SCHOOLING AND NATIONAL INCOME: HOW LARGE ARE THE EXTERNALITIES? REVISED ESTIMATES.

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Schooling and National Income: How Large Are the Externalities? Revised Estimates

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Abstract

This article presents revised estimates of the external rates of return on investment in schooling provided in "Schooling and National Income: How Large Are the Externalities?" The analysis is based on data for the same set of countries, but it incorporates methodological improvements that yield lower estimates of these rates. The revised marginal external rates of return range from four percent in the highest-income countries to about 35 percent in the lowest-income countries. These rates are about half the private rates of return in high-income countries and about double the private rates in the lowest-income countries.

In the article "Schooling and National Income: How Large are the Externalities?" Breton [2010] calculates the external benefits of schooling by subtracting estimates of the private rates of return on investment in schooling from estimates of the national rates of return for 20 countries. The national rate of return was calculated from a cross-country estimate of a standard Cobb-Douglas national income model that included a variable for human capital from schooling (Hs):

(1) $\quad Y_{it} = K_{it}^{\alpha}\, Hs_{it}^{\beta}\, (A_{it}\, L_{it})^{1-\alpha-\beta}$

In that article the marginal product of schooling is specified incorrectly as the change in the level of national income due to the sum of the direct and the indirect effects of changes in schooling on national income:

(2) $\quad MPHs_{it} = dY_{it}\,/dHs_{it} = \beta\,(Y/Hs)_{it} + [\alpha\,(Y/K)_{it} * (\delta K/\delta Hs)_{it}]$

Since the marginal product is a partial derivative, which holds the physical capital factor of production (K) constant, the correct equation for the marginal product of schooling includes only the direct effect of schooling on national income:[1]

(3) $\quad MPHs_{it} = \delta Y_{it}\,/\delta H_{it} = \beta\,(Y/Hs)_{it}$

As a result of this error, both the national marginal products of schooling and the national marginal external rate of return from investment in are substantially overestimated.

This article presents revised estimates of the private, national, and external marginal rates of return from investment in schooling in 1990. These estimates are calculated using the correct marginal product of human capital from schooling shown in equation (3) and the following methodological improvements:

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[1] Thanks to Roger Rogerson, who identified the error in the equation for the marginal product of schooling.

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- The stock of human capital from schooling (Hs) in 61 countries is estimated as the net stock using the perpetual inventory method rather than as cumulative investment in schooling.

- The foregone student earnings used to estimate Hs are increased from 0.7 to 0.9 times total direct expenditures on schooling, based on a review of numerous additional empirical studies.

- The estimate of national income (Y) in 1990 is increased to account for foregone student earnings, which Kendrick [1976] identified as a missing component in the national accounts.

- The estimates of the national economic variables are based on data from Penn World Table 6.2 instead of 6.1 [Heston, Summers, and Aten, 2006].

- The estimates of the average private rates of return on investment in schooling are revised using data from Cohen and Soto [2007] on the average schooling of the work force at each level of schooling in 1990.

- In the calculation of the external rates of return on investment in schooling, the private rates of return from workers' earning studies are reduced to make them consistent with the lower average experience of national work forces due to the population growth that occurred between 1950 and 1990.

The revised estimates indicate that the marginal external rate of return on investment in schooling in 1990 ranged from about four percent in the highest-income countries to about 35 percent in the lowest-income countries. These estimates are lower than the estimates presented in Breton [2010], but they continue to indicate that investment in schooling has substantial external benefits in countries with widely varying levels of cumulative investment in schooling.

The paper is organized as follows: Section I presents the estimates of the net stock of human capital from schooling. Section II presents the revised estimates of β in the Cobb-Douglas income model in equation (1) associated with the revised national data on income (Y) and human capital from schooling (Hs). Section III presents the revised private rates of return from workers' earnings studies. Section IV presents the revised estimates of the national external rates of return from investment in schooling. Section V concludes.

I.   Estimation of the Net Schooling Capital Stock

Calculation of the national marginal rates of return on schooling in equation (3) requires cross-country data on the stock of human capital from schooling. National estimates of this stock are developed using the perpetual inventory method specified in OECD [2001]. The OECD argues that for financial valuation, the appropriate stock of capital is the net capital stock, which includes all of the capital equipment in operation, with a value for this capital that is either a market value, or is calculated using the initial cost of the gross capital stock and an appropriate rate of financial depreciation. In the case of human capital from schooling, this stock is calculated using the aggregate investment made by the nation in formal schooling, which includes all expenditures related to schooling, including the implicit financial carrying costs and students' foregone earnings.

Gross Human Capital Stock

The methodology used to estimate the gross human capital stock is a modification of the methodology used in Breton [2010] to estimate the cumulative investment in schooling in 61 countries. After completion of their schooling, students are presumed to work for 40 years. A country's gross human capital stock from schooling in year t is assumed to be equal to the cumulative national investment in schooling over the years t-45 to t-5. The five-year lag in the

period used to estimate the capital stock is a rough approximation of the delay from a present-discounted-value standpoint between the time when a nation invests in schooling and the time that a student enters the work force. This lag is less than half the average student's period of schooling because higher levels of schooling have much higher unit costs than lower levels of schooling.

In this revised methodology the cumulative investment is estimated using data on public expenditures as a share of national income, a national ratio of total to public expenditures to account for private expenditures, a 1.9 ratio of total investment to total expenditures to account for foregone earnings, a national ratio of financial carrying costs for schooling investments, and national income:

$$(4) \qquad \text{Gross Hs}_{it} = 1.9 * (\text{TotExp/PubExp})_i * 5 * \sum_{j=1}^{8} [(\text{PubExp/Y})_{it-5j} * Y_{it-5j} * \text{FinCost}_{it-5j}]$$

The data on the ratio of public expenditures to GDP and the ratio of total to public expenditures for the period 1950-1985 are taken from Breton [2010], who obtained or estimated these ratios from UNESCO data.   National income, adjusted for purchasing power parity, is obtained from the Penn World Table (PWT) 6.2 data [Heston, Summers, and Aten, 2006].

 The lag between the time when the investment in schooling is made and the time when a student enters the work force has a financial cost, which in the case of physical capital is typically denoted "interest during construction," or IDC. This financial cost is included in the estimate of each country's gross human capital stock. It is calculated using an annual cost of capital of 8.0 percent and each country's distribution of schooling attainment in 1990 from Cohen and Soto's [2007] data. The cost of capital is based on Caselli and Feyrer's [2007] finding that the marginal product of reproducible physical capital is very similar across countries, with an average between 6.9 and 8.4 percent. The financial cost factor in equation (4) increases

the gross capital investment relative to outlays by factors that range from 1.3 to 1.7 across countries, depending on the average length of schooling. These ratios are shown in the Appendix.

Foregone Student Earnings

The 0.9 ratio of foregone earnings to total national expenditures on schooling was estimated based on a review of data in nine countries, principally for the late 1960s. This time period is the mid-point of the period of investment in schooling for the 1990 work force. The data were obtained from several sources. Raw data on direct costs and foregone earnings in the late 1960s by level of schooling were obtained for nine countries from Psacharopoulos [1973]. These data were weighted using the 1970 distribution of schooling by level provided in Cohen and Soto [2007] and an assumed schooling duration of six years for primary and secondary schooling and four years for university. The resulting estimates of the ratio of foregone earnings to direct expenditures are shown in Table 1. These estimates range from 0.23 in Malaysia to 1.54 in Great Britain. The average ratio was 1.02.

A review of Psacharopoulos's notes on the foregone earnings data in his study indicated that in some countries these earnings are not representative of all workers. In the U.S. the data are for white males only. In Great Britain foregone earnings at the university level are for science and engineering students. In Colombia workers were assumed to work full-time for 50 weeks, with no period of unemployment. These assumptions are likely to lead to an overestimate of foregone earnings under actual working conditions in these three countries.

Data from two other more comprehensive studies of national investment in schooling also indicate that the estimates in Table 1 are too high. Tilak [1988] provides estimates of the ratio of foregone earnings in India in 1979-80. The upper bound on his ratio of foregone earnings to

expenditures on schooling was 0.72. He also provides Kothari's estimates of the ratio of

foregone earnings to direct expenditures in India for 1960, which averaged 0.99. Both of these

estimates are considerably below the ratio of 1.12 percent for India calculated from the data in

Psacharopoulos [1973]. The average ratio for the two comprehensive studies in India is 0.86.

Table 1 Ratios of Foregone Earnings to Direct Schooling Costs			
	Estimated*	Tilak [1988]	Kendrick [1976]
Chile	0.69		
Colombia	0.79		
India	1.12	0.86	
South Korea	1.27		
Malaysia	0.23		
Mexico	1.53		
Great Britain	1.54		
New Zealand	1.03		
United States	0.99		0.90
Average	**1.02**		
*Estimated from data on direct costs and foregone earnings in Psacharopoulos [1973].			

Kendrick [1976] estimated the total capital investment in the U.S. in 1969. He estimated

that the ratio of foregone earnings to direct expenditures was 0.90. This estimate also is below

the ratio of 0.99 for the U.S. calculated from the data in Psacharopoulos [1973].

The review of the assumptions for the foregone earnings estimates in Psacharopoulos's

data indicates that the average ratio in these nine countries is below 1.02. The average ratio of

foregone earnings to direct expenditures in the two comprehensive studies is 0.88. There is no

evidence in these studies that the ratio of foregone earnings to direct expenditures varies across

national income levels. Based on this review of the data in these studies, foregone earnings are

estimated to be 90 percent of total direct expenditures in all countries.

Human Capital Depreciation

The net human capital stock from schooling (Hs) is estimated by applying a financial depreciation rate to the gross human capital stock. The OECD [2001] recommends that financial depreciation be estimated based on the market value of the capital stock over the capital's useful life. Since human capital does not have a market value, the implied value must be estimated based on the present discounted value of human capital's expected future income stream.

By assuming that human capital's contribution to national income over its life is proportional to its contribution to workers' earnings, worker earnings patterns by level of schooling can be used to determine an appropriate depreciation rate. Figure 1 shows the average of the earnings patterns for workers with four levels of schooling in Ecuador, Paraguay, Uruguay, and the Philippines around 1990.[2] This pattern is typical of patterns in every market economy, in that workers' earnings rise over time at all levels of schooling.

An analysis of the present discounted value of the increase in workers' earnings due to schooling indicates that a linear financial depreciation pattern is consistent with the implied market value of human capital from schooling over a worker's life. An annual depreciation rate of 2.5 percent was applied to the gross human capital stock to calculate the net capital stock in 1990. The data for the net human capital stocks in 1990 for the 61 countries are provided in the Appendix.

II.   Estimation of the Macro Rates of Return

The income model in equation (1) is estimated as a model of income per worker to reduce potential heterogeneity bias:

(5) $(Y/L)_{it} = (K/L)_{it}{}^{\alpha} (Hs/L)_{it}{}^{\beta} A_{it}$

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[2] The earnings data for these four countries were obtained from Gomez-Castellanos and Psacharopoulos [1990], Psacharopoulos, Velez, and Patrinos [1994], Psacharopoulos and Velez [1994], and Hossain and Psacharopoulos [1994].

A dummy variable for the sub-Saharan African countries is included to control for the reduced productivity (A) of the work force due to the high morbidity and mortality rates in these countries.

Figure 1: Typical Worker's Earnings vs. Experience by Level of Schooling
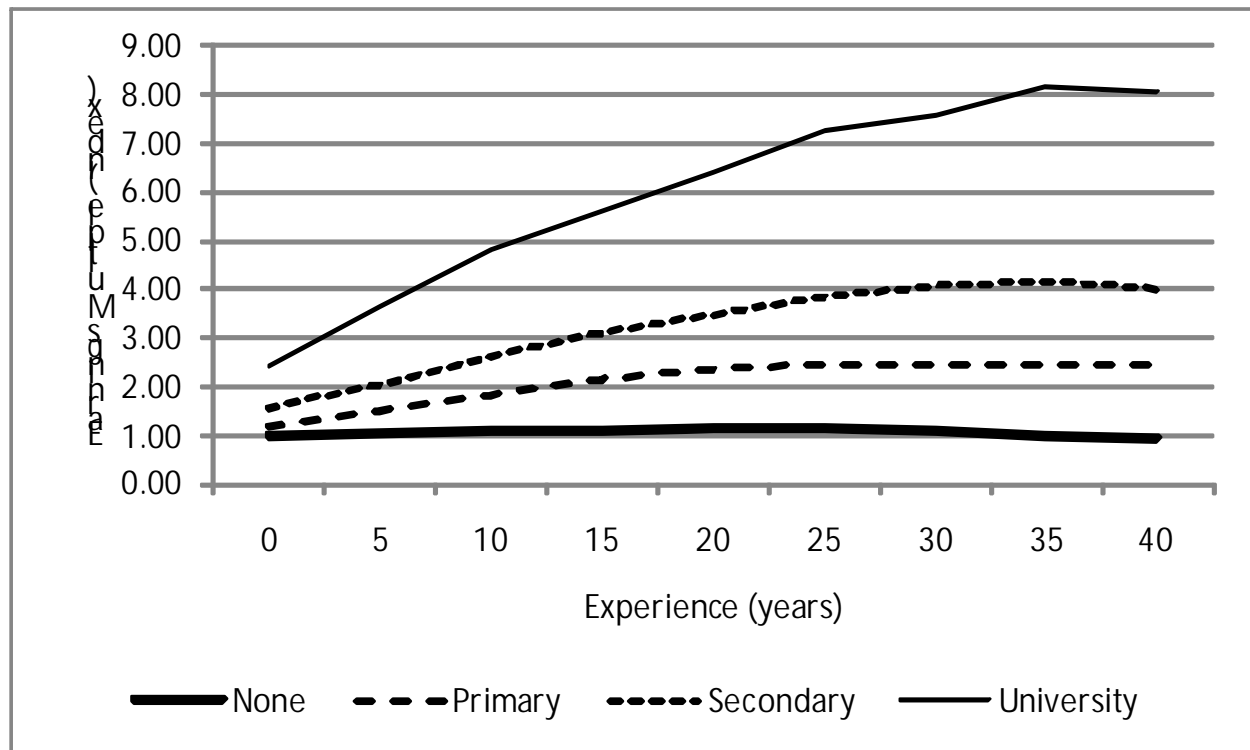
In the estimation of the income model, income per adult, human capital from schooling per adult, and physical capital per adult are used for Y/L, Hs/L, and K/L. The total investment in physical capital per adult during 1975-89 (the prior 15 years) in the PWT 6.2 data is used as a proxy for the physical capital stock in each country. As the model is estimated in log form, this proxy does not bias the results if it is proportional to the true (net) physical capital stock. National income per adult is estimated from the PWT 6.2 data, augmented by the foregone earnings of students in 1990, which are calculated using the methodology described earlier.

Human capital from schooling is calculated from the investment occurring 45 to five years earlier, so in the estimate of the national income model, the human capital stock is predetermined. Nevertheless, across countries there could be reverse causality between the stock of human capital and national income, so an instrumental variable is needed to control for simultaneity bias. Breton [2010] uses the log of the Protestant share of the population twenty years earlier as an instrument for cumulative national investment in schooling. This same instrument is used for net human capital from schooling in the 2SLS regressions in this analysis. The data on the Protestant share are obtained from Barrett [1982].

The regression results for the log version of the income model in equation (5) are shown in Table 1. Column 1 shows the results for an OLS regression. The estimate of α in this regression (0.38) is consistent with independent estimates of the share of national income accruing to physical capital, as required in a valid Cobb-Douglas model of a national economy. Bernanke and Gurkaynak [2001] have estimated that physical capital's share of national income is about 35 percent across countries. The estimate of $\beta = 0.31$ is higher than estimates obtained in earlier studies, due in part to the higher estimates of national income in the data base resulting from the addition of students' foregone earnings to the Penn World Table data. The coefficients on the capital variables are highly statistically significant, and the model accounts for 95 percent of the variation in log(Y/L) across the 61 countries.

Column 2 presents the OLS estimates of the model with the addition of the Protestant share variable to investigate whether there is any indication that this characteristic affects national income directly. The direct effect of the Protestant share on national income is negligible, the coefficients on the physical capital and human capital are virtually unchanged, and the variation in national income explained by the model is unchanged. There is no

indication that the Protestant share of the population affects income other than through its effect on the level of schooling.[3]

Table 1
Effect of Human Capital from Schooling on National Income
[Dependent Variable is Log(National Income/Adult)]

	1	2	3	4
Technique	OLS	OLS	2SLS	OLS
Countries	61	61	61	61
Log(K/L)	0.38*	0.38*	0.35	0.34
	(.06)	(.06)	(.14)	(.14)
Log(Hs/L)	0.31*	0.32*	0.34	0.30*
	(.06)	(.06)	(.14)	(.06)
Est Log(Hs/L)				0.05
				(.16)
Sub-Saharan Africa	-0.27	-0.26	-0.28	-0.28*
	(.11)	(.11)	(.11)	(.11)
Log(Protestant Share)		-0.04		
		(.07)		
R^2	.95	.95	.95	.95

Note: White-adjusted standard errors in parentheses
*Significant at one percent level

Column 3 presents the 2SLS estimate of the model using the log(Protestant share) instrument. The coefficients on physical capital and human capital are similar to the OLS estimate, indicating that the OLS estimates of the coefficients are unbiased. The results from the first stage of the 2SLS estimate indicate that the Protestant share variable is a valid instrument for human capital from schooling:

(9) $\log(Hs/L) = 0.79 \log(K/L) + 0.10 \log(\text{Prot Share}) - 0.17 \text{ SSAfrica} + 1.98 \quad R^2 = .85$

            (.07)   (.03)   (.27)   (0.83)

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[3] Becker and Woessmann [2009] present evidence that Protestants' higher rate of literacy entirely explains their higher income relative to Catholics in Prussia in 1871, so again there is no evidence that Protestant affiliation affects national income through mechanisms other than its effect on the incidence of schooling.

The Hausman test in column 4 confirms that the small difference between the OLS and 2SLS estimates of β is not statistically significant. Even though this tests indicate that the OLS estimate of β = 0.31 is unbiased, the 2SLS estimates of α = 0.35 and β = 0.34 are preferred due to the existence of the independent evidence that α = 0.35.[4] For this reason the 2SLS estimate of β = 0.34 is used to calculate the macro returns on investment in schooling in 1990. This estimate of β is substantially higher than the estimate of β = 0.27 in Breton [2010].

The national marginal rates of return on investment in schooling in 1990 calculated using equation (3) are shown in Figure 2 as a function of the net human capital stock. The pattern of rates exhibits substantial diminishing returns as countries increase their cumulative investment in schooling, but the marginal rates remain attractive relative to rates of return on physical capital even in countries with high levels of investment in schooling.

III.   Rates of Return in Workers' Earnings Studies

Psacharopoulos and Patrinos [2004] summarize the rates of return on investment in schooling from workers' earnings studies performed in numerous countries. They provide "full return" private rates and social rates for all levels of schooling during the period 1985-1996 for 19 of the 61 countries included in the macro data set.[5] The social rates of return include the public costs of schooling, so they are the most comparable to the rates of return calculated from the macro data. These rates are provided for primary, secondary, and tertiary levels of schooling.

The weighted average national social rates of return for these 19 countries were calculated using the 1990 distribution of schooling attainment by level in Cohen and Soto [2007]

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[4] Bernanke and Gurkaynak's [2001] did not include students' foregone earnings in the national income data they used to estimate the share of national income accruing to physical capital. If they had included these foregone earnings, their estimate of the share of national income accruing to physical capital would have been slightly smaller.

[5] Breton [2010] included data for Singapore in the data set used to estimate the external rate of return. Singapore is not included in this data set because these data were from a later time period (1998).

and the relative unit costs at each level of schooling for low-income and high-income countries in Breton [2010]. These rates are shown in Table 2. A review of these rates indicates that they exhibit considerable variance by level within countries and at the same level of schooling across countries.

Figure 2: Marginal National Rates of Return on Investment in Schooling in 1990
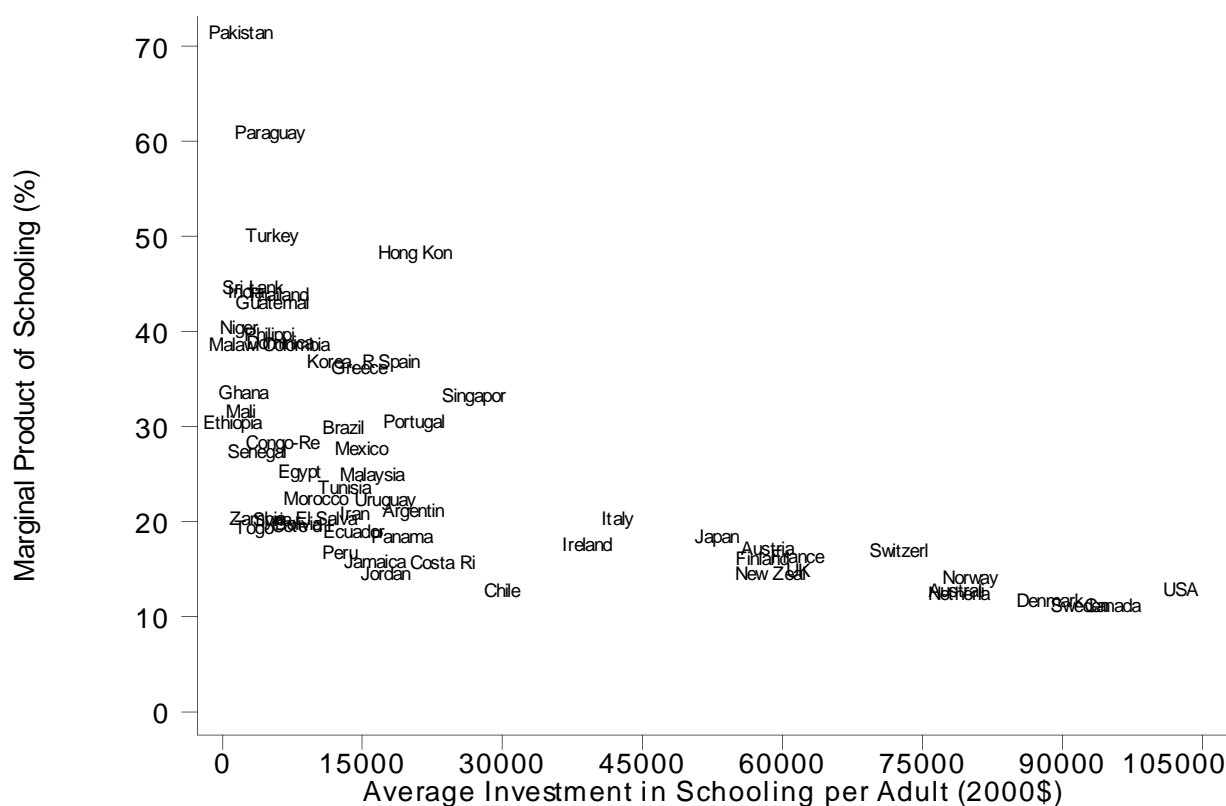
IV.   External Rates of Return on Investment in Schooling

The national rates of return and the private rates of return are not comparable because the workers' level of experience is not the same at the macro and micro levels. Due to the growth in the adult population over the 1950-1990 period, the average worker in each country had less work experience than assumed in the workers' earnings studies. As shown in Figure l, workers with less experience receive lower incomes, and these lower incomes lead to a lower estimated

return on investment in human capital from schooling. Without correction this inconsistency in the level of experience between the private (micro) and national (macro) rates of return would bias downward the estimate of the external rate of return from investment in schooling.

Table 2 Rates of Return on Investment from Earnings Studies – Full Return Method								
Country	Year	Rate of Return (%)*			Share of Investment			Rate (%)
		Primary	Second	Higher	Primary	Second	Tertiary	Average
Argentina	1989	8.4	7.1	7.6	0.50	0.33	0.17	7.8
Bolivia	1990	13	6.0	13.0	0.36	0.41	0.23	10.1
Brazil	1989	35.6	5.1	21.4	0.49	0.32	0.19	23.1
Chile	1993	8.1	11.1	14.0	0.41	0.44	0.15	10.3
Colombia	1989	20	11.4	14.0	0.52	0.27	0.21	16.4
Costa Rica	1989	11.2	14.4	9.0	0.44	0.20	0.36	11.0
Ecuador	1989	14.7	12.7	9.9	0.38	0.33	0.30	12.6
El Salvador	1990	16.4	13.1	8.0	0.47	0.27	0.26	13.3
Ethiopia	1996	14.9	14.4	11.9	0.75	0.25	0.00	14.8
Jamaica	1989	17.7	7.9	7.9	0.54	0.37	0.08	13.2
Mexico	1992	11.8	14.6	11.1	0.52	0.24	0.24	12.3
New Zealand	1991	12.4**	12.4	9.5	0.45	0.41	0.15	12.0
Paraguay	1990	20.3	12.7	10.8	0.56	0.26	0.18	16.6
Philippines	1988	13.3	8.9	10.5	0.42	0.36	0.22	11.1
Senegal	1985	23	8.9	8.9	0.52	0.36	0.12	16.2
Spain	1991	7.4	8.5	13.5	0.62	0.29	0.09	8.3
UK	1986	8.6	7.5	6.5	0.40	0.49	0.10	7.8
Uruguay	1989	21.6	8.1	10.3	0.49	0.29	0.21	15.2
USA	1987	10.0**	10.0	12.0	0.37	0.43	0.20	10.4
*Source: Psacharopoulos and Patrinos [2004] **Assumed to be the same as the rate at the secondary level.								

Table 3 shows the adjustments in the private rates of return made to ensure consistency between the private and national rates and the resulting external rates of return. The private rates of return are reduced to make them consistent with the lower average worker experience implicit in the national rates. The adjustments to the internal private rate of return are approximate, as they are based on the average share of investment at each level of schooling in the 19-country data set and the relationship between worker experience and earnings in Figure 1. As shown, the

higher the growth rate of the labor force, the larger the reduction in the private rate used in the adjustment for each country. The reduction in the private rate of return ranges from 0.5 to 3.4 percent, with an average reduction of 2.4 percent.

	Labor Growth	Private Rate	Decline in Private Rate	Adjusted Private Rate	Macro Rate	External Rate
			Table 3			
		Calculation of Marginal External Rates of Return Adjusted for Experience (%)				
Argentina	1.6	7.8	2.1	5.7	20.5	14.8
Bolivia	2.2	10.1	2.6	7.5	19.1	11.6
Brazil	2.9	23.1	3.1	20	29.3	9.3
Chile	2.2	10.3	2.6	7.7	12.1	4.4
Colombia	2.9	16.4	3.1	13.3	37.9	24.6
Costa Rica	3.3	11.0	3.4	7.6	15	7.4
Ecuador	2.9	12.6	3.1	9.5	18.2	8.7
El Salvador	2.5	13.3	2.8	10.5	19.7	9.2
Ethiopia	2.1	14.8	2.5	12.3	29.8	17.5
Jamaica	1.5	13.2	1.9	11.3	15.1	3.8
Mexico	2.9	12.3	3.1	9.2	27	17.8
New Zealand	1.7	12.0	2.1	9.9	13.8	3.9
Paraguay	2.5	16.6	2.8	13.8	60.3	46.5
Philippines	2.9	11.1	3.1	8	39	31.0
Senegal	2.5	16.2	2.8	13.4	26.7	13.3
Spain	1.1	8.3	1.5	6.8	36.1	29.3
UK	0.4	7.8	0.5	7.3	14.2	6.9
Uruguay	0.9	15.2	1.2	14	21.7	7.7
USA	1.4	10.4	1.8	8.6	12.2	3.6

The calculated marginal external rates of return in Table 3 range from 3.6 percent in the highest income country (the U.S.) to 46.5 percent in Paraguay. While there could be substantial error in the individual rates due to the measurement error in the various elements of the rate of return estimates, the pattern in the rates is likely to be more accurate than the individual rates. Figure 3 shows the fitted trend for the private rates of return and the external rates of return in the 19-country data set. This trend shows that the external rate of return varies from four percent

in the countries with the largest stock of human capital to about 35 percent in the countries with the lowest stock of human capital. In proportion to the private rates of return, the external rates vary from about half the private rate of return in countries with high levels of human capital to about double the private rate of return in countries with low levels of human capital.

Figure 3: Marginal Private and External Rates of Return on Investment in Schooling
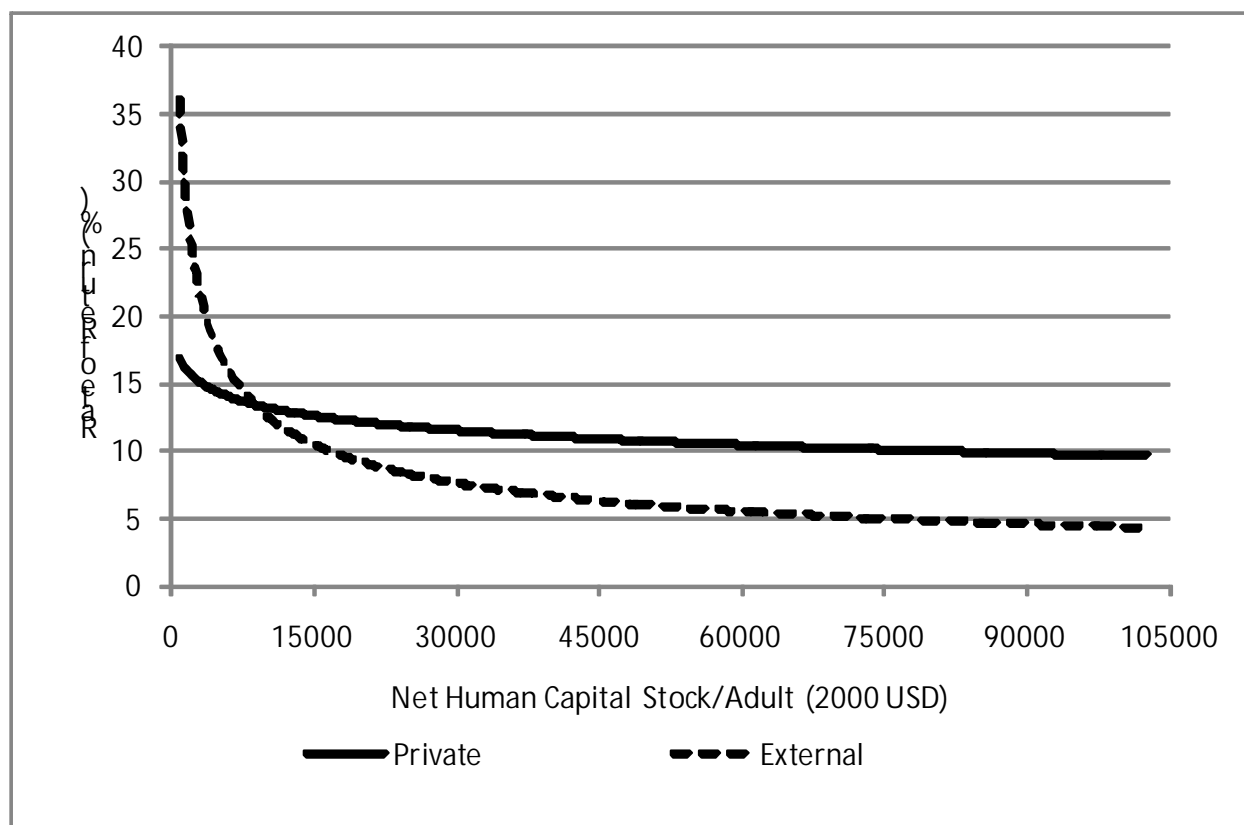
V. **Conclusions**

The external rates of return calculated with the improved methodology have the same pattern as in Breton [2010], but the magnitude of these rates is considerably lower. Nevertheless, the revised rates continue to indicate that national investment in schooling has a positive external effect on national income and that this effect is larger in percentage terms for countries with

lower levels of human capital from schooling. Implicitly, educated workers have a larger spill-over effect on the productivity of other workers in countries where the average level of schooling is lower.

The rates of return estimated in this study are for 1990, so they may not be representative of the marginal return on investment in schooling today. National levels of human capital have increased considerably in the last 20 years, and the trends in Figure 3 clearly show that investment in schooling is subject to diminishing returns. But the rate of decline in these returns was quite slow in 1990 at higher levels of human capital, and in 1990 the total marginal rate of return (private + external) in the highest-income countries was about 14 percent. It seems likely that twenty years later the marginal rate of return on national investment in schooling continues to be higher than the marginal cost of capital.

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Country	Y/L	Hs/L	Financial Multiple	MPHs
	2000$/Adult	2000$/Adult	Ratio	Percent
Argentina	12305	20400	1.44	20.5
Australia	27834	78567	1.68	12.0
Austria	28286	58301	1.58	16.5
Bolivia	4561	8116	1.43	19.1
Brazil	11096	12885	1.40	29.3
Canada	29461	95251	1.66	10.5
Chile	10622	29873	1.50	12.1
Colombia	8793	7892	1.39	37.9
Congo-Rep	5163	6357	1.30	27.6
Costa Rica	10400	23553	1.38	15.0
Cote d`Ivoire	4739	8535	1.31	18.9
Denmark	28730	88616	1.61	11.0
Dominican Rep	6921	6174	1.36	38.1
Ecuador	7528	14044	1.42	18.2
Egypt	6033	8343	1.36	24.6
El Salvador	6418	11102	1.35	19.7
Ethiopia	896	1022	1.30	29.8
Finland	26090	57698	1.57	15.4
France	28326	61517	1.55	15.7
Ghana	2143	2213	1.35	32.9
Greece	15288	14625	1.48	35.5
Guatemala	6522	5237	1.34	42.3
Hong Kong	28855	20571	1.52	47.7
India	3112	2428	1.32	43.6
Iran	8375	14112	1.33	20.2
Ireland	19460	39026	1.51	17.0
Italy	24425	42252	1.49	19.7
Jamaica	7250	16271	1.45	15.1
Japan	27617	52980	1.63	17.7
Jordan	7088	17426	1.50	13.8
Korea, Rep	13451	12648	1.58	36.2
Malawi	1323	1183	1.33	38.0
Malaysia	11431	16025	1.45	24.3
Mali	1703	1873	1.30	30.9
Mexico	11731	14785	1.42	27.0
Morocco	6366	9954	1.31	21.7
Netherlands	27099	78859	1.57	11.7
New Zealand	23822	58649	1.58	13.8

Table A-1
Macro Data Used in the Estimation of National Rates of Return

Niger	2019	1727	1.30	39.7
Norway	31529	80052	1.66	13.4
Pakistan	3998	1922	1.30	70.7
Panama	9998	19188	1.44	17.7
Paraguay	8981	5062	1.38	60.3
Peru	5919	12531	1.43	16.1
Philippines	5652	4933	1.42	39.0
Portugal	17942	20457	1.38	29.8
Senegal	2823	3600	1.31	26.7
Singapore	25801	26910	1.42	32.6
Spain	20032	18833	1.47	36.2
Sri Lanka	4152	3210	1.30	44.0
Sweden	28411	91759	1.64	10.5
Switzerland	34665	72374	1.69	16.3
Syria	3039	5280	1.38	19.6
Thailand	7413	5827	1.40	43.3
Togo	1804	3287	1.30	18.7
Tunisia	8756	13005	1.33	22.9
Turkey	7604	5228	1.36	49.4
UK	25680	61599	1.65	14.2
Uruguay	11112	17423	1.44	21.7
USA	36912	102630	1.67	12.2
Zambia	2132	3672	1.37	19.7