

Economic Benefits of Higher Education in Ethiopia: A Benefit-Cost Ratio Analysis

Mesfin Molla Demissie*

Abstract. This study examined the economic benefits of higher education in Ethiopia. It utilized a quantitative research approach. The study revealed that the benefit-cost ratio (BCR) for secondary and higher education is 1.97 and 1.84 respectively. This implies that both levels of education provide benefits outweighing their costs. Regarding the private and social rate of return, they were 68% and 23% respectively. These figures reveal that both the private and social benefits are higher than the those found in any previous studies. Lastly, higher education has the highest rate of return for employees of three key sectors—that is, teacher education, agriculture, and health sciences—with an estimated value of 23, 15.3, 16.3 per cent increases to earnings compared to 3.8 for secondary education. In conclusion, the increasing pattern of high private rates of return to higher education shows that a shift of the education cost burden from the social to the private might be accomplished through loan schemes in higher education.

Keywords: benefit of education, cost of education, rate of return

1. Introduction

Higher education boosts income and can have both social and private benefits (Hanushek & Woessmann, 2020). Greater tax revenue, higher saving and investment rates, and a more enterprising and civic society are all potential outcomes of higher education. Regarding the advantages of higher education for a nation's economy, many observers credit the BRICS' (Brazil, Russia, India, China, and South Africa) phenomenal growth to its successful decades-long effort to offer a sizeable portion of its citizens a high-quality and technically oriented higher education.

A nation's economic development and progress are driven by its higher education system. In actuality, educated people are more inventive, more productive, and earn higher pay. They can also handle economic shocks better as well. Higher education has long been viewed as a public good due to

* Assistant Professor, Department of Educational Planning & Management, Dilla University,
e-mail: mesfinmollademissie@gmail.com

the significant positive externalities it generates, which benefit not just the individual citizens of a nation but also the entire society. The social benefits/externalities of higher education, according to Mulu (2017, p. 591), are visible across the economy, politics, society, culture, and technology, such as technological advancements and economic growth.

Higher education achievement is correlated with educational costs. The direct cost of education is the sum of all expenses incurred for it by students, their families, and academic institutions. Tuition, books, and other fees for the hostel, boarding, uniforms, transportation, and other expenses are borne by the students and their families. Educational institutions pay specified fees for salaries of teaching and non-teaching workers, library books, capital investment, laboratory chemicals, and workshop equipment. These and other explicit educational expenditures are included in the direct educational costs. Individuals (students and families) as well as society/government may face the burden of these costs (World Bank, 2017).

All expenses incurred by students to meet educational expenditures, non-tuition charges, and earnings foregone are included in their private costs. Books, stationery materials, equipment, refurbishment, transportation, and boarding are all expenses in the non-academic private sector. The overall cost borne by the government is called the social cost of education. The operating and capital costs of education are borne by society as institutional costs. The opportunity cost of education, or lost revenue, is not factored into the total societal cost of education calculation (Polley, 2015).

The earning premium associated with educational attainment demonstrates that productivity raises as people gain more qualifications. A different perspective on earning is that it rises with education as a result of credentialism. This relates to the assumption that higher levels of education are linked to higher profits, not because they boost production instantly but because they certify that the employee is likely to be productive (Psacharopoulos & Patrinos, 2018).

There is substantial evidence on the rate of return on education in both advanced and developing nations (Chirwa & Matita, 2009). In the 1990s, Mincerian earning functions were used to do comparative analyses of educational returns in various countries. The findings revealed that education returns are higher in low-income countries (11%) than in high-income countries (7%) (Psacharopoulos, 1994; Lemieux, 2006). Moreover, Psacharopoulos and Patrinos (2018) found that nations in Latin America, the Caribbean, and Sub-Saharan Africa had the best returns on education. Furthermore, estimates from African countries are consistent with previous findings, which show that higher and secondary education yield higher returns (Kahyarara & Teal, 2008).

Similarly, the World Bank (2005) confirmed that education in Ethiopia has resulted in a large increase in earnings and growth in economy. Education, according to prior trends, is an attractive funding source for persons seeking salaried work (ILO, 2020). On the other hand, education is not always an investment in and of itself; it involves estimating the rate of return. Specifically, higher education has positive and significant effect on the Ethiopian economic growth (Kidist, 2012).

2. Statement of the problem

Higher education is a very costly affair. In Ethiopia, recurring spending per student in primary, secondary, and higher education for one academic year in 2017/18 were 205, 455, and 6,646 birr respectively (Molla, 2018). This indicates that 32 and 22 elementary and secondary school children can be educated by the cost incurred for one higher education student.

In Ethiopia, only few researchers have attempted to investigate the economic benefits of higher education. One was conducted by Woubet (2006), who found that the average level of education has a negligible impact on the economy. Another was by Seid (2016), who discovered that the human capital variable has no effect on economic growth, consistent with Woubet's (2006) findings, who only used education as a proxy for human capital. A further study was conducted by Muhammed and Asfaw (2014), who found that only investing in health resulted in significant change, while investing in education, on the other hand, was statistically insignificant for economic development. On the other hand, Kidist (2012) figured out that higher education has a positive and significant effect on economic performance of the country. All in all, the above studies mainly focused on the relationship between higher education and economic growth. Most of them applied the ADF (Augmented Dickey Fuller) test to investigate the relationship between the two variables. The uniqueness of this paper is that it investigated the benefits of higher education from a Benefit Cost Ratio (BCR) perspective, which other previous studies didn't take into account. Another study that was conducted in this area is by Wolday (1999). He estimated the rate of return of education in general in the manufacturing sector. His findings are slightly different from the global results found by different researchers. Other researchers like Desalegn (2018) and Verwimp (1999) studied about the returns to education in Ethiopia but none of them dealt with higher education.

In Ethiopia, investment in higher education has accelerated rampantly over the last thirty years. This indicates that the country's human capital has been increasing in terms of knowledge and skills (Abate, 2021). Higher education has a substantial influence on the country's micro and macro-economic activity. Reduced economic disparities and the building of a link between higher education and the labor market are indicators of education's return to the economy (Fasih, 2008). Similarly, Zerihun (2014) and Berhane (2000) found a significant impact of human capital development on Ethiopian economic development for the last 70 years. About 30% of any nation's annual budget, including Ethiopia's, is set aside for funding educational access. Approximately 70% of this sum is earmarked for the development and growth of higher education (World Bank, 2017).

This is due to the fact that the necessity of higher education in fostering economic growth through both direct and indirect effects has increased along with the demand for human capital. Indeed, one of the top concerns for this century is access to higher education, even when it comes to the recent Sustainable Development Goals (SDGs). In order to realize economic growth and development in the process of ending extreme poverty, narrowing the extreme gap between the rich and the poor, and

ensuring the welfare of all people on the planet, it is believed that this century will be known as the century of knowledge-based economies (MOE, 2018). As a result, partnerships, research and development, soft science skills, and innovation are priority areas. Countries could achieve this by improving access to higher education institutions, which serve as breeding grounds for new ideas, scientific and technological innovations, and research and development.

Ethiopian HEIs receive incredibly low finance. The government is the sole source of funding for all schools of higher learning. Students are responsible for 15% of the cost of tuition while 100% of the cost of food and accommodation is reimbursed (Yizengaw, 2006).

While some research has been done on how education benefits economic growth, according to Matundura (2017), there is insufficient data to prove either a positive or negative influence of access to higher education on economic growth. There are still limited or no studies on both government and private higher education access and its effects on economic growth in Ethiopia. Results and evidence vary by country, analytical approach used, and categorization of government and private education expenditures, stock of human capital, and enrolment rates (FDRE, 2019; Befkadu, 2018). In Ethiopia, over the past 70 years, there have also been delays, changes in policy, and mixed execution of policies and strategies. Although economic growth and its association with higher education have a strong theoretical foundation (Hanushek & Woessmann, 2020), there is little empirical support for this relationship (Mekonnen, 2021).

However, inspiration came from the notion that access to higher education is growing quickly and is important to both the global and Ethiopian economies. The requirement for a more highly skilled labor force may help to explain some of this rapid growth, but the placement of government higher education also has implications for the need for national cohesion. However, there have been ups and downs that have limited the growth of higher education in Ethiopia (World Bank, 2020). Government spending can be low in some years, which can have an impact on variables like enrollment and graduation rates.

The difficulty of obtaining empirical data on the economic benefits of higher education in Ethiopia is a challenge for policymakers and academics. Perhaps this study may alleviate this problem. Therefore, the purpose of the study is to investigate the economic benefits of higher education.

3. Historical development of higher education in Ethiopia

In Ethiopia, Saint Yared Music School is a pioneer, whose establishment dates back to the fifth century. Its goal was to prepare highly qualified priests to coordinate religious music and dancing. In the Ethiopian Orthodox church, Saint Yared's innovation is still largely used. The musical nota (musical style) created by him is still taught in Ethiopian classrooms and is used in more advanced levels of Ethiopian Orthodox Church training. Although elite education has a 1,700 years history connected to the Orthodox Church (Girma, 1967), secular higher education did not begin until 1950s,

with the establishment of the University College of Addis Ababa.

It was the first modern higher education institution in the country. It had roughly 1000 students and less than fifty lecturers, the majority of them were foreigners. The next two decades saw the establishment of a number of specialized technical institutions that provided training for professionals in the disciplines of agriculture, engineering, public health, and teacher education. In 1960, the university college was given a new name, as Hailesillase I University. Most of the junior colleges were reorganized under it. The university was renamed Addis Ababa University in 1974, after the imperial administration fell (Aklilu, 2017).

Ethiopia's higher education system developed relatively slowly during the Derg regime (1974-1991). During this period, the gross enrollment ratio (GER) of the higher education sector was around 0.2%. Twenty-five years later; that is, in 1995, the rate had barely risen to 0.7% (World Bank, 2003). Until the establishment of Alemaya University in 1985, Addis Ababa University had been the only institution of higher learning, and no graduate programs had been introduced until the middle of 1979 (Aklilu, 2017).

The growth of higher education was rapid with the change of administration in 1991. The Transitional Government of Ethiopia (TGE) established a comprehensive education and training policy in 1994, designating education as one of its top priorities (ETP). The policy aims to enhance the general quality of education at all levels and make sure that education contributes as necessary to the nation's development. In essence, the policy paved the way for a time of extensive, all-encompassing reforms, and rapid expansion. There were not any significant changes in higher education prior to 2002, with the exception of few improvements in student enrollment in existing universities and colleges and the opening of junior colleges in the regions. In the years before 2000, there were only two universities. In 2002, six (four) new universities were founded (Alemayehu, 2006).

Increased access to higher education is given a significant percentage of Ethiopia's annual budget. The government's green economy will rely heavily on the human capital produced by higher education if it is to become middle-income by 2025. There were two government universities in the country before 1991 but thirty-six in 2014, and fifty-one in 2018 due to the expansion of higher education (Mulu, 2017). Through a variety of programs, these universities offer various formal experiences. When it comes to private universities, there were three before 1996 but in 2014, there were about 100 and in 2018, there were over 300 (Yirdaw, 2016).

4. Literature

Since the beginning of 1960s, the importance of education in connection with economic benefits has been given a focus and well recognized as a significant factor of production. As indicated in Psacharopoulos and Patrinos (2004), Hough (1994), Schultz (1993), McMahon and Wagner (1982), and Becker (1964), education, as proxied by human capital, has a positive economic return. Thus, for

the past 70 years, the benefit of investing in education has been well recognized. As a result, many countries around the world invest huge amounts of money in education (Psacharopoulos & Woodhall, 1993). Education has long been viewed as an important instrument for increasing productivity (Musselin, 2007). Higher productivity and a positive work culture are examples of education's rate of return. On the other hand, a lack of skilled and knowledgeable professionals may stifle economic development. As a result, Aljabri and Bhutoria (2020) believed that education benefits all stakeholders. In accordance with this, in its policy (MOE, 1994), the Ethiopian government proclaimed that education allows individuals and society to fully engage in the development process by acquiring knowledge, talents, skills, and attitudes. One of the goals of education is to increase people's problem-solving abilities and promote a positive work environment.

Therefore, this study is based on the human capital theory which assumes that investment in education yields high rates of return. In other words, it is based on the assumption that the more a country consists of skilled and educated citizens, the better the earnings are. Hence, better earnings are highly associated with investment in education.

Education also has an indirect impact on social welfare due to its effects on health, fertility, and life expectancy, as well as enhancing the productivity of other types of social and physical investments. It has a measurable return on investment. The rate of return can be calculated using the discount rate, which equalizes the present value of an investment's economic expenses and benefits. The private rate of return on education is calculated using after-tax earnings differentials (Dissou, Didic, & Yakautsava, 2016).

The private benefit of investing in another year of education is the increase in earnings for the rest of a person's working life. The private cost will comprise any fees or direct costs paid by the individual, as well as the opportunity cost in terms of foregone income. Since these values occur throughout time, they must be discounted to be comparable with the present ones. The cost-benefit approach, according to Patrinos, Psacharopoulos and Tansel (2020), fails to account for the heterogeneous character of the impacts of educational spending after a year in school. The other issue is that when it comes to allocating investment outcomes, there is a dearth of evidence.

Higher education in Ethiopia takes around a 4.3% share of the nation's GDP annually. The government allocates these resources for the development, testing, and evaluation of innovative undergraduate and post graduate programs, which, if demonstrated to be effective, often are expected to be sustained from other sources when grant funding ends. Yet the changing landscape in higher education, including increasing enrollment and expanding access, is putting an added pressure on higher education budgets. Spending on education per capital by sub-sector suggests a preference for higher education. Higher education expenditures per person were 50 times more than those for primary education and 16 times greater than those for secondary education (UNESCO, 2021).

Individuals and their families benefit much from higher education. Higher levels of education are associated with significantly higher average wages for members of all demographic categories. Over

the course of their careers, the average university graduate makes roughly 73% more money than the average high school graduate and those with advanced degrees make two to three times as much money as high school graduates. People with higher levels of education have lower unemployment and poverty rates. Financing higher education is a wise investment because of these financial benefits (Oreopoulos & Petronijevic, 2013)

The decision to attend higher education is not the same for every discipline. Thus, it is difficult to say whether or not someone should do so. It is crucial to evaluate the “value” of higher education on a case-by-case basis because the costs and advantages of higher education might vary greatly amongst individuals. For each person, the earnings associated with a higher education degree will vary since everyone experiences higher education differently. Individuals also have difference experiences in terms of the cost of a higher education (Bound & Turner, 2007).

Calculating the “internal rate of return” is helpful for comparing the return on investment provided by a higher education with other investments. This is the discount rate that balances the benefits’ and expenses’ present values. Internal rate of return is the same as what financial economists refer to as a financial asset’s “yield to maturity.” Regardless of the timing of interest and principal payments, returns computed in this manner can be compared across all types of loans or bond purchases. Another way to think of the internal rate of return is as a hurdle or break-even interest rate. If the internal rate of return on a higher education is 12 per cent, a student might borrow the entire amount necessary to cover a four-year university’s costs at a rate of 12 per cent interest and still have just enough in additional earnings from the university to cover the loan’s interest.

Before making education investment decisions, an internal rate of return should be assessed (Potelienė & Tamašauskienė, 2014). The first step is to think about many investment scenarios as you advance through your education: from primary school to secondary school to a bachelor’s degree, from a bachelor’s degree to a Master’s degree, and from a Master’s degree to a PhD.

A bachelor’s degree; for example, has the ability to provide a student with much more than a diploma – it could be the crucial and vital instrument for future global competition. University graduates earn an average of 80 per cent more than high school graduates. The earnings potential of high school graduates versus college graduates differs by more than \$1 million over the course of a child’s life. Your child’s education is one of the most essential investments you will make in your life. It may, however, give the greatest reward: a child’s bright future (Engle & Tinto, 2008). A bachelor’s degree will significantly boost your lifetime earnings. In the contemporary Ethiopia, on the other hand, there was a feeling that bachelor’s degrees were being disregarded; that is, pay, recognition, and social status are no better than that of a daily laborer.

According to World Bank, research that covered 139 nations from 1970 to 2013, the return to education was 10.1 per cent (Montenegro & Patrinos, 2014). Patrinos (2016) completed a study utilizing the Mincer earnings equation and discovered that the average global returns to education are 5-8%. Using a different metric; however, he discovered that the global return on higher education is

nearly 17%. The highest return comes from this level of earnings, with the primary level of education coming in second and the secondary level of education coming in third. According to a recent study, the global average return on schooling is 8.8% (Psacharopoulos & Patrinos, 2018).

The amount of time available in the labor market to generate higher labor earnings determines the rate of return on education in general. The longer the time horizon over which a person can expect to realize the benefits of their next education investment, the younger they are. Highly educated personnel, according to Hout (2012) have a higher age-earning profile than those who are less educated.

5. Methodology

This study adopted a descriptive research design. This is because teachers' and agriculture and health employees' salaries and costs are ongoing events with influences on current and future conditions (Erickson, 2017).

The population of study was made up of the regional bureau in nine regions of the country; namely, Amhara, Afar, Benishangul, Gambela, Harari, Oromiya, SNNPR, Somali, and Tigray. Simple random sampling technique was adopted to select four regional states: Amhara, Oromiya, SNNPR, and Somali which formed the final sample of the study. Three bureaus — namely, education, agriculture, and health — in the four regions independently manage the entire government population of employees' used for the study. Employees in these three sectors were chosen because, in comparison to employees in telecommunications, banks, and a variety of other industries, they had roughly identical initial salary scales. Following sampling, in the aforementioned regional bureaus, the earnings of education, agriculture, and health professionals, expressed in terms of salary and other fringe benefits, were collected. Moreover, the cost of primary and secondary education borne by the government was also taken from the four regional states' education bureaus.

The main sources of data used were wage earnings of secondary education leavers and BA/BSC graduates, cost of general education (grade 1-12) from MOE, and cost of higher education (BA/BSC graduates) from Custom and Revenue Authority. For the first case, the data were derived from Job Evaluation and Grading (JEG). The data covered the years 2018-2021 and were primarily collected by the MOE, Ethiopian Ministry of Finance and Economic Development (MOFED), Customs and Revenue authority, and the three regional bureaus. The authorizing ministry and regional officials duly authenticated the data collected. The following were the specific techniques applied for statistical analysis.

a. Calculating Benefit-Cost Ratio

To apply the full discounting technique to compute the rate of return on education investment, one

must first determine the cost of education incurred over his/her lifetime in higher education in order to determine the income differentials between BA/BSc graduates and secondary school leavers. This method aims to calculate the Benefit-Cost Ratio (BCR) and rate of return in secondary and higher education. BCR is stated as the discounted present value of the return divided by the forward-adjusted investment cost (Pscharopoulos, 2007). Hence, the BCR is calculated as follows:

$$\text{BCR} = \frac{\text{Present value of return}}{\text{Present value of costs}}$$

$$\text{BCR} = \frac{\sum_{t=1}^n Bt / (1+r)^t}{\sum_{t=1}^n Ct / (1+r)^t}$$

Where:

- t is times of earnings in years
- Bt is present value benefit in t years
- Ct is present value costs incurred in education, and
- r is rate of interest in education.

Thus, to find the BCR as an investment in education assumes that one spends 3 years in higher education and works up to the age of 60. Both the Internal Rate of Return (IRR) and Net Present Value (NPV) are popular ways to calculate the feasibility of educational investment in BCR. Technically, IRR is calculated by comparing the present value of all costs incurred throughout the duration of education with the present value of all cash inflows incurred throughout the year of education. The result of BCR is denoted using per cent (Barro & Lee, 1996).

Years of education are used as a proxy to analyze the return to education. It is measured as the whole years of one's life spent in the study of formal education (Kwon, 2009). In Ethiopia, primary education takes 8 years and secondary education takes 4 years, thus the overall general education takes 12 years. Additionally, a student who graduated from higher education has a further three years of education.

b. Computing private and social rate of return

Calculating the rate of return on education is useful when considering whether or not students should pursue further education. It can also give policymakers an indication of the benefit of allocating additional funds to the education sector (Garcia Moreno & Patrinos, 2020).

Accordingly, Woodhall (2004) used a “short-cut” method for calculating the rate of return in education, in which the rate of return is divided into private and social. Estimating the private rate of return on educational investment at a given level of education can be done by finding the rate of discount (r) that equalizes the stream of discounted benefits to the stream of costs at a given point in time. The following is the formula for expedited higher education:

- Private rate of return (r) = $[(W_u - W_s)] / [4 (W_s)]$
- Social rate of return (r) = $[(W_u - W_s)] / [4(W_s + C_u)]$

Where:

- W_u is the wage earnings of university graduates
- W_s is wage earnings of secondary leavers
- C_u is the annual direct cost of higher education.

In the Ethiopian context, the duration of higher education in the three sectors is years, and wage earning time after higher education is expected to be 35 years for those who complete higher education at the age of 25 and until the retirement age of 60.

c. Computing rate of return for secondary and higher education (BA/BSC)

In the absence of the specific data required for the “elaborate” or “complete” approach, Psacharopoulos (1981) contends that the short-cut strategy can be used to estimate rates of return. Occasionally, a simpler procedure is utilized, which is now known as the “short-cut” method. This is used when there isn’t enough data to calculate all of the earnings functions but there are statistics that show the average salary of employees with primary, secondary, and higher education at one point in time, as well as estimates of the annual cost of primary, secondary, and higher education.

The short-cut method ignores the effect of age on earnings and assumes a flat earnings curve. It means that the earnings gap between graduates and workers with secondary education leavers remains stable throughout their working lives. The rate of return can then be estimated using the following formula:

➤ **For primary school leavers:**

$$r = E(\text{prim}) / n [E(\text{Prim}) + C(\text{Prim})]$$

Where:

$E(\text{Prim})$. . . Average annual earnings of primary school leavers

$C(\text{Prim})$. . . Annual cost of primary school leavers (government)

n . . . Years of primary education, which is 8

r . . . Rate of return

➤ **For secondary school leavers:**

$$r = [E(\text{sec}) - E(\text{prim})] / n [E(\text{prim}) + C(\text{sec})]$$

Where:

E (sec) . . . Average annual earnings of secondary school leavers

E (prim) . . . Average annual earnings of primary school leavers

C (sec) . . . Annual cost of secondary school leavers (private & government)

n . . . Years of secondary education, which is 4

r . . . Rate of return

➤ **For higher education graduates (BA/BSC graduates):**

$$r = [E(\text{higher}) - E(\text{sec})] / n [E(\text{sec}) + C(\text{higher})]$$

Where:

E (higher) . . . Average annual earnings of 1st degree graduate (BA/BSC)

E (sec) . . . Average annual earnings for secondary complete

C (higher) . . . Annual cost of higher education (private & government)

n . . . Years of higher education, which is 3

r . . . Rate of return

Moreover, the cost of primary and secondary education was calculated using raw data from the district finance office and responses from respondents, whereas higher education data was obtained directly from the Ethiopian Revenues and Customs Authority. The researcher obtained information on government employees' earnings from the Job Evaluation Grading (JEG) which is an income wage scale document, adopted in 2017.

6. Findings

The earnings and benefits of employees as well as the cost of education for teacher education, agriculture, and the health sector are discussed hereafter.

a. BCR for investing in education

The BCR is calculated by dividing the Net Present Value (NPV) of benefits by the NPV of costs. This enables for a direct comparison of benefits and costs from the outset of the project (time zero). The higher the BCR, the better, and it should be above 1.0 at the very least. Any ratio less than 1 show that the educational investment costs exceed the risk reduction and functional benefits of the investment (Pscharopoulos, 2007).

Table 1. BCR for investing in education

Level of education	Duration in year	Annual earning	Cost of education	BCR measured in rate of return (r)
Higher education	3	74,316.00	46,230.73	1.84
Secondary school leavers	4	24,336.00	12,353.60	1.97

r = Interest rate of banks in Ethiopia is 15 %

The above data reveals that $BCR > 1$, indicating that the benefit of education outweighs the cost of education. As a result, secondary and higher education are financially beneficial. The benefit-cost ratios for secondary and higher education show that higher education requires more investment than secondary education, with a BCR of 1.84 for higher education vs 1.97 for secondary education.

b. Computing private and social rate of return for higher education

The formula for private and social rate of return for higher education is stated below:

- Private rate of return (r) in education
 - $r = [(W_u - W_s)] / [3 (W_s)]$
- Social rate of return (r) in education
 - $r = [(W_u - W_s)] / [3(W_s + C_u)]$

Table 2. Private and social rate of return for higher education

W_u	W_s	C_u	Private rate of return (r)	Social rate of return
74,316.00	24,336.00	46,230.73	0.68	0.23

The discount rate is 0.1 (10%) (Psacharopoulos, 1995)

* W_u is the wage earnings of university graduate

* W_s is wage earnings of secondary leavers

* C_u is the annual direct cost of higher education

* Duration of higher education in Ethiopia is 3 years

Private rates of return are higher than social rates of return, as evidenced by the figures above. This is due to the government bearing the major share of cost, that is, 85 per cent of the cost, with the remaining 15% shared by the students. Nonetheless, the degree of government subsidization rises with educational attainment, resulting in regressive policy implications. Higher education in Ethiopia remains a worthwhile investment, as evidenced by the private rate of return of 0.68. In Ethiopia, there is an even stronger private incentive to invest in education. Almost identically, education has a high social return (0.23).

c. *Computing rate of return for secondary and higher education*

Because the estimation using this approach requires the average income earned in the workplace with a given degree of education in the years of schooling, a short-cut method is used which is believed to be a simpler form of the earnings function.

Table 3. Rate of return to education

Level of education	Duration in year	Field of specialization	Earning		Cost in Ethiopia currency (birr)	Rate of return (r) in %
			Monthly	Annual		
Higher education	3	Teacher education	6,193.00	74,316.00	45,230.73	23.0
		Agriculture	5,780.00	69,360.00	49,208.73	15.3
		Health	6,100.00	73,200.00	50,448.00	16.3
Secondary school leavers	4	Secondary education	2,028.00	24,336.00	12,353.60	3.8
Primary school leavers	8	Primary education	1,624.00	19,488.00	5,291.60	7.7

Primary and secondary education costs were 5,291.60 and 12,353.60 birr respectively. Teacher education, agricultural, and health science costs were 45,230.73, 49,208.73, and 50,448.00 respectively. Agriculture and health sciences degrees had higher costs due to the practical character of the curriculum, which required practical demonstration equipment.

Similarly, primary and secondary school leavers received 19,488.00 and 24,336.00 in benefits respectively. Furthermore, the benefits of higher education were 74,316.00, 69,360.00, and 73,200.00 respectively, for the three sectors. Data on incomes, benefits, and the cost of education is provided below. The data in the above table reveal that the rate of return for secondary school graduates was 3.8 per cent and 7.7 for primary schooling whereas it is 23 per cent, 15.3 per cent, and 16.3 per cent for teacher education, agriculture, and health professions respectively. Because the basic monthly salary for secondary school leavers is 2,028.00 birr and for BA/BSC holders for the three sectors is 6,193.00, 5,780.00, and 6,100.00 birr accordingly, the rate of return for higher education (BA/BSc) is about four times greater than secondary education graduates. Additional years of schooling have consistently been linked to increased individual earnings (UNESCO, 2012).

Figure 1 also shows the rate of return to education. As it is clearly indicated, investment in higher education is more rewarding than primary and secondary schooling, as figures of 23%, 16.3% and 15.3% are all higher than the 3.8 % and 7.7% figures for primary and secondary education.

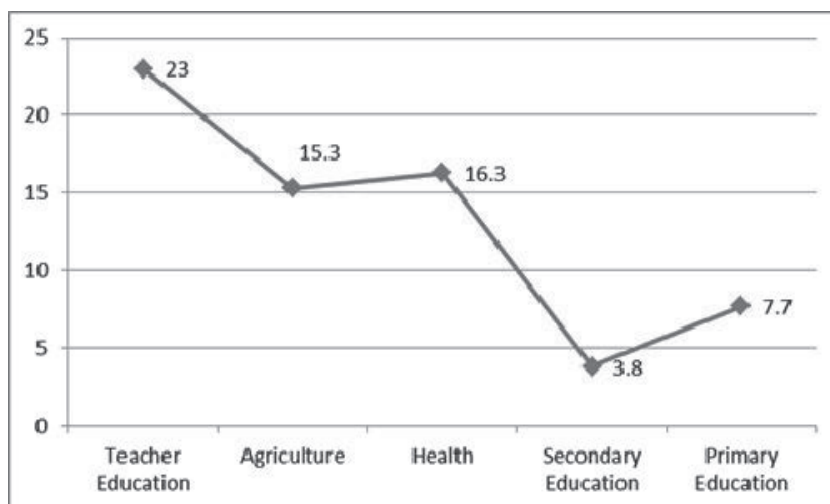


Figure 1. Rate of return to education

7. Discussion

The Benefit-Cost Ratio (BCR) for secondary education was 1.97 (19.7%), which was greater than 0.1 (10%). It implies that secondary school's benefits outweighed its costs, meaning that secondary education is lucrative. The Benefit-Cost Ratio (BA/BSc) for higher education was 1.84 (18.4%), which was more than 0.1 (10%) or positive, showing that benefits outweighed the cost of higher education. Individual investment in this sector is encouraged by the individual return provided by this value; that is, higher education investment is feasible. Accordingly, earning a bachelor's degree has several ancillary benefits and bonuses. The rate of interest that correlates to the discounted present value of anticipated benefits and the present value of the project's costs is clearly the price of return for any investment project. The rate of return is most likely the decisive factor for students when deciding whether or not to continue in education or enter the workforce.

As the above data show, higher education is a profitable investment in Ethiopia. For the first time since 2003, the government implemented cost sharing, requiring students to pay 15% of the cost of teaching-learning with the government covering the remaining 85%, as well as 100% of the cost of food and accommodation. The government is under a lot of strain as a result. Currently, there is a rumor that government-run higher educational institutions will become financially autonomous. This may be a way for the government to be relieved of its burden.

The private rate of return is frequently used to motivate students to invest in higher education. Its investment yields a higher rate of return in Ethiopia. The social rate of return was 23%, compared to a private rate of return of 68%. This figure reveals that both private and social benefit is higher than any previous studies (Psacharopoulos & Patrinos, 2018; Potelienė & Tamašauskienė, 2014). However, it is very difficult to conclude that high levels of inequality among countries could cause high levels of

private return to education because, as seen in the empirical data, other factors influence returns. Furthermore, it is possible that countries with high inequality are in general developing countries, where job opportunities are greater than in developed economies, maximizing private returns to education.

In general, the findings showed that both private and social investment are economically viable in Ethiopia, since the graduate enters the workforce and the rates of private and social return exceed that of the market interest rate. Furthermore, individuals' expectations of receiving high future salaries to satisfy their goals and realize their self-fulfillment justify the growing level of expenditure on higher education. University graduates are associated with societal benefits in addition to private benefits. It involves a high standard of living, family planning, reducing crime, democratic enjoyment, and efficient consumption and saving.

Secondary school teachers are typically employed as teachers in either government or private schools, which could explain this pattern of impacts. Teachers in Ethiopia, in my experience, are underpaid. Even years of experience do not greatly increase pay in the teaching profession, while graduates of higher education can work in other sectors with higher pay and preferential treatment. Though teachers have a high rate of return (23%), it is the opposite on the ground. Teachers in Ethiopia complain daily about low salaries, no fringe benefits, poor working conditions, low opportunities for career improvement etc. Though the rates of return for agriculture (15.3%) and health sciences (16.3%) employees seem slightly lower than teacher education, the lived experience is totally inverse. They are enjoying better life than teachers.

8. Conclusion

Ethiopia has a particularly high private rate of return to education, implying a need to consider private and shared education costs. The increasing pattern of private rates of return to education by level of education shows that a shift of some of the education cost burden from the social to the private might be accomplished through loan schemes, particularly in higher education. This could reduce the amount of money spent by the government per student, which is significantly greater in higher education than basic education. However, if the government attempts to share a portion of the total cost of higher education such as by establishing a loan program, the result will still be a cost-effective growth in the stock of human capital.

The government's strong intention to increase education participation, as well as the establishment of a long-term plan to accomplish this increase, might be seen as optimistic element in Ethiopia. However, significant population growth, poverty, and the opportunity cost of education continue to be sources of concern. Individuals with a higher degree of education have a better rate of return, therefore individuals may consider higher education to be an excellent investment. When the greater wages that a bachelor's degree provides are compared against the private cost of further

education, the degree appears to be a very smart investment. However, the expected private rates of return are averages, and rates can vary greatly depending on an individual's skill and field of study. The social rate of return is also high, since the state benefits from higher revenue and more educated people bringing new ideas to life.

9. Implications

Based on these findings, the following implications are drawn.

- a. Since higher education is heavily subsidized by the government, there is room to cut back. This is due to calculations that a drop in government higher education subsidies would bring the private rate closer to the social rate, resulting in a still acceptable return on private investment. The money saved from cost-sharing reductions could be used to support underprivileged higher education institutions with libraries, laboratories, and workshops.
- b. Despite fears of unemployment, there has been a rapid development of universities, as well as a significant increase in the number of university graduates. In Ethiopia, higher education remains a valuable investment option, both privately and socially.
- c. Regardless of the rate of return indicated in the findings section, teacher education warrants further attention and its future fate is in danger due insufficient preferential treatment.

10. Limitations

The following were some of the limitations related to the research:

- a. Ability, talent, and chance factors (alpha factors) show that the income received by the respondent is not solely based on education but also on other economic factors such as demand and supply for a particular job field. Others, such as motivation and ability, also contribute to an increase in income. So, it is hard to conclude whether an income received is solely due to education or other factors.
- b. In Ethiopia, the most significant challenge in estimating rates of return is a lack of data. In practice, no country possesses detailed data, yet it is easier easy to gather sufficient data even with assumptions.
- c. The effects of time and imperfect memory are evident in the majority of responses. This demonstrates challenges in collecting data on exact earnings figures in graduates' first job. In their responses, they frequently utilize estimation. Simultaneously, the problem with inflation is that it can raise the price of products, lowering the actual worth of income while keeping other elements constant.

Declaration of Competing Interest: This research was exclusively funded by Dilla University. The university will not take any responsibility for the results beyond reporting purposes. The researcher is affiliated to Dilla University as teaching and research staff. I also confirm that Intellectual Property Rights (IPR) and other ethical principles were adhered.

Acknowledgements: I acknowledge Dilla University for funding this research entitled “**Economic Benefits of Higher Education in Ethiopia: A Benefit-Cost Ratio Analysis**”. In this regard, my sincere gratitude goes to the Office of Research and dissemination (RDO) and the Office of Vice President for Research and Technology transfer (RTTVP) for facilitating and motivating the research activities.

Availability of the data: I would like to inform the journal managers that a set of field data is available and it will be shared whenever requested.

References

- Abate, C.A. (2021). Ethiopian higher education and economic growth nexus. *Ethiopian Journal of Sciences and Sustainable Development*, 8(2), 56-64.
- Adepoju, T.L., & Odunitan, I.B. (2018). Education and Economic Growth in Nigeria: The Nexus. *Asia Pacific Journal of Academic Research in Social Sciences*, 3, 28-34.
- Admasu, E., & Desta, A. (2021). Internationalization of Higher Education System in Ethiopia: A Review of Education Policies and Strategies. *Agathos*, 12(1), 139-156.
- Aklilu Habte (2017). History of the Haile Selassie I University: Establishment and Expansion of Higher Education in Ethiopia: Chia Chin Printing Ltd.
- Alemayehu, B. (2006). History of Ethiopian education. Unpublished Teaching Material, Bahir Dar University.
- Alemayehu, B.T., & Melesse, S. (2017). Historical analysis of the challenges and opportunities of higher education in Ethiopia. *Higher education for the future*, 4(1), 31-43.
- Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher education studies*, 10(3), 16-25.
- Aljabri, N., & Bhutoria, A. (2020). Access to educational technology and its implications on learning outcomes of 15-year olds in Saudi Arabia empirical evidence from OECD PISA 2018 in the context of COVID-19. *Journal of Educational Science*, 6(1), 367-400.
- Barro, R.J., & Lee, J.W. (1996). International measures of schooling years and schooling quality. *The American Economic Review*, 86(2), 218-223.

- Barrett, P., Treves, A., Shmis, T., & Ambasz, D. (2019). The impact of school infrastructure on learning: A synthesis of the evidence. Washington, DC: The World Bank.
- Berhane, M. (2000). The Role of Education in the Economic development (Ethiopia Case): Unpublished MA Thesis, Addis Ababa University.
- Befkadu, B. (2018). The Impact of Human Capital on Economic Growth in Ethiopia: Evidence from Johansen Co-integration Approach. Unpublished MA Thesis, St. Mary's University.
- Becker, G. (1964). *Human Capital*. New York: Columbia University Press. 2nd ed 1975 and 3rd 1994.
- Ben-David, J. (2017). *Centers of Learning*. Britain, France, Germany, United States: Routledge.
- Bloom, D.E., Hartley, M., & Rosovsky, H. (2007). Beyond private gain: The public benefits of higher education. In *International handbook of higher education* (pp. 293-308). Dordrecht: Springer.
- Bound, J., & Turner, S. (2007). Cohort crowding: How resources affect collegiate attainment. *Journal of public Economics*, 91(5-6), 877-899.
- Chirwa, E.W., & Matita, M.M. (2009). *The rate of Return of Education in Malawi*. Working Paper No. 2009/01. Zomba: Chancellor College
- Creswell, J.W. (2014). *A concise introduction to mixed methods research*. SAGE publications.
- Desalegn, Y. (2018). Returns to education in Ethiopia. In *Economic Growth and Development in Ethiopia* (pp. 199-226). Singapore: Springer.
- Dissou, Y., Didic, S., & Yakautsava, T. (2016). Government spending on education, human capital accumulation, and growth. *Economic Modelling*, 58, 9-21.
- Erickson, G.S. (2017). Descriptive research design. In *New Methods of Market Research and Analysis* (pp. 51-77). Edward Elgar Publishing.
- ETP. (1994). The Ethiopian education and training policy. Addis Ababa: St. George Printing Press.
- Engle, J., & Tinto, V. (2008). Moving beyond access: College success for low-income, first-generation students. Washington, DC: Pell Institute for the Study of Opportunity in Higher Education.
- Fasih, T. (2008). *Linking education policy to labor market outcomes*. Washington, DC: World Bank.
- FDRE (Federal Democratic Republic of Ethiopia). (2019). *Higher Education Proclamation 1152/2019*. Addis Ababa: FDRE.
- Garcia Moreno, V.A., & Patrinos, H.A. (2020). Returns to education in Azerbaijan: Some new estimates. *World Bank Policy Research Working Paper*, 9117.
- Girma Amare (1967). Aims and Purposes of Church Education in Ethiopia. *The Ethiopian Journal of Education*, 1(1), 1-11.
- Gelan, A. (2018, April 25). Economic commentary: Ethiopia's low wage is a curse, not a blessing. *Addis Standard Monthly Magazine*.
- Grant, C. (2017). *The contribution of education to economic growth. K4D Helpdesk Report*. Brighton, UK: Institute of Development Studies.
- Hanushek, E.A., & Woessmann, L. (2020). Education, knowledge capital, and economic growth. In *The economics of education* (pp.171-182).

- Hanushek, E.A., Schwerdt, G., Wiederhold, S., & Woessmann, L. (2015). Returns to skills around the world: Evidence from PIAAC. *European Economic Review*, 73, 103-130.
- Habte A. (2017). *History of the Haile Selassie I University: Establishment and Expansion of Higher Education in Ethiopia*. Tainan City: Chia Chin Printing Ltd
- Hough, J.R. (1994). Educational cost-benefit analysis. *Education Economics*, 2(2), 93-128.
- Hout, M. (2012). Social and economic returns to college education in the United States. *Annual review of sociology*, 38, 379-400.
- ILO. (2020). *Global employment trends for youth 2020: Technology and the future of jobs*. International labour office.
- Kahyarara, G., & Teal, F. (2008). The returns to vocational training and academic education: Evidence from Tanzania. *World Development*, 36(11), 2223-2242.
- Keller, K. (2004). Investment in education by education levels and effects on growth. *Contemporary Economic Policy*.
- Kidist, I. (2012). The Role of Higher Education on Economic Growth in Ethiopia. Presented in Partial Fulfillment of the Requirements for the Degree of Master of Science in Economics (Economic Policy Analysis). Addis Ababa University.
- Kwon, D.B. (2009, October). Human capital and its measurement. In *The 3rd OECD world forum on "statistics, knowledge and policy" charting progress, building visions, improving life* (pp. 27-30).
- Lemieux, T. (2006). The "Mincer equation" thirty years after schooling, experience, and earnings. In S. Grossbard (Ed.), *Jacob Mincer: a pioneer of modern labor economics* (pp. 127-145). Boston, MA: Springer.
- Livanos, I. (2010). The relationship between higher education and labour market in Greece: the weakest link? *Higher Education*, 60(5), 473-489.
- Marginson, S. (2016). High participation systems of higher education. *The Journal of Higher Education*, 87(2), 243-271.
- Matundura, G.E. (2017). The Impacts of Higher Education on Economic Growth in Kenya: Cointegration Analysis. *International Journal of Social Science and Humanities*, 5(4), 590-595. Research ISSN 2348-3164 (online)
- Mattoon, R.H. (2006). Can Higher Education Foster Economic Growth? *Chicago Fed Letter, Number 229*. Federal Reserve Bank of Chicago.
- McMahon, W.W., & Wagner, A.P. (1982). The monetary returns to education as partial social efficiency criteria. In W.W. McMahon & T.G. Geske (Eds.), *Financing education: Overcoming inefficiency and inequity* (pp. 150-187). Urbana, IL: University of Illinois Press.
- Mekonnen, M.A. (2021). *The Causes of youth unemployment among tertiary graduates in Ethiopia* (Doctoral dissertation, KDI School).
- MOE. (1994) Education and training policy. Addis Ababa: Ethiopia
- MOE. (2018). *Ethiopian Education Development Roadmap (2018-30)*, Draft for Discussion. Addis

- Ababa: Ministry of Education, Education Strategy Center (ESC).
- Momeni, A., Kaffashpoor, A., Malekzadeh, G., & Khorakian, A. (2020). Presenting employees' self-development behaviour pattern. *International Journal of Procurement Management*, 13(4), 578-595.
- Molla, T. (2018). *Higher education in Ethiopia: Structural inequalities and policy responses* (Vol. 2). Singapore: Springer.
- Montenegro, C.E., & Patrinos, H.A. (2014). Comparable estimates of returns to schooling around the world. *World Bank policy research working paper*, 7020.
- Muhammed, A., & Asfaw, M. (2014). Government Spending for Economic Growth in Ethiopia. *Journal of Economics and Sustainable Development*, 5(9), 66-74.
- Mulu, N. (2017). The Links between Academic Research and Economic Development in Ethiopia: The Case of Addis Ababa University. *European Journal of STEM Education*. 2(2), 05.
- Musselin, C. (2007). The Transformation of Academic Work: Facts and Analysis. *Research & Occasional Paper Series: CSHE. 4.07*. Center for studies in higher education, UC Berkeley.
- Oreopoulos, P., & Petronijevic, U. (2013). Making college worth it: A review of research on the returns to higher education. *The Future of Children*, 23(1), 41-65.
- Patrinos, H.A. (2016). *Estimating the return to schooling using the Mincer equation*. IZA World of Labor.
- Polley, W.J. (2015). The rhetoric of opportunity cost. *The American Economist*, 60(1), 9-19.
- Poteliienė, S., & Tamašauskienė, Z. (2014). The rate of return to investment in education: a case study of Lithuania. *Wroclaw review of law, administration & economics*, 4(2), 41-55.
- Psacharopoulos, G. (1981). Returns to education: an updated international comparison. *Comparative education*, 17(3), 321-341.
- Psacharopoulos, G. (1994). Returns to investment in education: A global update. *World development*, 22(9), 1325-1343.
- Psacharopoulos, G. (2007). *The costs of school failure: A feasibility study*. Brussels: EENEE.
- Psacharopoulos, G., & Patrinos, H.A. (2004). Returns to Investment in Education: A Further Update. *Education Economics*, 12(2), 111-34.
- Psacharopoulos, G., & Patrinos, H.A. (2018). Returns to investment in education: a decennial review of the global literature. *Education Economics*, 26(5), 445-458.
- Patrinos, H.A., Psacharopoulos, G., & Tansel, A. (2020). Private and social returns to investment in education: the case of turkey with alternative methods. *Applied Economics*, 53(14), 1638-1658.
- Psacharopoulos, G., & Woodhall, M. (1993). *Education for development*. Oxford: oxford university press.
- Ruducha, J., Mann, C., Singh, N.S., Gemebo, T.D., Tessema, N.S., Baschieri, A., ... & Berman, P. (2017). How Ethiopia achieved millennium development goal 4 through multi-sectoral interventions: a countdown to 2015 case study. *The Lancet Global Health*, 5(11), e1142-e1151.

- Schultz, T.P. (1993). Investments in the schooling and health of women and men: quantities and returns. *Journal of human resources*, 28(4), 694-734.
- Seid, Y. (2016). Does learning in mother tongue matter? Evidence from a natural experiment in Ethiopia. *Economics of Education Review*, 55, 21-38.
- Stone, D.F. (2015). Clarifying (opportunity) costs. *The American Economist*, 60(1), 20-25.
- Todaro, M.P., & Smith, S.C. (2012). *Economic development* (11th edition).
- UNESCO. (2012). *Education for all global monitoring report youth and skills: Putting Education to Work*. Paris: UNESCO Publishing.
- UNESCO. (2021). *Non-State actors in education: Global Education Monitoring Report*. ED/GEMR/MRT/2021/P1/10: Paris: UNESCO Publishing.
- Verwimp, P. (1999). Measuring the quality of education at two levels: A case study of primary schools in rural Ethiopia. *International review of education*, 45(2), 165-194.
- Wolday, A. (1999). Returns to schooling in Ethiopia: The case of the formal Sector. *Ethiopian Journal of Economics*, 6(1), 87-104.
- Woodhall, M. (2004). *Cost-benefit analysis in educational planning*. Paris: UNESCO, International Institute for Educational Planning.
- World Bank. (2003). *Higher Education Development for Ethiopia: Pursuing the Vision*. Washington, DC: The World Bank.
- World Bank. (2005). *Education in Ethiopia: strengthening the foundation for sustainable progress*. Washington, DC: The World Bank.
- World Bank. (2017). *World development report 2018: Learning to realize education's promise*. Washington, DC: The World Bank.
- World Bank. (2020). *Ethiopia poverty assessment: Harnessing continued growth for accelerated poverty reduction*. Washington, DC: The World Bank.
- Woubet, K. (2006). Human capital and economic growth in Ethiopia. Unpublished master's thesis. Addis Ababa, Ethiopia: Addis Ababa University.
- Yirdaw, A. (2016). Quality of education in private higher institutions in Ethiopia: The role of governance. *SAGE open*, 6(1), 1-12.
- Yizengaw, T. (2006). Cost Sharing in the Ethiopian Higher Education System: The Need, Implications and Future Directions. *The Ethiopian Journal of Higher Education*, 3(2), 1-32.
- Yizengaw, T. (2007). Implementation of cost sharing in the Ethiopian higher education landscape: critical assessment and the way forward. *Higher Education Quarterly*, 61(2), 171-196.
- Zerihun, T. (2014). Human capital and economic growth: causality and co-integration analysis. Doctoral dissertation, Jimma University.