

Comparable Estimates of Returns to Education for the World

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Comparable Estimates of Returns to Education for the World

- 50 years of returns to schooling
- Usually based on compilations
- Our data: private returns, 142 economies, 1970- 2014, 853 harmonized surveys
- Holds constant: definition dependent variable, controls, sample definition, method
- Average private return: 10%

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A data set of comparable estimates of the private rate of return to schooling in the world, 1970–2014

Estimates of the returns to education

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Abstract

Purpose – Young people experience lower employment, income and participation rates, as well as higher unemployment, compared to adults. Theory predicts that people respond to labor market information. For more than 50 years, researchers have reported on the patterns of estimated returns to schooling across economies, but the estimates are usually based on compilations of studies that may not be strictly comparable. The authors create a dataset of comparable estimates of the returns to education.

Design/methodology/approach – The data set on private returns to education includes estimates for 142 economies from 1970 to 2014 using 853 harmonized household surveys. This effort holds the constant definition of the dependent variable, the set of controls, sample definition and the estimation method for all surveys.

Findings – The authors estimate an average private rate of return to schooling of 10%. This provides a reasonable estimate of the returns to education and should be useful for a variety of empirical work, including critical information for youth.

Originality/value – This is the first attempt to bring together surveys from so many countries to create a global data set on the returns to education.

Keywords Gender, Earnings, Returns to schooling, Investments in education

Paper type Research paper

Introduction

In a time of ever-increasing educational attainment levels, young people still experience lower income compared to adults. Yet, more information is needed on how education affects labor market outcomes. Such information will affect, hopefully positively, the youth decision-making process, as well as how countries finance and provide education (Pastore, 2018). The canonical model of human capital predicts that individuals respond to returns to education, as with any investment (Becker, 1964). Standard models of optimal human capital accumulation (Becker, 1967; Ben-Porath, 1967; Weiss, 1995) predict that the returns to education positively affect an individual's own level of investment in schooling. More recent causal studies also confirm that youth respond to signals emanating from expected returns to schooling (see, for example, Kuka *et al.*, 2020; Abramitzky and Lavy, 2014; Jensen, 2010). Youth respond to changing labor market conditions and the returns to education are used as an important indicator in relation to choices about more schooling and effort in the labor market (see, for example, Saad and Falkh, 2020; Armand *et al.*, 2019; Sequeira *et al.*, 2016; Kerr *et al.*, 2020). It is also true that perceptions about the likely returns to education matter for decisions about continuing one's education (see, for

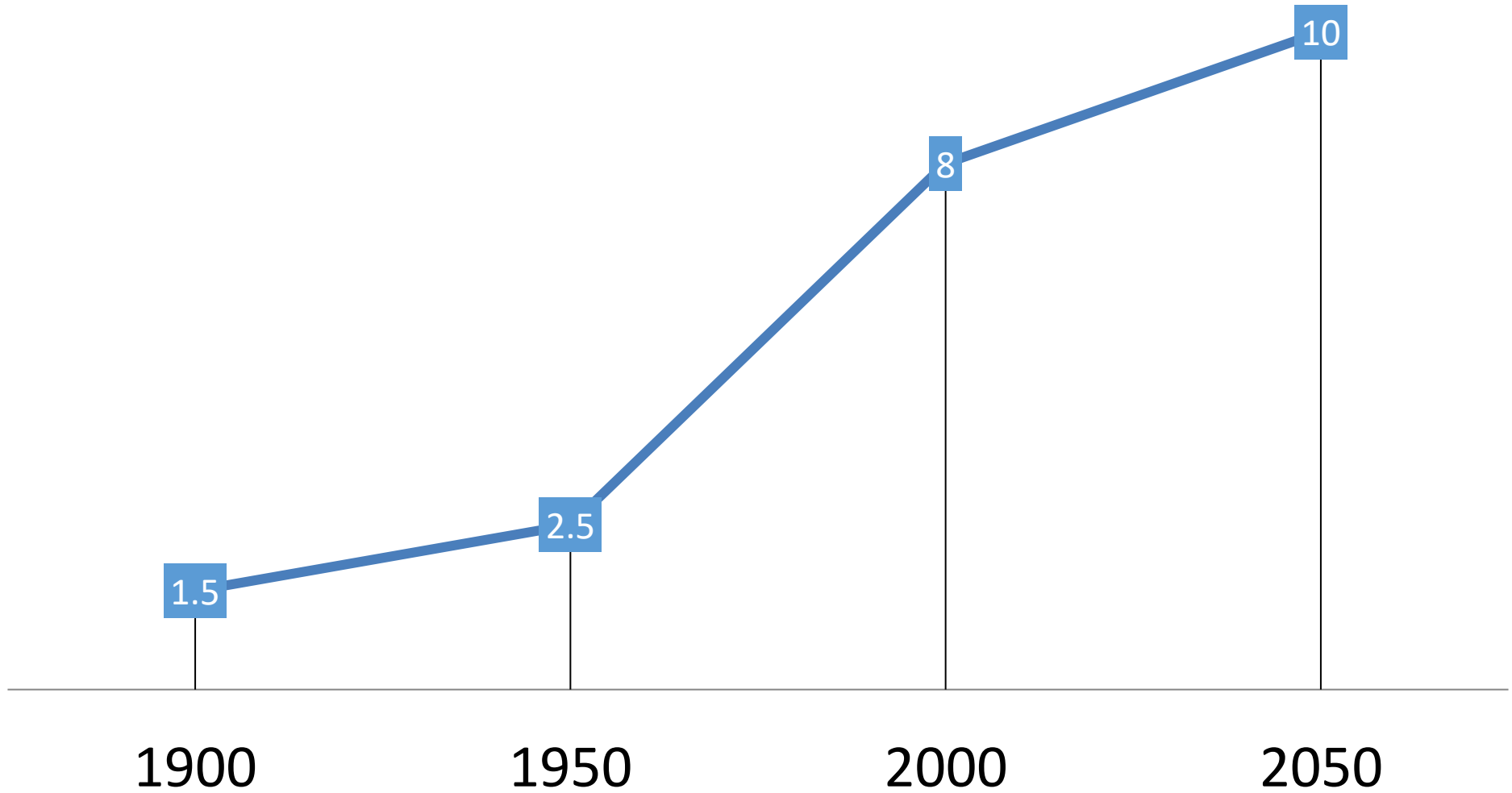
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The Education Revolution



History



- Invest in HK: Mincer, Becker, Chiswick
- Education \uparrow poverty, inequality \downarrow
- The Great Equalizer (Horace Mann)
- Schultz: economic development:
 - theory of human capital
 - disequilibria

Private Rates of Return

- Explain behavior of people seeking schooling
- Useful proxy of productivity
- Can guide public policy design:
 - incentives to promote investment
 - ensure low-income make investments

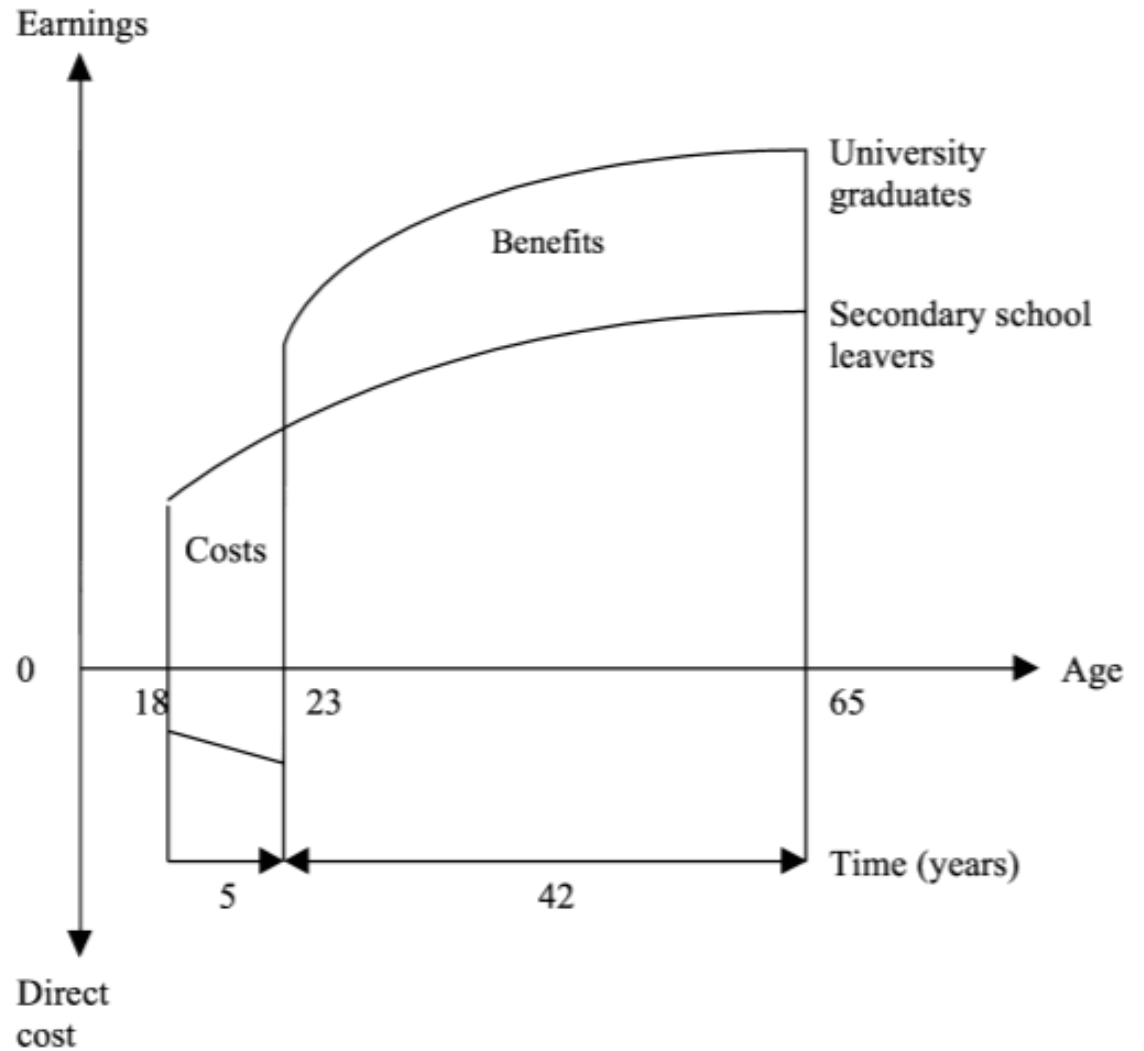
Useful to Study

- Discrimination (Chiswick 1988; Goldin & Polacheck 1987)
- Impact of technology on wages (Krueger 1993)
- Impact of technology shocks (King et al 2012)
- Impact of information on demand for schooling (Jensen 2010)

Are There Returns to Schooling?

- Cost-benefit analysis
- Value of lifetime earnings to net present value of costs
- Costs: student's foregone earnings while studying & fees
- Benefits: extra earnings compared with someone with less education

Private Returns to Education



Priors

- Returns to schooling 10%
- Higher in low, middle income
- Highest at primary level
- Higher for women
- Declined modestly over time

Limitations of Previous Compilations

- Studies may not be strictly comparable
- Data sample coverage
- Methodology

This Study

Comparable data and methods

- Definition of dependent variable
- Specification
- Sample definitions
- Estimation method

Estimates of Returns to Schooling

$$\ln(w_i) = a + \beta_1 S_i + \beta_2 X_i + \beta_3 X_i^2 + \mu_i$$

$$\ln(w_i) = \alpha + \beta_p Dp_i + \beta_s Ds_i + \beta_t Dt_i + \beta_1 X_i + \beta_2 X_i^2 + \mu_i$$

$$r_p = (\beta_p) / (S_p)$$

$$r_s = (\beta_s - \beta_p) / (S_s - S_p)$$

$$r_t = (\beta_t - \beta_s) / (S_t - S_s)$$

Data

- 142 economies, 853 harmonized surveys
- 1970 to 2014
 - <5% <1990, 25% <2000, most 2000-14
- Waged employees aged 15 to 65 years
- Dependent variable is the log of earnings
- Schooling defined by highest grade

Summary

- Mincerian model stable
- Returns higher for women than for men
- Decreasing pattern over time
- Returns to tertiary education are highest
- For same countries, returns increased

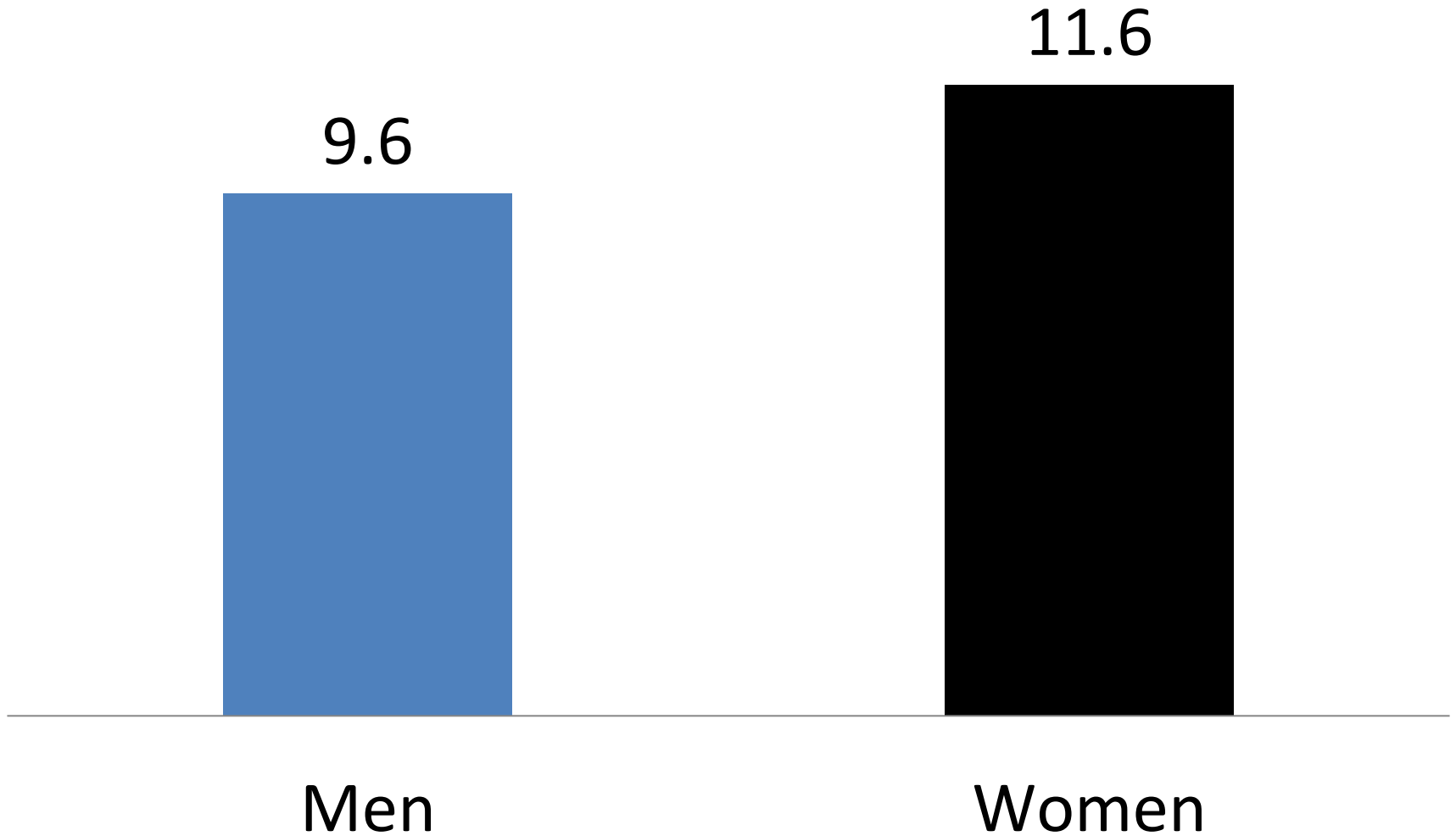


Findings

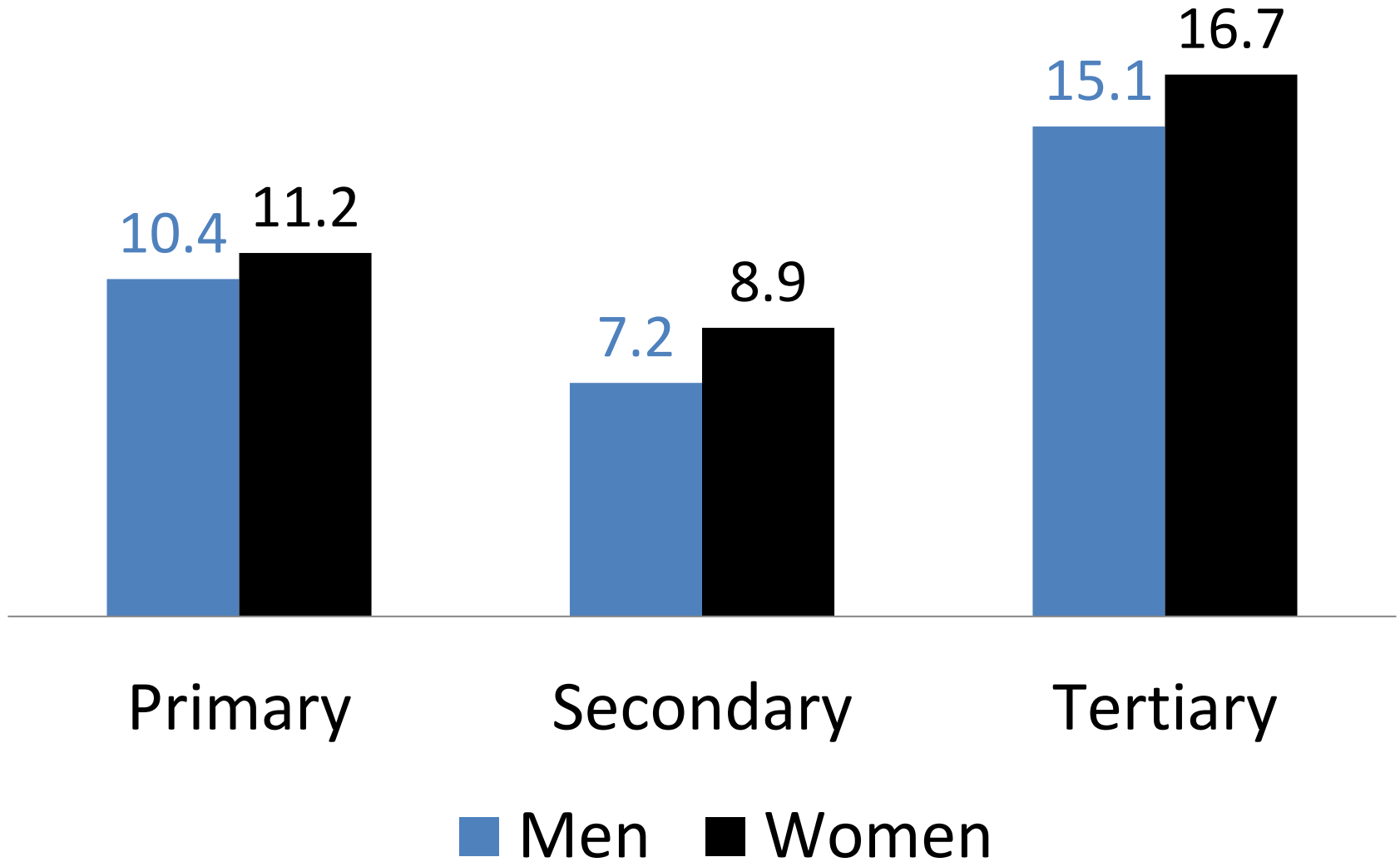


Average Rate of Return to Year of Schooling: 10%

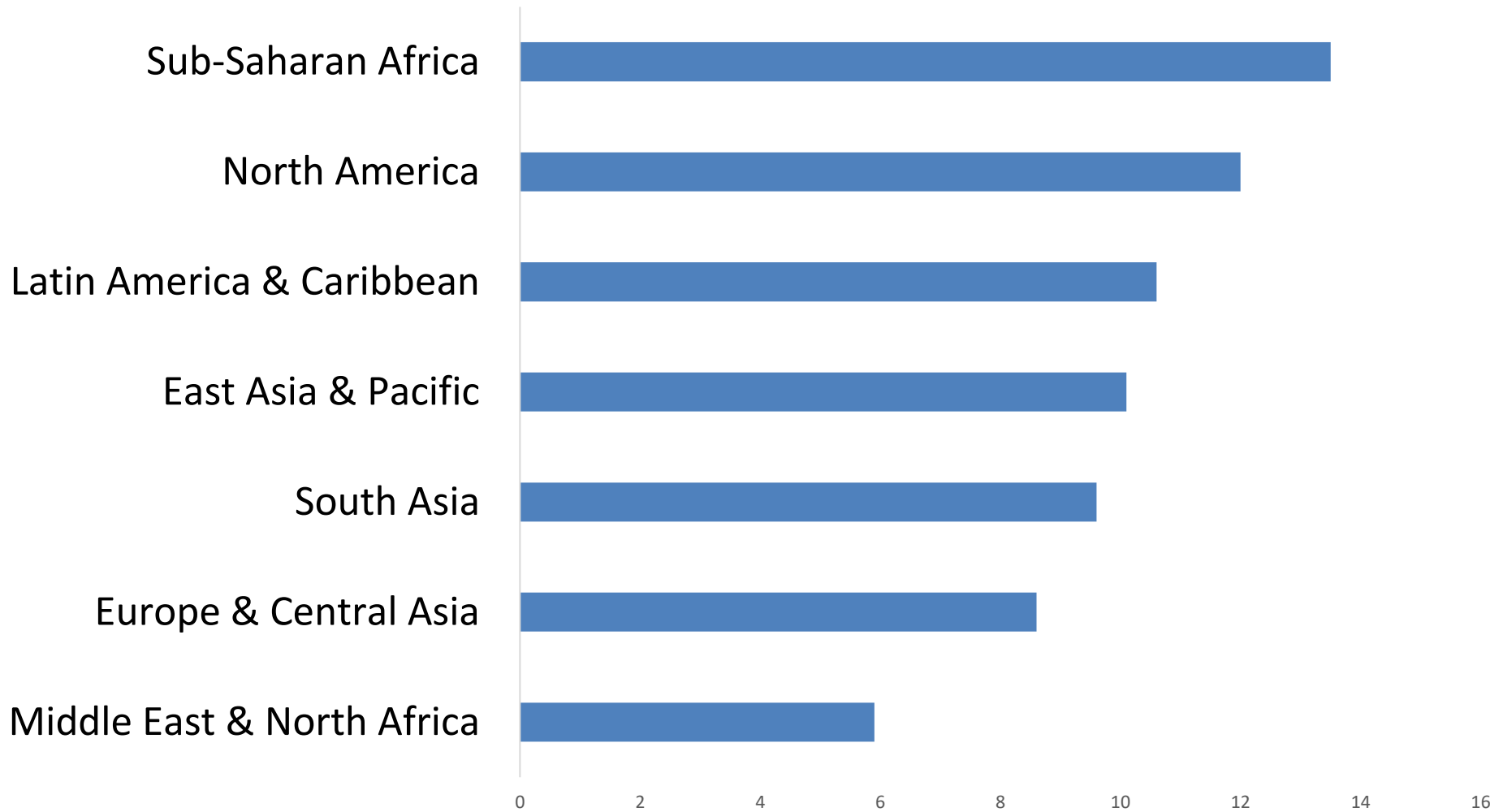
Returns to Schooling Higher for Women



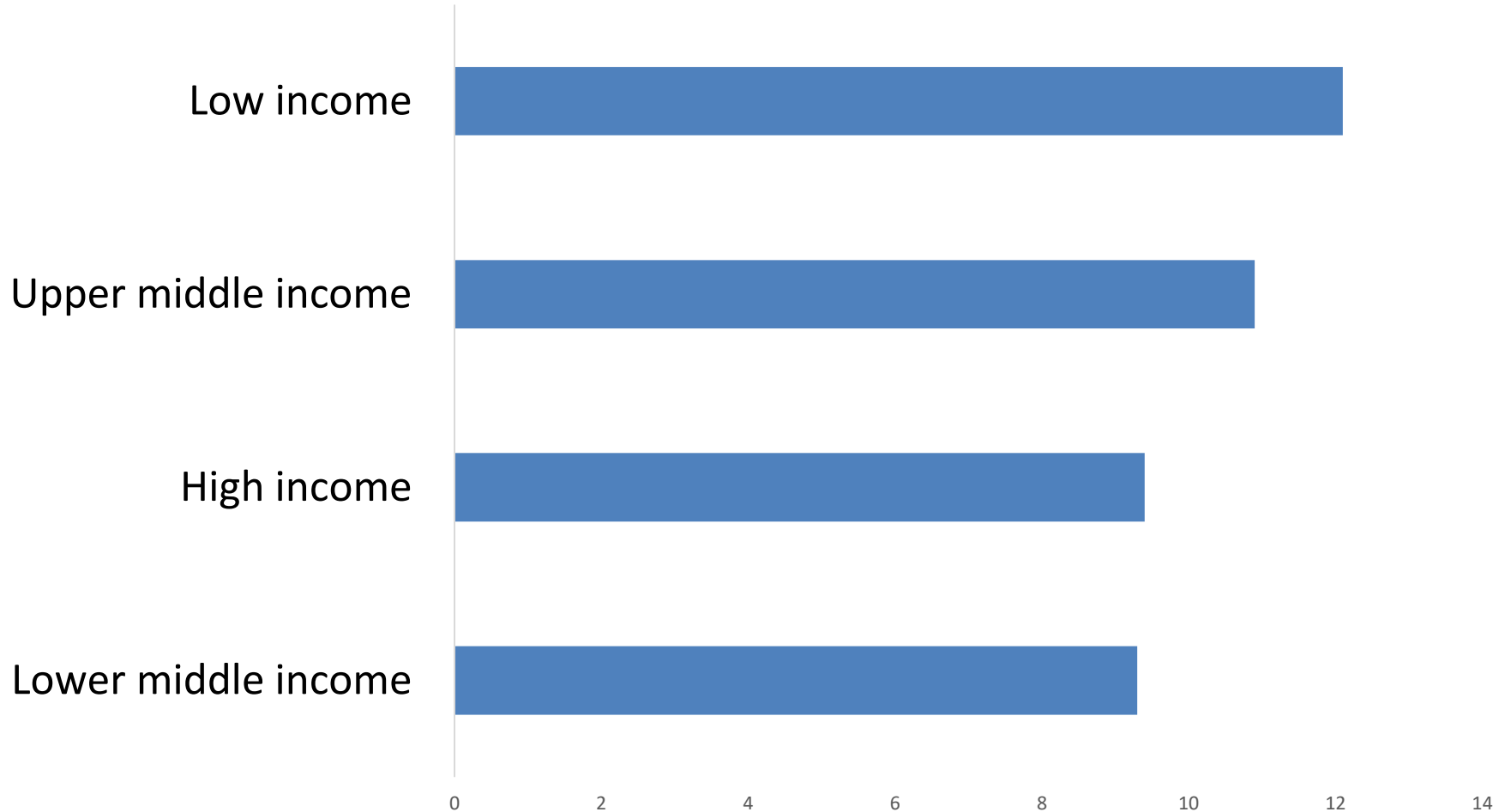
Returns to Schooling Higher for Women



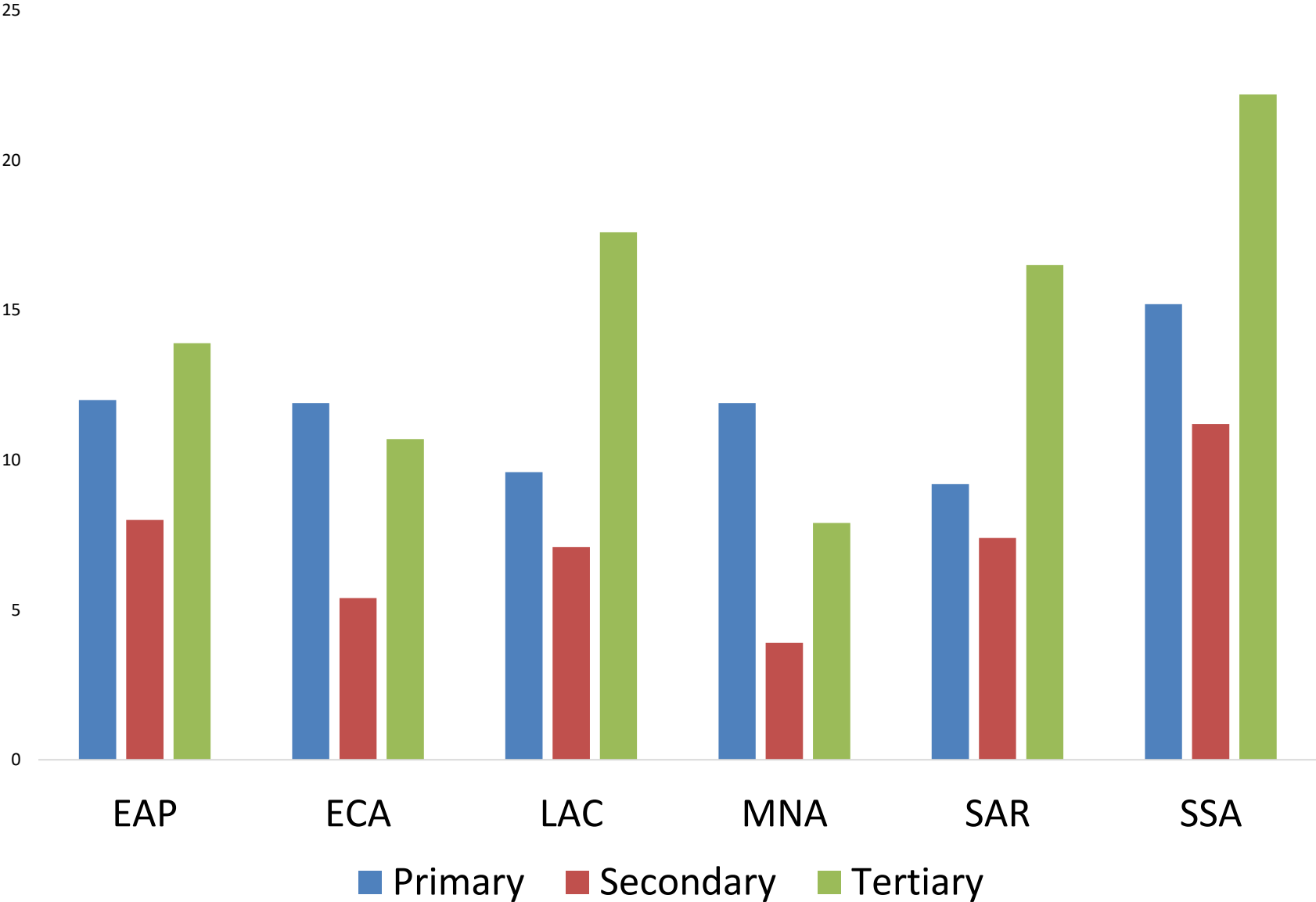
Returns to Schooling Highest in Africa



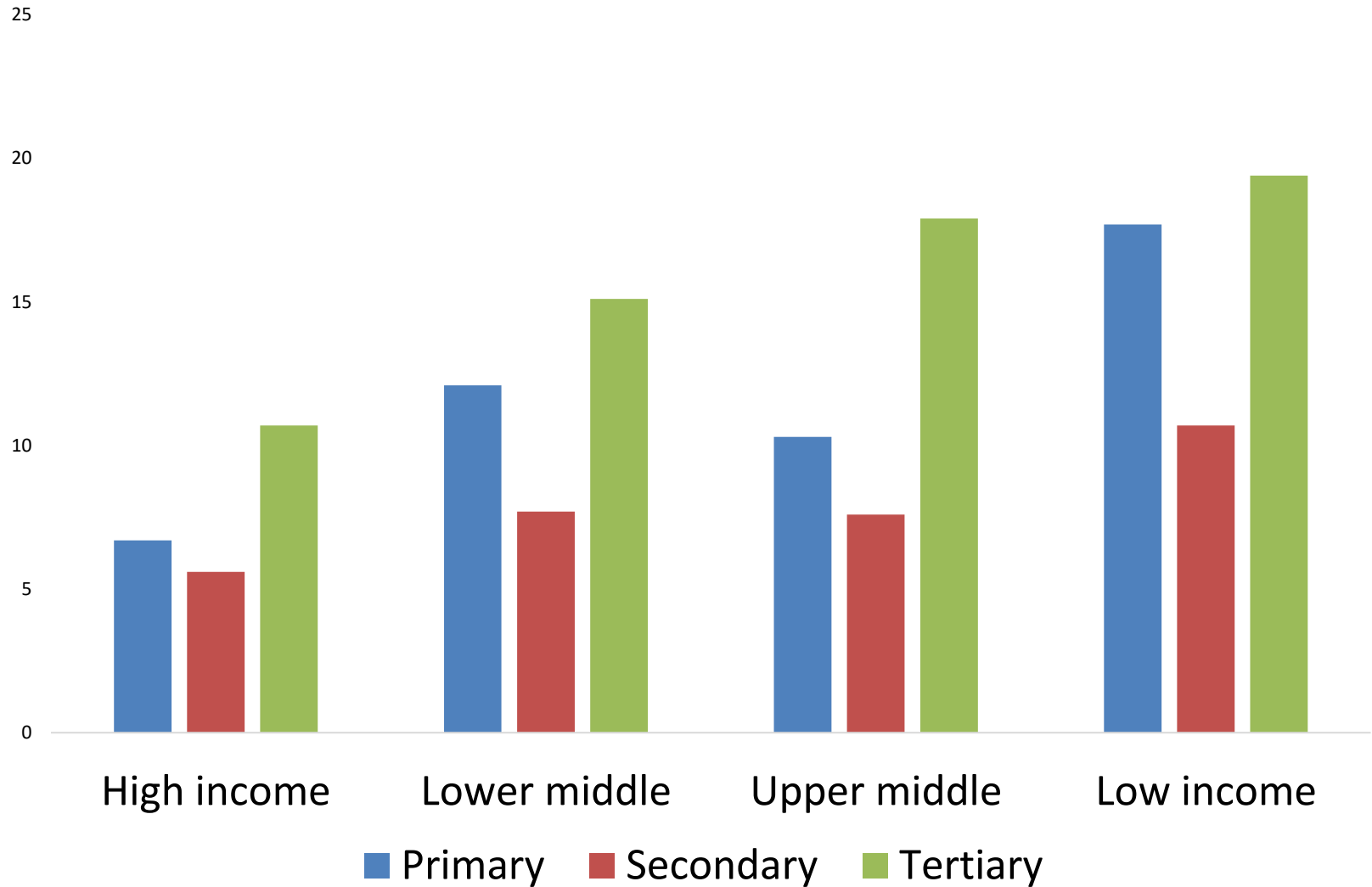
Highest Returns in Low Income Countries



Returns Highest at Tertiary Level

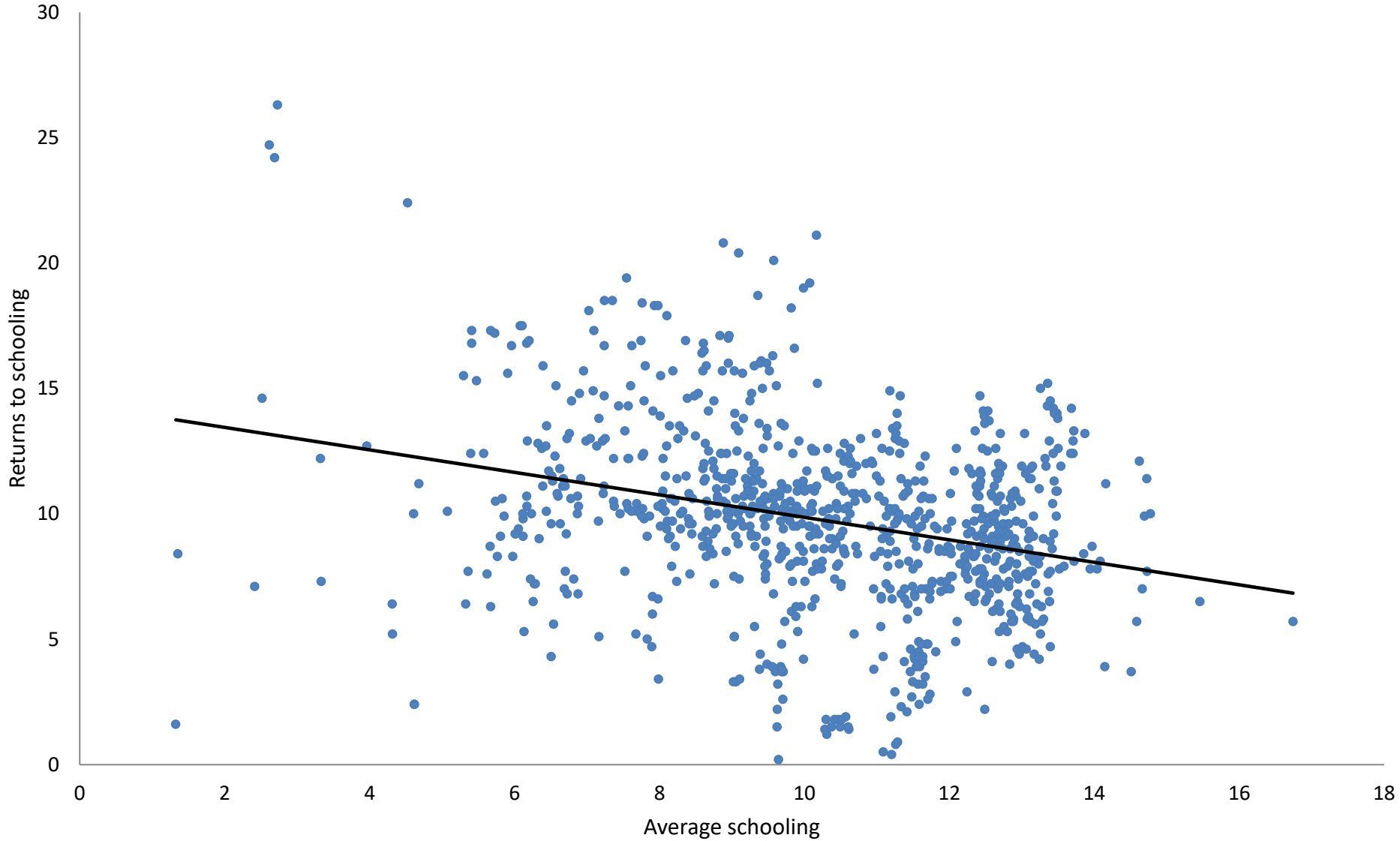


Returns Highest in Low Income Countries



Higher Returns in Countries with Less Schooling

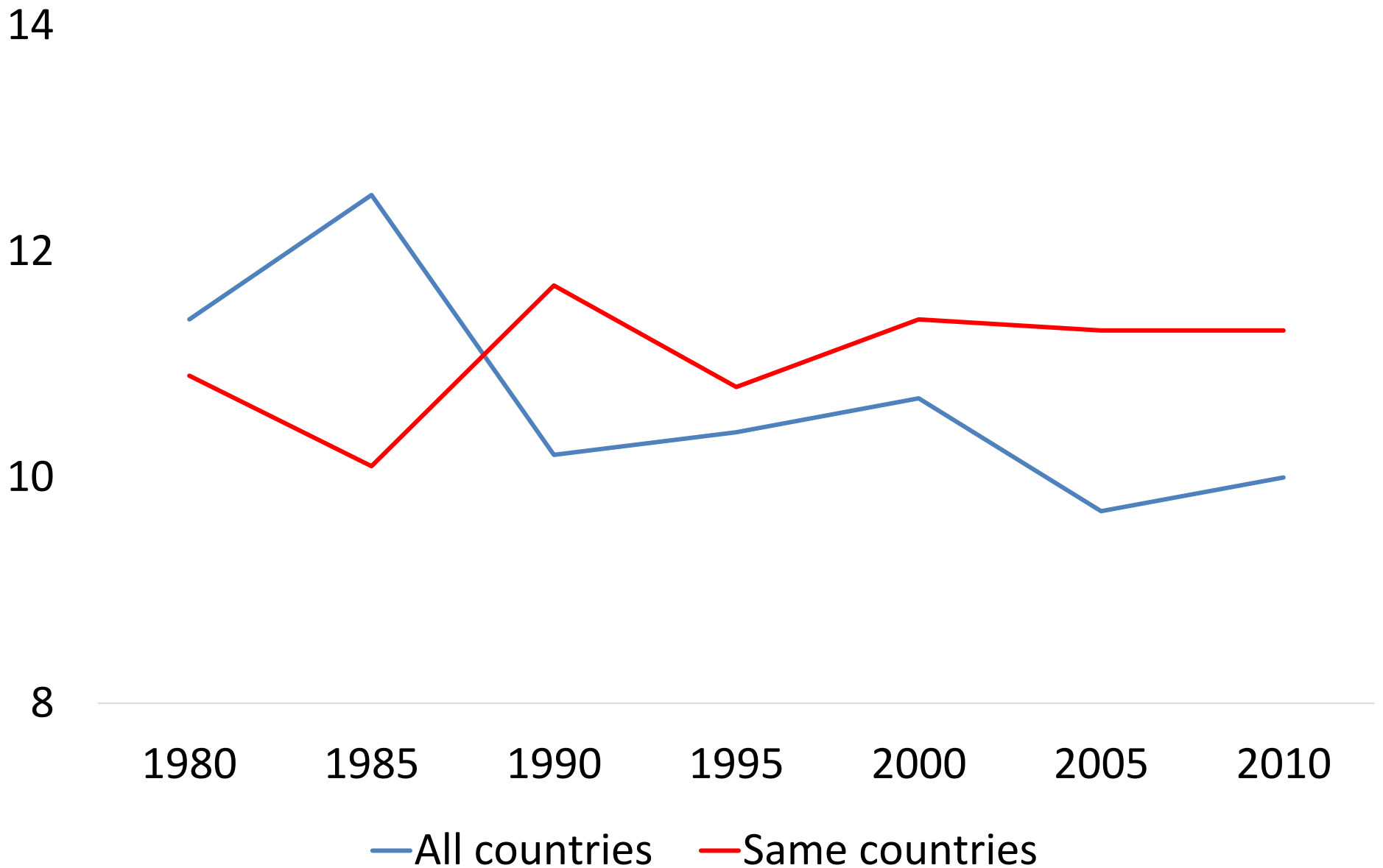
Returns to Schooling and Years of Schooling



A blue callout box with a folded corner effect on the left side, containing the text "Supply and Demand".

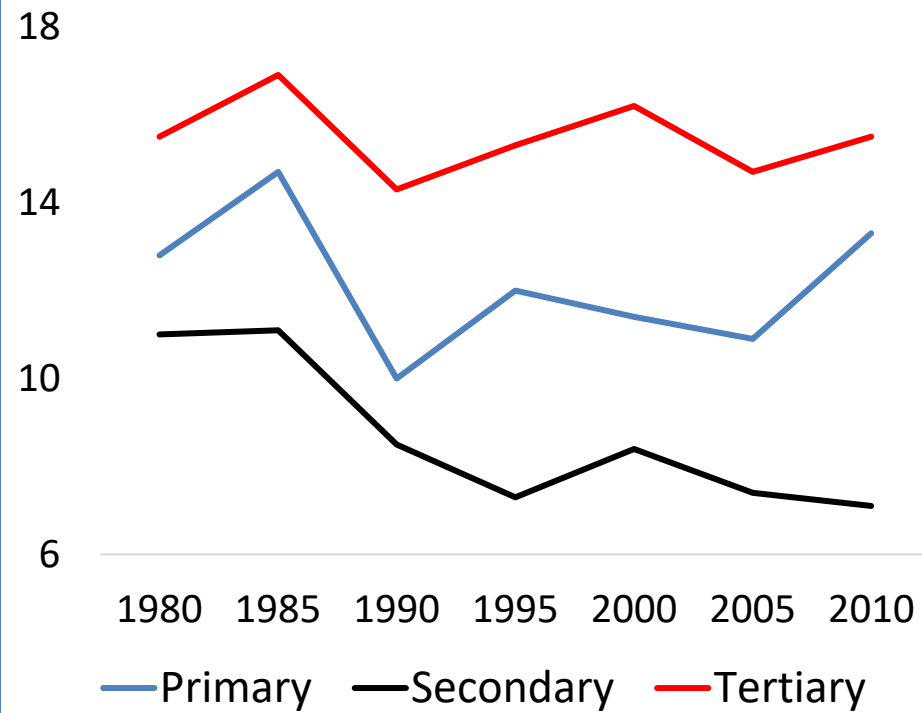
Supply and Demand

Returns to Schooling over Time

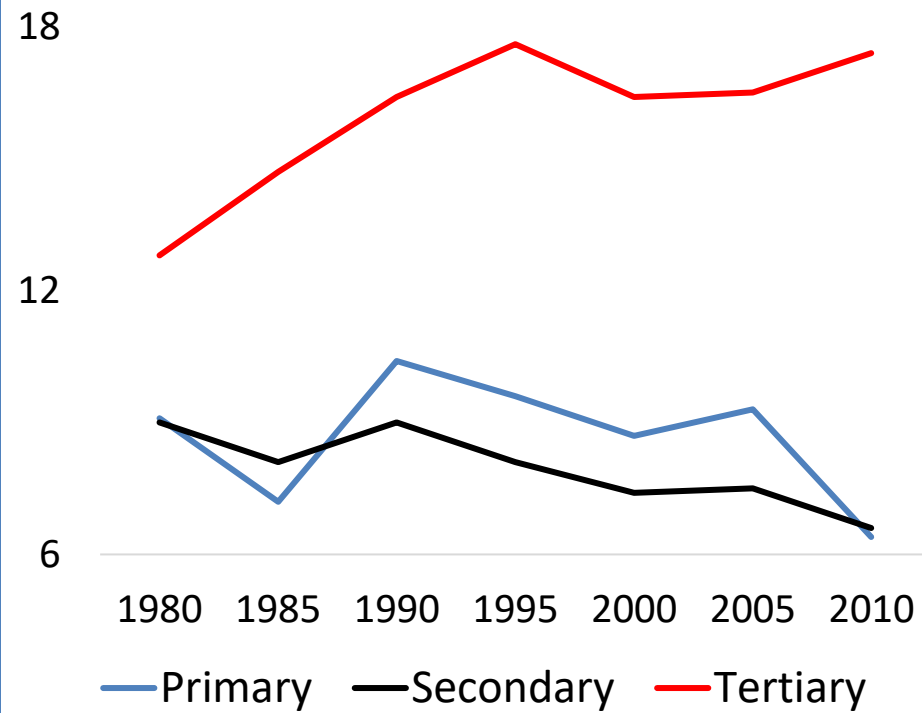


Returns over Time by Level

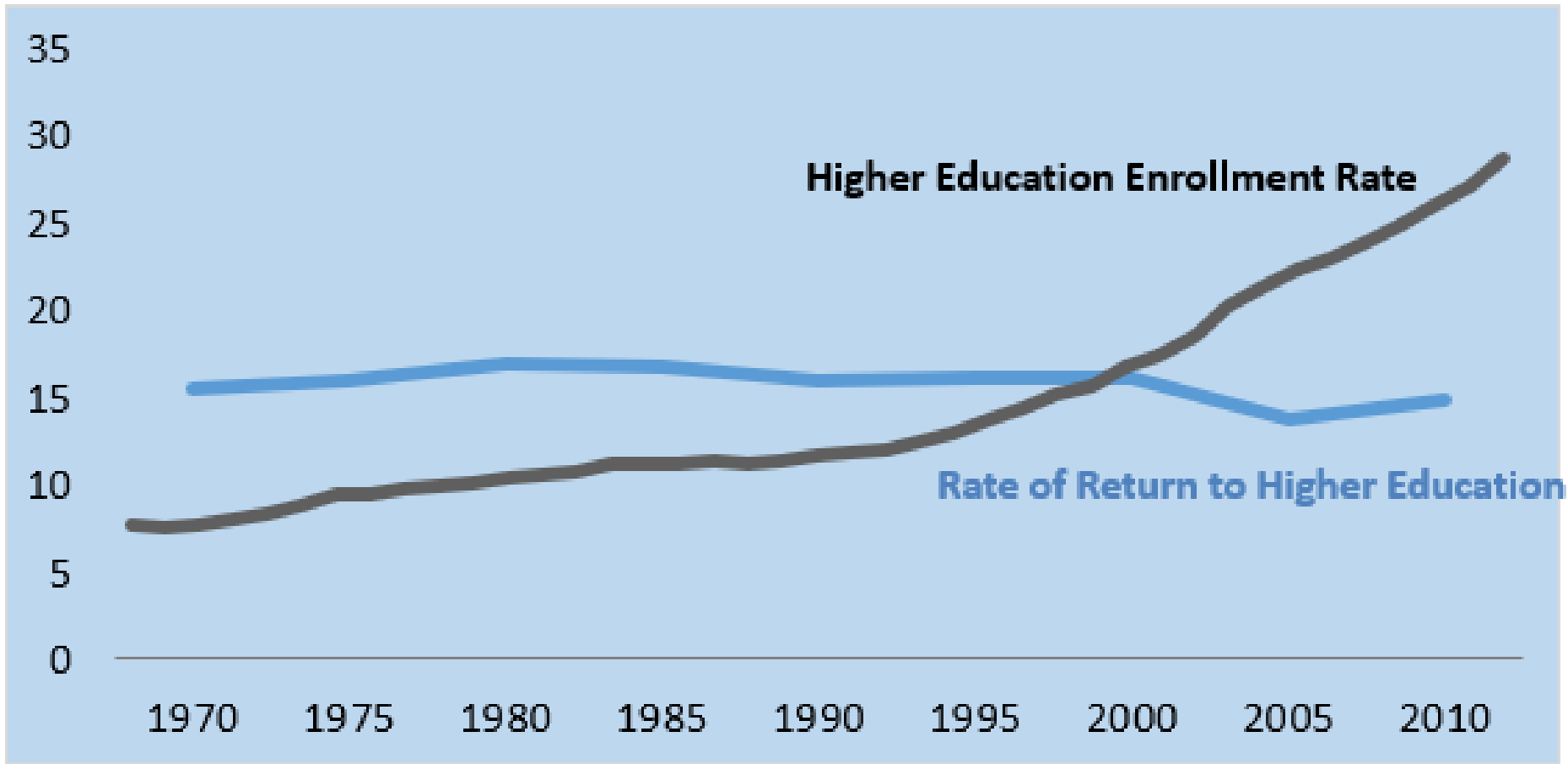
All countries



Same countries



Race Between Education & Technology



Trade, Growth and Returns to Schooling

Economy	Overall	Primary	Secondary	Tertiary	Years of schooling
Contracting	10.0	11.7	7.6	14.8	7.9
Growing	10.9	12.3	8.3	17.6	7.2
Closed	10.2	12.0	7.8	15.6	7.5
Open	10.0	11.1	7.5	14.4	9.1

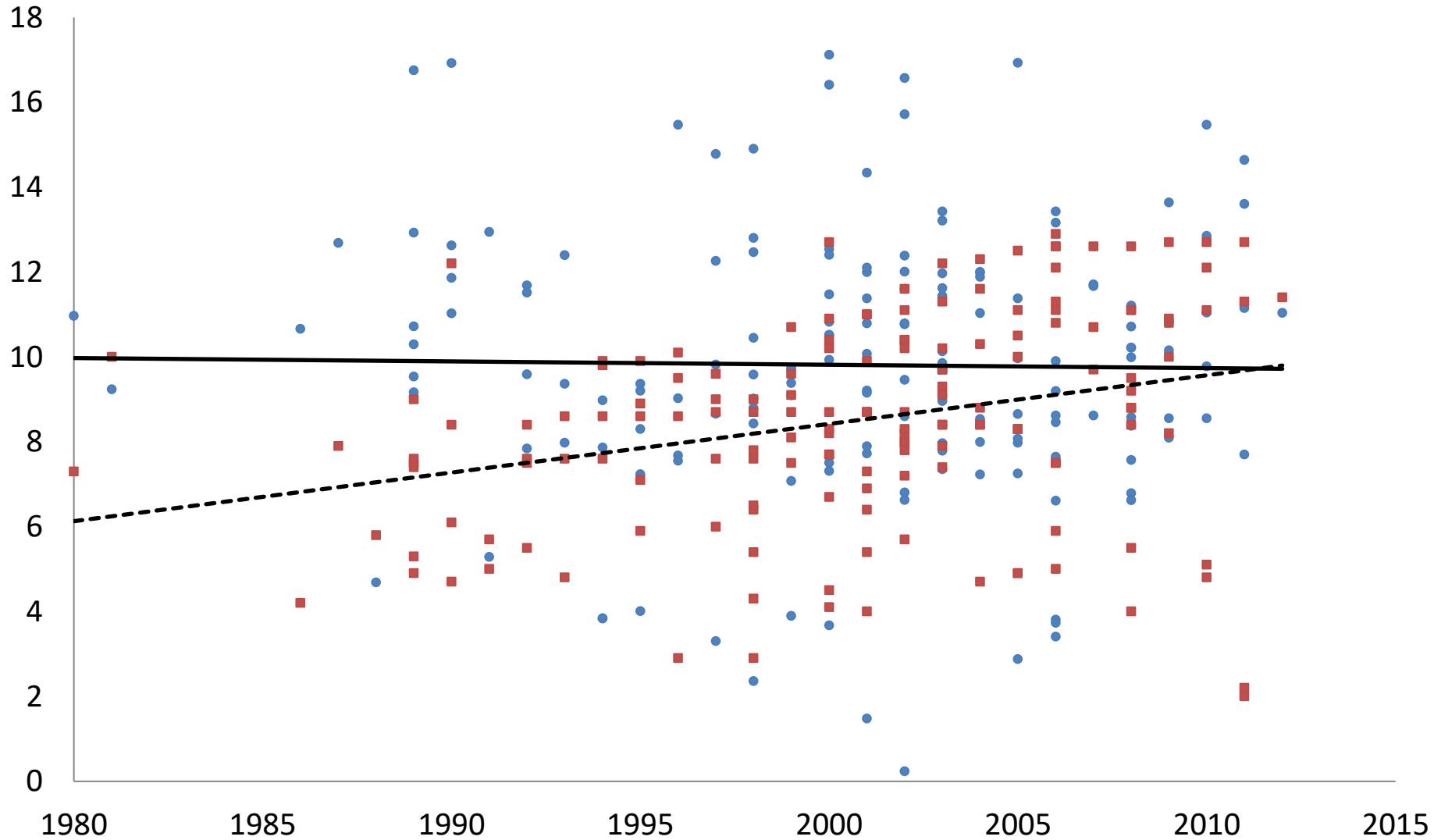
Results for OLS, Fixed and Random Effect

Variables	OLS	Random Effect	Fixed Effect
Schooling years	-0.817***	-0.397**	0.815***
	(0.142)	(0.183)	(0.309)
Growing economy	0.579	0.611	0.340
	(0.751)	(0.535)	(0.541)
Open economy	0.078	1.649*	2.876**
	(0.902)	(0.943)	(1.143)
Constant	21.386	17.372	8.143
Observations	267	267	267
R-squared	0.133		0.104
Number of Countries		108	
Country FE			YES
Year FE			YES

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Comparisons

Returns to Schooling – all data points



● This paper
— Linear (This paper)

■ Psacharopoulos and Patrinos
- - - Linear (Psacharopoulos and Patrinos)

Comparison of Returns to Education to Other Databases (Same Economies/Years)

This paper	9.6								
		Psacharopoulos & Patrinos 2018							
		9.7	Diff						
			-0.1						
				Peet et al 2015					
				7.3	Diff				
					1.9				
						Caselli & Ciccone 2013			
						9.9	Diff		
							-0.1		

Peet, E.D., Fink, G. and Fawzi, W. (2015), "Returns to education in developing countries: evidence from the living standards and measurement study surveys", *Economics of Education Review*, Vol. 49, pp. 69-90.

Caselli, F. and Ciccone, A. (2013), "The contribution of schooling in development accounting: results from a nonparametric upper bound", *Journal of Development Economics*, Vol. 104, pp. 199-211.

Comparison of Returns to Education for Males & Females across Databases

Harmon		diff		Trostel		diff		P&P		diff		Peet		diff	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
7.1	7.8	0.7	1.8	6.1	7.5	2.1	2.5	9.4	11.0	-0.5	-0.1	7.1	8.6	-2.3	4.0

Harmon: Harmon, C., Walker, I. and Westergaard-Nielsen, N. (Eds), (2001a), Education and Earnings in Europe: A Cross Country Analysis of the Returns to Education, Edward Elgar Publishing, Cheltenham.

Trostel: Trostel, P., Walker, I. and Woolley, P. (2002), "Estimates of the economic return to schooling for 28 countries", Labour Economics, Vol. 9 No. 1, pp. 1-16.

P&P: Psacharopoulos and Patrinos (2018)

Peet: Peet et al. (2015)

M: male

F: female

Summary Statistics of the Returns to Schooling

	This paper	Psacharopoulos & Patrinos 2018	Peet et al 2015	Trostel et al 2002	Harmon et al 2001	Casseli & Ciccone 2013
Overall	10.0	8.8	7.6			9.3
Male	9.6	8.0	7.1	4.8	7.2	
Female	11.6	9.8	8.6	5.7	8.1	
Primary	11.0	25.4	7.3			
Secondary	7.4	15.1	6.5			
Tertiary	15.1	15.8	8.2			

Limitations

- Estimates provided here only for *wage workers*
- Does not address *endogeneity of schooling*
Recent work shows that traditional estimates close to estimates provided in studies that control for endogeneity (Ichino & Winter-Ebmer 1999; Card 1995; Duflo 2001)
- Social returns not estimated (eg, Acemoglu & Angrist 2001; Wolfe & Haveman 2002)

Causal Estimates of Returns to Schooling

- 42 estimates, 23 countries, 1970-2018
- 30/42 (71%) IV higher
- Average: OLS = 7.3%; IV = 9.4%

Implications

- Investments in schooling profitable for individual
- Avoid inequality by incentivizing participation by poor
- Look for alternative, innovative mechanisms for post-compulsory

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