

## Returns to Education in Developed and Developing Countries

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EE473

❖ Earnings differentials by level of education reflect the monetary incentives for someone to invest in education

❖ Earnings differentials by education represent the intersection of supply and demand curves for educated labor

❖ Differences in relative earnings between countries reflect a number of factors, for example, the demand for skills in the labor market, minimum wage legislation, the strength of unions, collective agreements, the supply of workers with various levels of educational attainment, the work experience of workers with high and low levels of schooling, the distribution of employment among occupations, and the relative incidence of part-time and seasonal work

## Glossary

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Ability bias

Causal returns

Endogeneity of education

Measurement error

Returns to education

Selection bias

Sheepskin effect

Social returns to education

## Ability bias

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❖ The bias is to the returns to schooling that can result from the fact that people who acquire more education may have greater innate skills that would allow them to earn more even without additional schooling

❖ Individuals may differ by innate ability, motivation, organizational skills, entrepreneurship, time-management skills, and willingness to work hard

❖ To the extent that these factors lead to higher earnings as well as higher education, and they are not accounted for in the statistical analysis, then omitting them from the estimating equation means that some of the higher returns to education may be reflecting the effect of these factors

## Causal returns

- ❖ The returns to education that are induced or caused by additional education rather than simply correlated or associated with additional education

## Endogeneity of education

- ❖ The fact that education is a decision variable in that the amount of education acquired may be a function of factors such as ability, motivation, family background, income, proximity to school, and compulsory school laws

## Measurement error

- ❖ The possibility that collected data, like education, may be measured with error since people may not accurately report their education
- ❖ If the misreporting is random or unrelated to the level of education, then such classical measurement error leads to a downward bias in the estimated returns to education
- ❖ If the misreporting is systematically related to the level of education, then the bias can go in either direction
- ❖ Card (1999) concludes that measurement error in education leads to a downward bias in returns to education, with the estimated returns understating the true returns by about 10%—that is, if the estimated returns were 0.10, the true returns would be 0.11

## Returns to education

- ❖ The financial rate of return to investing in an additional year of schooling, obtained by comparing the additional earnings from an additional year of education with the cost of acquiring the additional education— it shows how average earnings increase with added education

## Selection bias

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- ❖ It is the bias that can be created by the fact that education may be a function of conventionally unobserved factors such as ability or motivation

## Sheepskin effect

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- ❖ The credential effect or additional returns associated with the credential of completing key phases of education like graduating from high school or university (sheepskin was used historically to make the parchment for diploma)

## Social returns to education

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- ❖ A positive externality and its existence justifies government involvement in the promotion of education
- ❖ Citizenship
  - ❖ an educated citizenry is often argued to be necessary for a functioning democracy
  - ❖ Milligan et al. (2004) find that schooling increases civic participation in the United States – they find that higher levels of education are positively associated with individual awareness of campaign issues and that educated individuals are generally more involved in the political process

- ❖ Crime
  - ❖ the reduction in crime due to higher education level is de facto an externality of education
  - ❖ Crime usually involve opportunity-cost arguments - individuals with few marketable skills have a low opportunity cost in the commission of crime and in the possible time cost of incarceration
  - ❖ Property and violent crimes increases through adolescence for males, peaks in the late teens, and declines markedly thereafter
  - ❖ White-collar crime tends to require some what more sophistication, peaks at a much later age and the declines more slowly
  - ❖ Lochner and Moretti (2004) attempts to measure the causal effect of schooling on crime activity
    - ❖ they estimate that an extra year of schooling results in a 0.37 percentage point reduction in the probability of incarceration for blacks, and a 0.10 percentage point reduction for whites
    - ❖ They estimate that the social savings per additional high school graduate is between US\$1170 and US\$2100

❖ Health

- ❖ Vaccinating an individual against communicable diseases benefits the individual (a private return), but also lowers the incidence of the disease in the population (a social return)
- ❖ If education has a causal effect that increases vaccination rates, this would imply the existence of an externality – although a strong positive correlation exists between education and vaccination rates, a definitive causal link has not been established

- What are the private returns that individuals can expect from investing in education?
- How do those returns vary by factors such as level of education, field of study, and individual background characteristics?
- How have those returns varied over time and across different countries?
- Is there an extra effect from a year of education if that year provides the credential of completing a phase of study such as graduating from high school or university?

- If potential dropouts are compelled to stay in school longer by compulsory school laws do they receive returns that are higher or lower than the average returns?

- Are the returns the result of education enhancing the productivity and skills of individuals or are they the result of signaling of such conventionally unobserved factors such as ability, motivation, and time-management skills?
- What are the appropriate methodologies for estimating the returns to education, especially for dealing with factors such as measurement error, ability bias, credential effects, and financial constraints?

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- ❖ The causal returns to education after controlling for other observable and unobservable factors like innate ability or motivation that may affect the outcomes associated with higher education

- ❖ Understanding the underlying causal relationship process is important for policy purposes so as to ascertain the effect of policy interventions
  - ❖ To reallocate resources from fields of low returns to fields of high returns or raise the age of compulsory schooling or institute policies to deter dropping out

## Illustrative estimates of returns to education using alternative approaches

Author	General Method	Sample	Returns to education
Grilliches (1997)	Regression log median earnings of expected occupation at age 30 on schooling while using IQ scores as additional proxy control for ability	17-27 year old men in 1969 from US National Longitudinal Survey for Young Men, using log median earnings of expected occupation at age 30	0.059(0.003)
Ashenfelter and Rouse (1998)	Regression difference in log earnings between identical twins on difference in schooling	1991-93 Princeton Twins Survey of identical twins	0.102(0.010)
Card (1995)	Use indicator for whether living near a 4-year college as an IV for predicting schooling	US Longitudinal Survey for Young Men	0.132(0.049)
Chen (2008)	Use average tuition fees at the local college in county as instruments for predicting schooling	25-42 year old men in 1979-2000 from US National Longitudinal Survey for Youth, 1979	0.133(0.028)
Oreopoulos (2006)	Use differences in state compulsory schooling laws as instruments for predicting schooling	25-64 year old men and women in 1950-2000 US Censuses	0.142(0.012)
Bezil and Hanson (2007)	Construct structural model on education attainment decisions and estimate model along with returns to schooling	White males from the US National Longitudinal Survey of Youth	0.069 (average between grade 10 and 16)

- Returns to education tend to be in the neighborhood of 10%, typically ranging from 6% to 15%
- Returns to education tend to be in the 6-10% range when based on OLS estimates from conventional schooling equations and the 10-15% range (and sometimes higher) when based on instrument variables (IV) and other procedures used to identify exogenous variation in education
- The returns tend to be higher for
  1. Females as opposed to males
  2. Obtaining the credentials associated with completing phases like high school or university
  3. General academic streams compared to technical vocational streams
  4. Professional fields like engineering, medicine, business, and sciences and lower in social sciences and humanities and especially fields like fine arts

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- The returns tend to be increasing over time in spite of the large increases in the supply of educated persons, highlighting that the demand for education associated with the knowledge economy and the widening of the skilled–unskilled wage differential are outstripping the supply responses

## Returns to Investment in Education: A Global Update

PSACHAROPOULOS, G. (1994)  
 WORLD DEVELOPMENT

- ❖ Provide a comprehensive update of the profitability of investment in education at a global scale
- ❖ The returns decline by the level of schooling and the country's per capita income
- ❖ Investment in women's education is in general more profitable than that for men
- ❖ Returns in the private competitive sector of the economy are higher than among those working in the public sector
- ❖ The public financing of higher education is regressive
- ❖ Investment in education continues to be a very attractive investment opportunity in the world today—both from the private and the social point of view

Table 1. Returns to investment in education by level (percentage) (full method, latest year, regional averages)

Country	Social			Private		
	Prim.	Sec.	Higher	Prim.	Sec.	Higher
Sub-Saharan Africa	24.3	18.2	11.2	41.3	26.6	27.8
Asia*	19.8	13.3	11.7	26.0	18.8	18.9
Europe/Middle East/North Africa*	15.5	11.2	10.6	17.4	15.8	20.7
Latin America/Caribbean	17.9	12.8	13.3	26.2	16.8	19.7
OECD	14.4	10.2	8.7	23.7	12.4	12.3
World	16.4	13.1	10.9	28.1	18.3	20.3

Source: Table A-1.  
\*Non-OECD.

Table 2. Returns to investment in education by level (percentage) (full method, latest year, averaged by per capita income group)

Country	Mean per capita income (US\$)	Social			Private		
		Prim.	Sec.	Higher	Prim.	Sec.	Higher
Low income (\$610 or less)	299	23.4	15.2	10.6	35.2	19.3	23.5
Lower middle income (\$1,449)	1,482	18.2	13.4	11.4	28.9	18.7	18.9
Upper middle income (\$3,679)	4,184	14.3	10.6	9.5	21.3	12.7	14.8
High income (\$7,620 or more)	33,188	n.a.	10.3	8.2	n.a.	12.8	7.7
World	2,026	20.9	13.5	10.7	30.7	17.7	19.0

Source: Table A-1.

Table 3. The coefficient on years of schooling: Mincerian mean rate of return

Country	Mean per capita income (US\$)	Years of schooling	Coefficient (percent)
Low income (\$610 or less)	301	6.4	11.2
Lower middle income (\$1,449)	1,353	6.4	11.7
Upper middle income (\$3,679)	4,322	9.9	7.8
High income (\$7,620 or more)	13,699	10.9	6.6
World	5,865	8.7	10.1

Source: Table A-2.

Table 4. The coefficient on years of schooling: Mincerian rate of return (regional averages)

Country	Years of schooling	Coefficient (percent)
Sub-Saharan Africa	5.9	13.4
Asia*	8.8	9.6
Europe/Middle East/North Africa*	8.5	8.2
Latin America/Caribbean	7.9	12.4
OECD	10.9	6.8
World	8.4	10.1

Source: Table A-2.  
\*Non-OECD.

Table 7. Returns to education by gender (percentage)

Educational level	Rate of return	
	Men	Women
Primary	20.1	12.8
Secondary	13.9	18.4
Higher	13.4	12.7
Overall*	11.1	12.4

Source: Table A-3 (available from the author).  
\*Mincerian method.

Table 9. Returns to secondary education by curriculum type (percentage)

Curriculum type	Rate of return	
	Social	Private
Academic/General	15.5	11.7
Technical/Vocational	10.6	10.5

Source: Tables A-5 (Available from the author).

Table 10. Returns to higher education by faculty (percentage)

Subject	Social	Private
Agriculture	7.8	15.0
Art, Science, Arts & Human	8.1	16.6
Economics & Business	12.8	17.7
Engineering	18.8	19.0
Law	12.7	16.8
Medicine	16.8	17.7
Physics	1.8	13.7
Sciences	8.8	17.0

Source: Table 4.4 (available from the authors)

Table 11. Returns to education by economic sector (percentage)

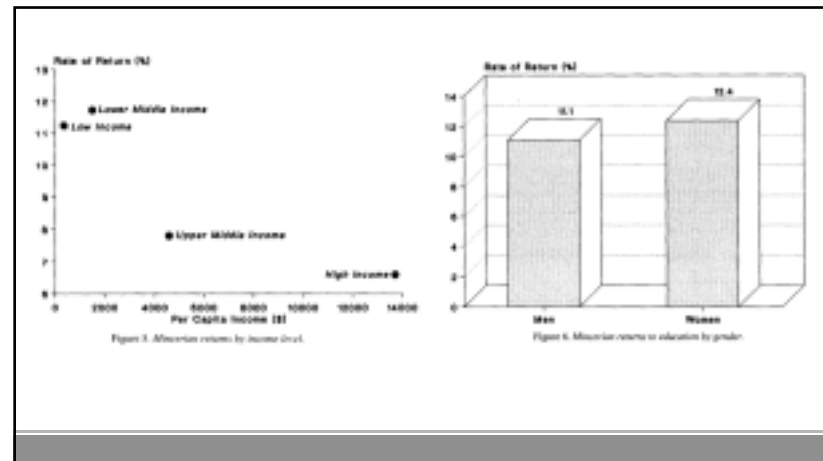
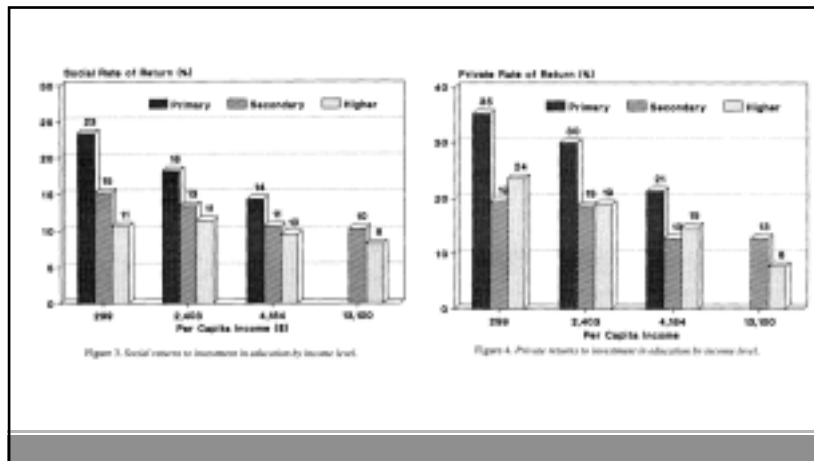
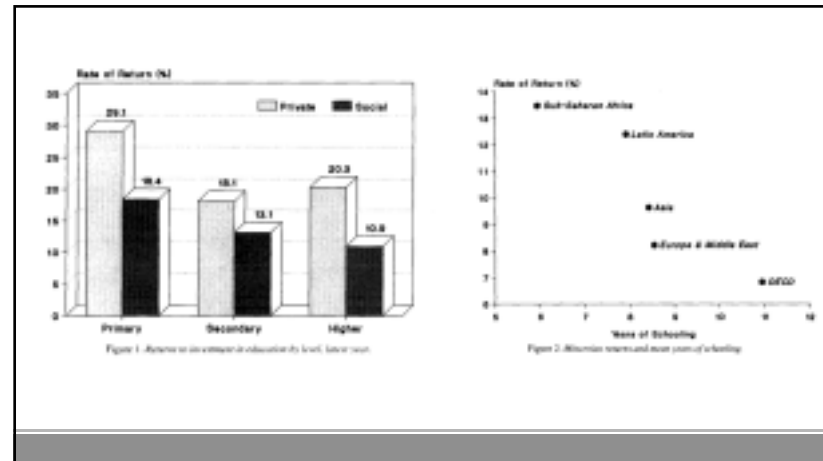
Economic sector	Rate of return
Private	11.1
Public	9.0

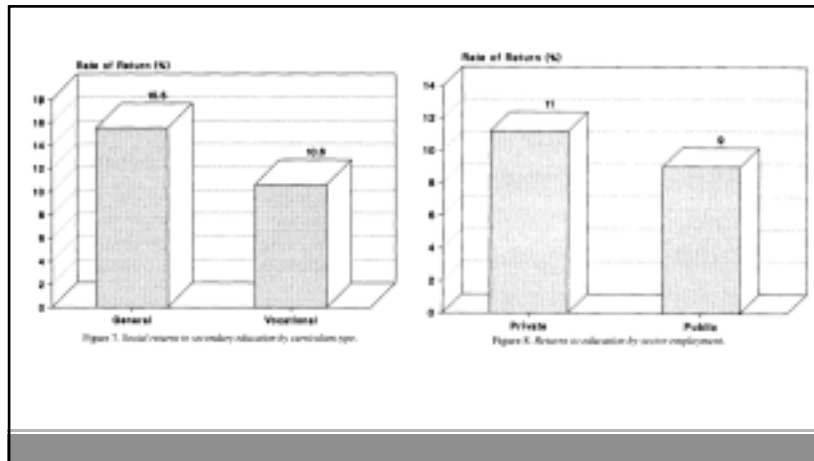
Source: Table 4.7 (available from the authors)

Table 12. Returns to education in self-employed employment (percentage)

Employment type	Rate of return
Self employment	10.8
Dependent employment	11.7

Source: Table 4.8 (available from the authors)

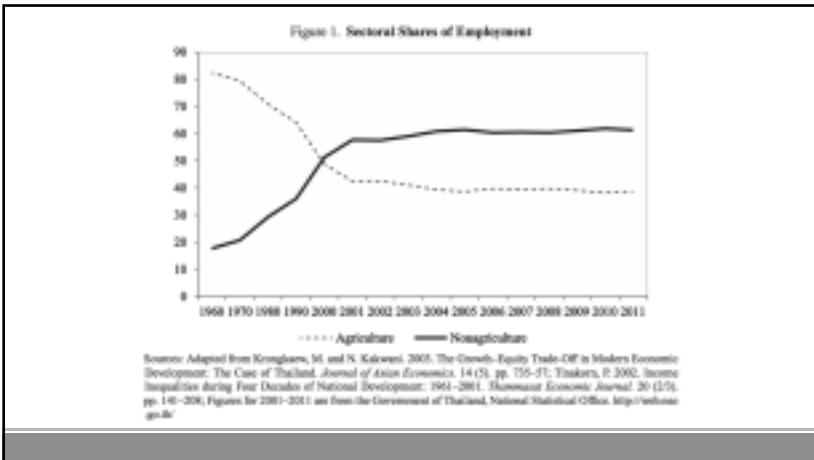




## Rates of Return to Schooling in Thailand

TANGTIPONGKUL, K. (2015)  
ASIAN DEVELOPMENT REVIEW

- ❖ This paper examines the rates of return to schooling
- ❖ Using 2007–2010 data from Thailand’s National Labor Force Survey
- ❖ The Mincer-type rate of return to investment in schooling was estimated
- ❖ The rates of return to schooling for work experience are significantly positive, but at a decreasing rate
- ❖ Region of residence and variation in gross provincial product per capita are significant factors in determining the private rate of return
- ❖ The rates of return to schooling by type of industry reveal higher earnings in mining, utilities, construction, manufacturing, and services than in agriculture
- ❖ The private and social returns on vocational secondary education attainment are greater than on general secondary education
- ❖ Finally, the private returns on university attainment for women exceed men by about 1.5 percentage points.



The regressions are based on Mincer (1974)

$$\ln W_i = \gamma_1 + \gamma_2 Yrs\ of\ schooling_i + \beta_3 E_i + \beta_4 E_i^2 + u_i \quad (1)$$

where  $\ln W_i$  is the log of monthly earnings of individual  $i$ ,  $Yrs\ of\ schooling_i$  represents years of schooling of individuals,  $E_i$  is a potential year of working experience of individual  $i$ ,  $E_i^2$  is a potential year of working experience squared, and  $u_i$  is the random disturbance term.

An extended earnings function which replaces Year of schooling<sub>*i*</sub> with levels of schooling and individual characteristics is shown in equation (2):

$$\ln W_i = \beta_1 + \beta_2 X_i + \beta_3 S_i + \beta_4 E_i + \beta_5 E_i^2 + u_i \quad (2)$$

The internal rate of return of education is estimated in terms of both private and social rate of returns. The private rate of return is used to describe the demand for education and assess the equity effects of public education expenditures (Psacharopoulos 1994, 1995). On the other hand, the social rate of return reviews the costs and benefits of the education investment from the government's viewpoint (Psacharopoulos 1994, 1995). Psacharopoulos (1995) states that a key assumption in a social rate of return calculation is that observed wages are a good proxy for the marginal product of labor, especially in a competitive economy using data from the private sector of the economy. The first method to compute the private rate of return to an investment in a given level of education is finding the rate of discount ( $r$ ) that equalizes the stream of discounted benefits to the stream of costs at a given point in time as shown in equation (3):

$$\sum_{t=1}^M \frac{(W_U - W_s)_t}{(1+r)^t} = \sum_{t=1}^4 (W_s - C_U)_t (1+r)^t \quad (3)$$

where  $W_U - W_s$  is the earnings differential between a university graduate (subscript  $U$ ) and a secondary general school graduate (subscript  $s$ , the control group),  $C_U$  represents the direct costs of university education (e.g., tuition, fees, books), and  $W_s$  denotes the student's foregone earnings or indirect costs (Psacharopoulos 1995).

The second method is the shortcut method to approximate the private returns to education based on Psacharopoulos (1995):

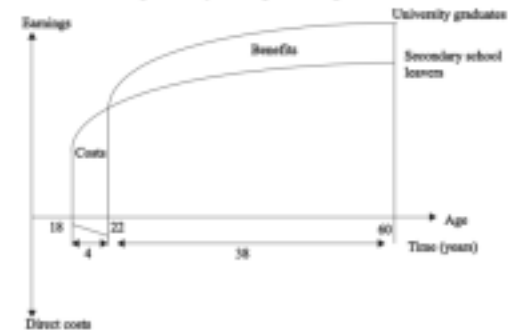
$$private\ r = \frac{\bar{W}_U - \bar{W}_s}{4(\bar{W}_s)} \quad (4)$$

where  $\bar{W}$  refers to the mean earnings of an individual with the subscripted education level,  $\bar{W}_U$  is the mean earnings of an individual with a university education,  $\bar{W}_s$  is the mean earnings of an individual with a general secondary education, and 4 years is the length of the university cycle. The social rate of return in this case is shown in equation (5):

$$social\ r = \frac{\bar{W}_U - \bar{W}_s}{4(\bar{W}_s + C_U)} \quad (5)$$

where  $C_U$  is the annual direct cost of university education.

Figure 2. Stylized Age-Earnings Profiles



Source: Adapted from Psacharopoulos, G. 1995. The Profitability of Investment in Education: Concepts and Methods. Human Capital Development and Operations Policy Working Paper No. 15280. Washington, DC: World Bank.

Table 6. Mincer-Type Returns to Education

Explanatory Variable	Log Monthly Earnings			
	2007	2008	2009	2010
Constant	6.8274*** (0.0098)	6.8884*** (0.0098)	6.8628*** (0.0093)	6.9836*** (0.0098)
Years of schooling	0.1376*** (0.0005)	0.1337*** (0.0005)	0.1322*** (0.0005)	0.1263*** (0.0006)
Experience	0.0501*** (0.0007)	0.0503*** (0.0006)	0.0514*** (0.0006)	0.0506*** (0.0006)
Experience squared	-0.0006*** (0.00001)	-0.0006*** (0.00001)	-0.0006*** (0.00001)	-0.0006*** (0.00001)
Number of observations	209,999	210,810	209,260	191,593
R-squared	0.4497	0.4577	0.4601	0.4575

Notes: Robust standard errors in parentheses. \*\*\* = significant at 1% level, \*\* = significant at 5% level. Source: Author's computations.

Table 7. Determinants of Earnings (dependent variable: log monthly earnings)

Explanatory Variable	Log Monthly Earnings			
	2007	2008	2009	2010
Constant	8.2439*** (0.0049)	8.3047*** (0.0051)	8.3179*** (0.0049)	8.4071*** (0.0049)
Education attainment				
Primary education	0.1403*** (0.0070)	0.1319*** (0.0070)	0.1179*** (0.0066)	0.1063*** (0.0069)
Lower secondary	0.3349*** (0.0076)	0.3223*** (0.0076)	0.3081*** (0.0074)	0.2698*** (0.0072)
Upper secondary	0.5099*** (0.0088)	0.4754*** (0.0084)	0.4379*** (0.0079)	0.4071*** (0.0081)
Secondary vocational	0.8163*** (0.0117)	0.7445*** (0.0114)	0.6937*** (0.0122)	0.6442*** (0.0127)
Higher vocational	0.9015*** (0.0099)	0.8494*** (0.0105)	0.8112*** (0.0096)	0.7590*** (0.0096)
Diploma	0.8417*** (0.0308)	0.8324*** (0.0308)	0.8667*** (0.0442)	0.8014*** (0.0470)
Bachelor's	1.2088*** (0.0071)	1.3406*** (0.0071)	1.2997*** (0.0070)	1.2371*** (0.0072)
Master's or higher	2.8688*** (0.0147)	3.0688*** (0.0122)	3.0639*** (0.0118)	3.0829*** (0.0147)
Number of observations	209,999	210,810	209,260	191,593
R-squared	0.4871	0.4152	0.4143	0.4301

Notes: Robust standard errors in parentheses. \*\*\* = significant at 1% level, \*\* = significant at 5% level. Source: Author's computations.

Table 8. Returns to Education in Thailand: Extended Earnings Function Method (%)

Education Level	2007	2008	2009	2010
Primary	2.3	2.2	1.9	1.8
Secondary (General)	6.2	5.7	5.3	5.0
Secondary (Vocational)	11.3	10.2	9.6	8.9
Bachelor's	21.9	21.6	21.6	20.8

Note: Computations are based on extended earnings function method described in Psacharopoulos, G. 1995. The Profitability of Investment in Education: Concepts and Methods. Human Capital Development and Operations Policy Working Papers No. 15280. Washington, DC: World Bank.

Table 9. Determinants of Earnings (dependent variable: log monthly earnings)

Explanatory Variable	Log Monthly Earnings			
	2007	2008	2009	2010
Female	-0.1887*** (0.0075)	-0.1898*** (0.0075)	-0.1877*** (0.0075)	-0.1887*** (0.0075)
Primary education	0.1270*** (0.0075)	0.1247*** (0.0075)	0.1207*** (0.0075)	0.1207*** (0.0075)
Lower secondary	0.3070*** (0.0075)	0.2970*** (0.0075)	0.2917*** (0.0075)	0.2617*** (0.0075)
Upper secondary	0.4867*** (0.0075)	0.4607*** (0.0075)	0.4307*** (0.0075)	0.4017*** (0.0075)
Secondary vocational	0.8067*** (0.0075)	0.7407*** (0.0075)	0.6907*** (0.0075)	0.6407*** (0.0075)
Higher vocational	0.8917*** (0.0075)	0.8407*** (0.0075)	0.8107*** (0.0075)	0.7607*** (0.0075)
Diploma	0.8317*** (0.0075)	0.8207*** (0.0075)	0.8507*** (0.0075)	0.7907*** (0.0075)
Bachelor's	1.2067*** (0.0075)	1.3307*** (0.0075)	1.2807*** (0.0075)	1.2207*** (0.0075)
Master's or higher	2.8567*** (0.0075)	3.0567*** (0.0075)	3.0517*** (0.0075)	3.0717*** (0.0075)
Age of worker	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Male	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Female	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)
Male	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Female	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)
Log of monthly earnings	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Log of monthly earnings squared	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)
Male	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Female	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)	-0.0007*** (0.00001)
Number of observations	209,999	210,810	209,260	191,593
R-squared	0.4871	0.4152	0.4143	0.4301

Notes: Robust standard errors in parentheses. \*\*\* = significant at 1% level, \*\* = significant at 5% level. Source: Author's computations.

Table 10. Continued

Explanatory Variable	Log Monthly Earnings			
	2007	2008	2009	2010
Low skill manufacturing	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
High skill manufacturing	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Low skill services	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
High skill services	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Quintile 1	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Quintile 2	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Quintile 3	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Quintile 4	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Quintile 5	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)	0.0007*** (0.00001)
Number of observations	209,999	210,810	209,260	191,593
R-squared	0.4871	0.4152	0.4143	0.4301

Notes: Robust standard errors in parentheses. \*\*\* = significant at 1% level, \*\* = significant at 5% level. Source: Author's computations.

Table 10. Mean Earnings and Direct Cost by Level of Education, 2010

Education Level	Mean Earnings		Length of School (years)	Annual Direct Cost per Public School Year (B)
	Cycle (B/year)			
No education	51,302.5		n.a.	n.a.
Primary	66,449.5		6	40,970
Secondary (General)	90,258.8		6	29,600
Secondary (Vocational)	122,657.4		3	29,600
			3	40,242
University	224,654.5		4	67,885

B = baht, n.a. = not applicable.

Note: \$1 = B35.65 as of 28 August 2015.

Sources: Government of Thailand, National Statistical Office. National Labor Force Survey (Table 2: Number and Percentage of Employed Persons by Industry, 2001–2011). [http://service.nso.go.th/nso/tso\\_center/project/search\\_center/23/project-th.htm](http://service.nso.go.th/nso/tso_center/project/search_center/23/project-th.htm) (accessed 30 May 2011); National Education Account of Thailand. [seminar.qif.or.th/File/DownloadFile/699](http://seminar.qif.or.th/File/DownloadFile/699)

Table 12. Shortcut Estimates of the Returns to Education (%)

Education Level	Returns (%)	
	Private Returns	Social Returns
Primary	4.9	2.7
Secondary (General)	6.0	4.1
Secondary (Vocational)	14.1	8.8
University	37.2	21.3

Sources: Government of Thailand, National Statistical Office. Labor Force Survey, 2010. [http://web.nso.go.th/eng/stat/lfs\\_e/lfs\\_e.htm](http://web.nso.go.th/eng/stat/lfs_e/lfs_e.htm); National Education Account of Thailand. [seminar.qif.or.th/File/DownloadFile/699](http://seminar.qif.or.th/File/DownloadFile/699)

Table 13. Mean Earnings and Direct Cost by Level of Education and Gender

Education Level	Mean Earnings (B/year)		Length of School Cycle (years)	Annual Direct Cost per Public School Year (B)
	Male	Female		
No education	56,338.8	46,840.7	n.a.	n.a.
Primary	71,254.0	59,399.4	6	40,970
Secondary (General)	97,279.9	80,897.9	6	29,600
Secondary (Vocational)	132,224.3	108,986.7	6	40,242
University	247,880.8	210,802.3	4	67,885

B = baht, n.a. = not applicable.

Note: \$1 = B35.65 as of 28 August 2015.

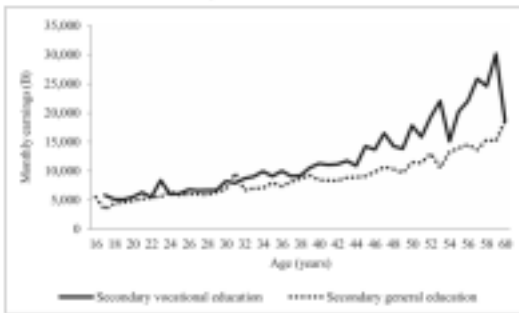
Sources: Government of Thailand, National Statistical Office. Labor Force Survey, 2010. [http://web.nso.go.th/eng/stat/lfs\\_e/lfs\\_e.htm](http://web.nso.go.th/eng/stat/lfs_e/lfs_e.htm); National Education Account of Thailand. [seminar.qif.or.th/File/DownloadFile/699](http://seminar.qif.or.th/File/DownloadFile/699)

Table 14. Shortcut Estimates of the Returns to Education by Gender (%)

Education Level	Returns (%)			
	Private Returns		Social Returns	
	Male	Female	Male	Female
Primary	4.41%	4.47%	2.55%	2.38%
Secondary (General)	6.09%	6.03%	4.30%	4.03%
Secondary (Vocational)	14.26%	13.91%	9.11%	8.29%
University	38.70%	40.14%	22.80%	21.83%

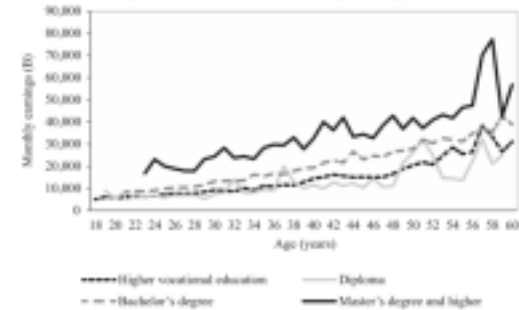
Sources: Government of Thailand, National Statistical Office. Labor Force Survey, 2010. [http://web.nso.go.th/eng/stat/lfs\\_e/lfs\\_e.htm](http://web.nso.go.th/eng/stat/lfs_e/lfs_e.htm); National Education Account of Thailand. [seminar.qif.or.th/File/DownloadFile/699](http://seminar.qif.or.th/File/DownloadFile/699)

Figure 3. Average Monthly Earnings for Secondary Vocational Education Attainment and Secondary General Education Attainment



U = baht.  
Source: Government of Thailand, National Statistical Office, Labor Force Survey, 2010. [http://web.nso.go.th/eng/stat/03\\_a/03a.htm](http://web.nso.go.th/eng/stat/03_a/03a.htm)

Figure 4. Average Monthly Earnings for Higher Vocational Education Attainment, Bachelor's Degree Attainment, and Master's Degree or Higher Attainment



U = baht.  
Source: Government of Thailand, National Statistical Office, Labor Force Survey, 2010. [http://web.nso.go.th/eng/stat/03\\_a/03a.htm](http://web.nso.go.th/eng/stat/03_a/03a.htm)

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