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ABSTRACT

Education is the key for economic growth and social development in developing countries. This paper presents findings of a study that analyzed the impact of overall educational expenditures on economic growth in developing nations. It also identifies the levels of education that should be allocated more public expenditures. The study used regression analysis of GNP (gross national product) data of over 140 countries obtained from the World Development Reports of 1982 and 1992 published by the World Bank. Findings indicate that the allocation of greater expenditures on education, especially on primary education, has a positive impact on countries' economic development. Three tables are included. (Contains 20 references.) (LMI)

"Financing Education for Economic Development in Cross Section of Countries"

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I. Introduction

Education is the key for economic growth and social development in developing countries. Almost all the governments of the Third World have put a high priority on the expansion of public education. In addition, they have spent much of their precious resources in this sector. In order to use the limited resources in developing nations, the discussion of priorities of public finance in education is crucial. This study will empirically analyze the effect of educational public finance on economic development by cross national analysis. First, this research will examine the impact of overall educational expenditure on economic growth. And secondly, this research will focus on the allocation of educational expenditures on certain educational levels and try to identify which level of education should receive more public expenditure.

II. Research Questions

(1) Does allocating more public expenditure on education lead to economic development?

(2) Which level of education should more educational expenditure be allocated for economic development?

III. Review of literature

There have been many studies of the contribution of education to economic growth and have suggested that educated human resource are necessary for economic development. Schultz (1961) made a great contribution in establishing the idea that education has a function to formulate human capital which is a basis for economic growth. In the beginning study of education and economic growth, scholars tried to explain the unexplained part of economic growth (they called it "residual") as the technical progress or human factor. (Solow 1957; Svennilson 1964) Education is considered to be a significant part of this residual. Denison

(1962) found that 42% of economic growth in the US between 1929 and 1957 could be attributed to education. Kendrick (1977) also found that 15-25% of economic growth could generally be attributed to education. Psacharopoulos (1973) argued that there are various rates of education that contribute to economic growth depending on the age and income level.

After the fact, that education makes a significant contribution to economic growth, became obvious for researchers, they started to focus on the different levels of education. Most importantly, primary education has been found to have a significant positive impact on economic development. There have been several kinds of research which demonstrate this fact.

The first group of research focuses on the private and social rate of return for each level of education. Looking at earnings of educated people in each level of education - primary, secondary and post secondary education, Psacharopoulos (1973, 1981, 1985, 1993) found that primary education obtains the highest private and social rate of return among the three levels of education across nations and regions all over the world (See Table I). He suggested that the result of the private rate of return explains people's behavior in seeking education of different levels and that of the social rate of return can be used to set investment priorities for future educational investments.

The second research approach noting the contribution of education to economic development is based on productivity. As the result of research in a specific context, for example, individual farmers in agricultural regions in Brazil (Patrick and Kehrberg 1973), rural households in Nepal (Jamison and Moock 1984) and workers in auto factory in Beijing (Min 1987), many studies on productivity and education indicate that primary education has a positive impact on the productivity of workers and farmers in these developing countries. The meta analysis of Lockheed, Jamison and Lau (1980) summarized 18 studies and

concluded that a farmer with 4 years of primary education had an average productivity of 8.7% higher than one with no education.

The third kind of study focused on the experience of successful East and Southeast Asian economies. The World Bank's recent publication "East Asian Miracle" (1993) suggested that the quantity of basic education is considerably higher in this region than in economies with similar income level. It suggested that one of the reasons for the successful economic development in this region is its high human capital formation. This research concluded that the prioritized allocation of public resources to primary and secondary education was the major determining factor in the success of educational strategies in this region.

The fourth approach deals with cross national study. Lee and Psacharopoulos (1979) found that the correlation between the indicators of primary and secondary education in 1960 and the economic indicators in 1970 was higher than those for higher education. Meyer et al (1979), Benavot (1985) and Tilak (1986) also found a more significant and positive impact of primary education on economic development than that of higher education by using cross national study methods.

However, while these cross national studies looked at years of education, literacy rates and enrollment rates, no cross national study has focused on the allocation pattern of educational expenditure, which "East Asian Miracle" suggested to play a significant role in educational development. The purpose of this study is to determine which level of education should receive more expenditures by using cross national study methods. It is hoped that this study may indicate more direct relationships between educational finance patterns and economic development. Also, it may provide public finance administrators with useful information about efficient financial allocations to each level of education.

IV Research Methods

This study uses regression analysis with a time lag to identify the effect of educational expenditure variables on economic growth with cross national data. The data covers over 140 countries. GNP data is obtained from the World Development Reports of 1982 and 1992 published by the World Bank. The educational expenditure variables are from UNESCO Statistical Yearbook, 1982. The existence of missing data and insufficient standardization of data collection are potential problems, especially for educational expenditure variables. The regression model of this study is as follows.

$$Yt = b0 + b1*Yt\text{-}1 + b2*Xt\text{-}1 + e$$

Yt = Gross National Product per capita in 1990

Yt-1 = GNP per capita in 1980

Xt-1 = Educational Expenditure Variables in 1980

To answer the research questions, this regression will run the following different educational expenditure variables independently to identify the effect of each expenditure variables on the growth of GNP per capita.

For the research question (1)

(a) Total educational expenditure as a percentage of GNP in 1980

(b) Total educational expenditure as a percentage of total government expenditure in 1980

(c) Current educational expenditure a percentage of GNP in 1980

(d) Current educational expenditure as a percentage of current government expenditure in 1980

For the research question (2)

(a) Public expenditure on primary and 1st level education as a percentage of all levels in 1980

(b) Public expenditure on 2nd level education as a percentage of all levels in 1980

(c) Public expenditure on 3rd level education as a percentage of all levels in 1980

This type of regression model is generally called a panel design, in which a time gap is put between the dependent variable and the independent variable. This model is more effective in identifying causation than a model in which the times of the independent and dependent variables are the same. In this model, because the time of the dependent variable t and the time of the independent variable t-1 are set differently, the dependent variable of t-1 must be put as an independent variable to control the already existing effect of the dependent variable of t-1. In this research, the time gap is set as 10 years. Although I recognize other possibilities, for example, 20 years instead of 10 years, I decided 10 years because the oil shock presumably had a too big impact on the economic growth in oil producing countries in the 1970's.

V. Results

Table II is the result of the regression analysis for the research question (1). It showed that a country which allocates more total and current expenditure on education as a percentage of GNP grew more in the 1980's while there is no significant evidence which supports the fact that a country which allocates more expenditures as a percentage of government expenditures grew more. Clearly, the findings suggest the importance of actual amount which is invested in education for economic development.

Table III is the result of the regression analysis for the research question (2). It indicates that a country which allocates more expenditure on lower levels of education in 1980 grew more

in the 1980's. There is a significant positive impact of allocating more expenditure on preprimary and 1st level of education on economic development, while the regression with expenditure on 3rd level of education obtained a statistically significant negative impact on economic growth. Apparently, the findings confirmed the importance of primary education for economic growth, as it has been suggested by previous researches.

VI. Discussion and Conclusion

The purpose of this paper was to identify the efficient educational finance pattern for economic development in developing countries. The statistical analysis suggested that allocating more expenditure on education, especially on primary education, has a positive impact on economic development. These findings confirmed the previous findings of the study of educational development. The new point of this research is that it focused on the direct relation between development and educational finance, not on other educational indicators. Implications of the findings are simple. More expenditure should be allocated on education, especially primary education in developing countries. So, the question becomes, "who will fund education in these countries?". Certainly, the governments of developing countries are the primary funders. Given that it is difficult for them to increase the educational expenditure as the first finding suggested, it is still possible for them to change their expenditure allocation pattern on levels of education. They should change their allocation pattern to the pattern in which primary education gets more and higher education gets less as the second finding suggested. In this sense, the second finding is even more encouraging because it suggests the change of allocation pattern of educational expenditure may cause significant impact on economic growth.

Second funders for education in developing countries are international organizations and developed countries. Recognizing that only about 5% of international aid in education goes

to primary education (King 1991), they should allocate more on lower levels of education. Although the importance of investing in primary education has been admitted by the academic community and related international organizations, the emphasis on primary education became apparently stronger in just recent years. Particularly, the two international conferences had a great impact on the international development community to make it concern more in primary education. The first one was the World Conference on Education for All in Jomtien, Thailand which was sponsored by UNDP, UNESCO, UNICEF, and the World Bank in 1990. The conference emphasized basic education in development cooperation. The second conference was the World Summit for Children in the same year. Due to many political leaders' participation in this conference, it successfully gathered the world's interest in the children's situation in the Third World. The World Bank and OECD's involvement in educational development became active after the conferences. Actually, the World Bank is increasing its proportion of educational aid in recent years . Considering the Bank's (and OECD's) influence on the general trend of development cooperation, the emphasis on education in development cooperation may be diffused compared to previous years.

Further research is necessary in the following three areas for financing education in developing countries. First, although this study utilized the worldwide cross national analysis, in the future research, we should focus more on the different stages of development and identify the characteristics of the relationship between education and economic growth in each stage to suggest appropriate financing patterns for the diverse developing world. Second, admitting the importance of financing primary education, we need to identify which part of primary education should accept more public expenditure. There are various ways to use the additional funding in primary education such as teachers' salary, text books, school buildings, etc. Third, as suggested in this study, if the proportion of educational expenditure

on higher education decreases, we need to find alternative way of providing higher education such as privatization of higher educational institutions.

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Table I

Returns to investment in education by level (%)

Region	Social			Private		
	Prim.	Sec	Higher	Prim.	Sec.	Higher
Sub-Saharan Africa	24.3	18.2	11.2	41.3	26.6	27.8
Asia*	19.9	13.3	11.7	39	18.9	19.9
Europe/Middle East/North Africa*	15.5	11.2	10.6	17.4	15.9	21.7
Latin America/Caribbean	17.9	12.8	12.3	26.2	16.8	19.7
OECD	14.4	10.2	8.7	21.7	12.4	12.3
World	18.4	13.1	10.9	29.1	18.1	20.3

* Non-OECD

Source: "Returns to Investment in Education A Grobal Update", 1993, by George Psacharopoulos

Table II *The effect of educational expenditure on economic growth*

Model $Yt = b0 + b1*Yt-1 + b2*Xt-1+e$

	Parameter Estimate	*Standard Error*	*T value*	*Prob > ITI*	*R square*
Xt-1(a)	0.092704	0.0524152	1.769*	0.0791	0.8718
Xt-1(b)	0.004798	0.0491683	0.098	0.9224	0.8649
Xt-1(c)	0.110968	0.0541058	2.051**	0.0422	0.8624
Xt-1(d)	0.076031	0.0550102	-1.362	0.1754	0.8631

* P < 0.1
** P < 0.05
*** P < 0.01

Yt = GNP per Capita in 1990
Yt-1 = GNP per Capita in 1980
Xt-1(a) = Total educational expenditure as % of GNP in 1980
Xt-1(b) = Total educational expenditure as % of total governement expenditure in 1980
Xt-1(c) = Current educational expenditure as % of GNP in 1980
Xt-1(d) = Current educational expenditure as % of current government expenditure in 1980

Table III *The effect of expenditure on each level of education on economic growth*

Model $Yt = b0 + b1*Yt-1 + b2*Xt-1+e$

	Parameter Estimate	*Standard Error*	*T value*	*Prob > ITI*	*R square*
Xt-1(a)	0.128862	0.04769828	2.702***	0.007	0.8671
Xt-1(b)	-0.051817	0.05238889	-0.989	0.3244	0.8629
Xt-1(c)	0.118827	0.0438233	(-2.712)***	0.0075	0.8631

* P < 0.1
** P < 0.05
*** P < 0.01

Yt = GNP per Capita in 1990
Yt-1 = GNP per Capita in 1980
Xt-1(a) = Public expenditure on primary and 1st level education as % of all levels in 1980
Xt-1(b) = Public expenditure on 2nd level education as % of all levels in 1980
Xt-1(c) = Public expenditure on 3rd level education as % of all levels in 1980