On the Role of Education and Culture in Economic Development: The Comparison of Korea and Latin America

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Abstract

The contrasting economic records of Latin American and East Asian countries for the last few decades have motivated vast researches. Many economic policies and development strategies were tested as relevant variables for their successes and failures. This paper intends to explore a less studied aspect, education and culture for the same purpose. One important issue regarding Korean experience in education is how education has played such a significant role in the economic development process with only meager investment. The emphasis given to the primary and secondary education compared to the tertiary was found to be the key both to increase the efficiency of educational investment and to form a virtuous cycle between education and income distribution. And the expansionist strategy even sacrificing material conditions of education was an additional source of increasing returns to educational investment. Another issue is whether the success of East Asian countries can be replicated by other developing nations. If culture matters, the answer will be negative. But the concept of culture is so broad that it cannot be a explanatory variable determining long-run economic growth of a nation. Since many variables, classified as cultural, can be changed by policies, there is no reason why other poor countries should not aspire to the remarkable progress witnessed in East Asia.

I. Introduction

The contrasting economic records of Latin American and East Asian countries during the last three decades have motivated vast researches. Many economic policies and development strategies were tested as relevant variables for their successes and failures. The inward-looking import substitution

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policies of Latin American countries vs. the outward-oriented trade policies of East Asian countries is just one example. This paper intends to explore a less studied aspect, education and culture.

The central question addressed in this paper is how the education in Korea could play such a significant role in the economic development process with only meager investment. And the second question is whether the success of East Asian countries can be replicated by other developing nations. If culture matters, the answer will be negative.

We begin our inquiry in section 2, by introducing four different interpretations -- Neoclassical, Revisionist, No Miracle, Mere Luck -- of the East Asian performance of the last few decades. In section 3, we survey selectively recent researches which have tested the conventional wisdom of neoclassical growth model and new growth theories that have provided the ground for alternative interpretation of the fact. We pay special attention to the role of openness, government intervention and inequality in the growth process because of the contrasting experiences in Korea and Latin America in relation with these variables.

We turn to the data on education and draw some inferences in section 4. Four special features of Korean education, in comparison to the Latin American, are reported: 1) the initial schooling was higher in Korea; 2) the public investment on education had higher return in Korea; 3) the interaction between education and income distribution formed a virtuous cycle in Korea; 4) the quantitative expansion has also contributed to the efficiency. In section 5, we try to show the limitations of the cultural determinism and section 6 summarize our tentative conclusions.

II. Four Interpretations of the East Asian Performance

East Asian countries have a remarkable record of unusually high and sustained economic growth for the last few decades. There have been thousands studies emerging to explain this phenomenon. This literature can be grouped into several with different views according to their interpretation and assessment of the performance. Most economists would agree that their performance was unusual success and there are major lessons to be drawn for other countries, but some others would deny the success itself or the chance to learn any lesson. And even among those who agree on, what these lessons are remains subject to considerable controversy.

"Neoclassical" View:

The East Asian countries' sustained high growth combined with low and declining income inequality was really a miracle requiring explanation. The neoclassical view attributes the remarkable success to rapid accumulation of physical and human capital, sound macroeconomic management, rapidly declining population growth, and market-friendly government policies.

Adherents of the neoclassical view stress in getting the basics right. They argue that the successful Asian economies have been better than others at providing a stable macroeconomic environment and a reliable legal framework to promote domestic and international competition. They also stress that the orientation of the East Asian economies toward international trade and the absence of price controls have led to low relative price distortions. Investment in people, education, and health are legitimate roles for government in the neoclassical framework, and its adherents stress the importance of human capital." (World Bank, 1993)

"Neo-mercantilist or Revisionist" View:

The advocates of this view have successfully shown that East Asia does not wholly conform to the neoclassical model. Industrial policy and interventions in financial markets in some countries, notably Japan, Korea and Taiwan, are not easily reconciled within the neoclassical framework. These countries maintained significant trade barriers during their periods of rapid growth. Revisionists contend that markets consistently fail to guide investment to industries that would generate the highest growth for the overall economy. In East Asia, governments remedied this failure by deliberately 'getting the price wrong' - altering the incentive structure - to boost industries that would not otherwise have thrived. (World Bank, 1993)

The revisionist view appears to be gaining theoretical support from new trade theories that explicitly incorporate features such as imperfect competition and increasing returns to scale, as well as from theories of endogenous growth. The literature on new trade theories admits a possibility that an export subsidy to a domestic oligopolist may increase national welfare. To be specific, the presence of increasing returns to scale, combined with technology spillover, may make it possible for industrial subsidies to permanently alter comparative advantage and thus raise national income.

"Myth of Asia's Miracle or No Miracle" View:

Once appropriate allowances have been made for the large increases in labor force participation rates and for high investment levels, the rates of total factor productivity increase in the four tigers (Korea, Hong Kong, Singapore, and Taiwan) were not unusually high, especially when compared to those in the industrial countries during their convergence in the 1960s and 1970s.(Young, 1993, 1994)

Because "economic growth that is based on expansion of inputs, rather than on growth in output per unit of inputs, is inevitably subject to diminishing returns," the implication of this "Myth of Asia's Miracle" view is that "rapid Asian growth is less of a model for the West than many writers claim, and the future prospects for that growth are more limited than almost anyone now imagines."(Krugman, 1994)

Although there remains question to be answered, such as why only East Asian countries have succeeded to mobilize their resources while other developing countries have failed, Krugman's prediction seems to be vindicated by the Asian currency and financial crisis of 1997. Furthermore, this view has reminded us the importance of productivity growth and technologies and has shown us the policy direction to pursue.

"Mere Luck" view:

Growth rates are highly unstable over time so that differences among countries, or groups of countries, are likely to be ephemeral (Wood, 1997). Shocks, especially those to terms of trade, rather than country characteristics such as education levels or political stability play a large role in explaining variance in growth. It means economic growth depends more on 'good luck' than on 'good policy'. This argument may be true for average of 115 countries in the sample of Easterly et al.(1993). But the issue is why the East Asian countries remain outlier in the sample.

III. Determinants of Economic growth

There has been a rush to test the conventional wisdom of neoclassical growth model. Among them the most comprehensive studies are Barro and Lee(1993), Barro(1996), Hall and Jones(1996), Rodrik(1997), and Sachs and Warner(1997).

Barro(1996) reports empirical finding that strongly supports the general notion of neoclassical convergence. In his words, "for a given starting level of real per capita GDP, the growth rate is enhanced by higher initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of the rule of law, lower inflation, and improvements in terms of trade. For given values of these and other variables, growth is negatively related to the initial level of real per capita GDP. Political freedom has only a weak effect on growth but there is some indication of a nonlinear relation."

Rodrik(1997) obtains a very similar result confirming the contribution of initial income and initial education level, but extended role of institutional quality that is measured taking into account factors like quality of the bureaucracy, rule of law, risk of expropriation and repudiation of contract by government.

In Sachs and Warner(1997), once again, the conventional wisdom is confirmed. Other things being equal, initial conditions -- GDP per capita and schooling -- matter. Demographic variables such as life expectancy, dependency ratio, population growth rate affect the saving and investment in education, in turn, growth rate. Openness, government saving, and institutional quality are also proved crucial for economic development. In addition to these variables, they adds physical geography. Landlocked countries grew more slowly than coastal economies. And tropical countries grew more slowly than those

temperate zones. A surprising result is the negative correlation between endowment of natural resources and growth rates reported in Sachs and Warner(1995).

Openness and Growth

Since the Mercantilist era, social analysts have debated the relation between trade policy and economic performance. The controversy continues today in spite of numerous studies that claim to find a positive effect of openness on growth. However, the lack of solid theoretical model and reliable data put in question the validity of those studies' conclusions. A wave of new attempts has turned to re-test those claims with newly accumulated data set. (See Helliwell(1992, 1996); Barro(1996); Frankel, Romer and Cyrus(1996); Sachs and Warner(1997); Edwards(1997)

The experience of East Asia, supported by these recent researches on growth, has convinced many observers that an outward-looking development strategy is conducive to growth. There are at least four channels through which trade is believed to affect growth. First, international trade allows countries to specialize according to comparative advantage. Second, international trade provides access to larger markets and allows greater exploitation of increasing returns. Third, trade can contribute to growth by creating channels to acquire technology and managerial know-how. Finally, trade can affect economic performance through its impact on the political process. Trade restrictions generally encourage rent-seeking actions at the expense of productive activities.

Although all of the above mentioned studies attributes to openness a significant role for the East Asian growth, in the case of Sachs and Warner(1997), Helliwell(1996) and Frankel et al.(1996), openness is the dominant explanation. Helliwell(1992) reports that growth is faster in those Asian countries that are more open to imports and capital movements. This may be because, as emphasized by Grossman and Helpman(1991), technological spillover could come via imports as easily as exports. Indeed, imports of natural resources, intermediate inputs, and capital goods played a crucial role in Korea's rapid growth.

Though Korea's exports grew faster than her imports, the increase of Korea's imports in absolute terms exceeded growth of exports during last thirty years. If the country had been forced to rely on domestic supplies of raw materials and capital goods, its exports would not have been competitive and thus could not have grown so rapidly. Thus Korea's growth was as much import-led as export-led.

Government Intervention and Growth

The controversy between 'neoclassical' and 'revisionist' is basically concerning the role of government intervention in the development process. The fact that in most of East Asian countries the government played active role permitted the alternative interpretations. They intervened systematically and through multiple channels to foster development, and in some cases the development of specific industry.

In this respect Korea offers a prime example since growth policies in Korea did involve interventionist and protectionist elements. The Korean case deserves attention because not only there is disagreement

about the extent or the role played by government policies, but also both sides claim its experience as evidence for their contentions.

The standard position to which most orthodox economists subscribe is one of 'neutral' or 'market friendly' intervention argument.[2] They have reckoned that Korean government intervention was an effort to maintain a rough neutrality between the incentives provided to the different industries, thus leading a virtual free trade regime. World Bank(1991) endorsed this view by declaring that in Korea "intervention was moderate in the sense that it did not lead to large price distortions."

This orthodox account has been criticized for downplaying the active role of government in shaping the allocation of resources.[3] Popularizing the revisionist view, Amsden(1989) have argued that the Korean export-oriented strategy went considerably beyond giving markets and comparative advantage free rein. According to her, Korean government had clear industrial priorities and did not hesitate to intervene to get the relative price 'wrong' in order to overcome the penalties of late industrialization.

An eclectic interpretation that does not fully support the revisionist view but sympathizes with it, emphasizes the pre-conditions for success of intervention policy. In assessing the role of selective interventions for growth, World Bank(1993) concludes that "in a few economies, mainly in northeast Asia, government interventions sometimes resulted in higher and more evenly distributed growth than otherwise would have occurred. The prerequisites for success were so rigorous, however, that policy-makers seeking to follow similar paths in other developing economies have often met with failure." Rodrik(1994) also asserts that "that government intervention could play such a productive role was conditioned in turn by a set of advantageous initial conditions, namely a favorable human capital endowment and relatively equal distribution of income and wealth." Therefore the challenge is not only to try understand which specific policies may have contributed to growth, but to understand the institutional and economic circumstances that made them viable.

Despite all the discussion and interest concerning the issue, empirical investigation is surprisingly rare and the arguments supporting each view are based merely on macroeconomic data or on isolated case of a particular industry. To evaluate whether selected intervention were good for growth, it need to investigate the effect of each government intervention such as tariffs, import restrictions, credit and tax incentives at sectoral level. Yoo(1990) and Lee(1995) have met this demand. Using panel data on 38 Korean manufacturing industries, Lee tested the relationship between government intervention and sectoral productivity growth. They have presented a completely different view on the subject. The Korean economic growth has been in spite of government intervention rather than because of it..

[2] See Lal(1985), Balassa(1988), Krueger (1990) among others.

[3] See Pack and Westphal(1985), Wade(1990) for the revisionist view.

Inequality and Growth

It has long been economists' conventional wisdom that the equitable distribution of income and wealth in East Asian countries played a favorable role in their economic performances, while the extremely skewed distribution in Latin American countries were a serious impediment to growth. In recent years many studies have examined the link between inequality and growth. And the conventional wisdom finally comes under scrutiny.

Benabou(1996) surveys and reports "the main results from twenty-three recent studies of the links from inequality to growth or investment." These formal empirical tests, "run over a variety of data sets and periods with many different measure of income distribution, deliver a consistent message: initial inequality is detrimental to long-run growth. The magnitude of this effect is consistent across most studies: a one standard deviation decrease in inequality raises the annual growth rate of GDP per capita by .5 to .8 percentage points."

High inequality affects growth rate mainly through investment level. Under incomplete capital market, many poor people cannot borrow to finance their children's education. Perotti(1996) confirms that higher inequality leads to less education, especially at the secondary level. The inequality influences the level of investment via fertility change too. Greater equality brings lower fertility rates.

Another possible channel is social conflict and the security of property rights (Benabou(1996); Perotti(1996). Greater inequality increases the pressure for redistribution; and thus, the investment becomes riskier.

IV. Education and Economic Growth in Korea

Economists are unanimous on that education is important for economic growth. And recent researches confirm that the human capital has played major role in the economic development process of Korea. It is interesting to see what features of Korean education have contributed to its economic success. With a glance through the basic data on education and some help of the well-established research results, we may assert the followings:

The initial schooling was higher in Korea.

The school enrollment data (See Table 1) show that, at the beginning of 1970s, Korea had no advantage of education, both in primary and secondary level, over major Latin American countries except Brazil. The gross school enrollment ratio of secondary level in Korea began to increase rapidly from 1975 widening gap with those of Latin American countries. In tertiary level, Korean enrollment ratio was much lower than that of Argentina until 1980 and a little bit higher than those of Brazil and

Chile. Due to the steady increase during the 1980s and 1990s, it reached very high level even by high income country's standard.

The direct comparison of the data raises doubts whether Korea had any advantage in initial schooling conditions and, consequently, the validity of cultural root hypothesis of the high Korean investment in human capital. Considering income level, however, the Korean education level measured in terms of school enrollment is much higher than major Latin American countries. In 1980 when Korea reached the comparable income level to Latin American countries (See Table 6), its secondary level enrollment ratio exceeded far above those of Latin American countries.

The public investment on education had higher returns in Korea.

Although the allocation share of the public expenditure on education for primary level, around 40% to 50%, is not much different in all four countries, the shares of secondary and tertiary level show big differences (See Table 2). In 1980, the only year when comparable data is available, Korea ranked in the middle in total public spending on formal education and primary education as proportion of GDP. During the 1970s and 1980s, Korea had been spending less than Chile on primary education and this relation reversed only in 1990. The marked difference in public spending pattern can be noticed in secondary and tertiary level. Korea had been spending far more on secondary level and far less on tertiary level than Latin American countries.

The first important implication of this spending pattern is on the efficiency of educational investment. Measuring the efficiency with the benefit-cost ratio of education where the benefits represent the relative earning differentials by educational level, the returns to investment on secondary education are much higher than those on tertiary education. (Psacharopoulos, 1972) Therefore, the country that spend more on secondary education than on tertiary will get higher return on their educational spending. It is the case of Korea.

The interaction between education and income distribution formed a virtuous cycle in Korea.

The second implication of the above-mentioned spending pattern is on the distribution of income. The education contributes to long-run economic growth directly by enhancing productivity of labor force. Also it works indirectly influencing levels of fertility and rural-urban migration. Another important channel through which education affects the performance of an economy is its impact on the distribution of income. This impact, however, may act to increase or to decrease income inequalities depending on how educational systems are structured.

The reason for eventual perverse effect of formal education on income distribution is the positive correlation between a worker's schooling level and his lifetime earnings. If, for financial or any other reasons, the poor have disadvantage over the rich in access to secondary and higher educational

opportunities, the public spending on these levels of education will end up subsidizing the middle and upper income class students who actually enjoy the educational opportunities of these level and, consequently, the educational system may help to perpetuate or to increase inequalities. Considering 'opportunity cost' of a child's labor to poor families, the private cost of education is higher for poor students than for rich students. So it is reasonable to assume that poor student have less chance of completing any given educational cycle than relatively rich students.

In short, in countries "characterized by highly unequal distributions of personal income, sizable secondary school fees and subsidized higher education, the educational system probably operates to increase inequality and perpetuate poverty."(Todaro, 1977: p.256) Unfortunately, it is the case of most Latin American countries. Their educational systems, especially of Brazil, have acted to increase rather than to decrease these income inequalities.

The quantitative expansion has also contributed to the efficiency.

In all educational level, Korea has recorded considerably higher pupil/teacher ratio than Latin American countries (See Table 3). Interpreting the pupil/teacher ratio as a proxy of educational quality, one may conclude Korea obtained high enrollment ratios at the expense of quality of education. But it is not necessarily so. Many empirical tests demonstrate that the pupil/teacher ratio does not necessarily reflect the quality of education. One recent evidence is the Third International Maths and Science Study (TIMSS). "TIMSS found that France, America and Britain, where children are usually taught in classes of twenty-odd, do significantly worse than East Asian countries where almost twice as many pupils are crammed into each class."[4] As this study suggests if there had been no trade off between education quantity and quality, the Korean expansionary approach could be the most important source of educational investment efficiency.

In summary, the special feature of Korean experience in education is its efficiency. With only small public expenditure on education compared to those of Latin American countries Korean government managed to supply the skilled labors that the development process had been requiring. The allocation of public resources to primary and secondary education was the major determining factor in Korea's successful educational strategies.[5] The expansionist strategy even sacrificing educational quantitative standard such as the pupil/teacher ratio also has contributed to raise the rate of return on educational investment. These facts raise deeper question: What has made Korea to choose this kind of policies?

When we talk about education policy strategies, our attention is usually concentrated in the supply side of educational services. The variables such as overall budgetary commitment to education or the

[4] "World Education League: Who's top?" *The Economist,* March 29, 1997.

[5] The World Bank Report puts this point as "They responded more appropriately to coordination failures in the market for education. . . . . This stands in stark contrast to many other low- and middle-income economies, which have stressed public subsidies to university education."

distribution of budget among different levels of education are closely watched. However, these variables alone cannot explain how education plays such a significant role for the economic growth in Korea [6]. We need to understand the secret of maintaining the minimum quality standard of education and the determinants of demand for educational services. More specifically, we should explain why the demand for education in Korea remains high in spite of the poor material condition. The writers of cultural explanations may claim that unusually high and inelastic demand for education comes from the respect of learning which is a part of the Confucian value system. It may contain a grain of truth but it is a hypothesis never tested. For economists, the investment is a function of its rate of return. In a traditional Confucian society, high learning meant job, respect, power, and social status, in short everything. Then the high demand for education is the natural response to this incentive system.

But rewarding high learning with high rate of return occurs in most developing countries. Then why other countries did not take the same path choosing the kind of policies Korea had? Have not people responded to the incentive of high reward? Or are the demands suppressed to guard the interest of the ruling and learned class? As noted above, in most Latin American countries, the unfortunate combination among variables -- the unequal income distribution, the higher education centered educational system, and the incentive mechanism -- worked to form a vicious cycle between income distribution and education. On the other hand, in Korea, the equitable initial income distribution, well chosen educational system, and the Confucian flavored incentive mechanism have worked to ensue the opposite result.

V. Culture and Economic Growth

For a long time critiques of the neoclassical growth theory have been arguing that major determinants of long-run growth are the product not of rational behavior in the economists' sense of term, but of non-rational habit. To those academics who normally give more weight to the uniqueness of historical experience of a society, factors such as education, economic instability or openness are more of cultural products rather than the product of rational choice obeying universal law.

If only geography and culture matter so that their claims acquire credibility, its implication in practical level is very serious because it implies one country's success cannot be replicated by other countries. This, inevitably, leads us to intriguing questions about the relationship between culture and economic growth.

The classic pronouncement of the thought which links culture and economic performance was Max Weber's study of capitalism and the Protestant work ethic. For him the Protestantism was the reason

[6] According to Frankel, Romer and Cyrus(1996), education is the dominant factor -- excluding the unexplained residuals (Solow residual) -- explaining more than one quarter of Korean growth.

why one region of Europe was more prosperous than other areas. In the 1950s, some writers of this tradition pointed the Confucian value reflected on class stratification disdaining commerce and industry as responsible for the Asian economic retardation.

In the recent upsurge of interest in culture, the theme has returned to explain the old and new fact. However, it is embarrassing to see the same factors of one value system doing the opposite role now. To Thomas Sowell(1995), a disdain for commerce and industry was a Hispanic trait and the cause of Latin American problems. Harrison(1992) and Lee Kuan Yew, the ex-premier of Singapore, defended the thesis that the respect for education and work ethic of Confucian value, which once was blamed for Asian economic under-performance, is the key to economic success of Asian countries.

The fundamental doubts that plague all these cultural explanations come from the definition of culture. What most culture writers mean by this term is so vague and broad that, you could argue, they can hardly be useful to explain behavior. The same culture embraces such conflicting features that it can produce wholly different effects at different times. A culture may disdain commerce and industry but value education at the same time as it occurred in the Confucian value system. The former attitude certainly discourages the economic activities and the latter help the economic development. However, the effect of education on economic growth will be much greater in information age than in agricultural age. Therefore, it is important to understand how each component or aspect of a culture affects the economic behavior.

The second problem with the culture argument that is also derived from the vagueness of the definition, is a belief that the concept of culture excludes rationality. If we admit that education, fertility, institutions be cultural variables, the critics of the growth model are right. Many determinants of long run growth are cultural. However, what they have missed is that these variables, classified as cultural, can be changed by policies and can be modified through economic incentives and, above all, can be explained by rationality. Thus there is no reason why other poor countries should not aspire to the remarkable progress witnessed in East Asia and replicate their success.

Barro(1996) shows a very meaningful result regarding the cultural factors on growth. The unusual growth experiences of Sub-Saharan Africa, Latin America and East Asia is mostly accounted for by explanatory variables, already cited in Section II. The regional dummies representing three regions in the regression were statistically insignificant. The inclusion of inflation, government consumption, and schooling , is critical for eliminating regional dummies. If the regional dummies were essential, it might have been claimed these were cultural.

VI. Conclusion

The economic performance of East Asian countries during the last thirty years is so exceptional that it has raised many questions. On the other hand, new economic theories that have provided the ground for alternative interpretation of the fact, have encouraged debates on many fronts and have claimed empirical researches as supporting evidence. Consequently large numbers of studies have loomed up. We surveyed selectively a part of them.

Even though there is no consensus on which one is more important than others, these new empirical findings point out the following factors as the crucial determinants of long-run growth: initial level of income per capita, initial schooling, life expectancy, fertility, dependency ratio, population growth rate, government consumption, openness, institutional quality, inflation, terms of trade, and physical geography. A part of them is exogenously given by nature, by history or by international environment. The rests are variables that can be changed by government policies as long as governments have a will to do so. However, some of them can be changed only in the long run.

One important issue regarding Korean experience in education was how education played such a significant role in the economic development process with only meager investment. The emphasis given to the primary and secondary education compared to the tertiary was found to be the key both to increase the efficiency of educational investment and to form a virtuous cycle between education and income distribution. And the expansionist strategy even sacrificing material conditions of education was an additional source of increasing returns to educational investment.

Another issue is whether the success of East Asian countries can be replicated by other developing nations. If culture matters, the answer will be negative. But the concept of culture is so broad that it cannot be a explanatory variable determining long-run economic growth of a nation. Since many variables, classified as cultural, can be changed by policies, there is no reason why other poor countries should not aspire to the remarkable progress witnessed in East Asia.

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TABLES

Table 1. School Enrollment in Argentina, Brazil, Chile and Rep. of Korea

	1970	1975	1980	1985	1990	1992	1993
School enrollment, primary (% gross)							
Argentina	105	106	106	107	111	-	107
Brazil	-	88	99	101	109	111	-
Chile	107	118	109	105	100	99	98
Korea, Rep.	103	107	110	97	105	103	101
School enrollment, secondary (% gross)							
Argentina	44	54	56	70	-	-	-
Brazil	26	26	34	36	39	43	-
Chile	39	48	52	67	73	69	70
Korea, Rep.	42	56	78	92	90	91	93
School enrollment, tertiary (% gross)							
Argentina	-	-	21.8	35.7	-	-	40.5
Brazil	-	-	11.1	-	11.3	11.5	11.5
Chile	-	-	12.3	15.5	20.5	25.8	26.7
Korea, Rep.	-	-	14.7	34	38.6	42.4	48.2

Source: World Bank, *World Development Indicators on CD-ROM*, 1997.

Table 2. Public current expenditure by level of education in four countries

(% of total)

		1st level	2nd level	3rd level	other	Not distributed
Argentina	1980	40.1	25.6	22.7	1.9	9.7
	1986	5.5	43.3	30.8	2.4	18.0
	1990	3.4	44.9	46.7	2.4	2.6
	1993	72.2	-	18.1	-	9.7
Brazil	1980	44.8	7.1	18.9	-	29.3
	1985	45.9	7.7	19.6	-	26.8
	1989	48.8	6.9	25.6	1.3	17.5
Chile	1980	42.7	18.0	33.2	2.3	3.8
	1985	51.0	19.5	20.3	6.0	3.2
	1991	49.2	15.3	21.6	9.3	4.6
	1993	48.6	13.4	21.0	8.1	8.8
Korea	1980	49.9	33.2	8.7	0.1	8.2
	1985	46.7	36.7	10.9	0.9	4.8
	1990	44.3	34.1	7.4	1.3	12.8
	1992	42.2	39.4	6.9	2.4	9.1

Source: UNESCO, *'95 Statistical Yearbook.* UNESCO Publishing & Bernan Press, 1995.

Table 3. Pupil/Teacher Ratio in four countries

Pupil-teacher ratio, primary				
	1982	1987	1991	1993
Argentina	20.3	19.5	16.5	-
Brazil	24.5	23.0	22.5	22.7
Chile	33.4	29.1	24.9	26.2
Korea, Rep.	43.9	36.7	34.4	31.1
pupil-teacher ratio, secondary				
	1980	1985	1990	1991
Argentina	-	7.8	-	8.0
Brazil	14.2	14.6	14.4	14.6
Chile	-	-	-	14.3
Korea	39.1	35	25.2	23.2(94)
pupil-teacher ratio, tertiary				
	1980	1985	1990	1993
Argentina	10.6	12.0	-	12.0(91)
Brazil	12.8	12.4(86)	11.7	11.6
Chile	-	-	-	13.8
Korea	29.2	37.6	20.0	18.3

Source: World Bank, World Development Indicators on CD-ROM, 1997.

UNESCO, '95 Statistical Yearbook. UNESCO Publishing & Bernan Press, 1995.

APPENDIX

Table A: Public Spending in Education in Argentina, Brazil, Chile and Republic of Korea

	1975	1980	1985	1990	1992	1993
Public spending on education, primary (% of GDP)						
Argentina	-	0.90	-	-	1.55	2.33
Brazil	-	1.60	-	-	-	-
Chile	1.30	1.81	1.94	1.27	1.25	1.23
Korea, Rep.	0.99	1.49	1.60	1.36	1.40	1.43
Public spending on education, secondary (% of GDP)						
Argentina	-	-	-	-	0.80	-
Brazil	-	0.30	-	-	-	-
Chile	0.50	0.76	0.74	0.42	0.38	0.34
Korea, Rep.	0.41	1.00	1.26	1.04	1.31	1.36
Public spending on education, tertiary (% of GDP)						
Argentina	-	0.50	-	-	0.54	0.59
Brazil	-	0.70	-	-	-	-
Chile	0.94	1.41	0.77	0.49	0.52	0.53
Korea, Rep.	0.19	0.26	0.37	0.23	0.23	0.27
*Total public spending on formal education(% of GDP)**						
Argentina	-	1.40	-	-	2.89	2.92
Brazil	-	2.60	-	-	-	-
Chile	2.74	3.98	3.45	2.18	2.15	2.10
Korea, Rep.	1.59	2.75	3.23	2.63	2.94	3.06

Source: World Bank, *World Development Indicators on CD-ROM*, 1997.

Note: * = primary + secondary + tertiary

Table B: Education in Argentina, Brazil, Chile and Rep. of Korea: Some comparisons

	School life expectancy number of years	Net enrollment ratios at the first level	Percentage of cohort reaching grade5	Number of 3rd level students per 100,000 inhabitants	Public expenditure on education as % of GNP
	1992	1993	1991	1992	1993
Argentina	13.2	95	-	3323	3.3
Brazil	10.9	90	72	1079	-
Chile	11.8	87	95	2336	2.7
Korea	13.7	99	100	4253	4.2
Latin America	-	-	-	-	4.6
East Asia	-	-	-	-	3.0

Source: UNSCO, '95 Statistical Yearbook. UNESCO Publishing & Bernan Press, 1995.

Table C: Education and Population in Argentina, Brazil, Chile and Rep. of Korea

	1970	1975	1980	1985	1990	1992	1993	1995
Age dependency ratio (dependents to working-age population)								
Argentina	0.6	0.6	0.6	0.7	0.6	-	-	0.6
Brazil	0.8	0.8	0.7	0.7	0.6	-	-	0.6
Chile	0.8	0.7	0.6	0.6	0.6	-	-	0.6
Korea, Rep.	0.8	0.7	0.6	0.5	0.4	-	-	0.4
Age efficiency, primary (net enrollment as % of gross)								
Argentina	89.89	90.79	-	-	-	-	-	-
Brazil	92.44	80.40	81.76	81.50	81.34	80.70	80.23	-
Chile	86.44	83.86	-	-	87.82	86.86	88.71	-
Korea, Rep.	60.61	61.08	63.58	62.01	66.07	61.48	60.04	-
Illiteracy rate, adult total (% of people 15+)								
Argentina	-	-	-	-	4.7	-	-	3.8
Brazil	-	-	-	-	18.9	-	-	16.7
Chile	-	-	-	-	6.6	-	-	4.8
Korea, Rep.	-	-	-	-	3.7	-	-	2

Source: World Bank, World Development Indicators on CD-ROM, 1997.

Table D: GNP per capita in Argentina, Brazil, Chile and Rep. of Korea

Atlas method (US$)

	1970	1975	1980	1985	1990	1992	1993	1995
Argentina	1210	2680	2890	2660	3270	6110	7260	8030
Brazil	450	1170	2190	1580	2610	2660	2670	3640
Chile	830	920	2160	1410	2170	2860	3190	4160
Korea, Rep.	270	640	2330	2260	5770	7220	7720	9700

Source: World Bank, World Development Indicators on CD-ROM, 1997.