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# *Higher Education: Does Public Expenditure Increase Enrollment?*

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## Abstract

This paper evaluates the effects of public education expenditure on student enrollment in tertiary education. We use a cross-section of 132 countries to demonstrate that public expenditure on primary and secondary education positively affects tertiary enrollment rates, while the generosity of tertiary education subsidies themselves do not appear to have any significant impact on tertiary enrollment. The results presented are robust to various specifications, and raise serious concerns regarding the within country allocation of public resources on education, which seems to be biased towards higher education especially for less developed countries.

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*Keywords: Higher (Tertiary) Education, Enrollment*

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# 1 Introduction

The degree of government involvement in tertiary education is high in most countries, and there appear to be both economic and political reasons for such public interventions. First, and most importantly, overall empirical evidence on the positive growth effect of human capital seems to be quite strong (see for example Barro 1998, Barro and Sala-i-Martin 1995). If this relation holds true, higher education generates a positive externality and should be subsidized. Second, it is often claimed that the presence of credit constraints prevents young agents from achieving their optimal amount of educational investment, so that public intervention in tertiary education will give a larger share of the population access to higher education, leading not only to more growth but also to more equality in the long run.

From an empirical perspective, enrollment in higher education varies substantially among countries and so does the extent to which higher education is publicly funded. For example, only about one percent of each cohort enrolls in higher education in Ethiopia and Kenya, whereas gross enrollment rates in South Korea, Finland and the United States are above 70 percent. As for relative public spending, the variation is even bigger. For example, several – and mostly poor – countries spend 10 times as much per student in tertiary as they spend per student in secondary education. For other countries, like Italy, Bulgaria and Korea, this ratio is below 1.<sup>1</sup>

The goal of this paper is to examine the factors explaining enrollment in tertiary education, and especially to evaluate whether or not public spending significantly affects tertiary education enrollment.

From an economic viewpoint, several factors are expected to influence tertiary education enrollment. The wealthier a country, the larger should be the share of agents able and willing to invest into higher education. Second, enrollment rates should depend on the price of higher education. If higher public funding per student decrease marginal private cost without affecting the benefits

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<sup>1</sup>See appendix for corresponding country rankings.

of education, we expect countries with higher public spending to exhibit higher enrollment rates. Furthermore, theory suggests that higher private returns to education will have a positive effect on enrollment. Because higher enrollment rates will dynamically lower returns to education, a complete empirical evaluation of the interaction between returns and enrollment becomes quite complex, and lies beyond the scope of this paper.

Another factor to be considered is the quality and level of subsidization of primary and secondary schooling. Higher public spending on basic education will not only allow a larger fraction of the population to complete secondary education, but it is also likely to improve each student's preparation and ability to complete tertiary education.

We use cross-sectional data for over 100 countries to test these hypotheses. Our main findings are as follows. Higher education is a normal good: Higher incomes have a positive and strongly significant effect on tertiary education enrollment. Public expenditure on primary and secondary education has a positive and significant impact on tertiary education enrollment. This effect can be decomposed into a quality effect, driven by higher spending per capita, and a quantity effect, driven by higher total spending as more people complete secondary education. Government size and fertility rates have a negative and (mostly) significant effect on tertiary education enrollment. Most importantly, public expenditure on tertiary education has no significant positive effect on tertiary education enrollment - if anything, the effect is negative.

These results are robust to various tests, including testing for endogeneity between enrollment and expenditure, excluding poor countries from the sample and adding other explaining variables to the regressions.

This paper proceeds as follows. In the next section we review some previous research regarding enrollment. Section three presents our data, and section four contains the main analysis. Section five concludes with a discussion of our findings.

## 2 Previous Research

While much work has been done on the relation between different types of education and growth<sup>2</sup>, few cross-country studies exist that examine the link between public funding and enrollment.

Using panel data for 15 EU-countries, Winter-Ebmer and Wirz (2002) find a positive effect of aggregated public spending on all education levels (primary, secondary and tertiary), but they find no additional impact of funding for higher education specifically. The authors conclude that “public money spent on education has the same impact on college enrollment whether it is spent on universities themselves or on secondary-level schooling, preparing students for college” (p. 12). As shall be seen, our data suggests that these findings do not generalize to a wider sample of countries used in our study.

Using time series data for Sweden, Fredriksson (1997) argues that enrollment rates can be explained by the private return to higher education, which decreased in Sweden from the late 60s to the early 80s and then increased slightly. Fredriksson also finds a small positive effect of the study allowance scheme.

For Netherlands, Huijsman et al. (1986) find that per capita income, future earnings and financial aid has a positive effect on male enrollment, whereas tuition fees and foregone earnings exert a negative effect. This is in line with what economic theory suggests. For females, the signs of the coefficients are the same for all variables except tuition fees and financial aid. The study does not include data on total public spending on education at any level.

In all, previous research largely confirms predictions from economic theory, but little has been done to examine and distinguish the effects of public funding of primary and secondary versus the funding of tertiary education.

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<sup>2</sup>See for example Barro and Sala-i-Martin (1995), Barro (1998) and Krueger and Lindahl (2001). Also, Aghion et al. (2004) argue that the effects on growth from primary, secondary and higher education may differ, and also depend whether the country is rich or poor.

### 3 The data

The data used in our cross-sectional analysis has been taken from the 2003 version of the Worldbank's Development Indicators (WDI). The dataset provides detailed information on the total enrollment of students, as well as the levels of public spending on students in primary, secondary and tertiary education for a sample of 130 countries. Enrollment rates are gross rates and measure the total number of students in the respective branch of education over the targeted age group.

The data on education expenditure was compiled by UNESCO, and is based on official government budget information.

Data on the returns to education is constructed from various national studies cited by the Worldbank ([www.genderstats.worldbank.org](http://www.genderstats.worldbank.org)). All remaining control variables are taken directly from the WDI. The base year for all data is 2000. We refer the interested reader to the appendix for a complete data summary and more detailed variable descriptions.

### 4 Analysis

As mentioned in the introduction, the goal of this paper is to determine the effects of government expenditure on tertiary education enrollment across countries. Since data on very poor countries are less reliable, and because the forces behind enrollment in poor countries may be different, we distinguish between a sample containing all the countries and a sample restricted to medium and high income countries in all of our empirical work. We run all regressions on both of these samples. Poor countries are those with GDP per capita below 5000 US\$. This divides our sample in roughly two halves.

We start our analysis with the most naive approach, and test whether or not total public expenditure on education and income per capita matter for enrollment in tertiary education. The results are displayed in columns 1 and 2 of table I. The results are only partially in line with our expectations. As con-

jectured, the income effect is positive in both samples; this can be interpreted simply as evidence for tertiary education being a normal good. Total public expenditure on education, on the other side, appears to have a positive effect on enrollment in the full sample, but no longer so when poor countries are excluded.

	1	2	3	4	5	6
Total Educational Expenditure	1.99** (0.047)	2.47 (0.178)				
GDP per Capita (2000, PPP)	1.58*** (0.000)	1.29*** (0.000)	0.84*** (0.000)	0.72*** (0.000)	1.13*** (0.000)	0.97*** (0.000)
Spending on Prim.&Sec. Educ.			2.18** (0.016)	5.08*** (0.000)	2.82*** (0.001)	4.92*** (0.001)
Per capita Spending on Tertiary Education (%GDP/cap)			-0.01* (0.091)	-0.22*** (0.000)	-0.002 (0.700)	-0.24*** (0.000)
Population <15 (% of total)			-1.08*** (0.000)	-0.91*** (0.001)	-1.20*** (0.000)	-0.93*** (0.001)
Government Revenue (% of GDP)					-0.45*** (0.003)	-0.32*** (0.034)
Small Country Dummy			-10.40*** (0.004)	-8.31 (0.157)	-18.0*** (0.000)	-19.96*** (0.000)
Method	OLS	OLS	OLS	OLS	OLS	OLS
Restrictions	none	GDP/cap > 5000	none	GDP/cap > 5000	none	none
# of Obs.	127	69	106	63	84	56
R squared	0.57	0.37	0.78	0.74	0.78	0.82

*Robust standard errors based p-values in brackets. \*\*\*, \*\* imply significance at 90, 95 and 99% confidence interval.*

Attempting to provide a first explanation of this effect, we separate public expenditure on higher education from spending on primary and secondary education. Further, we control for fertility (likely to increase the cost of sending students to university for parents) and small countries (population smaller than 1 million), whose students are likely to enroll in neighboring countries and thus feature lower national enrollment rates. The results displayed in column 3 and 4 are intriguing and consistent for both samples. Spending on primary and secondary education seems to have a significant and positive effect on tertiary enrollment. Public spending on tertiary education – measured as expenditure per student relative to GDP per capita – seems to be negatively related to enrollment, even when controlling for income and fertility. More surprisingly, this effect seems to be more significant when poor countries are excluded.

In columns 5 and 6 of table I we run similar regressions, controlling for the overall size of the government. Including government size is important for two reasons. First, it controls to some degree for the overall generosity of the welfare state, and second, it is expected to be negatively related to the returns to education. The bigger the size of governments, the higher are taxes, and the lower thus the returns to educational investment. The expected negative sign of government size is confirmed by the data, and significant for both samples.

There are good reasons to believe that public expenditure on tertiary education is not exogenous in our framework. First, higher enrollment rates likely lead to economies of scale and lower cost per student, thus allowing for lower average public spending per student in tertiary education. Second, it could be argued that countries with low enrollment want to improve incentives for higher enrollment and thus subsidize public education more. We try to control for this endogeneity problem by instrumenting for tertiary education expenditure.<sup>3</sup>

Table II shows the results of our model as specified in columns 5 and 6 of table I for two types of instrumentation. In column 1 and 3 we use a basic 2SLS approach with only one instrument, the generosity of secondary expenditure

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<sup>3</sup>Winter-Ebmer and Wirz (2002) use a measure of government ideology to instrument public education expenditure. Their IV-regression confirms the result of their OLS-regression.



per capita, while in column 2 and 4 we use a standardized IV approach with all exogenous variables as explanatory variables in the first stage. The results nicely confirm our prior findings: Private wealth and public expenditure on primary and secondary education always have a significantly positive effect on tertiary education enrollment, while the effects of fertility and government size are negative, even though they appear significant only in the large sample. The generosity of spending on tertiary education, on the other hand, still displays a negative coefficient, but is no longer significant.

TABLE II - IV (2SLS) REGRESSIONS				
First Stage: Expenditure per Student in Tertiary Education (%GDP/Cap)				
	Small Sample		Full Sample	
	1	2	3	4
Per Capita expenditure on 2ndary Educ.	11.48*** (3.36)	1.01 (0.87)	11.48*** (3.36)	15.1*** (1.77)
Population younger 15		2.38*** (0.62)		5.27** (2.56)
GDP per capita PPP		-0.65 (0.54)		2.57 (2.72)
Method	OLS	IV 2SLS	OLS	IV 2SLS
Restrictions	1 instr	all instr	1 instr	all instr
# of Obs.	119	56	119	84
R squared	0.36	0.41	0.36	0.68
Second Stage: Gross Enrollment in Tertiary Education (%)				
	Small Sample		Full Sample	
	1	2	3	4
GDP per Capita (2000, PPP)	1.14*** (0.19)	0.87*** (0.26)	1.13*** (0.16)	1.11*** (0.16)
Spending on Prim.&Sec. Educ.	5.28** (2.00)	6.16** (2.72)	3.43*** (1.04)	3.14*** (0.89)
Exp. on Tert. Education (%GDP/cap) (instr.)	-0.036 (0.023)	-0.408 (0.313)	-0.009 (0.009)	-0.007 (0.007)
Population <15 (% of total)	-1.53*** (0.187)	-0.55 (0.68)	-1.18*** (0.15)	-1.14*** (0.17)
Government Revenue (% of GDP)	-0.46** (0.174)	-0.21 (0.25)	-0.44*** (0.14)	-0.44*** (0.15)
Small Country Dummy	-17.89*** (3.70)	-21.2*** (5.15)	-17.81*** (3.51)	-16.0*** (4.74)
Method	2SLS	IV (all)	2SLS	IV (all)
Restrictions	GDP>5000		none	
# of Obs.	56	56	84	84
R squared	0.72	0.77	0.79	0.78

*Robust standard errors in brackets.*

To confirm our results, we test a few alternative specifications, which are shown in table III. Columns 1 and 4 display the baseline results for the small and large sample, respectively. In the remaining columns, we test various alternative models. In column 2 and 5 we test, whether or not the degree of urbanization has an effect on enrollment. It can be argued that living on the country side is likely to increase the average cost of attending tertiary education and thus to lower enrollment rates. We find this effect significant, but only for the full sample, implying that the urbanization effect is less important for wealthier

countries. Columns 3 and 6 test for the effects of unemployment and inequality. While unemployment has no significant effect on either sample, inequality seems to negatively effect enrollment in richer countries.

Table III: Dependent Variable: Gross Enrollment in Tertiary Education (%)						
	Small Sample			Full Sample		
	1	2	3	4	5	6
GDP per Capita (2000, PPP)	0.97*** (0.163)	0.90*** (0.172)	1.05*** (0.140)	1.13*** (0.163)	0.98*** (0.174)	0.89*** (0.181)
Spending on Prim.&Sec. Educ.	4.92*** (0.998)	5.01*** (0.950)	5.06*** (1.022)	2.82*** (0.81)	2.58*** (0.715)	3.55*** (1.06)
P.c. Exp. on Tert. Educ. (%GDP/cap)	-0.24*** (0.043)	-0.23*** (0.043)	-0.42*** (0.085)	-0.002 (0.004)	-0.04 (0.03)	0.001 (0.016)
Population <15 (% of total)	-0.93*** (0.272)	-0.96*** (0.270)	-0.076 (0.387)	-1.20*** (0.155)	-1.13*** (0.162)	-0.74*** (0.266)
Government Revenue (% of GDP)	-0.32** (0.148)	-0.33** (0.152)	-0.44*** (0.138)	-0.45*** (0.145)	-0.482*** (0.136)	-0.49** (0.182)
Small Country Dummy	-19.96*** (3.64)	-19.93*** (3.650)		-18.0*** (3.900)	-19.7*** (3.6)	
Urban Population		0.12 (0.08)	0.005 (0.089)		0.198*** (0.075)	0.29** (0.111)
Unemployment			-0.45 (0.309)			-0.211 (0.283)
Gini Coefficient			-0.44*** (0.212)			-0.29 (0.148)
Method	OLS	OLS	OLS	OLS	OLS	OLS
Restrictions		GDP per cap > 5000			none	
# of Obs.	56	56	40	84	84	57
R squared	0.82	0.82	0.82	0.78	0.80	0.81

*Robust standard errors in brackets. \*\*\*, \*\* imply significance at 90, 95 and 99% confidence interval.*

Further corroborating our prior findings, the generosity of tertiary education appears to have no, or if anything, a negative effect on enrollment in all regressions, while spending on primary and secondary education always has a positive and significant impact on tertiary education enrollment. This later finding itself is not surprising. The more students are enrolled in primary and secondary education, the more students are likely to qualify and also enroll in tertiary education, and clearly also increase the total public outlays for this type of education. A more interesting question is, whether or not this effect is generated by only by enrollment rates (quantity effect), or if there is also a quality effect, so that tertiary enrollment depends also on public spending per student in primary and secondary education. We examine this with the regressions shown in table IV.

Once again, columns 1 and 4 display the main results of our basic specifica-

tion. In columns 2 and 4, we distinguish between quantity effects (enrollment rates) and quality effects (expenditure per students) for both primary and secondary education. While enrollment in primary education is not significant due to the fact that it is close to 100% for most countries in the sample, there is a strong and positive effect of for secondary enrollment. This is intuitive: The more students are enrolled in secondary education, the more students are likely to proceed to tertiary education later on in their lives.

More importantly, the regressions also indicate that the quality of primary and secondary education seems to have a positive and significant effect on tertiary enrollment. That is, the positive effect for the total spending on primary and secondary education derives not merely from enrollment rate, but also from different levels of public spending per student.

<b>Table IV: Decomposing Educational Spending</b>						
<b>Dep. Variable: Gross Enrollment Rate in tertiary Education</b>						
	Small Sample			Full Sample		
	1	2	3	4	5	6
GDP per Capita (2000, PPP)	0.97*** (0.163)	0.73*** (0.224)	0.80*** (0.185)	1.13*** (0.163)	0.78*** (0.187)	0.81*** (0.188)
Spending on Prim.&Sec. Educ.	4.92*** (0.998)			2.82*** (0.81)		
Per cap. Exp. on Tert. Educ. (%GDP/cap)	-0.24*** (0.043)	-0.21*** (0.048)	-0.25*** (0.039)	-0.002 (0.004)	0.003 (0.005)	0.003 (0.005)
Population <15 (% of total)	-0.93*** (0.272)	-0.46 (0.343)		-1.20*** (0.155)	-0.69*** (0.205)	-0.70*** (0.202)
Government Revenue (% of GDP)	-0.32** (0.148)	-0.39** (0.153)	-0.39** (0.147)	-0.45*** (0.145)	-0.51*** (0.137)	-0.51*** (0.136)
Small Country Dummy	-19.96*** (3.64)	-18.17*** (5.26)	-18.7*** (6.00)	-18.0*** (3.900)	-16.4*** (3.980)	-16.7*** (3.900)
Urban Population					0.14* (0.075)	0.14* (0.075)
Per cap. Exp. On Prim. Education (% GDP/cap)		0.43** (0.187)	0.56*** (0.203)		0.39*** (0.126)	0.41*** (0.126)
Per cap. Exp. On Sec. Education (% GDP/cap)		0.36** (0.153)	0.37** (0.153)		0.11 (0.108)	0.11 (0.108)
Enrollment Rate in Prim. Education (gross)		-0.09 (0.136)			-0.06 (0.86)	
Enrollment Rate in Sec. Education (gross)		0.21*** (0.071)	0.24*** (0.079)		0.22*** (0.067)	0.20*** (0.064)
Method	OLS	OLS	OLS	OLS	OLS	OLS
Restrictions		GDP per cap > 5000			none	
# of Obs.	56	56	56	84	84	84
R squared	0.82	0.82	0.81	0.78	0.83	0.83

*Robust standard errors in brackets. \*, \*\*, \*\*\* imply significance at 90, 95 and 99% confidence interval.*

## 5 Concluding discussion

In this paper we use an extensive cross-sectional study to evaluate the effects of public spending on tertiary education enrollment. The major empirical findings of this paper are intriguing: First, higher spending on tertiary education does not appear to generate higher enrollment rates. Second, if higher tertiary enrollment is the defined public goal, increased spending on primary and secondary education are probably appropriate means to achieve it.

While a complete explanation of this phenomenon goes beyond the scope of this paper, a few remarks are at order here. It is unreasonable that government subsidies to tertiary education have no incentive effect on the consumption. However, the evidence suggests that these incentives are dominated by other economic and social factors, and therefore public spending has no significant effect on the average enrollment decision. Even if public spending on universities completely removes tuition fees, the private opportunity cost in terms of foregone earnings may still be prohibitively high, and this mechanism is probably especially important in developing countries. The higher these opportunity costs, the lower the marginal effect of public expenditure on enrollment.<sup>4</sup>

As for primary and secondary education, the positive effect of public expenditure on basic education on tertiary enrollment rates is less surprising. Higher public spending on basic education is not only likely to lead to higher graduation rates, but should also be expected to better prepare and motivate young students for continued studies at a higher level.

The findings presented here confirm prior results of the World Bank, which has argued that developing countries tend to overspend on higher education relative to primary and secondary education (Psacharopoulos et al. 1986).<sup>5</sup>

Our results indicate that this finding is not only limited to developing countries,

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<sup>4</sup>The marginal effect comes from higher spending requiring higher taxes, thus slightly decreasing the opportunity cost of higher education. However, this affect is counterbalanced by the fact that higher taxes decrease the expected private returns to education. In practice, both these effects are likely to be very small.

<sup>5</sup>On the other hand, Birdsall (1996) argues that there may be positive externalities associated with higher education not accounted for by previous studies.

but equally applies to rich and industrialized nations. Nevertheless, developing countries would probably be wise to revise their higher education policies in the light of our results. Furthermore, recent findings (Aghion, Meghir and Vandebussche 2004) suggest that higher education has positive growth effects only for countries at the technology frontier. If these results are correct, public expenditure on tertiary education may turn out to be an inefficient way to achieve a questionable goal for developing countries.

## Appendix

### World Development Indicators – Definition of Variables

#### **Expenditure per student, primary (% of GDP per capita)**

Public expenditure on education (primary) is the percentage of GDP accounted for by public spending on public education plus subsidies to private education at the primary level.

#### **Expenditure per student, secondary (% of GDP per capita)**

Public expenditure on education (secondary) is the percentage of GDP accounted for by public spending on public education plus subsidies to private education at the secondary level.

#### **Expenditure per student, tertiary (% of GDP per capita)**

Public expenditure on education (tertiary) is the percentage of GDP accounted for by public spending on public education plus subsidies to private education at the tertiary level.

#### **GDP per capita, PPP (current international \$)**

GDP per capita based on purchasing power parity (PPP). GDP PPP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar in the United States. GDP measures the total output of goods and services for final use occurring within the domestic territory of a given country, regardless of the allocation to domestic and foreign claims. Gross domestic product at purchaser values (market prices) is the sum of gross value added by all resident and nonresident producers in the economy plus any taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current international dollars.

**PPP conversion factor (LCU per international \$)**

Purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as \$1 would buy in the United States.

**Primary education, pupils**

Primary education pupils is the total number of pupils enrolled at primary level in public and private schools but may exclude certain specialized schools and training programs

**Public spending on education, total (% of GDP, UNESCO)**

Public expenditure on education (total) is the percentage of GDP accounted for by public spending on public education plus subsidies to private education at the primary, secondary, and tertiary levels.

**School enrollment, primary (% gross)**

Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on UNESCO's classification of education levels. Primary, or first level, provides the basic elements of education at elementary or primary school.

**School enrollment, secondary (% gross)**

Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on UNESCO's classification of education levels. Secondary provides general or specialized instruction at middle, secondary, or high schools, teacher training schools, vocational or technical schools; this level of education is based on at least four years of instruction at the first level.



**School enrollment, tertiary (% gross)**

Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Estimates are based on UNESCO's classification of education levels. Tertiary requires, as a minimum condition of admission, the successful completion of education at the second level or evidence of attainment of an equivalent level of knowledge and is provided at a university, teachers college, or higher-level professional school.

**Secondary education, general pupils**

Secondary general education pupils is the total number of pupils enrolled at this level in public and private schools but may exclude certain specialized schools and training programs.

## Summary statistics

<u>Variable</u>	<u>Code</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Min</u>	<u>Max</u>	<u>Obs</u>
<i>% of population older 65</i>	pop65	7.65	4.96	2.23	18.60	132
<i>% of population younger 15</i>	pop14	30.10	10.40	14.00	50.12	132
<i>Dummy for Countries with population &lt; 1 Million</i>	small1	0.09	0.29	0.00	1.00	132
<i>Enrolment in primary education (gross)</i>	e1enrolgr	101.17	17.26	35.48	162.30	132
<i>Enrolment in secondary (gross)</i>	e2enrolgr	71.80	34.34	6.22	160.76	132
<i>Enrolment in tertiary education (gross)</i>	e3enrolgr	26.10	21.72	0.31	77.62	132
<i>Expenditure per student in primary education (% GDP/cap)</i>	e1exppc	14.68	9.07	0.41	61.43	117
<i>Expenditure per student in secondary education (% GDP/cap)</i>	e2exppc	22.43	14.44	0.88	81.05	119
<i>Expenditure per student in tertiary education (% GDP/cap)</i>	e3exppc	133.04	268.53	7.37	2074.61	132
<i>GDP per capita 2000 at PPP</i>	gdpppp	9714.73	9561.83	586.13	36047.49	127
<i>Gini coefficient</i>	gini	40.27	9.47	24.44	60.88	100
<i>Government revenue over GDP</i>	revgdp	24.92	9.50	2.01	45.24	101
<i>Life expectancy at birth</i>	lifeexp	66.42	12.05	37.46	81.09	132
<i>Number of students in primary education (millions)</i>	studprim	4.39	15.00	0.02	128.23	132
<i>Number of students in secondary education (millions)</i>	studsecond	2.98	8.37	0.01	65.21	132
<i>Returns to tertiary education (%)</i>	e3returns	9.54	3.73	2.70	21.30	47
<i>Total expenditure on secondary education as % of GDP</i>	e2gdp	0.02	0.01	0.00	0.05	119
<i>Total expenditure primary &amp; sec. education as % of GDP</i>	e12gdp	0.03	0.01	0.00	0.08	111
<i>Total Expenditure primary education as % of GDP</i>	e1gdp	0.02	0.01	0.00	0.05	117
<i>Total Population (millions)</i>	poptot	42.41	146.91	0.12	1280.98	132
<i>Total public education expenditure as % of GDP</i>	etotalgdp	4.48	1.88	0.46	10.36	132
<i>Total Spending tertiary education as % of GDP</i>	e3gdp	1.66	1.08	0.09	6.55	111
<i>Unemployment rate 2000 %</i>	unemploy	9.89	6.98	1.10	39.30	92

## Country list

### *GDP per capita < 5000 US\$ (PPP)*

1 Armenia	36 Madagascar
2 Azerbaijan	37 Malawi
3 Bangladesh	38 Mali
4 Benin	39 Mauritania
5 Bolivia	40 Micronesia, Fed. Sts.
6 Brunei	41 Moldova
7 Burkina Faso	42 Mongolia
8 Burundi	43 Morocco
9 Cambodia	44 Myanmar
10 Cameroon	45 Nepal
11 Central African Rep	46 Niger
12 Chad	47 Pakistan
13 China	48 Papua New Guinea
14 Comoros	49 Paraguay
15 Cote d'Ivoire	50 Peru
16 Cuba	51 Philippines
17 Ecuador	52 Rwanda
18 Egypt, Arab Rep.	53 Senegal
19 El Salvador	54 Sri Lanka
20 Ethiopia	55 Swaziland
21 Gambia, The	56 Syrian Arab Republic
22 Georgia	57 Tajikistan
23 Guatemala	58 Togo
24 Guinea	59 Ukraine
25 Guyana	60 Vanuatu
26 Honduras	61 Vietnam
27 India	62 Zambia
28 Indonesia	63 Zimbabwe
29 Jamaica	
30 Jordan	
31 Kenya	
32 Kyrgyz Republic	
33 Lao PDR	
34 Lebanon	
35 Lesotho	

### *GDP per capita > 5000 US\$ (PPP)*

1 Argentina	36 Lithuania
2 Australia	37 Macedonia, FYR
3 Austria	38 Malaysia
4 Barbados	39 Malta
5 Belarus	40 Mauritius
6 Belgium	41 Mexico
7 Botswana	42 Namibia
8 Brazil	43 Netherlands
9 Bulgaria	44 New Zealand
10 Canada	45 Norway
11 Chile	46 Oman
12 Colombia	47 Panama
13 Costa Rica	48 Poland
14 Cyprus	49 Portugal
15 Czech Republic	50 Romania
16 Denmark	51 Russian Federation
17 Estonia	52 Samoa
18 Finland	53 Saudi Arabia
19 France	54 Singapore
20 French Polynes	55 Slovak Republic
21 Gabon	56 Slovenia
22 Germany	57 South Africa
23 Greece	58 Spain
24 Hong Kong, Cf	59 St. Lucia
25 Hungary	60 Sweden
26 Iceland	61 Switzerland
27 Iran, Islamic Re	62 Thailand
28 Ireland	63 Trinidad and Tobago
29 Israel	64 Tunisia
30 Italy	65 Turkey
31 Japan	66 United Kingdom
32 Kazakhstan	67 United States
33 Korea, Rep.	68 Uruguay
34 Kuwait	69 Venezuela, RB
35 Latvia	

## Country rankings

Rank	<i>Gross Enrollment Rates in Tertiary Education</i>		<i>Expenditure per Student in Tertiary Education</i>		<i>Expenditure per student in tertiary over expenditure per student in secondary education</i>	
	<u>Country</u>	<u>%</u>	<u>Country</u>	<u>US\$ (2000, PPP)</u>		<u>Ratio</u>
1	Korea, Rep.	78	Vanuatu	58 241	Kenya	418.8
2	Finland	74	Lesotho	21 877	Malawi	58.8
3	United States	73	Denmark	19 514	Vanuatu	26.0
4	Sweden	70	Norway	16 762	Central African Republic	16.8
5	Norway	70	Kuwait	16 755	Lao PDR	16.8
6	New Zealand	69	Swaziland	16 155	Guyana	16.7
7	Russian Federation	64	Switzerland	15 833	Kuwait	15.6
8	Australia	63	Mauritius	15 470	Samoa	15.4
9	Latvia	63	Austria	14 594	Guinea	15.1
10	Slovenia	61	Sweden	13 547	Swaziland	15.0

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