the equalization policy of pay scales, flattens mean earnings differentials and, hence, depresses the returns to education.

Table 3.6. Average Returns to Education by economic sector:

Sector Specification	Rate of Return
Competitive, Private	13
Non-competitive, public	10

Note: *The countries included in this table are Brazil, Colombia, Greece, Guatemala, Japan, Malaysia, Pakistan, Portugal, United Kingdom, Tanzania and Venezuela.*

Source: same as Table 3.4.

In reviewing studies on the returns to schooling on self–employment income, we first find Chiswick (1976). He advanced the hypothesis that the partial effect of schooling on earnings is overstated if only data from wage and salary workers are used in estimating earning functions. For male wage and salary workers Chiswick (1976 table 2,P. 74) reports a coefficient of schooling on earnings of 0.104. However, when the self-employed are added to the estimating sample the coefficient falls to 0.091. J.W. Henderson (1983) rejects this hypothesis. He applied the standard human capital earnings model to data from a 1975 socio-economic survey conducted in Tehran, Iran. Results show that the returns to schooling for the self-employed are statistically equivalent to those of wage and salary workers. In other words, when wage and salary workers are compared with the self–employed in similar occupations, their earnings profiles are similar.

A similar study done by Blau (1986) using Malaysian data rejected the hypothesis that the self-employed earn less than wage employees. Similarly, Spear and Harris (1986), using Indonesian data, found little difference between the formal and informal sectors. A couple of other researchers, however, stressed the differences that exist between the returns to Education in self versus dependent employment. Table 3.7 summarizes the relationship.

Table 3.7 Returns to Education in Self-Vs Dependent Employment

Country	Year	Self	Dependent	Source
Australia	1981	4.6	6.4	McNabb & Richardson (1986), P.17
Australia	1982	5.9	7.0	McNabb & Richardson (1989), p.70

Brazil	**1980**	**13.8**	**14.7**	**Stelchneretal (1991), Table 15**
Brazil	**1980**	**18.3**	**15.7**	**Dabos and Psacharopollos (1991), T.12**
Colombia	**1981**	**12.0**	**15.1**	**Magnac (1991), Table 13**
Colombia	**1982**	**12.9**	**15.1**	**Magnac (1991), Table 13**
Colombia	**1983**	**13.1**	**15.8**	**Magnac (1991), Table 13**
Colombia	**1984**	**12.9**	**14.7**	**Magnac (1991), Table 13**
Colombia	**1984**	**12.9**	**10.6**	**Psacharopoulos, Arriagada and Velez (1991), Table 4**
Colombia	**1985**	**11.0**	**15.6**	**Magnac (1991), Table 13**
Ecuador	**1987**	**7.4**		**Ctomez & Psacharopoulos (1990)**
Peru	**1990**	**9.5**	**9.1**	**Ctill (1991 b), Table 9**
United States	**1978**	**9.0**	**8.6**	**Cohn, Kiker and Oliveria (1987)**
Venezuela	**1987**	**7.7**	**10.0**	**Psacharopoulos & Alam (1991)**
Mean		**10.8**	**12.2**	

Source: Psachropoulos (1993)

Psacharopoulos (1993) updates compilations of rate of return estimates to investment in education published since 1985. Some key world patterns:

- ❖ Among the three main levels of education, primary education continues to exhibit the highest social profitability in all world regions.

- ❖ Private returns are considerably higher than social returns because of the public subsidization of education. The degree of public subsidy increases with the level of education, which is regressive.

- Overall, the returns to female education are higher than those to male education, but at individual levels of education the pattern is more mixed.

- The returns for those who work in the private (competitive) sector of the economy are higher than in the public (non competitive) sector. And the returns in the self-employment (unregulated) sector of the economy are higher than in the dependent employment sector.

3.2.2. CONTROVERSIES

A number of criticisms have been published about the human capital model and its applications (See: Psacharopoulus, 1993 for useful review). Some critiques focused on measurement problems and suggested that estimates of the rates of return on investments in education are likely to be biased but others were more profound in that they challenged the very concept or theory of investing in human capital.

On the much-debated screening hypothesis of the seventies, Katz and Ziderman (1980), using Israeli data, found strong screening effects at work. But Cohn, Kiker and Oliveira (1987), using United States data, found no empirical supports for the screening hypothesis. Also, Boissiere, Knight and Sabot (1985) found strong support for the human capital hypothesis in explaining earnings differentials in Kenya and Tanzania.

The issue of the returns to investment in the quality rather quantity of education continues to be the holly grail and research frontier in this field (see: Solmon (1985) for further explanation of the concepts involved).

Card and Krueger (1992a) examined the effect of school quality on the returns to education using United States 1980 census data. Quality was measured by the student-teacher ratio, the average term length and the relative pay of teachers etc. They found that persons educated in states with higher quality schools exhibit higher returns to additional years of schooling. For example, a decrease in class size from 30 to 25 pupils per teacher is associated with a 0.4 percentage point increase in the returns to education.

Another debated issue in the literature has been the role of socioeconomic background. Card and Krueger (1992b) found that, holding school quality constant, there is no evidence that parental income or education affects state-level returns to education. But Solmon (1985), using Israeli data found that the returns to schooling are higher to those coming from more favorable socioeconomic backgrounds.

3.3. PREVIOUS STUDIES IN ETHIOPIA

An attempt was made to review some research papers that dealt with the topic. To the best of the researcher's knowledge, no exclusive and stand-alone study tried to examine the impact of education on earnings of self-employed households in Ethiopia.

Most of the literatures under review based their empirical analysis on the formal sector (i.e. on individuals who are employed either in public or private institutions). This opens a room for criticism which is related to human capital and screening hypothesis. This is mainly due to the fact that earnings of employees represent either productivity (which derived from education) or possession of marketable traits as explained by "the screening hypothesis". As a result returns to investment in education is over or under stated.

The other point is that the problem of selectivity bias was not addressed in most of previous works. This is a common problem in this type of analysis. It must be corrected to make the result more reliable.

For example, Fasil et.al (1975) assessed the determinants of individual earnings among central government employees in Addis Ababa between the year 1969 and 1974. They found out that education and experience were the most important factors that determine earnings.

Wolday (1997) estimated the returns to schooling in one state owned enterprise (Edget Cotton Factory) and one private enterprise (MOENCO), both belonging to the formal sector. Earning function was employed in the study. The main findings were:

a) Human capital variables (education and experience) are the most important factors in influencing wages in the two enterprises.

b) The Mincerian rate of return to primary, junior secondary, senior secondary, diploma certificate, and above diploma levels in Edget factory were 3.3%, 5.5%, 2.8%, 18.3% and 11.3% respectively. The Mincerian regression coefficients, associated with primary education, although positive and significant, do not conform with global patterns observed by Psacharopoulos (1994) who estimated highest returns to primary education.

c) A comparison of the wages of males and females, in Edget Factory, showed that, for the same level of educational attainment, males had higher average wages than females.

d) Rates of return estimated using comparative data (1985 and 1996) for Edget Factory also reveal that women were paid less in 1996 compared to 1985, suggesting that their situation in the factory has deteriorated over time. But, for both males and females, a one-year increase in education increased wages from about 9% in 1985 to about 56% in 1996.

Mengistu (1998) had done a similar analysis. He estimated the returns to college education in the Development Bank of Ethiopia (DBE) by using a Mincerian earnings function. The result showed that there are positive private returns to college education (of about 8.6%). However, he argued that compared with the average returns to college education for the country as a whole (which is close to 27.4%), the returns obtained for the DBE seem far from attractive

and would thus seem to necessitate revision in the bank's pay scales. Similarly, Tesfayi G. and P. Krishnan (1998) examined whether returns to education have changed over the period 1990 – 1997 by using a multinomial logit model in Ethiopia. They found out that returns to education at all levels (primary, secondary and tertiary) have declined over the study period. They reasoned out that a larger group of students entering the labor force at a time when the quality of education is thought to have fallen in recent years. Also the stagnation in public sector employment and the removal of employment guarantees probably means that returns are converging to "market values" i.e. they were overstated in the previous period.

Admit (1998) made a comprehensive analysis in Ethiopian manufacturing industries. He tried to find out whether schooling influences productivity by using Cob-Douglas production function. The result showed that the higher the proportion of the labor force with a high level of schooling in an enterprise, the higher is productivity.

Zinash (2000) tried to assess the impact of education and work experience on earnings of households in the selected urban centers in Ethiopia by employing earning function.

The main findings of the study were:

a) Human capital variables (education and experience) are the most important in influencing earnings of the household's heads for wage or salary employees.

b) Male household heads who are wage/salary employees on average, receive higher earnings than average female household heads with the same level of education experience, occupation etc.

c) Household heads who are employed in the private or international organization receive, on average, higher earnings than other sectors.

Another study done by Netsanet (1998) tried to measure the contribution of education to Ethiopia's economic growth. He estimated the growth equation by using data covering 28 years (from 1967/68 to 1994/95). The results revealed that education enters positively and significantly in explaining growth in aggregate real output over the study period. Assefa and Abay (1998) examined the impact of education on the technical and allocative efficiency of smallholder farmers in Ethiopia by using the frontier profit function approach. The results showed that educated farmers are relatively and absolutely more efficient than illiterate farmers.

3.4 THE GAP THAT THIS THESIS FILLS

Previous studies on returns to education in Ethiopia, as discussed in section 3.3, restrict their empirical analysis on the formal sector i.e. on individuals who are employed either in public or private institutions (see: for example, Wolday (1988, 1997), Fassil et.al (1975), Zinash (2000), Mengistu (1998), Admit (1998)).

Paradoxically, however, in many less developed countries particularly in Ethiopia, a significant portion of the labor force is self-employed. It is the purpose of this study to examine the economic returns of education in connection with self-employment in selected urban centers in Ethiopia. The study, therefore, tries to fill this major gap in knowledge, and serves as a basis for further studies.

In addition, a study of self-employed workers may shed light on the controversy related to human capital theory and screening/signaling hypothesis due to the fact that the income of self-employed is presumably not tied to credential or pay scales.

CHAPTER FOUR

EMPIRICAL RESULTS

4.1. INTRODUCTION

On the basis of empirical data, the results of our analyses are presented and discussed in this chapter. First an attempt is made to estimate the private returns to schooling in connection with self-employment in selected urban centers in Ethiopia. Then we assess the profitability of investment in women versus men education. Finally, the impact of other factors such as start-up capital and sectors of business activity on earnings of households is analyzed.

The results presented in this paper are obtained from econometric modeling of the urban household socio-economic survey jointly undertaken by the department of Economics of Addis Ababa University and Gothenburg University in 2000. The survey consists of a sample of 1500 household heads. From this, 357 households heads are own account or self-employed workers.

The empirical investigation focuses on explaining to what extent does the earnings of the household heads (who are self-employed) is sensitive to productivity endowments for selected urban centers in Ethiopia.

4.2. RETURNS TO SCHOOLING IN NON-FARM SELF-EMPLOYEMNT

In this section, an attempt is made to estimate the private returns to schooling in connection with self-employment. Since our empirical investigation restrict its analysis on household heads that are self-employed, it is important to test and correct for sample selectivity bias. Heckman's (1979) two-step estimation procedure is employed to this end.

Accordingly, a two-equation model consisting of an earning function and a self-employment (selection model) is specified.

$$\mathbf{Y_i = X_i \beta + u_i} \text{------------------------ } \mathbf{(1)}$$

and

$$\mathbf{C_i^* = Z_i \alpha + \varepsilon_i} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(2)}$$

Where: - Y_i is the natural logarithm of monthly earnings; X_i is an exogenous regressors that are hypothesized to influence monthly earning; Z_i is an exogenous regressors that are hypothesized to influence the probability of being self -employed; and C_i* is

unobservable; C_i has a realization I_i which takes the value of one when $C_i^* > 0$ and the value of zero otherwise; Y_i is observed only when $I_i = 1$ and is unobserved otherwise.

Thus, the probability of selection into self-employment is first estimated by fitting a model of equation (2) (by employing probit estimation) and computing the selectivity correction term (λ) from these probabilities. Second, λ is used as an additional regressor in the earnings equation (1) with a view to controlling for selectivity bias. The bias due to non-random sample selection will be measured by the coefficient of λ. If the coefficient is statistically significant, the null hypothesis of " no bias" will be rejected.

4.2.1 SELF-EMPLOYMENT (SELECTION MODEL): PROBIT ANALYSIS

To control for selection bias, we ran the selection model in the first step of our two-step procedure. Accordingly; age, sex, education and having a start-up capital are hypothesized to influence an individual's decision to be self-employed or not.

The model is specified as: - $\mathbf{Yo = \beta_0 + \Sigma\, \alpha_j X_j + v_i}$ .... **(3)**

Where: - Yo is a dummy variable that is 1 if the person chooses to be self-employed worker and 0 otherwise

X_1 represent age which is taken as a continuous variable

X_2 represent the quadratic of age that is taken as a continuous variable so as to capture the behavior of the individual at the latter stage.

X_3 represent the education variable that is taken as a continuous variable.

X_4 is a dummy for sex and is 1 for male or 0 otherwise.

X_5 is a dummy for start-up capital and is 1 for having it or 0 otherwise.

ν_i is a random disturbance term that is assumed to be normally distributed.

β_0 and α_j are parameters to be estimated; j =1….5

Maximum likelihood (ML) estimation method is used to estimate the above model. Table 4.1 summarizes the results of self-employment (selection model).

The linear term of age is dropped due to collinearity problem while the quadratic term (age square) is statistically significant with a negative sign suggesting a tendency for becoming self-employed decreases at latter stages in life. This is again confirmed by our descriptive statistics (in section 1.3.2) which revealed that the majority of household heads (around 48%) were aged less than 40 years. Only 16% of the sample household heads aged above 60 years. The sex and education variables are also statistically significant. In the case of sex, this could mean that male household heads are more likely to be self-employed than female counterparts. This fact is in line with our descriptive statistics where 72% of household heads that are self-employed were males and the rest (28%) were females.

As regards education, it is significant with a negative sign. This implies the probability of being self-employed decreases for each additional years of schooling holding all other factors constant. Our survey data revealed that only 7% of household heads have got diploma and above diploma educational level. The last but not the least is start-up capital that is significant and has a positive sign. It indicates the probability of being self-employed increases with having a start-up capital, ceteris paribus.

Table 4.1 Self-Employment (Selection Model) Estimates

Probit Estimates		
		No. of obsn. = 1500
LR chi2(4)= 1517.99		
		Prob > chi2 = 0.000
		Pseudo R2= 0.9221
		Log likelihood= -64.152771
Variables	**Parameters**	**Estimated values**
Constant	β_0	**-4.982507*** **(-3.9000)**
Age square	**α2**	**-0.4111971**** **(-2.484)**
Sex	**α3**	**0.4708631***** **(1.877)**
Education	**α4**	**-0.1466786*** **(-5.469)**
Start-up capital	**α5**	**9.565514*** **(7.498)**

Note: figures in parentheses are Z ratios

Significant at 1%; ** significant at 5%; * significant at 10% level*

Source: Own computation

4.2.2 EARNING EQUATION ESTIMATION

The following model is specified to estimate an earning equation: -

$$\mathbf{Ln\ Y_i = \alpha_0 + \Sigma\ \beta_i\ X_i + \theta\ \lambda + \xi\ \ldots\ldots\ldots\ldots (4)}$$

Where: - Ln Y is the natural logarithm of monthly earning.

X_1 is dummy variable for sex and is 1 for being male or 0 otherwise.

X_2 and X_3 are age and its square that is used as a proxy for labor market experience. They are continuous variables.

X_4 represent an education variable which is taken as both continuous and dummy (primary, secondary and higher education).

X_5 is a start up capital for the main business and is measured in Birr.

X_6 is a dummy for service sector

X_7 is a dummy for manufacturing sector

θ is the coefficient of the lambda term and is measure the bias due to non-random sample selection.

α_0 and β_i are parameters to be estimated; i = 1….7

ξ is a random unobserved disturbance term with zero mean and constant variance.

It is expected that $\beta_1>0$, $\beta_2 >0$, $\beta_3 <0$, $\beta_4>0$, $\beta_5>0$, $\beta_6 >0$, $\beta_7>0$ and $\theta \geq 0$ or ≤ 0. The ordinary least squares (OLS) method is used to estimate the earning equation.

Table 4.2 presents the selection-corrected estimates of the earning equation for self-employed (own-account) household heads in selected urban centers in Ethiopia. An attempt was made to correct heteroscedasticity (by using robust standard errors) that resulted from the introduction of selection correction term (λ) in the earning equation. Thus the results shown are heteroscedasticity consistent.

As is evident from Table 4.2 all variables, except the dummy for manufacturing sector, are statistically significant. The selection correction term (λ) is significant at 1% level. It is an indication of sample selectivity bias and OLS results without λ would be inconsistent.

As would be expected, the coefficients of human capital (education and age) are positive. The quadratic term for age which has a negative sign as expected shows that the marginal returns to age grow at a decreasing rate. The coefficient of the sex variable is positive and statistically significant at 1% level. It is an indication of positive relationship between earnings and being a male.

Table 4.2 Selection- Corrected Estimates of the Earning Equation (Education Continuous)

Regression with robust standard errors		No. of obsn.= 357 F(8,348)= 36.57 Prob>F= 0.000 R2= 0.3381
Variables	**Parameters**	**Estimated Values**
Constant	α_0	**-8.461401*** **(-2.182)**
Sex	β_1	**1.111857*** **(9.041)**
Age	β_2	**6.804298*** **(3.129)**
Age square	β_3	**-1.014309*** **(-3.353)**
Education	β_4	**0.0562675*** **(3.384)**
Start-up capital	β_5	**0.1579994*** **(5.884)**
Service sector	β_6	**0.7961482**** **(2.421)**
Manufacturing sector	β_7	**0.4263391** **(1.284)**
λ	θ	**-0.869123*** **(4.720)**

Note: **Figures in parentheses are t-ratios**

***Significant at 1%; ** significant at 5% level; Source: own computation**

As shown in Table 4.2, where education is included as a continuous variable, the average private rate of return from a one-year increase in schooling is about 5.6% in connection with self-employment. According to an update of international studies by Psacharopoulos (1993), the Mincerian average rate of return to schooling for the self-employment (unregulated) sector of the economy is around 11% at global level. In some of Latin America countries (such as Brazil and Colombia), this figure is as high as 15%. This indicates that the 5.6% rate of return to schooling in Ethiopia is smaller than the global average by 5.4% and by 9.4% from some developing countries. This could show to some extent low quality of education in Ethiopia. It has been criticized for not equipping individuals to acquire the necessary skills and to be more productive and thereby increase one's earning (income).

The low quality of education in Ethiopia can reflected in a number of ways such as high pupil to teacher ratios, very crowded classrooms, lack of vocational and technical education etc. According to PHRD (1996) report, the average student-teacher ratio in Ethiopia is estimated to be 50:1 at primary level, and 40:1 at secondary level, with wide variations between regions. A study done by kirdar and Hag (1988) noted that the curriculum at all levels of schooling in Ethiopia is loaded with theory and is not designed to practical and real life problems. They added that a large number of youth in Ethiopia are getting general and theoretical education when the society is crying out for skills. This tendency is due to distorted priorities, distaste for manual work and wrong

incentives. These make education to yield small pay-off in self-employment (unregulated) sector of the economy in Ethiopia.

The returns to different levels of education are also presented in Table 4.3, where education has been treated as a dummy variable. It reveals that the average private rate of return to schooling for the binary variables representing primary, secondary and higher level of education are 27.9%, 31.8% and 68.8% respectively.

As indicated earlier in section 1.4**,**in order to obtain the Mincerian returns to education at each level, these coefficients need to be adjusted for the opportunity cost of time spent in school. By dividing the coefficients by factors of 4 for primary, 4 for secondary, and 4 higher education. Thus, the Mincerian rates of return to primary, secondary and higher education are estimated to be 6.9%, 7.9% and 17.2% respectively. As is apparent from these coefficients, the highest return is derived from higher education and the lowest return for primary education. This indicates the existence of substantial productivity and earning differential between college graduates and those who have no formal education. This result is similar to that of Appleton et.al (1994) for Ethiopia, Uganda and Cote d'ivoire, and of Tesfayi and Krishnan (1997) for Ethiopia. But, the result conflicts with the widely accepted finding of Psacharopoulos (1993) who estimated highest returns to schooling for primary education, at global level. This conflicting finding may partially be explained by the difference in method adopted by various researchers. For those who used the full or elaborate method, it takes into account the direct cost of education incurred by the individual. The cost increases as the level of education increases and this indicates higher return for low level of education and vice versa.

Table 4.3 Selection-Corrected Estimates of the Earning Equation (Education Dummy)

Regression with robust standard errors		No of obs =357 F(10,346)=28.80 Prob>F =0.000 R^2 = 0.3815
Variables	**Parameters**	**Estimated values**
Constant	α_0	**-8.227849**** **(-2.118)**
Sex	β_1	**1.143127*** **(9.315)**
Age	β_2	**6.70153*** **(3.077)**
Age square	β_3	**-1.002653*** **(-3.307)**
Primary education	β_4	**0.2796006**** **(2.007)**
Secondary education	β_5	**0.31284847**** **(2.082)**
Higher education	β_6	**0.6883593**** **(3.008)**
Start-up capital	β_7	**0.1574212***

		(5.847)
Service sector	$ß_8$	**0.8998094** **(2.706)**
Manufacturing sector	$ß_9$	**0.5277169** **(1.565)**
λ	**θ**	**-7.1912322***** **(-1.679)**

Note: Figures in parentheses are t-ratios

Significant at 1%, ** significant at 5%, * significant 10%*

Source: Own computation

This study supports the hypothesis made by Chiswick(1976) that the partial effect of schooling on earnings is overstated if only data from wage and salary workers. For example, in the survey of Psacharopolous (1988), the private rate of return for primary, secondary and higher education are 45%, 26% 32% respectively for Africa and 35%, 22.8% and 27.4% in particular for Ethiopia. This could show to some extent that the earnings of those employed in the formal sector may not better reflect the worker's productivity. Earning may simply related to education qualification or credentials that one has.

4.3 RETURNS TO EDUCATION BY GENDER

In this section an attempt is made to assess the profitability of investment in women versus men education by employing the standard human capital model. The model typically equates human capital with education and assumes that earnings are parabolic in the experience (proxied by age in this study), the function being of the form: -

$$\mathbf{Ln\ W = \gamma_0 + \Sigma\ \eta_j\ X_j + \psi \text{ ....}(5)}$$

Where: - Ln W is natural logarithm of individual monthly earnings.

X_1 is schooling (either dummy or continuous)

X_2 is the number of years of individual age.

X_3 represent the quadratic term of age

ψ is the error term.

γ_0 and η_j are parameters to be estimated; j = 1…..3

The ordinary least squares (OLS) method is used to estimate the above model. Table 4.4 and Table 4.5 summarize the result.

As is apparent from the regression results, education and the age are important variables explaining the variation in earnings for both males and females. While the coefficient of education is significant and positive for both male and females, it is higher marginally for females (10.5%) compared to males (10.2%).

Table 4.4 Regression Results Of The Human Capital Model For Male Household Heads

Regression with robust standard errors		**No. Obsn. = 256** **F(3,252) = 14.00** **Prob > F = 0.000** **R^2 = 0.1801**
Variables	**Parameters**	**Estimated values**
Constant	γ_0	**-7.717126** **(-1.352)**
Schooling	η_1	**0.1020521***

		(4.625)
Age	η_2	**7.683002** (2.438)**
Age square	η_3	**-1.125929** (-2.597)**

Note: Figures in parentheses are t-ratios

**Significant at 1%, ** significant at 5%*

Source: Own computation

Table 4.5 Regression Results of The Human Capital Model For Female Household Heads

Regression with robust standard errors		**No. of Obsn. = 101** **F(3,97) = 12.09** **Prob> F = 0.000** **R^2 = 0.2136**
Variables	**Parameters**	**Estimated values**
Constant	γ_0	**-12.55149***** **(-1.775)**
Schooling	η_1	**0.105265*** **(3.271)**
Age	η_2	**9.675418**** **(2.405)**
Age square	η_3	**-1.379046**** **(-2.443)**

Note: Figures in parentheses are t-ratios

*Significant at 1%, **significant at 5%, *** significant at 10% level.*

Source: Own computation

The regression results of the human capital model are summarized in Table 4.6 and 4.7, where education is treated as a dummy variable .As might be expected, for both males and females, the coefficients of the human capital variables (education and age) are found to be positive and significant.

Table 4.6 Regression Results of The Human Capital Model For Male Household Heads.

Regression with robust standard errors		**No. of Obsn. = 256** **F(5,250) = 10.88** **Prob > F = 0.002** **R^2 = 0.1973**
Variables	**Parameters**	**Estimated values**
Constant	γ_0	**-6.991408** **(-1.174)**
Age	η_1	**7.45368**** **(2.252)**
Age square	η_2	**-1.098164**** **(-2.401)**
Primary education	η_3	**0.3907601**** **(2.353)**
Secondary education	η_4	**0.6606236*** **(4.263)**
Higher	η_5	**1.380194***

		(4.004)

Note: Figures in parentheses at t-ratios

**Significant at 1%, ** significant at 5%,*

Source: Own computation

Table 4.7 Regression Results of The Human Capital Model For Female Household Heads.

Regression with robust standard errors	No. of Obsn. = 101 F(5,95) = 5.44 Prob > F = 0.002 R^2 = 0.1945	
Variables	**Parameters**	**Estimated values**
Constant	γ_0	**-11.51894** **(-1.489)**
Age	η_1	**9.266968**** **(2.133)**
Age square	η_2	**-1.329705**** **(-2.203)**
Primary education	η_3	**0.6739399**** **(2.388)**
Secondary education	η_4	**0.6421841**** **(2.051)**
Higher	η_5	**0.6904148****

Note: Figures in parentheses at t-ratios

**Significant at 1%, ** significant at 5%,*

Source: Own computation

The estimates of the Mincerian returns to schooling, presented in Table 4.8, provide further insights on gender differences. While primary schooling has an important influence on female earning, yielding rates of return 16.8%, it has lesser influence on the earnings of male household heads. The returns to schooling are much higher for males at secondary (16.5%) and higher education (34.5%) levels. These results could show that women are engaged in small type of business activities (e.g guillit, kiosk), requiring little if any educational qualification, while men usually engaged in higher earning business activities requiring some secondary or higher level education.

Table 4.8 Mincerain Returns To Schooling

Level of Education	Returns for Males (%)	Returns for females (%)
Primary	9.7	16.8
Secondary	16.5	16.0
Higher	34.5	17.2

Source: Own Computations

The results of this study did conform with estimates obtained at global level by Psacharopoulos (1993) who found that returns to female education are higher than those for males but show a mixed pattern at individual levels of education.

Part of the explanation for the difference in rate of return between male and female can be found in Table 4.9, which provides information on the average earning, age and education, disaggregated by sex. As can be seen from Table 4.9, female household heads are 4 years younger than men and less educated. On average, male household heads earn over 2.5 times the earnings of female household heads. These figures suggest that women are engaged in small businesses and have a tendency to stick to these positions, probably because of their low level of education.

Table 4.9 Gender Differences In Average Earning, Age And Education

Variables	Female	Male
Earning	155	400
Age	38	42
Education	5	9

Source: Own Computations.

4.4 THE IMPACT OF START-UP CAPITAL AND SECTORS OF BUSINESS ACTIVITY ON EARNINGS OF HOUSEHOLDS

As indicated in Table 4.2, the coefficient of start-up capital is positive and statistically significant at 1% level. This indicates that those households' heads who put higher start-up capital earn more than others. Its rate of return is also higher even compare to

education i.e. the average rate of return from one additional unit of Birr is about 15.7% holding all other factors constant.

Table 4.2 also shows the coefficient of dummy for service sector is positive and statistically significant as 5% level but the coefficient of dummy for manufacturing sector, although positive, is statistically insignificant. This implies that those household heads who run their business in the service sector earn more than others. This result is inline with a report released by ACORD (1996) which pointed out that the most striking feature of small towns in Ethiopia is the predominance of service function, mainly retail trades and complete absence of production related activities.

CHAPTER FIVE

SUMMARY AND CONCLUSION

Education satisfies a basic human need for knowledge; adds greater sense of participation; provides a means for meeting other basic needs; and helps add cultural and civic dimensions to an individual's existence. It is demanded both as a consumer good, valued for its own sake, and as an investment good that provides future financial returns.

The main focus of this study has been on assessing the economic returns to education in connection with self-employment by using the Mincerian earning function with appropriate correction with selectivity.

Given that, the study relies mainly on data from seven selected urban centers, its findings are, of necessity, restricted in scope and coverage and cannot claim to be representative of the whole urban, let alone rural, centers in Ethiopia. The other limitation arises from the inability to control for all factors that may have an impact on earnings such as individual personality, ability, family background, quality of education etc. So the lists of variables which have an impact on productivity (earning) are not exhaustive. In addition, the methodology adopted could not allow us to assess the social returns to education. However, although the results reported in this study should be interpreted with caution, they may serve to highlight some important features of the impact of education in the informal sector.

An attempt was made to estimate the private returns to education in selected urban centers in Ethiopia. The foregoing discussion has shown that the private average returns to a one-year increase in schooling was estimated about 5.6%. This figure is smaller than the global average (as estimated by Psacharopolous, 1993) by 5.4 percentage points and even by 9.4 percentage points from the average of some developing countries. This could partially explained by the overall low quality of education in Ethiopia. A number of studies confirmed that the curriculum at all levels of schooling in Ethiopia is loaded with theory and is not designed to convey theoretical knowledge in a manner related to

practical and real life problems. These make education to yield small pay-off in self-employment (unregulated) sector of the economy in Ethiopia.

The Mincerian rates of return to primary, secondary and higher education were estimated to be 6.9%, 7.9% and 17.2%, respectively. As is apparent from these coefficients, the highest return is derived from higher education and the lowest return for primary education. This indicates the existence of substantial productivity and earning differential between college graduates and those who comes from the lower level of education.

This study supports the hypothesis made by Chiswick(1976) that the partial effect of schooling on earnings is overstated if only data from wage and salary workers. For example, in the survey of Psacharopolous (1988), the private rate of return for primary, secondary and higher education are 35%, 22.8% and 27.4% in particular for Ethiopia. This could show to some extent that the earnings of those employed in the formal sector may not better reflect the worker's productivity. Earning may simply related to education qualification or credentials that one has.

An attempt was also made to assess the profitability of investment in women versus men education. The result showed that educating females is marginally more profitable than educating males. This implies that expanding the provision of school places to cover women is not only equitable but economically efficient as well.

Finally, an attempt was made to analyze the impact of start-up capital and sectors of business activity on earnings of households. We found out that the coefficient of start-up

capital in the earning equation was positive and significant. It indicates that those household heads who put higher start-up capital earn more than others. The coefficient of dummy for service sector is also positive and significant. This implies that those household heads who run their business in the service sector earn more than others.

BIBLIOGRAPHY

Admit Zerihun. (1998). "Does Schooling Influence Productivity? The Case of Ethiopian Manufacturing Enterprises". *Proceedings of the Seventh Annual Conference on the Ethiopian Economy.* Nazareth. Ethiopia.

Agency for Co-operation and Research in Development (ACORD). (1996). *An Overview of the Ethiopian Economy: An Assessment for Possible Gaps for NGO's Intervention*. Addis Ababa.

Appleton, S. Moddino; H.J. Krishnan and Max K. (1994). *Does the Labor Market Explain Lower Female Schooling?: Evidence from the Study of African Economies.* Oxford. (Unpublished).

Assefa A. and Abay A. (1998). "The Impact of Education on Allocative and Technical Efficiency of Farmers: The case of Ethiopian Smallholders". *Proceedings of the Seventh Annual Conference on the Ethiopian Economy.* Nazareth. Ethiopia.

Becker G. (1975). *Human Capital.* 2ed. New York: National Bureau of Economic Research. Chap. 4.

Behrman, J.R.(1987). "Schooling and Other Human Capital Investments: Can the Effects be Identified?". *Economics of Education Review*. 6. No. 3 : 301-5.

Behrman J.R. and Birdsall, N. (1987). "Comments on Returns to Education: A Further International Update and Implications". *The Journal of Human Resources*. 22. No. 4: 603-606.

Bjerkan, Ole-Christian. (1972). *Plans, Targets, and Trends in Ethiopian Education*. Unpublished Ph.D. Dissertation. University of Maryland.

Boissiere, M., Knight, J.B. and Sabot, R.H. (1985). "Earnings, Schooling, Ability, and Cognitive Skills". *American Economic Review.* 75: 1016-30.

Blau, D.M. (1986). "Self-employment, Earnings and Mobility in Peninsular Malaysia". *World Development.* 14. No. 7:839-52.

Blaug, M.(1976). "The Empirical Status of Human Capital Theory: A Slightly Jaundiced Survey" . *Journal of Economic Literature*. 14(3): 827-55.

Bowman, M.J. (1966)."The Human Investment Revolution in Economic Thought". *Sociology of Education.* Vol. 3q. PP.111-138.

Bowles, S. and Gintis, H. (1975). "The Problem with Human Capital Theory: A Marxian Critique". *American Economic Review*. 65(2): 74-82.

Card, D. and Krueger, Alan B. (1992a). "Does School Quality Matter? Returns to Education and The Characteristics of Public Schools in the United States?". *Journal of Political Economy*. 100, No. 1: 1-39.

___________. (1992b). "School Quality and Black-White Relative Earnings: A Direct Assessment". *The Quarterly Journal of Economics*. 107, No.1.

Chiswick, C.U. (1976). "On Estimating Earnings Functions for LDCs". *Journal of Development Economics*. March: 67-78.

Chiswick B.R. and J. Mincer. (1972). "Time Series Changes in Personal Income Inequality in the United States from 1939, with Projections to 1985". *Journal of Political Economy*. 80(May-June): S 34-74.

Cohn E., Kiker B.F. and De Olivera, M.M. (1987). "Further Evidence on the Screening Hypothesis". *Economics Letter*. 25: 289-94.

Denison, E.F. (1962). "Sources of Economic Growth in the United States and the Alternative Before US". *Supplementary Paper*. No. 13, New York: Committee for Economic Development.

Destefano, J. and Bernard Wilder. (1992). *Ethiopia: Education Sector Review, Part I.* USAID. Washington.D.C.

Dougherty C. and G. Psacharopoulos. (1977). "Measuring the Cost of Misallocation of Investment in Education". *Journal of Human Resources*. 12: 446-59.

Fassil G/kiros et.al. (1975)."Educational Outcome Distribution Among Central Government Employees in Addis Ababa between 1969 and 1974". *Mimeo graphed*. Staff Paper. No. 8. A.A.

Freeman R.B. (1976). *The Overeducated American.* New York: Academic Press.

Getahun Tafesse. (1998). “Current Status of Human Resource Development in Ethiopia”. *Proceedings of the Seventh Annual Conference on the Ethiopian Economy*. Nazareth. Ethiopia.

Griliches, Z. (1997). "Estimating the Returns to Schooling: Some Econometric Problems". *Econometrica*. Vol. 45. PP.1-22.

Gujarati, N.D. (1988). *Basic Econometrics.* Singapore: Mc Graw-Hill.

Hanoch G. (1967). "An Economic Analysis of Earnings and Schooling". *Journal of Human Resources*. Summer: PP 310-329.

Heckman, J.J. (1979). "Sample Selection As a Specification Error". *Econometrica*. Vol. 47(1). PP.153-161.

Henderson J.W. (1983). "Earnings Functions for the Self-employed". *Journal of Development Economics*. 13. August-October: 97-102.

Katz, E., Kiker B.F. and Ziderman, A. (1980). "On Education, Screening and Human Capital". *Economics Letters*. 6:81-8

Klees, Steven J. (1986). "The Rate of Return on Educational Expansion". *Economics of Education Review*. 6. No. 3:225-62.

Lau, L.J., Jamison, D.T. and Louat, F.F. (1991). "Education and Productivity in Developing Countries: An Aggregate Production Function Approach". *Working Paper*. No. 612. Policy, Research and External Affairs, The World Bank, Washington, D.C. , March.

Mattila J.P. (1982). "Determinants of Male School Enrollments: A Time Series Analysis". *Review of Economics and Statistics*. May: PP. 242-251.

Mengistu Bediye. (1998). "Returns to Collage Education in Ethiopian Financial Institutions: The Case of Development Bank of Ethiopia(DBE)". *Proceedings of the Seventh Annual Conference on the Ethiopian Economy*. Nazareth. Ethiopia.

MEDAC (Ministry of Economic Development and Cooperation), Welfare Monitoring Unit. (1997). *A Report on Human Development in Ethiopia*. Addis Ababa.

Mincer, J. (1958). "Investment in Human Capital and Personal Income Distribution". *Journal of Political Economy*. 66(4): 281-302.

________. (1970). "The Distribution of Labor Incomes: A survey with special reference to the human capital approach". *Journal of Economic Literature*. 3(1): 1-26.

MOE (Ministry of Education). (1994). *Transitional Government of Ethiopia Education and Training Policy*. Addis Ababa.

____________. (1977). *The Background of Educational Change in Ethiopia*. Addis Ababa.

____________. (1993). *Ethiopian Educational Policy Implementation Strategy*. Unpublished material. Addis Ababa.

__________.(2002). *Basic Annual Education Statistics*. Addis Ababa.

Natsanet Walelign. (1998). "Education and Economic Growth". *Proceedings of the Seventh Annual Conference on the Ethiopian Economy*. Nazareth. Ethiopia.

NLCCC (National Literacy Campaign Coordinating Committee). (1984). *Every Ethiopian Will be Literate and Will Remain Literate*. Unpublished material. Addis Ababa.

Pankhurst, Richard. (1962). “ The Foundation of Education, Printing, Newspapers, Book Production, Libraries and Literacy in Ethiopia”. *Ethiopian Observer*. 6,3.

PMAC (Provisional Military Administrative Council). (1977). *Basic Information on Education in Ethiopia*. Unpublished material. Addis Ababa.

Phillips, J.M. and Marble, R.P. (1986). "Farmer Education and Efficiency: A Frontier Production Function Approach". *Economics of Education Review* .5, No. 3: 257-64.

Psacharopoulos, G. (1973). *Returns to Education: An International Comparison.* Amsterdam: Elsevier.

___________. (1981). *Returns to Education: An Updated International Comparison.* Comparative Education. 17: 321-14.

___________. (1985). "Returns to Education". *Journal of Human Resources*. 14(4): 584-604.

_________. (1988). *The Contribution of Education to Economic Growth: International Comparison.* In J.W Kendrick (ed.). International Comparisons of Productivity and Causes of the Slowdown. Cambridge. Mass.: American Enterprise Institute/Ballinger Publishing Company. pp.335-59.

___________. (1994). "Returns to Investments in Education: A Global Update". *Working Paper 1067*. World Bank. Washington D.C.

Psacharopoulos, G. and Tzannatos, Z. (1992a). "Women's Employment and Pay in Latin America: Overview and Methodology". *The World Bank*. Washington. D.C.

________________.(1992b). "Women's Employment and Pay in Latin America: Country Case Studies". *The World Bank*. Washington D.C.

Policy and Human Resource Development – PHRD. (1996). "Education Sector Review: Synthesis and Summary". Addis Ababa.

Roamer, P.M. (1986). "Increasing Returns and Long Run Growth". *Journal of Political Economy*.94 (5): 1002-37.

_________.(1990). "Endogenous Technological Change". *Journal of Political Economy.* 98(5). 2

Rodrik, Dani. (1994). *King Kong Meets Godzilla : The World Bank and The East Asian Miracle*. March.

Schultz, T.W. (1961). "Investment in Human Capital". *American Economic Review*. 51: 1-17.

Seyoum Tefera. (1996). " Attempts at Educational Reform in Ethiopia: A Top-down or a Bottom-up Reform? ". *The Ethiopian Journal of Education*. Vol. 17. No.1

Shaffer, H.G. (1961). "Investment in Human Capital: Comment". *American Economic Review*. Vol. 52, No. 4. pp.1026-35.

Siebert. (1985). *Developments in the Economics of Human Capital.* In D. Carline et.al. Labor Economics. Harlow: Longmans.

Solow, Robert M. (1956). "A Contribution to the Theory of Economic Growth". *The Quarterly Journal of Economics*, 70: 65-94.

Solmon, L.C. (1985). "Quality of Education and Economic Growth". *Economics of Education Review*. 4. No.4: 273-90.

Speare, A., Jr., and Harris, J. (1986). "Education, Earnings, and Migration in Indonesia". *The Journal of Developing Areas*. 79: 223-44.

Spence, M.A.(1974). *Market Signalling: Informational Transfer in Hiring and Related Screening Process*. Cambridge Mass. : Harvard University Press

Tekeste Negash. (1996). *Rethinking Education in Ethiopia*. Nordiska Afrika Institute. Uppsala.

___________. (1990). *The Crisis of Ethiopian Education: Some Implications for Nation-building*. Uppsala University: Uppsala Reports on Education. No. 129.

Tesfayi Gebreselassie and Pramila Krishnan. (1997). "Changes in the Urban Market and Private Rates of Return to Education in Ethiopia: 1990-97". *A Paper Presented at the Seventh Annual Conference on the Ethiopian Economy*. EEA. Nazareth. Ethiopia.

Teshome Wagaw. (1979). *Education in Ethiopia: Prospect and Retrospect*. Ann Arbor: Michigan University Press.

Tilahun Sineshaw. (1994). *A Critical Examination of the 1979-1991 Ethiopian National Literacy Campaign*. In Harold Marcus (ed.). The 12th International Conference of Ethiopian Studies. The Red Sea Press.

Transitional Government of Ethiopia (TGE). *Ethiopian Education and Training Policy (EETP).*

Tilak, J. (1992). *Education and its Relation to Economic Growth, Poverty and Income Distribution : Past Evidence and Future Analysis*. Washington.

Weale, Martin. (1992). "Education Externalities, Fertility, and Economic Growth". *Policy Research Working Paper*, No. 1039, Education and Employment. Washington D.C.

Willis, R.J. (1986). "Wage Determinants: A Survey and Reinterpretation of Human Capital Earnings Functions". In O. Ashenfelter and R. Layard (eds). *Handbook of Labor Economics*. Amsterdam. North Holland.

Woodhall, M. (1987). "Human Capital Concept" in Psacharopoulus (ed.). *Economics of Education: Research and Studies*. Oxford.

Wolday Amha. (1988). " Personal Earnings in Ethiopia State-Owned Manufacturing: The Case of Edget Cotton Factory". *East African Economic Review*. 4(2).

___________. (1997). " Returns to Schooling in Ethiopia: The Case of the Formal Sector". *Ethiopian Journal of Economics*. 6(1).