

An essay on schooling outcomes in the Philippines: the role of households, markets, and institutions

Ma. Laarni D. Revilla¹

Asian Development Bank

Jonna P. Estudillo

National Graduate Institute for Policy Studies (Japan)

This essay explores the impacts of household income, markets, and institutions on schooling outcomes of children in high school age in the Philippines. We found that the development of the labor market and the rise in household income have encouraged schooling investment. The implementation of free secondary school act (Republic Act 6655) in 1988 has exerted positive impacts on schooling outcomes by decreasing the direct cost of schooling borne by parents. This finding suggests that government policies that decrease user fees in school tend to encourage parents to send their children to school.

JEL classification: I22, I25, I28

Keywords: education, income, schooling outcomes, Republic Act 6655

1. Introduction

The Millennium Declaration was ratified by the United Nations General Assembly in September 2000. It embodies the Millennium Development Goals that contains time-bound goals and targets aiming to provide the world a vision to fight poverty and to improve the living conditions of the world population. Goal 2 of the Millennium Development Goals, “Achieve universal primary education,” aims to “ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling” [United Nations 2015].

Meanwhile, the Sustainable Development Goals (SDGs), which replaced the Millennium Development Goals, collectively map out a set of agenda aiming to sustain social and economic progress from 2015 to 2030. SDG 4, “Quality education,” is to “ensure inclusive and equitable quality education and promote

¹ All correspondence should be addressed to mrevilla.consultant@adb.org

lifelong learning opportunities for all”. Specifically, SDG 4 focuses on building higher-order skills, creating equitable access to technical and vocational education and higher education, and acquiring knowledge and skills to function well and to contribute to society [United Nations 2016].

Building marketable skills is the main emphasis of SDG 4 because skills obtained from formal education accelerate social and economic mobility and could serve as a springboard of rapid economic growth. Barro and Lee [2010], using a panel data set on educational attainment of 146 countries from 1950 to 2010, showed that schooling has a significant positive effect on aggregate output, indicating that education confers benefits to individual, households, firms, and the aggregate economy as a whole. Thus, many countries, including the Philippines, consider the education-for-all initiative as an important propelling force in achieving economic progress [Mesa 2007]. Yet, it is in high-quality education that marketable skills are built.

The Philippines has implemented various educational reforms over the years to improve the quality of its labor force. In 1988, the Congress of the Philippines approved Republic Act (R.A.) 6655, entitled “An Act Establishing and Providing for a Free Public Secondary Education and for Other Purposes”. R.A. 6655 is one of the most important reforms since the early 1900s, when the American colonial government promoted the expansion of primary education. R.A. 6655 declares that the State shall provide for a free public secondary education to all qualified citizens and promote quality education at all levels [Free Public Secondary Education Act of 1988 1988]. R.A. 6655 essentially eliminates the user fees in school, thus making secondary schooling affordable to all including the poor.

After the implementation of R.A. 6655, there have been improvements in household income, as the Philippines started to embark on economic liberalization in 1986. Jobs were created and household income rose. Meanwhile, the labor market has developed when the newly industrializing countries in East Asia started to experience labor scarcity and higher wages, prompting them to move labor-intensive production processes to Southeast Asia including the Philippines. Filipino overseas migration continued on with the rising demand for foreign workers in the Middle East and East Asia. This essay assesses the impacts of the rise in household income, greater labor employment opportunities, and the free public secondary education act on schooling outcomes in the Philippines. The free public secondary education in 1988 is a landmark policy, which made secondary schooling affordable to all, similar to the effect of the free primary education during the American colonial period in the early 1900s.

This essay has five remaining sections. Section 2 presents a simple theoretical framework on the relationship between households, markets, and institutions. Section 3 provides an overview of school participation and education reforms in Southeast Asia. Section 4 narrates the history of Philippine education system and reforms. Section 5 describes the data, explains the methodology, and discusses the results. Finally, Section 6 summarizes and concludes this essay.

2. Households, markets, and institutions

Interactions between households, labor markets, and institutions can explain the rising trend in school enrolment. Figure 1 shows a simple schematic diagram on how these three could interact to come up with a favorable outcome of increasing child school enrolment. In this essay, we are particularly interested in explaining the rising trend in secondary school enrolment in the Philippines since the mid-1980s.

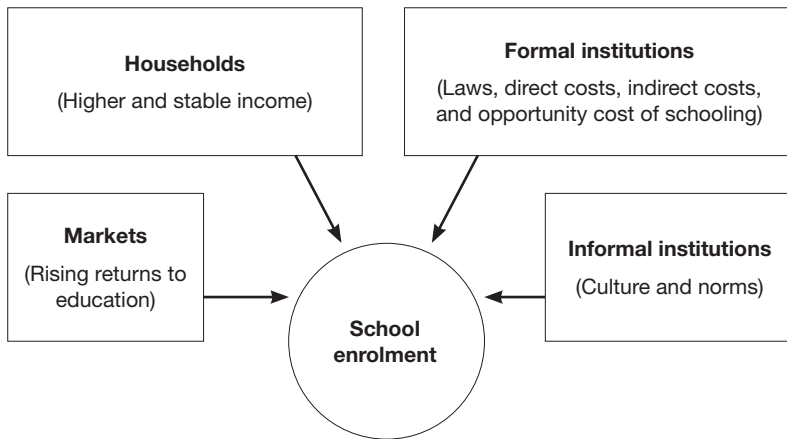


FIGURE 1. Interactions between households, markets, institutions, and school enrolment

Increase in household income has a positive impact on children's secondary schooling as schooling is a normal good [Behrman and Knowles 1999]. Rising household income also leads to later marriages that allow young girls to stay longer in school. Greater household income relaxes resource constraints, enabling households to send all their children in school regardless of gender. The development of labor markets that raises the returns to schooling makes child schooling a profitable investment. Rising returns to schooling means greater labor employment opportunities for both women and men. Since the mid-1980s, a new generation of jobs were created by the increasing globalization that led to the development of the non-farm sector, expansion of new technology, and emergence of high-value products in agriculture. In fact, the closure of the global gender gap in primary and secondary school enrolment and the emergence of gender gap in tertiary schooling in favor of girls are partially attributed to the emergence of new and lucrative employment opportunities for girls [World Bank 2012]. In India, for example, girls' enrolment in primary school (most notably in English-language schools) responded positively to the introduction of information-technology-enabled service centers.

Institutional change, such as the reduction of user fees in school, induces households to send their children to school and keep them there for a longer period of time. The implementation of R.A. 6655 in the Philippines makes secondary schooling free, which means that households do not need to pay tuition fees that is the largest chunk of school costs borne by the parents. Specifically, through R.A. 6655, secondary students enrolled in national high schools, trade, technical, vocational, agricultural schools, and other high schools funded by local government units are able to get free tuition and other school fees. Tuition fee refers to the direct costs of instruction, training, and access to facilities, while other school fees include costs that support instruction such as medical and dental, athletic, library, and laboratory fees [Free Public Secondary Education Act of 1988].

The reduction of distance to school (which is an indirect cost of schooling), through good road infrastructure and electricity and even the availability of school latrines for both sexes, could encourage girls' participation in school. The price of schooling reflects both the direct and indirect costs, as well as the foregone costs. The latter is the foregone revenues from child labor in the labor market and at home in household chores. Economic growth may retard child progress in school as labor markets expand and create jobs even for children. As adult employment opportunities expand with economic growth, children need to do more household and family farm chores, discouraging school participation. On the other hand, economic growth means higher household income and a greater ability to finance child schooling, thus encouraging school participation.

Informal institutions, such as cultural norms and practices, oftentimes are unfavorable to girls' schooling. The practice of *purdah* and early marriage of girls in southern parts of Asia, for example, serves as a serious impediment to girls' schooling. In rural Philippines, parents tend to favor girls in schooling investments, while giving land bequests to sons to equalize inter-generational transfers across children [Estudillo, Quisumbing, and Otsuka 2001]. This practice is favorable to girls inasmuch as income from the nonfarm sector is higher than income obtained from farming.

Overall, the interaction between household resources, markets, and institutions shape household decisions on schooling investments. In the case of the Philippines, epochal changes took place in the mid-1980s because of economic liberalization, labor market development, and institutional change as embodied in the ratification of R.A. 6655. In the Philippines, real household income grew at an annual rate of about 7 percent between 1985 and 1991 during the early period of economic liberalization and decelerated to annual growth rate of about 3 percent between 2006 and 2012. In the later period, the labor market deepens with economic liberalization that brings in more business investments and more jobs in the country. International migrant workers and remittances continue to increase from the mid-1980s to the 2000s, as the Philippine government implemented

various programs that protect the rights of Filipino overseas workers and foreign demand for Filipino workers continue to rise. Higher household income and more job opportunities along with the policy of free secondary schooling could bring in more children in secondary schools.

3. School participation in Southeast Asia

Based on the United Nations Educational, Scientific and Cultural Organization - International Bureau of Education [UNESCO-IBE], in 2012, most Southeast Asian countries are able to provide free primary and secondary education through country-specific laws and policies.

In particular, Brunei created the Compulsory Education Order 2007, which ensures that all children receive at least 9 years of formal education (primary and lower secondary) and children aged 6-15 years receive education either in government or private schools. Similarly, through Government Regulation No. 28/1990 and the National Education System Law of 2003, Indonesia provides a nine-year compulsory basic education for children between 7 and 15 years old. Cambodia promotes free primary and secondary education in public schools through Article 68 of the Constitution. Specifically, in December 2007, the Education Law, which offers nine years of free and compulsory education in public schools, was passed.

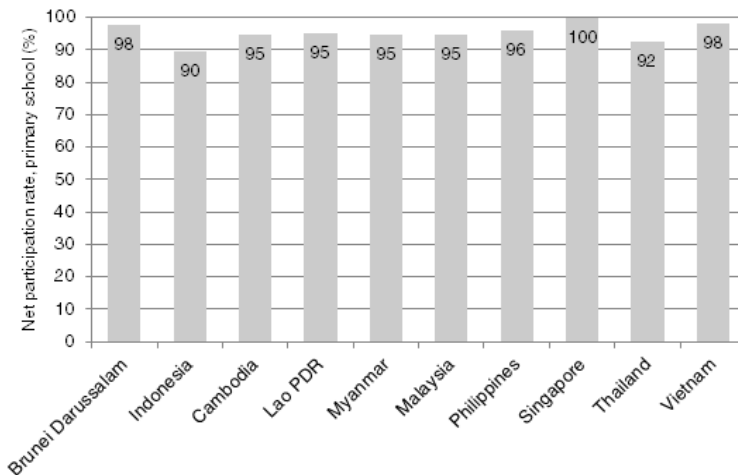
Lao PDR's 1996 Decree on Compulsory Primary Education No.138/PMO/96 states that primary education is free and compulsory, and can be provided by either public or private institutions. The Law on Education, which was ratified by the Lao National Assembly on 28 August 2015, states that the compulsory education is extended to primary (5 years) and lower secondary education levels (4 years) and that compulsory education is free. Upper secondary education (3 years), however, is not free. Yet, many secondary schools have requested to collect fees from students to cover overhead and other expenditures, which the Ministry of Education allows for no more than 20,000 kip (around US\$2.5) per student per year. These fees are for student registration and other specific school fees.

According to Article 20 of The Child Law (1993) of Myanmar, there should be free and compulsory basic education (primary level) at state schools. In the case of Malaysia, Education Amendment Act 2002 ensures free and compulsory primary education for all children. Primary schooling covers a period of 5 to 7 years, and the admission age is 6. Secondary education is not compulsory, but secondary education is provided free to all children. In the Philippines, the national legislation specifies that primary education is free and compulsory, while secondary education offers free tuition in public schools, but is not compulsory. Primary education has been free, and primary schools are numerous around the Philippines as early as the American colonial period between 1900 and the mid-1940s.

Singapore's Compulsory Education Act (Chapter 51) stipulates free and compulsory primary education for children above the age of 6 and below 15. Secondary schools are not free but are heavily subsidized. The National Education Act B.E. 2542 (enacted on August 1999 and amended in 2002) of Thailand gives a 12-year free basic education scheme covering six years of primary and six years of secondary education. Lastly, the Law on Universal Primary Education [1991] of Vietnam provides compulsory universal primary education for all children aged 6-14. Vietnam Constitution states "Primary education is compulsory and tuition-free," whereas secondary school institutions can always charge tuition fees [Hoang 2013].

To summarize, Brunei, Indonesia, Cambodia, Malaysia, Philippines, and Thailand provide free schooling for both primary and secondary, while Lao PDR, Myanmar, Singapore, and Vietnam offer only free primary schooling. Yet, it is important to mention that the quality of schooling matters a lot more than the quantity of schooling as it is in quality that we build marketable skills, which in turn determine the aggregate economic growth.

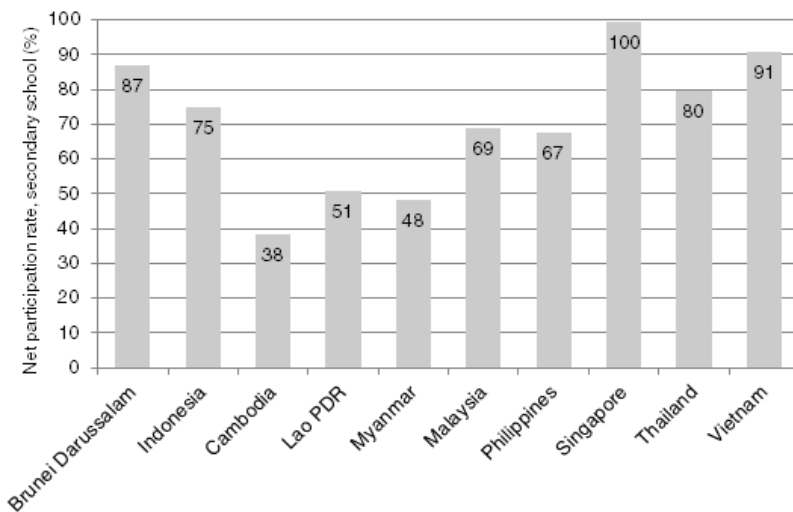
Given how education policies vary from one country to another, disparities in net participation rates among Southeast Asian countries are evident. Using the most recent data, Figure 2 presents the primary net participation rates in Southeast Asia. Singapore has the highest participation rate at 100 percent, while Indonesia relatively has the lowest participation rate at 90 percent. Primary school participation rates in all these countries, nevertheless, are above 90 percent attributable to the free primary school programs of these countries.



Sources: UNESCO Institute for Statistics, Data.gov.sg, and Ministry of Education, Brunei

FIGURE 2. Primary net participation rates, most recent available data, Southeast Asia

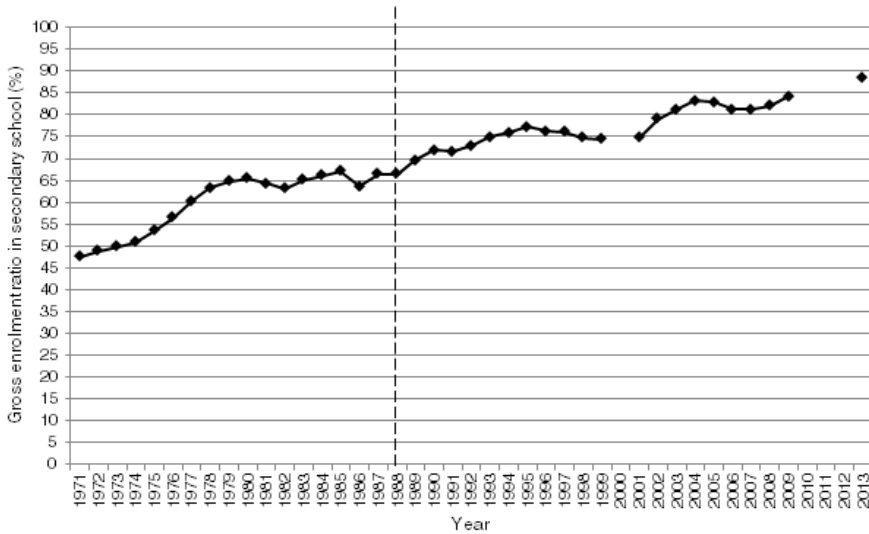
Figure 3 provides data on the current secondary school net participation rates, with Singapore having the highest participation (100 percent) although Singapore has no free secondary school policy. This means that high household income is the main factor behind the high secondary school participation rate in Singapore. Lao PDR and Myanmar have one of the lowest secondary school participation rates possibly because of low household income and because secondary school is not free. Moreover, inadequate complementary infrastructure in these countries tend to increase the price of schooling by increasing the indirect cost of schooling (e.g., distance problem). These two countries are included in the United Nations' list of the least developed countries in the world partly because of the low level of human assets including low gross secondary school enrolment ratio.



Sources: UNESCO Institute for Statistics, Data.gov.sg, and Ministry of Education, Brunei

FIGURE 3. Secondary net participation rates, most recent available data, Southeast Asia

The Philippines has experienced a rising gross enrolment ratio since the implementation of R.A. 6655 in 1988 (Figure 4). It is important to note that even before R.A. 6655, there was a modest rise in secondary school enrolment, indicating that there are other factors that affect secondary school participation other than the free public secondary school. Yet, it is evident that the rise in secondary school enrolment becomes more visible beginning 1988. This means that it is the interaction between the rising household income, increasing job opportunities, and R.A. 6655 that effectively leads to higher secondary school enrolment.



Source: UNESCO Institute for Statistics

FIGURE 4. Gross enrolment ratio in secondary school in the Philippines, 1971-2013

4. School reforms and outcomes in the Philippines

4.1. History of the Philippine education system

The Philippine educational system has gone through many changes and challenges. Below we present various reforms that came in from colonial period under Spain, America, and Japan.

During the Spanish colonial period from 1521 to 1898, Spanish missionaries were the main providers of education to the Filipinos. Education was controlled mainly by the Catholic Church, and was largely open only to the elite Filipino households, specifically to their elite male children. Schools during the Spanish colonial period were largely private schools.

The first free public school system was established during American rule from 1898 to 1946. A highly centralized public school system was installed in 1901 by the Philippine Commission by the virtue of Commonwealth Act No. 74. Due to the heavy shortage of teachers during this period, the Secretary of Public Instruction brought to the Philippines 600 teachers from America. They were the Thomasites, a religious order in the Catholic Church. The high school system supported by provincial governments, special educational institutions, school of arts and trades, an agricultural school, and commerce and marine institutes were established in 1902 by the Philippine Commission. In 1908, the Philippine

Legislature approved Commonwealth Act No. 1870, which created the University of the Philippines, which is a free public university.

During the Japanese regime from 1942 to 1945, love for work and dignity of labor was emphasized in schools. The teaching of Tagalog, Philippine history, and character education was mandated to young Filipinos [Department of Education n.d.].

4.2. Educational reforms in the Philippines

Here we review reforms in the Philippine educational system in the post-independence period since 1986. We focus on five reforms since the enactment of R.A. 6655. According to De Guzman [2003], the “Education for all Policy,” as stated in the 1987 Philippine Constitution, posits that the State shall promote the right of all citizens to quality education at all levels and ensure that education is accessible to all. It also aims to establish and maintain a system of free public education in the elementary and high school levels.

The first reform is the “Government Assistance to Students and Teachers in Private Education Act” (R.A. 6728), which states that the government shall provide the mechanisms to improve quality in private education by maximizing the use of existing resources of private education [Government Assistance to Students and Teachers in Private Education Act 1989]. The second reform is the “Higher Education Act of 1994” (R.A. 7722), which aims to enhance access of all Filipinos to affordable quality education [Higher Education Act of 1994 1994]. The third reform is the “Technical Education and Skills Development Act of 1994” (R.A. 7796), which focuses on providing high quality and efficient technical education and skills development [Technical Education and Skills Development Act of 1994]. The fourth reform is the “Fair and Equitable Access to Education Act” (R.A. 7880), which ensures fair and equitable access to the infrastructure and tools necessary for quality education [Fair and Equitable Access to Education Act 1995]. Lastly, the fifth reform is the “Enhanced Basic Education Act of 2013” (R.A. 10533), officially mandating kindergarten and a 12-year basic education curriculum. This new system includes six years of primary education, four years of junior high school, and two years of senior high school [Enhanced Basic Education Act of 2013 2013]. This new law that extends the years of basic education from 10 years to 12 years of formal schooling plus kindergarten is commendable because many Filipino educators have observed the declining quality of basic schooling (primary and secondary school) due to shorter duration of basic schooling (i.e., 10 years before the Enhanced Basic Education Act of 2013).

4.3. Educational reforms and their impacts

The study of Braga, Checchi, and Meschi [2011] analyzed the effects of changes in the institutional design of the educational system on school attainment in Europe. The study tests whether alternative reforms have increased the average educational attainment of the population and whether various deciles of the education distribution have been affected. Results suggest that the universal policies (i.e. expansion of compulsory education, opening access to universities, subsidizing university attendance) have raised the average educational attainment of the corresponding populations, while policies intended for quality improvements (either through higher selectivity on access or through increased accountability of educational institutions) tend to reduce it.

Chyi and Zhou [2014] estimated the effects on school enrolment of three sequential tuition reforms between 2000 and 2006 in China. The study involves primary and junior high school students from poor rural families. Using difference-in-difference approaches, the results show that tuition control has had little effect on primary and junior high school enrolment. Also, a policy that includes tuition waiver, free textbooks, and living expense subsidies for children who belong to rural poor families, starting from 2003, had a positive and statistically significant effect on school enrolment for girls, but not for boys. This means that user fees in school tend to retard girls schooling in China.

Another study in China revealed that a senior high tuition relief program had a statistically significant and positive impact on the math scores of seventh grade students. This may imply that low tuition fees increase the student's expectations of attending high school and thus improve academic performance in the seventh grade. The tuition relief program also had a statistically significant and positive effect on the poorest students in the treatment group (the group that receives tuition relief) compared to their wealthier peers [Chen et al. 2013]. This indicates that household resource constraints tend to dictate the school outcomes of children in school age.

Fox, Santibañez, Nguyen, and André [2012] analyzed the effects of the 2004-2005 reforms in Mozambique. Enrolment in lower primary continued to increase after the reforms, especially in rural areas and, importantly, for girls. Meanwhile, enrolment in upper primary also continued to increase, but at a slower rate than in the previous period. Despite significant improvements in enrolment rates, completion rates for primary school remain extremely low. The primary school reforms, which motivated students to enrol and remain longer in school, might have caused the increase in the secondary school enrolment. This increase was likely caused by the abolition of fees in primary school and by the Mozambique government's effort to build more secondary schools and improve school access in previously underserved areas. As primary school gross enrolment ratio increased between 1997 and 2008, so did the gross enrolment ratio in secondary schools, particularly in lower secondary level.

In the case of upper secondary education reform and immigrant youth in Norway, Brinch, Bratsberg, and Raaum [2012] concluded that the reform implemented in 1994 decreased the dropout rates and reduced the differences in educational attainment between the native Norwegians and immigrants. Non-targeted reforms, with an emphasis on securing access to secondary education for everyone, may give a sharp reduction in the educational dropout rates among groups that are constrained in terms of limited access. Lastly, the study of Meghir and Palme [2005] revealed that the major educational reform in Sweden in the 1950s, that aimed to increase compulsory schooling and impose a nationally unified curriculum, increased both the educational attainment and, subsequently, the earnings of a large part of the population.

These studies suggest that, indeed, education reforms have a positive impact on improving schooling outcomes. However, we argue in this essay that household resources are equally important because, eventually, parents make the schooling decisions for their children. Even if policies exist, but household resources are dwindling, parents may choose to keep their children out of school. This could come, for example, during a disaster, when policies are intact, but household resources are lacking. Thus, there is a need to assess the simultaneous impacts of changes in household resources and the implementation of reforms as these two may interact together to bring a better schooling outcome. Expansion of the labor markets is also important because schooling is a form of investment and job opportunities and higher wages created during rapid economic growth dictate the rates of returns to schooling investments. We choose the Philippines in this essay because household income started to increase more rapidly in 1986 with sweeping changes in economic activities brought about by liberalization, global labor market integration, and the implementation of what many educators believe as one of the most important educational reforms (R.A. 6655 in 1988) since the American colonial policy of free primary schooling in 1901.

5. Determinants of schooling attainment

5.1. Data

We used the Annual Poverty Indicators Survey (APIS) in 2011 (the latest data available). APIS is a nationally representative dataset that provides information on socioeconomic profile and living conditions of Filipino families [Philippine Statistics Authority n.d.]. As we are interested in assessing the impacts of household income, markets, and institutions on schooling attainment, we used individual-level information, such as educational attainment, age, and gender, as well as household-level information, such as income, characteristics of household head, and access to electricity and tube water.

5.2. Model

To analyze the educational attainment across generations before and after the implementation of R.A. 6655, our sample individuals were categorized into four cohorts. Cohort 1 includes those who are 36-40 years old in 2011 (they were 13-17 years old or high school age in 1988 when R.A. 6655 were ratified). This cohort took advantage of the free secondary education reform. Cohort 2 represents the age group 41-47 years old in 2011 (they were 18-24 years old or past high school age in 1988). Cohort 2 is the older generation and largely did not benefit from R.A. 6655. Cohort 3 comprises children aged 13-17 years old in 2011 (high school age in 2011), while Cohort 4 consists of those aged 18-24 years old in 2011 (past high school age or have just finished high school in 2011). Cohorts 3 and 4 are the youngest groups and thus their schooling attainment could further reflect the impacts of increase in household income, labor market development, and R.A. 6655 on educational attainment over the years.

For Cohort 3, we used the model below to examine what variables relate to an individual's completed years in school:

$$\begin{aligned} educ_ind = & \alpha + \beta_0 age_ind + \beta_1 sex_ind + \beta_2 educ_head \\ & + \beta_3 sex_head + \beta_4 urban + \beta_5 pcincomePPP \\ & + \beta_6 elec + \beta_7 water + \varepsilon \end{aligned} \quad (1)$$

where

educ_ind = number of completed years in school of the individual;
age_ind = age of the individual;
sex_ind = sex of the individual (1=female; 0=male);
educ_head = number of completed years in school of the household head;
sex_head = sex of the household head (1=female; 0=male);
urban = urban/rural classification (1=urban, 0=rural);
pcincomePPP = per capita income at Purchasing Power Parity (PPP) 2011;
elec = access to electricity (1=yes; 0=no);
water = access to piped water (1=yes; 0=no); and
 ε = error term.

It is important to mention that for Cohort 3 (who are in high school age in 2011), parental investments in child schooling is still on-going. Household income is a good measure of budgetary constraint, while household characteristics and access to electricity and water represent other household resources. Urbanity represents distance of households (remoteness) to school infrastructure.

For Cohorts 1, 2, and 4 (those who are past high school age in 2011), we used the model below:

$$educ_ind = \alpha + \beta_0 age_ind + \beta_1 sex_ind + \varepsilon \quad (2)$$

where

educ_ind = number of completed years in school of the individual;

age_ind = age of the individual;

sex_ind = sex of the individual (1 = female; 0 = male); and

ε = error term.

For Equations 1 and 2, we anticipate β_1 to be positive and significant, indicating that parents tend to invest more in girls' schooling after controlling for household income and other resources. In Equation 1, we anticipate that β_5 is positive and significant, which means that a rise in household income increases child schooling.

5.3. Analysis

Table 1 shows the average of years of completed schooling of the 4 cohorts. The average years of schooling have risen over time, indicating that children are staying longer in school in more recent years. In particular, the average years of schooling of Cohort 1 (those who were in high school age in 1988 and were the first to take advantage of R.A. 6655) is 12.68 years, which is significantly higher compared to that of Cohort 2 (who are past high school age in 1988), which is 12.58 years. For Cohort 4 (those who are past high school age in 2011), the mean is even way higher at 14.05 years.

Based on the test of difference in means, the difference in average years of schooling between Cohort 1 and Cohort 2 is statistically significant at 10 percent level, while for Cohort 1 and Cohort 4 and for Cohort 2 and Cohort 4, the difference is statistically significant at 1 percent levels. This means that the average years of schooling of the younger cohort is statistically higher compared to that of the older cohort. Thus, the increase in average years of schooling of the younger cohort reflects how individuals benefited from the implementation of free secondary schooling.

TABLE 1. Average years of schooling completed in the Philippines by cohort, 2011

Group	Completed years in school		
	Mean	Standard error	No. of observations
Cohort 1	12.68	0.05	11,727
Cohort 2	12.58	0.04	15,761
Cohort 3	10.50	0.02	23,190
Cohort 4	14.05	0.03	23,970

Group	Test of difference in means	
Difference	Significance level	
Cohort 1 versus Cohort 2	-0.10	*
Cohort 1 versus Cohort 4	1.37	***
Cohort 2 versus Cohort 4	1.47	***

Notes:

Authors' calculations are based on data from the APIS [2011].

Cohort 1 refers to individuals who are 36-40 years old in 2011 (i.e., those who were 13-17 years old in 1988). Cohort 2 refers to 41-47 years old in 2011 (i.e., those who were 18-24 years old in 1988). Cohort 3 refers to individuals who are 13-17 years old in 2011, and Cohort 4 refers to 18-24 years old in 2011. Cohort 1 were in high school age in 1988, Cohort 2 are past high school age in 1988, Cohort 3 are in high school age in 2011, while Cohort 4 are past high school age or have just finished high school in 2011.

*Significant at 10 percent level

**Significant at 5 percent level

***Significant at 1 percent level

n.s. means "not significant"

Table 2 presents the results of the regression runs on years of schooling completed for each of the cohorts. For Cohorts 1, 2, and 4, the sex of the child serves as a significant determinant of children's completed years in school. Females tend to have higher schooling attainment than males. The age of the individual, on the other hand, is an important factor in determining the educational attainment of Cohort 4 (younger generation), but not of Cohorts 1 and 2 (older generation), indicating that the younger cohort tend to stay longer in school.

TABLE 2. Determinants of educational attainment in the Philippines by cohort, 2011

Variable	Coefficient	Standard error	Level of significance
Cohort 1			
Age of individual in 2011	-0.05	0.03	(n.s.)
Sex of the individual (1=female)	0.78	0.09	***
Constant	14.06	1.23	***
Number of observations	11,727		
R-Squared	0.01		
Cohort 2			
Age of individual in 2011	0.02	0.02	(n.s.)
Sex of the individual (1=female)	0.79	0.08	***
Constant	11.29	0.87	***
Number of observations	15,761		
R-Squared	0.01		
Cohort 3			
Age of individual in 2011	0.87	0.01	***
Sex of the individual (1=female)	0.73	0.03	***
Completed years in school of head	0.11	0.00	***
Sex of head (1=female)	-0.05	0.04	(n.s.)
Urban (1=yes)	0.05	0.03	(n.s.)
Household per capita income at PPP 2011	0.00011	0.00001	***
Electricity (1=yes)	1.19	0.04	***
Water (1=yes)	0.16	0.03	***
Constant	-5.33	0.15	***
Number of observations	23,190		
R-Squared	0.38		
Cohort 4			
Age of individual in 2011	0.21	0.01	***
Sex of the individual (1=female)	1.64	0.06	***
Constant	9.00	0.29	***
Number of observations	23,970		
R-Squared	0.04		

Notes:

Authors' calculations based on data from the APIS [2011] and the World Bank Open Data [2016].

Cohort 1 refers to individuals who are 36-40 years old in 2011 (i.e., those who were 13-17 years old in 1988).

Cohort 2 refers to 41-47 years old in 2011 (i.e., those who were 18-24 years old in 1988). Cohort 3 refers to

individuals who are 13-17 years old in 2011. Cohort 4 refers to 18-24 years old in 2011. Cohort 1 were in high

school age in 1988, Cohort 2 are past high school age in 1988, Cohort 3 are in high school age in 2011, while

Cohort 4 are past high school age or have just finished high school in 2011.

*Significant at 10 percent level

**Significant at 5 percent level

***Significant at 1 percent level

n.s. means "not significant"

Meanwhile, the regression for Cohort 3 explores how schooling of those children who are of high school age are affected by the changes in household income, labor market, infrastructure, and implementation of R.A. 6655. The regression results in Table 2 reveal that household endowments in terms of household per capita income (adjusted based on US\$ PPP 2011) and access to electricity and tube water have positive and significant impacts on years of schooling completed. Specifically, a \$1 increase in household annual per capita income leads to a 0.00011 year increase in child schooling (or a \$1,000 increase in household income increases child schooling by 0.11 years) holding all other factors constant. Cohort 3 experienced a far greater access to education because R.A. 6655 made secondary schooling affordable by decreasing the cost of schooling borne by parents.

Access to electricity increases educational attainment by 1.19 years. The same is true for access to piped water although the impact of piped water is much less compared to electricity (0.16 compared to 1.19). Both electricity and tube water variables, nevertheless, are significant at the 1 percent level. It is clear that improvements in physical infrastructure affects the younger cohort of children that benefits from R.A. 6655, giving support to our argument that physical infrastructure is complementary to R.A. 6655. In brief, the regression outcome for Cohort 3 indicates that the increase in household resources, the development of the labor market, and the 23-year implementation of R.A. 6655 have had positive impacts on schooling among younger children who were of high school age in 2011.

Other important findings are as follows: First, female children have significantly higher schooling attainment than male children after controlling for household income, indicating a strong female bias in schooling investment. This bias holds true for all the four cohorts. Second, based on the results for Cohort 3, years of schooling completed of household head is a significant factor affecting children's schooling attainment, which means that the more educated heads have a higher propensity to send their children to higher levels of schooling. Third, and finally, urbanity of households is not a significant determinant of children's schooling attainment for Cohort 3 (i.e., urban variable is not statistically significant), which means that the advantage of urban households in schooling has been eroded. This is presumably because of improvements in the supply side of schooling in rural areas in terms of increase in the number of teachers and classrooms. Overall, our test of means and regression runs support our argument that schooling attainment of children has increased for the younger cohort, which is a result of dynamic interactions between households, markets, and institutions.

6. Summary and conclusion

Promoting child schooling is a commitment of the international community as embedded in the Millennium Development Goals and the SDGs. Investing in child schooling is a long-term process involving the dynamic interaction between households, markets, and institutions. When household resources are binding, households tend to discriminate among children, commonly choosing boys to stay in school and girls to drop out. The development of the labor market increases labor demand and raises the rates of returns to schooling, thus making schooling a lucrative investment. Institutions could promote child schooling by decreasing the direct cost (e.g., tuition fee) and indirect cost of schooling (e.g., distance problem). This essay explores how the interaction of households, markets, and institutions lead to favorable schooling outcomes in the Philippines. The focus of inquiry is the Free Public Secondary Education Act of 1988 (R.A. 6655), which provides free public secondary schooling to all qualified individuals. This institution has a direct impact of decreasing the cost of schooling borne by parents by eliminating user fees (tuition fee) in secondary schools.

The major finding of this essay is that secondary school enrolment has increased remarkably after 1988. This favorable scenario is an outcome of the rise in household income brought about by economic liberalization, the rise in demand for Filipino labor domestically and overseas, and the decline in the price of schooling through the elimination of tuition fees in secondary schools and the expansion of complementary physical infrastructure. What we found is that there is a stronger tendency for schooling to rise in the presence of institutions that make schooling affordable and, in the Philippine case, it is because of the implementation of R.A. 6655 in 1988. Overall, this essay points to the importance of government policies that eliminate user fees in school that make schooling an affordable good to all even for the poor. ■

Acknowledgments

The authors thank the Philippine Institute of Development Studies for providing the dataset. This research is partially supported by the Japan Society for the Promotion of Science KAKENHI Grant Number JP25101002. The usual caveat applies.

References

- Barro, R. and J. Lee [2010] “A new data set of educational attainment in the world, 1950-2010”, <http://www.nber.org/papers/w15902>. Accessed 10 October 2016.
- Behrman, J. and J. Knowles [1999] “Household income and child schooling in Vietnam”, *World Bank Economic Review* **13**(2):211-56.
- Braga, M., D. Checchi, and E. Meschi [2011] “Institutional reforms and educational attainment in Europe: a long run perspective”, IZA Discussion Paper No. 6190, <http://ftp.iza.org/dp6190.pdf>. Accessed 1 October 2016.
- Brinch, C., B. Bratsberg, and O. Raaum [2012] “The effects of an upper secondary education reform on the attainment of immigrant youth”, *Education Economics* **20**(5):447-473.
- Chen, X., Y. Shi, D. Mo, J. Chu, P. Loyalka, and S. Rozelle [2013] “Impact of a senior high school tuition relief program on poor junior high school students in rural China”, *China and World Economy* **21**(3):80-97.
- Chyi, H. and B. Zhou [2014] “The effect of tuition reforms on school enrollment in rural China”, *Economics of Education Review* **38**(2014):104-123.
- Data.gov.sg [2016] “Net enrolment ratio for primary and secondary education”, <https://data.gov.sg/group/education>. Accessed 23 September 2016.
- De Guzman, A. [2003] “The dynamics of educational reforms in the Philippine basic and higher education sectors”, *Asia Pacific Education Review* **4**(1):39-50.
- Department of Education [n.d.] “Historical perspective of the Philippine educational system”, <http://www.deped.gov.ph/history>. Accessed 1 October 2016.
- Enhanced Basic Education Act of 2013* [2013]. <http://www.gov.ph/2013/05/15/republic-act-no-10533/>. Accessed 21 September 2016.
- Estudillo, J., A. Quisumbing, and K. Otsuka [2001] “Gender differences in wealth transfer and expenditure allocation: Evidence from the rural Philippines”, *Developing Economies* **34**(4):366-394.
- Fair and Equitable Access to Education Act* [1995], <http://www.gov.ph/1995/02/20/republic-act-no-7880/>. Accessed 21 September 2016.
- Fox, L., L. Santibañez, V. Nguyen, and P. André [2012] *Education reform in Mozambique: lessons and challenges*. Washington DC: World Bank.
- Free Public Secondary Education Act of 1988* [1988]. <http://www.gov.ph/1988/05/26/republic-act-no-6655/>. Accessed 21 September 2016.
- Government Assistance to Students and Teachers in Private Education Act* [1989]. <http://www.gov.ph/1989/06/10/republic-act-no-6728-2/>. Accessed 21 September 2016.
- Higher Education Act of 1994 [1994], <http://www.gov.ph/1994/05/18/republic-act-no-7722/>. Accessed 21 September 2016.

- Hoang, L. [2013] “Vietnam: Where free education isn’t so free”, <http://www.aljazeera.com/indepth/features/2013/04/2013441131475898.html>. Accessed 13 November 2016.
- Law on Education [2015]. <http://www.ilo.org/dyn/natlex/docs/ELECTRONIC/100539/120639/F2010420423/LAO100539.pdf>. Accessed 13 November 2016.
- Meghir, C. and M. Palme [2005] “Educational reform, ability and family background”, *American Economic Review* **95**(1):414-424.
- Mesa, E. [2007] “Measuring education inequality in the Philippines”, *Philippine Review of Economics* **44**(2): 33-70.
- Ministry of Education, Brunei [2014] *MOE education indicator 2014 handbook*. Bandar Seri Begawan.
- Philippine Statistics Authority [n.d.] “Annual poverty indicators survey (APIS)”, <https://psa.gov.ph/content/annual-poverty-indicators-survey-apis>. Accessed 1 October 2016.
- Philippine Statistics Authority [2011] *Annual poverty indicators survey 2011*. Manila.
- Technical Education and Skills Development Act of 1994* [1994], <http://www.gov.ph/1994/08/25/republic-act-no-7796/>. Accessed 21 September 2016.
- UNESCO Institute for Statistics [2016] “Gross enrolment ratio by level of education”, <http://data.uis.unesco.org/>. Accessed 23 September 2016.
- UNESCO Institute for Statistics [2016] “Net enrolment rate by level of education”, <http://data.uis.unesco.org/>. Accessed 23 September 2016.
- United Nations [2015] *The Millennium Development Goals report 2015*. New York.
- United Nations [2016] *The Sustainable Development Goals report 2016*. New York.
- United Nations Educational, Scientific and Cultural Organization - International Bureau of Education (UNESCO-IBE) [2012] *World data on education 2010/2011*. Seventh edition. Geneva.
- World Bank [2012] *World development report 2012: Gender equality and development*. Washington DC.
- World Bank Open Data [2016] “PPP conversion factor, private consumption (LCU per international \$)”, <http://data.worldbank.org/indicator>. Accessed 2 November 2016.