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Public spending on education: Its impact on students  
skipping classes and completing school

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**Abstract**

Empirical results using cross-country data suggest that public spending on education increases the rate of students skipping school but does not influence the rate of students completing school. This infers that public spending on education leads to a deterioration in the effectiveness of education.

*Keywords:* Public spending, education, skipping class, incentive

*JEL classification:* H5, I21.

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## **1. Introduction**

The efficacy of public spending is considered a major issue for policymakers. Related to the formation of human capital, it is important to examine how public spending on education influences educational outcomes. Although public spending would be expected to increase the supply of education, it is not clear if this spending really improves economic efficiency through human capital formation. With respect to this issue, a number of case studies have suggested that the performance of public school students is worse than that of private school students (e.g., Bedi and Garg, 2000; Lassibille and Tan, 2003). The association between public education spending and educational outcomes is ambiguous, possibly due to the lack of incentives for both teachers and students (Hanushek, 2003). Supporting empirical study results, theoretical studies suggest that public spending on education increases enrollment but decreases incentives for student achievement (Blankenau and Camera, 2009). When educational outcomes are considered, quantity as well as quality are considered important.

To compare determinants of quantity and quality of education, this study used cross-country data to examine how public education spending affects school completion and skipping school. Public education spending is aimed at increasing the supply of education and enabling students in low-income households to attend school. This might result in a rise in school completion rates across populations. On the other hand, public schools are less likely than private schools to decide teacher salaries based on teacher performance, which is reflected in student performance. If the incentive for teachers to improve student attainment is smaller, performance evaluation standards become looser. Accordingly, students with poor performance can graduate from school, which reduces the incentive for students to learn and leads students to skip school. In short, if there is no incentive mechanism, students can complete school even if they frequently skip school. Public education spending is thought to reduce incentives for teachers and consequently students, leading to a rise in the rate of

students skipping school.

## 2. Data and Model

This study compared the effect of public education spending on skipping class and completion of school. Therefore, the sample should be the same for each estimation. The Organisation for Economic Co-operation and Development (OECD; 2000) provides data on how frequently 15-year-old students skipped class in 1999. For comparison, I used completion of secondary school education in 2000. The sample consisted of 30 observations, corresponding to the total number of countries included in the OECD (2000) as well as in Barro and Lee (2001), and for which other relevant data are available. Table 1 includes variable definitions, sources, and a summary of statistics.

Each independent variable is discussed as follows. The estimated function takes the following form:

$$\text{SCOMPL (or NOSKIP)}_i = \alpha_0 + \alpha_1 \text{PUBEDU}_i + \alpha_2 \text{SEC70}_i + \alpha_3 \text{INCOM}_i + \alpha_4 \text{GINI}_i \text{ (or LOW10, LOW20)} + \alpha_5 \text{TRUST}_i + \alpha_6 \text{NOCORRU}_i + \alpha_7 \text{EXPEND}_i + \alpha_8 \text{OECD\_DMY}_i + \varepsilon_i,$$

where dependent variables in nation  $i$  are rate of completed secondary school education denoted as  $\text{SCOMPL}_i$  or rate of students who did not skip school denoted as  $\text{NOSKIP}_i$ . The regression parameter is represented by  $\alpha$ ;  $\varepsilon_i$  represents the error term. If rate of public spending on education denoted as  $\text{PUBEDU}$  raises  $\text{SCOMPL}$ ,  $\text{PUBEDU}$  will take the positive sign when  $\text{SCOMPL}$  (rate of completed secondary school education in 2000) is the dependent variable. On the other hand, if  $\text{PUBEDU}$  reduces  $\text{NOSKIP}$ ,  $\text{PUBEDU}$  will take the negative sign when  $\text{NOSKIP}$  is the dependent variable.

As presented in Table 1,  $\text{INCOM}$  (per capita income) and  $\text{SEC70}$  (rate of completed secondary school education in 1970) vary greatly among countries, reflecting the difference in

economic development stages among them.<sup>1</sup> An initial condition of educational attainment has commonly been incorporated as an independent variable in existing works (e.g., Bjørnskov, 2009; Papagapitos and Riley, 2009). In this study, SEC70 was included to control for that initial condition. Even if average income is sufficiently large, income distribution is thought to affect human capital formation. To control for income distribution, proxies such as GINI (Gini coefficients of income), LOW10 (Income share held by lowest 10%), and LOW20 (Income share held by lowest 20%) were included. As shown in Bjørnskov (2009) as well as Papagapitos and Riley (2009), social trust plays an important role in human capital accumulation. The measure of trust (TRUST), obtained from the 2000 survey, was therefore anticipated to take a positive sign.<sup>2</sup>

The effectiveness of public education is influenced by governance (Rajkumar and Swaroop, 2008).<sup>3</sup> Absence of corruption (NOCORRU) was included to capture the degree of governance corruption. The sample included developing and developed countries. Therefore, the degree of economic development, which cannot be fully controlled for by the variables above, was captured by OECD\_DMY (OECD countries dummy). Actual investment in secondary education was captured by EXPEND (expenditure per student on secondary school).

### **3. Results**

In the interest of brevity, I have concentrated my focus on results for PUBEDU and results where coefficients were statistically significant. Table 2 shows that PUBEDU was not statistically significant, although it had the expected positive signs in all estimations. This implies that PUBEDU does not significantly influence the completion of school. The positive effect of PUBEDU on school completion is thought to be neutralized by the negative effect of PUBEDU on incentives for students.

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<sup>1</sup> I used the robust standard error to calculate t-statistics for the purpose of controlling for heteroscedasticity.

<sup>2</sup> The measure of trust was the same as in Papagapitos and Riley (2009).

<sup>3</sup> The difference in wages between private and public school graduates may be explained by public policy and regulatory regime (Asadullah, 2009).

In all estimations, SEC70 had a positive sign and was statistically significant, suggesting that the initial condition was positively associated with SCOMP. Consistent with previous works (e.g., Bjørnskov, 2009; Papagapitos and Riley, 2009), the coefficient sign of TRUST was positive in all estimations and was statistically significant in column (2), indicating that TRUST contributes to completion of school.

Table 3 reveals that PUBEDU had the anticipated negative sign and was statistically significant at the 5% level in all estimations, congruent with the prediction. That is, PUBEDU reduces the incentive of students and thus leads students to skip school. Furthermore, OECD\_DMY had a positive sign and was statistically significant at the 1% level in all estimations. As suggested in Table 2, OECD\_DMY had no significant effect on completion of school. A joint consideration of OECD\_DMY results in Tables 2 and 3 reveals that OECD countries do not loosen performance evaluation standards and provide a better incentive mechanism than other countries. Thus, it seems that developed countries (e.g., OECD countries) attach importance to quality of education rather than quantity of education.

The PUBEDU results support the prediction that public education spending leads students to skip school. The quality of human capital deteriorates as a result of public education spending, while quantity of human capital is not affected by such spending.

#### **4. Conclusions**

This study explored how public spending influences the effectiveness of education, using cross-country data. Major findings indicate that a rate of public spending on education over the GDP decreased the rate of 15-year-olds who attended school without skipping classes but did not affect the rate of students completing secondary school education. This implies that public spending promotes deterioration in the effectiveness of education even though it seemingly does not affect

human capital formation.

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Table 1. Variable definitions and basic statistics

Variables	Definition	Source	Mean	Standard deviation	Max	Min
SCOMPL	Percentage of the population over the age of 25 who have completed secondary school education (%).	Barro and Lee (2001)	19.3	10.0	42.9	4.1
NOSKIP	Rate of students who did not skip school within a two-week period at age 15 (%).	OECD (2000)	61.4	11.3	89.7	41.5
PUBEDU	Public spending on education, total (% of GDP)	World Bank (2006)	4.9	1.3	8.3	1.2
SEC70	Percentage of the population over the age of 25 who completed secondary school education in 1970.(%)	Barro and Lee (2001)	12.4	8.4	35.8	1.5
INCOM	Per capita income (thousands of US dollars).	World Bank (2006)	18.8	10.1	48.2	3.7
GINI	Gini coefficient of income	World Bank (2006)	35.8	8.8	57.6	24.7
LOW10	Income share held by lowest 10%	World Bank (2006)	2.7	0.9	4.7	0.7
LOW20	Income share held by lowest 20%	World Bank (2006)	7.0	2.0	10.5	2.6
TRUST	Rate of people who think that most people can be trusted (%)	World Value Survey Association. (2009)	31.9	15.7	66.5	2.8
NOCORRU	Absence of corruption measured from 0 (all-pervasive corruption) to 10 (no corruption).	Transparency International (2000)	6.1	2.4	10	1.7
EXPEND	Expenditure per student on secondary school (% of GDP per capita)	World Bank (2006)	20.0	6.95	38.6	7.7
OECD_DMY	This takes 1 if observation is an OECD country, otherwise 0. (22 and 8 observations are from OECD and other countries, respectively)		---	---	---	---

Table 2. Dependent variable: Those who have completed secondary school education (%; OLS model)

Variables	(1)	(2)	(3)
PUBEDU	0.65 (0.42)	0.66 (0.43)	0.71 (0.45)
SEC70	0.36* (1.90)	0.39* (2.02)	0.37* (1.88)
INCOM	-0.11 (-0.25)	-0.13 (-0.28)	-0.11 (-0.23)
GINI	-0.20 (-1.02)		
LOW10		1.10 (0.52)	
LOW20			0.73 (0.73)
TRUST	24.4 (1.66)	28.0* (1.80)	25.9 (1.66)
NOCORRU	0.04 (0.03)	-0.10 (-0.07)	-0.03 (-0.02)
EXPEND	0.02 (0.08)	0.12 (0.39)	0.07 (0.21)
OECD_DMY	0.81 (0.19)	1.57 (0.32)	1.16 (0.25)
CONSTANT	12.1 (0.79)	-1.10 (-0.16)	-2.12 (-0.32)
Adjusted R <sup>2</sup>	0.40	0.39	0.40
Obs.	30	30	30

*Note.* Values in parentheses are t-statistics calculated by robust standard errors. \* denotes significance at the 10% level.

Table 3. Dependent variable: Rate of 15-year-old students who did not skip school within a two-week period (%; OLS model)

Variables	(1)	(2)	(3)
PUBEDU	-4.43** (-2.64)	-4.26** (-2.72)	-4.29** (-2.67)
SEC70	0.009 (0.03)	0.009 (0.03)	0.002 (0.01)
INCOM	-0.23 (-0.53)	-0.22 (-0.53)	-0.23 (-0.52)
GINI	-0.11 (-0.32)		
LOW10		1.56 (0.43)	
LOW20			0.72 (0.40)
TRUST	6.33 (0.31)	4.27 (0.21)	4.14 (0.20)
NOCORRU	0.89 (0.42)	0.95 (0.47)	0.95 (0.46)
EXPEND	0.39 (0.65)	0.40 (0.71)	0.37 (0.63)
OECD_DMY	11.5** (2.67)	11.1** (2.42)	11.1** (2.47)
CONSTANT	66.1*** (3.00)	57.1*** (7.89)	56.9*** (7.42)
Adjusted R <sup>2</sup>	0.15	0.16	0.16
Obs.	30	30	30

*Note.* Values in parentheses are t-statistics calculated by robust standard errors. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.