Policies for Increasing School Enrollment and Completion Rates for the Poor

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Abstract

Human capital accumulated through education is the key factor in increasing individual income. Therefore, policies that aid the increase in school enrollment and completion rates amongst the poor are essential for poverty alleviation. In this study, we focus on four programs that have been implemented to increase school enrollment rates in the past decades and examine its effectiveness on poverty alleviation. We find that policies that organize the perfect credit market and cash or in-kind transfer during the education period are more effective, even more so than improving the learning environment or improving the quality of education.

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1 Introduction

Achieving universal primary education is an effective method to alleviate poverty. Through education, individuals accumulate human capital, which reflects on individual wages in the labor market. The Millennium Development Goals Report 2015 demonstrates that the primary school net enrollment rate in developing regions has reached 91 percent in 2015, up from 83 percent in 2000. The rapid increase is observed especially in Sub-Saharan Africa.

The attempts made by each government seem to be effective, as the enrollment rate of primary schools has increased over the past decade. However, there are still individuals who are unable to enroll in primary schools. Studies by UNICEF (2021) show that school dropout rate in Eastern and Southern Africa was 28 percent and 22 percent in Sub-Saharan Africa, whereas the worldwide rate was 11 percent in 2017. Moreover, it was 22 percent in the least developed countries. From these facts, we can see that poverty is one of the reasons that prevents children from receiving education. Leaving no one behind is the central promise of the 2030 Agenda for Sustainable Development Goals, adopted at the United Nations Summit as a subsequent agenda of the Millennium Development Goals in 2015. We should continue to increase enrollment rates, especially in the least developed countries.

To raise individual human capital and alleviate poverty, we should focus on the school completion rate as well as enrollment rates. Studies by UNICEF (2021) show that the worldwide primary school completion rate was 82 percent in 2017. Least

developed countries have low completion rates, such as 27 percent in Chad, 27 percent in Guinea-Bissau, and 25 percent in South Sudan. The total completion rate in the least developed countries was 59 percent. When we focus on the situation in Africa, the completion rates are 61 percent, 62 percent, and 62 percent in West and Central Africa, Eastern and Southern Africa, and Sub-Saharan Africa respectively and they are all lower than the world average rate. These low completion rates compared to enrollment rates mean that some students could not continue their studies and dropped out in the middle of primary school. Moreover, it is clear that this tendency is extremely high in poor countries.

In this study, we examine four programs that succeeded in increasing school enrollment rates through different policies: eliminate credit constraints by organizing the perfect credit market, enable cash or in-kind transfer during the education period, organize the learning environments, and provide high-quality education which enables students to improve their skills. We identify the most effective strategy to facilitate the poor to receive education. We also consider whether these policies increase the completion rates. We then clarify how the policies prioritize poverty alleviation.

In the next section, we review the policies that are effective in increasing school enrollment and completion rates. In section 3, we present a simple model that shows whether individuals choose to receive education or not under varied circumstances. In section 4, we analyze the effects of these policies on school enrollment and completion rates for both the poor and the rich and in section 5, we examine how these policies

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prioritize for poverty alleviation. The concluding remarks are presented in the last section.

2   Literature review

Various policies encourage individuals to choose education and increase school enrollment and completion rates. In this section, we examine four major programs that increase these rates. First, we focus on a policy that organizes a perfect credit market. Borrowing constraint is one of the factors that prevents parents from letting their children go to school. Glewwe and Jacoby (1992) suggest that borrowing constraints cause delays for the poor in schools. Jacoby (1994) states that parents who are constrained in their ability to borrow tend to withdraw their children from school at an early stage. Baland and Robinson (2000) indicate that an imperfect credit market gives rise to child labor. Fuwa et al. (2009) suggest that borrowing constraints decrease the period of schooling time. Ljungqvist (1993) indicates that a perfect credit market can increase school enrollment rate.

Second, cash or in-kind transfers can also increase enrollment and completion rates by compensating for individual opportunity costs while receiving education. Several studies have shown the positive effects of conditional cash transfers on enrollment rates. Under these programs, individuals can obtain cash as going to school and health centers. Schultz (2004) and Behrman et al. (2005) demonstrate that conditional cash transfers, called Progresa-Oportunidaes Program in Mexico, increased

enrollment rates. Glewwe and Kassouf (2012) show increased enrollment rates under the conditional cash transfer program called Bolsa Escola in Brazil. Schady et al. (2008), Attanasio et al. (2005), Maluccio and Flores (2005), and Glewwe and Olinto (2004) show that conditional cash transfer programs increased enrollment rates in Ecuador, Colombia, Nicaragua, and Honduras. Schady and Araujo (2006) show that a conditional cash transfer program in Ecuador contributed not only to increasing enrollment rates but also to decreasing the rates of child labor. Although such conditional cash transfers are effective in increasing the school enrollment rates, it is questionable whether they are effective in increasing individuals' academic performance. Dubois et al. (2012) indicate that the cash transfer program in Mexico succeeded in increasing the enrollment rate at all grade levels. However, it had a negative impact on students' performance at the secondary level. Takahashi and Hamaguchi (2008) show that conditional cash transfers in Mexico and Brazil increased enrollment rates. However, they did not increase individual academic performance because the poor often work while at school.

Local governments can transfer in-kind, such as free school meals, school supplies and school uniforms instead of cash. Vermeersch and Kremer (2005) indicate that providing school meals increases students' participation and academic performance when teachers are experienced prior to the program. Akanbi (2011) suggests that school meals increase parents' motivation to send their children to school and reduce their gender and social gap. Taylor and Ogbogu (2016) points out that the school enrollment rate and students' academic performance increase with school meals.

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Moreover, Konheim-Kalkstein (2006) demonstrates that school uniforms could lower clothing costs in the long term, even if individuals have to pay for the uniforms by themselves. Evans and Ngatia (2021) indicate that providing free school uniforms reduces school absenteeism in the short term. Evans et al. (2008) also show that distributing free school uniforms increase students' academic performance and reduce school absenteeism. Kremer et al. (2003) suggest that providing a package including textbooks, classroom construction, and school uniforms reduces the dropout rate and increases the rate of completion.

Third, organizing the learning environment is also effective in increasing the enrollment and completion rates. Coleman et al. (1966) demonstrate that individual backgrounds affect individual academic performance. Corcoran et al. (1992), Seshadri and Yuki (2004), and Nakamura (2020) clarify the positive relationship between individual learning environments and individual academic performance.

Moreover, school uniforms also improve learning environments. Konheim-Kalkstein (2006) suggests that school uniforms reduce violence and improve the atmosphere of the school. Baumann and Krskova (2016) focus on the relationship between school discipline and students' academic performance and show that students wearing school uniforms listen better. That is, school uniforms contribute not only towards saving money, but also towards increasing the quality of the learning environment and the possibility that individuals obtain skills through education.

Fourth, high-quality education also contributes to increasing individual wages for those who obtain skills through education. Hanushek et al. (2008) demonstrate that

school quality and grade completion by students have positive correlation. Multiple studies have analyzed pedagogy that provide high-quality education, including the reduction of class-size. Glass and smith (1979), Finn and Achilles (1990), Smith et al. (2003), Nye et al. (2004), and Shin (2012) clarify the positive effects of class size reduction on students' academic performance. Mathis (2017) shows that the reduction of class size affects the poor more. Moreover, Zyngier (2014) demonstrate that the reduction of class size contributes to weakening the achievement gap among students.

In the next section, we compare the effects of these four programs on individual choices of receiving education through a model. We then identify the policies that are beneficial especially to the poor and facilitate poverty alleviation.

3   Model

Let us compare the utility of three cases where individuals choose whether they receive education through a simple two-period model. Individuals have worked in two periods. In the first period, individuals can choose whether they receive education as they work. In the second period, the part of individuals who received education in the first period succeed in obtaining skills for jobs, whereas the rest of the individuals who received education in the first period and individuals who do not choose to receive education in the first period do not obtain skills.[1] After receiving education,

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[1]We assume that not all individuals who receive education can obtain high skills. Whether or not they acquire high skills depends on their capability or learning environments, besides receiving

the possibility that individuals obtain skill is p and $0 < p < 1$ is satisfied. p is

endogenous and increases when the conditions of individual learning environments,

such as enough school supplies or parents' attention on their children, improve.

Based on this assumption, individuals face three choices. First, they do not

receive education in the first period and engage in work.[2] Second, they choose to

receive education by borrowing money to finance their education from banks, or by

getting scholarship money and refunding it in the second period. Third, they choose

to receive education and pay for their education in the first period.

The individual utility function is constituted by individual income and disutility

of labor hours, as follows:

$$U_i = w_i l_i - h(l_i) + \delta(w_i l_i - h(l_i)), \tag{1}$$

where w_i, l_i, and δ are the wage of individual i, the labor hour of individual i, and

discount present value, respectively. The function h indicates the disutility of labor

hours, which we assume is increasing and convex. The derivative of (1) is shown as

$$\frac{\partial U}{\partial l_i} = (1 + \delta)(w_i - h^{'}(l_i)) = 0. \tag{2}$$

From (2), we can introduce the individual optimal labor hour, l_i^*. We assume that

education.

[2]Some children may take care of their siblings instead of working so that their parents can work
and earn more money for all members of the family, instead of taking care of their children. That is,
the cash dividends of the children who take care of their siblings increases. Therefore, for simplicity,
we assume that children engage in work when they do not go to school.

$U_u < U_s$ is always satisfied when individuals work their optimal labor hours.

Individuals are unskilled in the first period, whereas they are divided into two types in the second period: unskilled and skilled. Their wages are shown as w_u and w_s, respectively and $w_u < w_s$ is satisfied. When individuals choose not to receive education, their utility function is written as

$$U_1 = (1 + \delta)(w_u l_u^* - h(l_u^*)). \tag{3}$$

Next, when individuals choose to receive education by borrowing to finance their education in the first period, their utility function becomes

$$U_2 = w_u l_u^{**} - h(l_u^{**} + l_e) + \delta(p(w_s l_s^* - h(l_s^*)) + (1 - p)(w_u l_u^* - h(l_u^*)) - (1 + r)C_e), \tag{4}$$

where l_e, r, and C_e are the learning hour, the interest rate, and the education expense, respectively and $l_u^{**} = l_u^* - l_e$ is satisfied. r and C_e are exogenous.

Third, when individuals choose to receive education by paying for the education expense in the first period, their utility function is formed as

$$U_3 = w_u l_u^{**} - h(l_u^{**} + l_e) - C_e + \delta(p(w_s l_s^* - h(l_s^*)) + (1 - p)(w_u l_u^* - h(l_u^*)). \tag{5}$$

Let us compare the utility in the three cases and consider the key factors for

individual choice. First, we focus on individuals' choices regarding whether they choose to receive education. From (3) and (4), we obtain the following equation:

$$U_1 - U_2 = w_u l_e + \delta(p(w_u l_u^* - w_s l_s^* - h(l_u^*) + h(l_s^*)) + (1+r))C_e. \qquad (6)$$

Moreover, from (3) and (5), we obtain the following equation:

$$U_1 - U_3 = w_u l_e + \delta p(w_u l_u^* - w_s l_s^* - h(l_u^*) + h(l_s^*)) + C_e. \qquad (7)$$

From (6) and (7), we find that individuals tend to receive education when the value of education expense, the interest rate, and hours spent on education are low, whereas the difference between the wages for unskilled and skilled people is large. Moreover, when the discount present value in the second period and the probability of obtaining skills are high, individuals tend to receive education and vice versa.

Next, we consider the differences in the utility between the case where individuals borrow money to finance their education and the case where they pay for education expenses in the first period. From (4) and (5), we obtain the following equation:

$$U_2 - U_3 = (1 - \delta(1+r))C_e. \qquad (8)$$

From (8), it is clear that individuals tend to borrow money for education expenses when the value of the interest rate and the discount present value are low, and vice versa.

In the next section, we consider several policies for increasing school enrollment and completion rates, focusing on the values of some parameters. We then identify the policies that are effective, especially for the poor, to choose receiving education and clarify the priority order of these policies for poverty alleviation.

4　The policy for increasing the school enrollment and completion rates

4.1　The policy for increasing the school enrollment rates

4.1.1　The perfect credit market

When there is an imperfect credit market, some people cannot borrow money in the first period to finance their education. From (7), we obtain the following inequality, which shows the condition that individuals receive education.

$$w_u l_e + C_e < |\delta p(w_u l_u^* - w_s l_s^* - h(l_u^*) + h(l_s^*))|. \tag{9}$$

That is, the large values of p, δ, and the difference between U_s and U_u and the small values of C_e, l_e, and w_u urge individuals to receive education and vice versa. Next, under the perfect credit market, from (6), we obtain the following inequality which shows the conditions that individuals receive education.

$$w_u l_e + \delta(1+r)C_e < |\delta p(w_u l_u^* - w_s l_s^* - h(l_u^*) + h(l_s^*))|. \tag{10}$$

From (10), we find that individuals tend to receive education when the values of p and the difference between U_s and U_u are large, and the values of w_u, l_e, C_e, and r are small. Moreover, from (9) and (10), it is clear that some individuals choose to receive education under the perfect credit market, and choose not to receive it under imperfect credit markets when the following inequality is satisfied:

$$w_u l_e + \delta(1+r)C_e < |\delta p(w_u l_u^* - w_s l_s^* - h(l_u^*) + h(l_s^*))| < w_u l_e + C_e. \tag{11}$$

(11) is realized when the value of p and the difference between U_s and U_u are large and the values of r and δ are small. From this analysis, it is clear that organizing the perfect credit market has enabled especially the poor, who have a high discount rate, to decide on receiving education.[3]

4.1.2 Cash transfers and in-kind transfers at schools

Next, we focus on the values of l_e. From (6) and (7), we find that individuals do not receive education when their learning hours are long because their opportunity costs while receiving education become large. From (7), it is shown that this tendency is strong for the poor whose discount rate is high. Cash or in-kind transfers such as providing school meals compensate for their opportunity costs while receiving

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[3] Pender (1996) shows that the poor have a large discount rate compared to the rich.

education and enable the values of (6) and (7) to be negative. Therefore, parents'
motivation to send their children to school increases and the school enrollment rate
increases.

4.1.3   Organizing the learning environments

Let us consider the value of p. From (6) and (7), it clarifies that the higher the
value of p, the more individuals choose to receive education. That is, the high
possibility of obtaining skills through education encourages individuals to choose
receiving education. It is clear that this tendency is stronger for individuals with
large value of δ from (6) and (9). That is, organizing the learning environments is
effective, especially for the rich, compared to the poor.

In order to increase the value of p, the government implements policies that
improve the learning environment at school and at home. Increasing the value of w_s
through education causes a large difference between w_u and w_s, and individuals tend
to receive education.

4.1.4   Increasing the skills obtained through education

From (6) and (7), we find that the larger the difference in wages between unskilled
and skilled people, the higher the school enrollment rates. Therefore, enhancing the
quality of teaching is also effective in increasing school enrollment rates. Moreover,
these equations show that programs for increasing the skills obtained at school are
more effective for the rich whose discount rate is low compared to the poor whose

discount rate is high.

4.2   The policy for increasing the completion rates

Let us consider the effects of these programs on the school completion rates. The cash or in-kind transfer programs, the policies organizing the learning environment and the quality of education are all effective in making the values of (6) and (7) negative. That is, individuals assume that they will complete the education period when they choose to receive education. Therefore, these policies can increase the rate of school completion. Moreover, the policy for organizing the perfect credit market is effective in urging individuals to receive education when (11) is satisfied. They choose to go to school to obtain high skills through education because the value of U_s is considered in (11). Therefore, this policy can increase the school completion rate.

Since individuals choose to receive education by obtaining skills through education under the four programs in the model, all of them can increase the school completion rate as well as the school enrollment rate. However, in the real world, whether individuals complete their education depends on how motivated they are, as well as their environments. The policies of organizing the perfect credit market, improving the learning environments, and increasing the quality of education provide individuals with high skills at the end of the first period, whereas the transfer program provides cash or goods consecutively during the first period, in addition to high skills. We should consider how the timing of these rewards affects individuals'

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motivation to complete their education in the expanded model.

5 The order of priority of policies for poverty alleviation

Through the model, we examine the effects of the four programs that increase school enrollment and completion rates. Moreover, we find the way in which the policies prioritize the poor going to school is based on the individual discount rate. All of them are effective in increasing both school enrollment and completion rates because individuals choose whether they receive education by considering the skills obtained through education as (6) and (7). Since they can obtain skills after completing the education period, these policies motivate individuals to graduate from school.

Next, we show that the program that organizes the perfect credit market and eliminates borrowing constraints are effective, especially for the poor. Moreover, cash and in-kind transfers that compensate for the opportunity costs through receiving education are also effective, especially for the poor. On the contrary, the policy that organizes the learning environments at school and at home, and the policy that increases the quality of education and level of skills obtained through education are effective, especially for the rich. Therefore, the government can prioritize the former two policies, which particularly increase the human capital of the poor rather than the latter two policies for poverty alleviation.

6   Conclusion

The human capital theory states that the accumulation of human capital through education increases individuals' income. Although school enrollment has been increasing in the past decade, there are still people who cannot go to school due to poverty. Moreover, the school completion rates in primary schools are still low in some least developed countries. Therefore, to alleviate poverty, a policy that increases school enrollment and completion rates can an essential strategy. To find the policies that are particularly effective in urging the poor to go to school and obtain skills through education, we compare the effects of four programs that have been implemented in several developing countries and show their efficacy based on the model, focusing on the difference in individual discount rates. The four programs are: organizing the perfect credit market, cash or in-kind transfer programs, improving the learning environments, and increasing the quality of education. Lastly, we find that the former two programs particularly affect the poor rather than the rich. Therefore, the government can prioritize these two policies for poverty alleviation.

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