

Microeconomic Determinants of Economic Growth in East Asia

Ari Kuncoro¹

I. Introduction

Until recently, East Asian Economies have become the model of successful economic development. High growth is achieved largely by getting the basics right. This success is often thought within the framework of traditional trade theory in which both competitiveness and external trade, which are the keys of rapid economic growth and stability, are achieved through series of economic liberalization. The orthodox interpretation of East Asian economic miracle often conceals many country specific characteristics. Although, there is a little disagreement regarding the role of competitiveness and trade in fostering growth, it also clear that many highly relevant facts particularly from the perspective of microeconomic agents are still waiting to be explored.

East Asian phenomenal growth is often associated with its high saving rate.² There is no other region in the World where above average saving ratio is accompanied by above average economic growth. The World saving ratio has shown declining trend from 25 percent in 1973 to 19 percent in 1993-94. Meanwhile, the saving ratio in East Asia has risen from 18.3 percent of GNP during 1965-73 to 27.6 percent during 1984-93 and the Pacific (without China) and from 25.3 percent to 36.8 percent in China (Schmidt-Hebbel and Serven 1999). In other parts of the World, the trend is less encouraging than in East Asia. Schmidt-Hebbel and Serven (1999) documented that South Asia is the only other developing region showing increasing saving ratios albeit from a very low 9.5 percent in 1965-73 to 15.3 percent in 1984-93. The Middle East and North Africa (MENA) region saw a decline of saving rate after reaching its peak in the period of oil boom. The saving rate of MENA declined from 29.0 percent to 19.8 percent during 1984-93. Latin America and Caribbean region also experienced similar fate. But the worst case scenario took place in sub-Saharan Africa where saving rates have been declining steadily from 10.5 percent in 1965-73 to a low level of 6.4 percent in 1984-93 (Schmidt-Hebbel and Serven, 1999).

¹ Researcher and Lecturer, Faculty of Economics, University of Indonesia

² In contrast to the simplistic view of saving to growth relationship, the seminal work of Solow (1956) has shown that saving does not cause growth in the long run. In this model, the only possibility that an increase of saving rate would increase the rate of growth is in the “short-run”, when the output per capita moves from the old equilibrium to the new higher one.

Although a strong positive association between saving ratios and real per capita growth has been documented in many cross section empirical studies, the problem of economic development is not as simple as raising saving rate. There is no clear consensus on how to interpret such relationship. The problem is the direction of causality. On the one side there are supporters of saving to growth models (for example Mankiw, Romer, and Weil, 1992). On the other hand, there is also growth to saving model (Modigliani, 1970 and Carrol and Weil (1994). For the policymakers the direction of causality is important. If the causality runs from growth to saving, then the proper policy to promote economic growth should be aimed at promoting investment or improving the efficiency of investment. If on the other hand, the causality runs from saving to growth, then the focus of policy is to design saving incentives.

The availability of saving is not sufficient to ensure the rapid and sustained growth and the reduction of poverty. What also matters is how saving can be channeled into productive use. While the decision to save is decided by individual consumers, the decision to produce is made by individual firms. There is no guarantee that individual firms can use saving to finance their productive projects without the existence of efficient intermediary. Individual firms may face discrimination based on size, age, reputation, as well access to international market. Access to external funds is only one factor among many that may hamper individual enterprise to optimize or to expand its productive capacity. Other factors such as firms' technological progress, the quality of human capital, trade and industrial policies and the presence of adequate basic infrastructure may play role as well.

The purpose of this paper is to identify the main micro level factors contributing or hampering economic growth which is in the case of East Asia include high rates of household saving, productivity growth in firms and the willingness to invest in education. East Asia is defined to include China, Hong Kong (China), Japan, the Republic of Korea, Singapore and Chinese Taipei (Taiwan), and countries in South East Asia such as Indonesia, Malaysia, the Philippines and Thailand.

Geographically countries like Cambodia, Laos, Myanmar, and Vietnam are also located in South East Asia, however due to difficulties in obtaining good empirical articles concerning these nations we do not include them in the discussion of an individual country. Perhaps the most apparent reason for exclude them is that the economic performance of seven East Asian countries like North Korea, Mongolia, Vietnam, Cambodia, Laos and Myanmar is poor. Oil-rich Brunei is also appropriately omitted from any comparison other members of East Asian League. Vietnam has embraced more market-oriented approach in handling its economic affairs. However, its track record is too short to warrant any meaningful analysis.

2. Savings in East Asia

East Asian economies have been known for their high saving rates <Table 3 through Table 5> and Table 2). East Asian nations like Korea, Thailand, and Indonesia were also known for their appetites for foreign savings to finance their domestic investment. The lesson from the Asian crisis has been learned. The East Asian crisis has shown that although high level of nation saving is very important to domestic and external stability, it does not ensure the economy from the risk of fragile financial system and/or unrealistic exchange rate policies. In several East Asian countries mostly affected by the economic crisis such as Korea, Thailand and Indonesia, the high domestic interest rate policy and overvalued exchange rate played part in over-dependence on foreign savings. This turn increased the economy's exposure to three risks; currency mismatch, maturity mismatch and credit risk itself. For that reason, there is assertion in worst affected countries in East Asia that mobilization of national saving is still crucial issue in long-term economic growth, (Kohsaka 1998).

From the microeconomic point, the interesting question then is what factors that motivate East Asians to save so assiduously. Also, we can think of three players, government, private sector and household. Domestic or national savings comprise of household savings and corporate savings (which together form private savings) and government savings. Since the household sector in East Asia uses the financial system extensively to channel its saving to investment, this paper focuses on household savings.

A comprehensive review of saving trend in East Asia is documented in Kohsaka (1998). This study, perhaps due to the data limitation, focuses on the aggregate savings like domestic savings (public savings plus private savings). For most countries under study, household savings, which are together with corporate savings forms private savings, are calculated as residuals from the national account. Some countries however, manage to come up with a true household data.

The main East Asian Economies can be grouped into several categories according to their level of economic development. Japan is considered as the most industrialized economy in East Asia and then there is a group called the new industrialized economies (NIE) which comprises of Hong Kong, Korea, Chinese Taipei and Singapore. Finally, four members of ASEAN, Thailand, Malaysia, Indonesia and the Philippines are grouped in to the ASEAN four. The salient feature of Japan and NIE are their high saving rates. Especially after 1985, high domestic saving rate in excess of 30 percent of GDP is a norm rather than an exception. The ASEAN four are the next highest savers. Across countries in this region we can observe a strong positive correlation between domestic savings and real economic growth. The higher the saving rate to GDP, the higher is real GDP growth.

The similarity between NIE and ASEAN4 only appears at the aggregate domestic savings. If one looks at each component of domestic savings there is a striking difference

between Japan and NIE on one side with ASEAN4. For Japan, private savings exhibit a downward trend due to a significant decline in household savings. For NIEs on the other hand, after reaching a high level saving rate around 30 to 40 percent of GDP, private savings start to show the sign of leveling off. The aggregate savings data for ASEAN4 present us with an interesting observation. Although, the overall trend of domestic savings continues to follow an upward trend, private savings appear to become stagnant in Indonesia, Malaysia, and Thailand. The cause of private savings stagnation is a significant decline in household savings from the late 1980s. Whether this is due to the data defects is unclear. The only possible explanation is that during this period these economies experienced economic boom, which had a depressing effect on household savings.

The contribution of corporate saving in private saving in East Asia could not be underestimated. In fact corporate saving might be the crucial factor behind East Asian phenomenal growth. As mentioned before in some East Asian countries like Indonesia, Malaysia and Thailand in the face of declining household savings, corporate savings contributed significantly to prevent private savings from declining <Table 3>. In countries where the separate data on household and corporate savings are available, corporate saving accounts for more than half of private saving (for example Thailand, the Philippines, Malaysia). Unfortunately most corporate saving data are calculated from the national account. Unlike the household level saving data, the corporate saving data at the firm level or industry level are hard to get. So it is difficult to estimate the firm saving behavior.

Deaton (1999) raises a point on the importance of investigating the firms' saving behavior since they are ultimately the agents that retain profit to finance investment. The cross country relationship between growth and saving rates might come from economic growth driven by investment. In this respect, saving is an intermediate form of profits or any accumulated fund before turned into investment. Therefore saving only responds passively to investment. It is even possible that households do not take part in the act of saving, rather some well off people or entrepreneurs or big firms who actively carry out the saving.

3. Household Savings and Investment Decision

3.1. Determinants of Private Savings in East Asia

In the beginning the East Asian study on saving (Kohsaka 1998), the view is that economic growth is driven by saving. So to promote saving it is necessary to investigate the determinants of private saving. To achieve the above purpose, the approach is to use the standard framework of the Life Cycle Hypothesis (LCH) as its microeconomic foundation. One problem this study is that in the LCH model the causality runs from growth to saving. Therefore it is not too surprising that the study failed to answer on how important is saving for economic growth.

Kohsaka (1998) acknowledged the weaknesses of this study since for aggregate private savings in every individual country, the number of observation is quite small for macroeconomic variables with strong time trends. Also, because the shortage of household data, most countries used only aggregate saving data, so the results may not very useful in predicting household behavior. Given its weaknesses, the general results from aggregate data suggest that current income (GDP) growth has a positive effect on private saving rate. Saving rates seem to depend on a country's income level or development stage. Starting from a low income with low saving rates, country may grow with increasing saving rates until mature economy is reached with lower saving rates. The results also indicate the importance of demographic factors, dependency ratio seems to have negative effects on saving which is consistent with the theory that predicts saving is positively correlated with the number of working-age people.

The impact of changes in real interest rates on saving is a crucial issue in mobilizing domestic/household savings for economic development. According to McKinnon (1973) and Shaw (1973), an increase in real interest rates in developing countries will raise saving and eventually increase the supply of credit to potential domestic investors, and thus allowing the economy to grow faster. From the point of view of theoretical ground the impact of interest rate on saving is ambiguous due to the presence of substitution and income effects working in the opposite direction. Beside the substitution and income effects, interest rate also affects saving through a wealth effect. In this respect a higher real interest rate reduces the present value of future income streams from human capital or fixed-interest rate financial assets. The result is that consumption would be lowered even if the substitution and income effects cancel each other (Schmidt-Hebbel, Webb and Corsetti (1992).

In Kohsaka (1998) an attempt has been made to include real interest rate in the aggregate saving regression. The finding confirm the ambiguity of interest rate effect on saving <Table 6>. The impact of real interest rate is only significantly positive in Hong Kong and Indonesia, but for others the impact is inconclusive. For its comprehensiveness, the East Asian study on saving except on level of economic development and demographic factor does not give clear answer on why East Asian countries save so assiduously. The impact of interest rates on mobilization of household/domestic saving is also inconclusive. Given the central role of interest rate in saving mobilization, it is worthwhile to compare East Asian study on saving with other studies.

Fry (1991), estimated a saving function on polled time-series data which includes population dependency ratio and terms of trade changes. The sample also includes Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand. He found that the coefficient of real interest rates is positive and significant but the magnitude is quite small such that it does not have policy significance. He also experiments with the inclusion of the accessibility of depository

institutions' branches in rural areas, which is proxied by the rural population per branch. The result suggests that in countries like Korea, Taiwan and Thailand increased branch proximity was responsible for raising national saving ratios by increasing rural saving. In another study Gupta (1987) compared saving behavior in Latin America and Asia. The empirical evidence indicates that the nominal interest rates on deposit and the financial intermediation ratio affect saving positively in Asia but not in Latin America.

The inconclusiveness or the small impact of interest rate on saving proved to be a disappointment for the supporters McKinnon-Shaw thesis. In this respect a number of researcher questioned the methodology which might biased the effect of interest rate on saving downward. Ravalion and Sen (1986) pointed out to the possibility that the omission of inflation as independent variable might conceal the true effect of interest rates on saving. Their empirical work on saving shows that, the inclusion of inflation along with real interest rate as independent variables increases the magnitude of real interest rate coefficient.

The work of Rossi (1988) seems to be able to give a rather satisfactory answer to the findings of a zero or near zero interest rate sensitivity of saving in a number of developing countries. From analyzing the effect of liquidity or borrowing constraint and real interest rates on consumption behavior over the period 1973-1983 in 49 developing countries. He found that increases in the real interest rate are not going to increase saving substantially especially in low income developing countries. He added that this result might come from the omission of liquidity or borrowing constraint also biases the estimates real interest rate elasticity on saving downward. A plausible explanation for this phenomenon is that financial liberalization not only raises interest rates but also easing household borrowing constraint. As consequence, a positive interest rate effect on saving could be compensated by a negative effect of relaxing household liquidity constraint. This important point found strong support in Patrick (1994) who suggested that restriction on bank lending to finance consumption and housing seems to have positive effect in raising saving in Japan, Korea and Taiwan.

Ogaki, Ostry and Reinhart (1996) provided another explanation in this matter. One reason is that the zero or near zero interest rate sensitivity to saving is more related to subsistence considerations particularly in low incomes countries, rather than to intertemporal consumption smoothing. In this respect intertemporal consideration only applies to portion of the budget left after households first satisfy their subsistence needs. Related to this, the reason behind the low magnitude of the intertemporal elasticity of substitution has something to do with the relative share of necessities in the budget of poor households. Less substitutability through time of necessities over other goods makes intertemporal substitution for households with larger share of necessities in their budget lower compared to households whose

necessities are less important. This implies for relatively poor countries, the interest rate of saving would be low.

Taking account for this, Ogaki, Ostry and Reinhart (1996) reported that “much of the considerable cross-country variation in both level of saving and the responsiveness of saving to the real rate of interest could be systematically explained by the country's income level. The hypothesis that the saving rate and its sensitivity to interest changes were rising function of income found empirical support.” However, there are significant behavioral differences with regard to the country's stage of economic development. Higher saving rates may not materialize, even with relatively large increases in interest rates, if a particular country is at the bottom range of the income scale. The case of East Asia seems well suited for this proposition. Most East Asian economies are no longer at the lower end of the income spectrum so that increasing real interest rate from negative to modestly positive level seems to be positive factor in mobilizing domestic savings. Some examples can be drawn from financial liberalizations that increased interest rates significantly in Taiwan (1949), Indonesia (1983) and Korea (1970s). Therefore, despite evidence of small interest rate effect on saving we could not simply dismiss the importance of raising interest toward its free market equilibrium as an instrument to mobilize domestic savings. One thing is clear is that over period of time East Asian countries have abandoned much of financially repressive policies. It is true that some of selective credit policies remain. However, this is no longer dominant policy in fostering economic growth.

In the context of East Asian economies, one should not forget that macroeconomic stability in East Asian countries in the form of low inflation might also lead to household to save their wealth in the form of financial savings. Negative real interest rates on deposits as consequence of high inflation may induce people to save in the form of real assets especially consumer durable and into foreign currency assets through capital flight. High inflation is also a sign of economic uncertainty, which deters people from holding financial assets. For most East Asian countries the period of runaway inflation produced by monetization of government budget deficit have been things of the past (for example Indonesia in 1965). In fact East Asian countries have the best record of any developing region on inflation and exchange rate stability. (need table growth and inflation).

One important conclusion emerges from the East Asian study on saving (Kohsaka, 1998) is that from the way it is specified (based on the life-cycle income hypothesis) the causality runs from economic growth to saving. In this respect, Paxon (1996) using Thailand and Taiwan data found that the increases in the rate of economic growth will generate very little or no saving in these countries simply because there is not enough saving. Yet, international observation on the relationship between saving and growth in these countries showed to the different direction. The result suggests that the cross-country correlation of

saving with growth cannot be attributed to the life-cycle model. The causation runs in reverse, not from growth to saving, but from saving to growth. This is line with development economists' suggestion that the central issue of economic development is to raise savings. The most recent empirical work by Mankiw, Romer and Weil (1992) shows that using cross-country data the ratio of investment to GDP is an important determinants of growth which indirectly indicates the importance of saving.

In the face of controversy between saving to growth model versus growth to saving model, at least in the context of East Asian phenomenon of high growth and high saving, this paper finds that the argument raised by Deaton (1999) is very persuasive. He advocates to take stronger position in favor of saving to growth model, is very persuasive. The proposition is to take the relationship between growth and saving as result from investment driving growth. Thus, policies that promote saving have to be maintained to enhance economic growth.

2.2. Household Investment Decision in Human Capital

Recent research on economic growth, started from Lucas (1988) and Romer (1986,1990) have also given attention to models, which incorporates broadly defined concept of capital including human capital and knowledge. In the beginning, the human capital theory focuses on the effects of education and training on individual's earning capacity. Later on it was recognized that human capital is not only earning capacity produced by education and training, but also includes the health and physical condition of individuals.

Human capital includes knowledge, skills and experience as well as human health. In earlier model of human capital, health was considered as exogenous. Later on, it was recognized that to a certain extent it could be considered as exogenous. The most important factors that could affect health of individuals are nutrition medical care available. Investment decisions by individuals to improve nutrition and medical care and to reduce threat from other factors are likely to improve health condition. Even in some East Asian countries like Indonesia and the Philippines where epidemic diseases still a serious problem, government intervention in the form of provision of basic health facilities are very important.³ At first, efforts to model investment decisions on health were hampered by the measurement problem. The return on such investment is even more difficult to measure than the return on investment in education. To complicate the matter, education and health are not independent. Parents' education will affect not only their own health but also that of their children.

2.2.1. The Role of Education in Affecting the Quality of Human Capital

With respect to education Rowen (1998) puts East Asian countries in the special category that is as countries that are initially having primary and secondary school enrollment rate above the world norm, given their incomes, and later on growing faster than those with lower initial levels. These countries are also characterized by the tendency to spent smaller portion of their education budget on higher education and emphasizing instead on primary and secondary schooling more than others <Table 7 and Table 8>.

In this respect Snodgrass (1998) reported that looking at the initial endowment of East Asia in 1960, Latin America and Caribbean was more educated than East Asia. The average adult age (age more than 25) in Latin America had 3.0 years of schooling in 1960, compared to 2.3 years in East Asia and Pacific. Also 61 percent of adults had not completed primary schooling in East Asia and Pacific, compared to only 42 percent in Latin America and Caribbean. In reality the education attainment in East Asia and Pacific in 1960 were also not much better compared to average developing world. The average schooling for adults for all developing countries was 1.8 years, while 68 percent of adults had not completed primary school. The salient feature of East Asia compared to other regions was its initial higher average school enrolment ratios at both primary and secondary levels. Perhaps none in 1960 could predict this small East Asian advantages would become the important elements of rapid economic growth.

What are the reasons of the above phenomenon? Are people in East Asian countries are so willing to invest in education? Is it simply cultural difference with other regions? The role of government intervention to achieve a more equitable income distribution seems also important. Also the role of non-governmental organization like religious organization is very instrumental in providing basic education in East Asia. In Thailand for example high literacy was the efforts of Buddhist priest as well as government's public school. In Indonesia, the government program of compulsory primary education is responsible for increasing primary school enrollment from below 70 percent to 100 percent in 1985.

With regard to willingness to invest in education, there are ranges of quantitative model capable to shed some insight on household behavior. At the micro level, at first the model was developed to answer the question on how allocation of educational resources affects rates of return of educational investment. In applied work the focus is on examining the relationship between wage rate and schooling. In the later development the model of human capital is extended to capture the decision to invest in education (to continue or not to continue education beyond certain basic (minimum) level.⁴ This model can be distinguished into three

³ For Indonesian case see for example; Pitt, Rosenzweig and Gibbon (1993), and for the Philippines; Rosenzweig and Wolpin (1986).

⁴ Discussion in this section relies heavily on Kooreman and Wunderink, 1997, *The Economics of Household Behavior*, St. Martin Press.

versions. First, the model in which education or schooling is viewed as investment, or the pure investment model. Second, the model in which education is regarded as consumption or the pure consumption model. Finally, there is an integrated model, which integrates both investment and consumption models.

In the pure consumption model, family incomes and parents' education background are included, while future earnings are excluded. In the pure investment model we only include future earnings and two ability indicators. Forgone earnings are included in both models. If in fact family income is positive and significant, then it is interpreted as the presence of liquidity constraint. Deaton (1999) raises important point about the presence of liquidity constraint as a possible link between growth, saving and education. Parents may have to save to finance their children's education, which generate another link between growth, saving and education. To author's knowledge the application of this model to East Asian is quite rare. There is one study by Triaswati (1996) tried to apply a sophisticated version this model to the Indonesian family survey data. The conclusion emerged from this study is that households regard education more as investment goods rather than consumption goods.

In another study using Malaysian Family Life Survey (MFLS), Lillard and Willis (199?) found that parental education has strong impact on children education. In particular, at least two third of the impact of parental education on their children schooling transitions appears to be a direct or indirect consequence of parental schooling. The study also detects gender preferences where mothers' education has stronger impact on daughters, while fathers' education has large impact on the education of sons. It is not too surprising if one could apply the model to different data set and to find the result is the same with Indonesian sample. This might explain why East Asian people are so willingly invest in education. It is rather difficult to make generalization to other East Asian countries but at least it is evidenced that the emphasis on primary and secondary education adopted by East Asian government perpetuates itself from generation to generation.

At the macro level many efforts have been made to investigate the impact of education on economic growth. Employing macro data, recent work on growth regressions tend to show that the level of human capital has very important role in fostering economic growth (Barro 1991 and Mankiw, Romer and Weil (1992). Mankiw, Romer and Weil (1992) augmented the Solow model with human capital accumulation. For the proxy of human capital they focus on human capital investment in education. Thus ignores investment in human health. For the proxy for the are of human capital accumulation, they use the percentage of the working age population that is in the secondary school. The result suggests that education, saving and population growth are the three most important variables in explaining cross-country differences in income per capita.

In almost similar fashion, using the year of 1960 as the base year, the preliminary work of Hahn and Kim (1999) also suggests that human capital significantly related to total factor productivity growth, implying that a country with high human capital has better chance to adopt advanced technology. Romer (1990) noted that countries with greater initial stocks of human capital tend to grow faster through rapid introduction of new ideas or products. In fact, in 1960 the level of education attainment in East Asia is 2.3 year which is above the average developing countries (1.8 year) but still lower compared to Latin America and Caribbean (years). Only in terms of average enrolment ratios both at the primary and secondary East Asia is higher than average developing countries, <Table 7 through Table8>. Although, the education variable is strongly significant in the overall Total Factor Productivity Growth (TFPG) regression, its impact in explaining TFPG growth differences with other region is smaller compared to other independent variables like openness and institutional factor.

The role of education in fostering economic growth has been investigated both at the individual and economy wide levels. In particular, micro-economists tend to look at allocation of educational resources across levels of education and individuals in terms of rates of return to educational investment at each level measured as individual wage and educational attainment. Meanwhile, macroeconomists address the role of education in economic growth and rarely pay attention to the way educational resources are allocated in various countries. Findings, both at the micro and macro levels are rarely combined.

In this respect Judson (1998) tried to develop a framework to bridge a gap between those two. She developed a micro-based model of aggregate returns to education given budget, cost, choices of allocation and heterogeneity in ability. She used the model to categorize countries into two categories; countries with a low allocation efficiency in educational budget allocation versus those with high allocation efficiency. The criteria for categorizing a particular country into one category or another is based on the simple premise that the effectiveness of investment in higher education depends on how much investment in primary education. Primary education is very important because without basic education, an individual's potential remains unknown and could not proceed further to higher education. In the Solow type regression she found that countries whose allocations of educational budget are poor, on average tend to experience less GDP growth. Therefore, if countries want to spur growth through investment in education, they cannot invest indiscriminately. In other words, countries whose allocations of educational resources are inefficient, gaining little from their investment in education. Although, she did not particularly isolate the effect of budget allocation on growth in East, remarkably no single countries of East Asian League in the sample falls into the "low" category. <Table 10>.

This assertion is in line with Birdsall, Ross and Sabot (1995), who strongly suggest that one thing distinguishing East Asian from other regions, is its willingness to emphasize investment in primary education instead of higher education. Higher primary enrolments are the most important contributor to the difference in economic growth rates between East Asia and other regions in the period 1960-1985. Further, they argue that East Asian advantage in primary education became the future supply of educated workers. However, for education to boost growth, demand for educated labor must also rise. In this respect, prudent macroeconomic policies and export promotion have been instrumental for increasing demand for labor. The demand for unskilled labor may develop first. Eventually as the economy progresses to a more mature state, the demand for sophisticated goods also increase. With this, the demand for educated labor, also increases. The whole process signifies the role of manufacturing export providing the chance for educational endowment to make contribution to economic growth.

2.2.2. The Role of Fertility in Affecting the Quality of Human Capital

Bloom and Williamson (1998) put another dimension to East Asia's remarkable growth.⁵ They assert that the most important factor in this matter is East Asia's early and strong demographic transition from higher fertility-mortality to lower fertility-mortality. Demographic transitions start with declines in mortality. Parents tend to adjust fertility downward in slower pace than the fall of mortality. As a result there would be an acceleration of population growth. After some lags, fertility would also begin to decline, which marks the next stage of the transition.

There are two views regarding the impact of population growth on economic growth. The pessimistic view sees rapid a population growth as a burden to the economy since it would overwhelm any technological progress and capital accumulation.

Contrary to this, the optimistic view believes that a rapid population growth allows a particular country to exploit economies of scale and promote technological progress. Recent findings from empirical works tend to support the first view. Many empirical works decompose population growth into two components; fertility and mortality and investigate their independent effects on economic growth (for example Barlow (1994), and Kelley and Schmidt (1995)). The results emerge from this work is that measures of fertility such as past birth rates exert negative influence on economic growth, while the effect of mortality is insignificant.

Recent work of Bloom and Williamson (1998) is more supportive of the optimistic view. They argue that it is true that population growth resulted from a rise in fertility should have an

⁵ East Asian is defined to include China, Hong Kong, Japan, Korea and Taiwan so it is different than the definition we use in the beginning of the paper. However, the process of demographic transition also takes place in South-East Asia albeit at later date.

immediate negative effect on economic growth given the fact that output per head falls as there are many more people to feed. Later on, however, demographic effects will have positive impact on economic growth, because the economically active population will boom after two decades. Bloom and Williamson (1998), after incorporating demographic variables into a growth model, try to explore the possibility of reversing negative impact of demographic change on economic growth. The model also includes the growth rates of the total population and the economically active population instead of birth and death rates. As precautionary against possible endogeneity of the growth rate of population, a method of instrumental variables is used. The instruments include lagged population growth, past life expectancy, population policy indicators and information on the religious composition of the population.

Bloom and Williamson (1998) found that economic growth is less rapid in the first phase of demographic transition in East Asia (prior to 1970) in which the growth rate of working-age population less than that of the population as a whole. Economic growth is more rapid when the growth rate of working population is higher than that of the total population (second phase of the transition, which coincides with the East Asian miracle). Some calculation show that population dynamic contributes around half of the 'economic miracle' which is defined as the excess of growth over the estimated steady state growth of 2 percent. It is predicted that economic growth will return to 'normal' as East Asian encounters the problem of graying population in the next quarter century. <Table 11>.

Bloom and Williamson' study provides a new insight in to the phenomenal East Asian growth. However, it also raises a new question regarding the impact of demographic transition on economic growth that is so powerful that it seems to dominate other factors. The glut of working age population in the middle phase of the transition represents the growth potential. The realization of growth potential depends also on economic, social and political factors. It has been discussed previously that the supply of working age population needs to be balanced by the growing demand of labor. Perhaps this is only possible if governments adopt prudent macroeconomic policies and sufficient degree external openness. Rather surprisingly, the independent variables representing the degree of openness and institutional factors are significant in the growth regression.

Another minor question is whether demographic transition is exogenous or endogenous to the economic development. It is agreeable exogenous forces such as the advancement of health technology, increase in agricultural productivity and improvement in food trade, play dominant role in affecting the decline of mortality. The exogeneity of mortality is confirmed by the similarity of the timing across Asia (United Nations (1994)). The fertility on the other hand is endogenous event, which might be influenced by a number of factors such as government intervention in contraceptive use, also increase in income per capita and education, which

might be the product of economic progress itself. The problem of endogeneity apparently is not fully resolved because the instruments chosen are available only for smaller sample countries.

From the microeconomic perspective the fall of fertility is the result of household sector to have fewer children. There are number of factors that affect household's decision. Those factors are the quality or investment per child, the consumption of goods and quality not related to children, the price of other goods and family income. In this respect, one example of the model explaining household behavior is from Rosenzweig and Schultz (1983).

The model consists of a utility function representing household preferences, a health production function and a budget constraint. In the household optimization problem, in order to maximize utility, household has to choose the level of goods that do not affect health (x), goods that do affect health (y) and child health (H), subject to household's budget constraint. The production of child health, H , depends on family specific endowments, μ , that are known, but not controlled by the household, such as genetic and environmental factors, on health inputs that do not affect utility directly, z_k and consumption goods that do affect health, y_j .

$$H = \Gamma(y_j, z_k, \mu)$$

The household optimization problem will result in demand functions for goods x and y , and demand function for health inputs (z). Substituting such demand functions to the health production function we arrive at reduced form:

$$H = g(INC, \mu, p)$$

where INC = household income, μ = family specific endowments, and p = vector of prices. Since it is impossible to identify structural parameter estimates of the health production function from the reduced form, the hybrid equation is estimated:

$$H = H(y_s, p_i, INC, \mu)$$

The hybrid equation is estimated with log (birth weight) as dependent variable and the explanatory variables are variables such as age of mother, smoking mother and so on.

The model provides several important insights regarding household decision in fertility-investment in human capital. First, initially as household income rises both the quantity and quality of children demanded also rise, but eventually since the quality is more income elastic, the number of children grows less. Second, the number of children and their quality are substitutes. If quality rises more than quantity, households tend to have children since acquiring more quality is more costly. The net effect is that higher incomes can reduce the number of children demanded. Finally, since the number of other goods and the quality of children are complements while the quantity of children and other goods are substitute, an increase of consumption of other goods and services, tend to make a household to have fewer children and investing more in them.

In some empirical works, the effect of income is not significant if other 'non-economic variables' are not properly controlled (Koo, 1998). There are two types of non-economic variables that ought to be included in the regression analysis. First is demographic variable like infant mortality and fertility control. The reason is that a change in infant mortality may change the desired fertility and thus may affect the results with respect to the income effect on fertility. It might be possible that a substantial proportion of change of infant mortality is independent of income. In the case of fertility control, there are many instances where the program of fertility control affects fertility decision. The program is often independent of the level of income in the developing countries.

The second type of variable that needs to be included is educational attainment and labor force participation of women. More education for example lead to lower fertility, which means fewer but higher quality family members. The slower population growth as the result of lower fertility implies an increase of capital per worker, which leads to higher incomes. Simultaneously, an increase of quality of workers makes the technical progress through technology absorption and technology innovation a lot of easier. This process also leads to higher incomes. According to this view, there is a negative relationship between fertility and economic growth. In short, the effect of these variables is to increase the opportunity cost of children. More educated women are more likely to have fewer children through lower infant mortality or better fertility control.

Koo (1998) summarized the finding about East Asian fertility decline as followings. East Asia is divided into three groups. First is Northeast Asia (NEA) which includes Korea, Japan, Taiwan, Hong Kong and Singapore. Second group is Southeast Asia (SEA) comprises of Thailand, Malaysia, Indonesia and the Philippines. Third is China, a huge country with enormous economic diversity. The rapid decline of total fertility rate observed in Korea, China, Hong Kong and Singapore is due mainly to the demographic factors. In China, on the other hand, family planning is responsible for the low TFR. In Thailand and Malaysia economic factors are very important in explaining the decline of TFR. In Indonesia, TFR is lower than predicted because the effectiveness of family planning program. Finally, in the Philippines, the low prevalence of family planning results in lagging fertility decline.

2.2.3. Human Capital, Income Distribution and Economic Growth

After dormant for almost 2 decades, in the recent years, there has been renewed interest among issues economists in issues of distribution and growth. The pioneering work of Kuznets (1955) shaped the view of trade-off relationship between equity and growth. According to Kuznet's hypothesis, the time path of income distribution will follow an inverted U shape. In the early stage of growth in developing countries inequality will increase and after some point it will

start to fall. This popular view unfortunately also creates unnecessary highly politicized polarization between pro growth versus pro equity among policymakers and politicians in developing countries.

Bruno, Ravallion and Squire (1998) reject the generalization that distribution must worsen in poor countries before getting better. In fact the relationship between growth and equity is much more complex. The effect of growth on inequality at best is ambiguous. It could improve or worsen income distribution, depending on a number of other factors. In addition, there is possibility of measurement errors, which may give misleading picture of the shape of the growth versus inequality curve. The evidence also does not suggest that growth always benefits the poor or at least they do not lose from pro-growth policy reforms. In other words, the change of distribution does not correlate with growth.

Bruno, Ravallion and Squire (1998) suggested that the most important matter in the equity-growth story is the initial distribution. Policies intended to help the poor to accumulate physical productive assets and also human capital are very likely will result in higher growth, provided that they are adopted in non distorted way. Countries that emphasize the development of basic human capital through investment in schooling, health and nutrition are also more likely to have more equal income distribution. In addition, they hinted that distribution may affect growth more than growth affects distribution.

Contrary to the Kuznet's hypothesis, the recent theoretical research on the relationship between growth and equity suggests a positive correlation between those two. According to Perotti (1996), those literatures can be divided into four main approaches: fiscal policy, sociopolitical instability, borrowing constraint/investment in education approach and endogenous fertility approach. The fiscal policy approach can be summarized in three simple results: growth increases as distortionary taxation decreases, redistributive government expenditure and therefore distortionary taxation decreases as equality increases, growth increases as equality increases. Meanwhile, the sociopolitical instability approach can be summarized in three simple results: investment and growth increase as sociopolitical instability decreases, sociopolitical instability decreases as equality increases, growth increases as equality increases. The borrowing constraint/ investment in education can be summarized as follows: growth increases as investment in human capital increases, for any given degree of imperfection in the capital market, investment in human capital increases as equality increases, growth increases as equality increases. Finally, the endogenous fertility approach can be summarized as follows: growth increases as investment in human capital increases and fertility decreases, fertility decreases and investment in human capital increases as equality increases, growth increases as equality increases. Though, each has its own underlying mechanism, the

prediction of four approaches above are remarkably similar that is positive relationship between equality and growth.

Perotti (1996) applied the Solow type of growth to regression to the reduced form of the above four approaches. He found that there is a positive association between equality and growth. This positive association is quantitatively much weaker and statistically insignificant in poor countries. Regarding East Asia he only examined the emerging economies in Southeast Asia. In this regard, he found that Latin American and Sub-Saharan countries have grown slower and Southeast Asia faster in the 1960-85 period. In addition, Southeast Asian have not only high rates of growth but also high levels of equality. In contrast, Latin America and Africa often have high levels of inequality, in addition to low growth rates.

Other evidences also show that income inequality is detrimental to economic growth (for example Alesina and Rodrik (1994) and Park (1998)). Park (1998) asserted that investment in human capital is as important as investment in physical capital to economic growth. However, their effects on income are exactly the opposite. Investment in human capital is more likely to increase the labor share, thus improving income distribution. Meanwhile, investment in physical capital tends to increase capital share with the consequence of worsening income distribution. This implies that emphasis on equity may not necessarily conflict with the efficiency. Using Japan, South Korea and Taiwan as a prime example, these countries have invested extensively in human capital and the result is a remarkable economic growth.

The earlier assertion from Bruno et.al' and empirical works explained above are in line with the pattern of growth with relatively equal income distribution observed in East Asia. <Table 12>. The tendency of governments in East Asia in emphasizing on primary and secondary education has profound impact on income distribution.⁶ Rapid increase in primary and secondary enrollment did much to reduce income inequalities in East Asia for two reasons. First, wage differential fell as rapid increases were made at all education levels. Second, the poor have much to gain simply by moving from no or little formal education to at least completed primary education. In turn, plentiful supply of labor with good basic education has been met by the increase of demand for labor especially in manufacturing.

What is missing from the above growth-equity exercise is perhaps the degree of openness in trade and of foreign direct investment. Outward orientation is instrumental in achieving growth with equity. In the earlier stage of economic development, the shift toward labor-intensive export-oriented industrialization proved to be improvement of the standard of living for the poor by increasing the demand for labor. This does not mean the capital intensive industry is completely absent from the scene and East Asian countries remains locked in labor-

⁶ See section 2.2.1 on the role of education in human capital formation.

intensive industry. Rather, the introduction of capital intensive is very gradual. Had the capital intensive been introduced earlier, it would be very difficult to absorb supply of labor, which might result in income inequality and social instability. So the manufacturing export has not been only functioning as engine of growth but also in promoting more equal income distribution. This path of industrialization was copied by Korean, Taiwan, Hong Kong from Japan, and which in turn copied by Malaysian, Thailand, Indonesia, the Philippines and now China also follows the same track. Regional proximity or the habit of "learning from your neighbor" seems to matter in the spread of the strategy of rapid growth but more or less equitable, through trade and exporting.

III. Saving allocation, Firm Investment and Financial Constraint⁷

The Traditional neo-classical model of investment implicitly assumes the existence of perfect capital market. In this setting, the optimal capital stock is determined by the interaction between demand schedule for capital and the supply schedule where expected marginal profitability of capital equals the interest rate. As consequence, financial factors are not determinants of the actual capital stock.

The reality however especially in developing countries is very different. Financial factors often become formidable hurdle that hampers firms to finance their productive investment and thus eventually will be detrimental to economic growth. In this respect, the modern theories of investment relax the assumption of perfect capital market by recognizing the existence of information asymmetries and incentive problems. Financial intermediaries' information on profitable investment opportunities often differs from the ones perceived by firms who have to make investment decisions which ultimately leads to financial discrimination against less favored types of firm. Thus, financial factors become an important determinant of the actual capital cost and ultimately economic growth. If as a result, the formation of capital stock becomes less than optimal, financial constraints are said to be binding on firms.

3.1. Financial Repression and Allocation of Saving

The availability of saving at sufficient level is only a necessary condition for economic growth. There is another economic agent that ultimately uses saving to make productive investment namely a firm. What also matters however is how efficient financial intermediaries channeled saving into user. The most important stylized fact of East Asian countries is the dominance of commercial banks in financial systems. Bond markets are often very thin, while equity markets although they become quite well developed in recent years in terms of size their function still

limited to accumulating funds for large firms in the formal sector. Through these banking systems (some if not many) East Asian countries exercised some sort of financial repression in their history.

The rationale for financial repression has rooted in the theoretical foundation found in Marx's, Keynes's (Keynesian Liquidity Trap), and Tobin's (Tobin's portfolio allocation model) writings. The Keynesian liquidity trap provides rationale for taxing money holding in order to achieve full employment equilibrium. Meanwhile, Tobin's portfolio allocation model shows that reducing attractiveness of holding money vis-à-vis productive capital through financial repression may increase capital/labor ratios and per capita incomes (Fry, 1995).

In exercising financial repression many developing countries use selective credit policy. Banking system are subject to interest rate ceilings on loans and deposits. The main instrument of selective credit policy is ceiling on loan rates. The loan rates are set below the equilibrium market rates so that credit can be allocated according to a set of non-price criteria defined by government. Therefore, a firm met these criteria could undertake investment projects that might be unprofitable under the market equilibrium rate.

After a decade or so, using firm level or at least industry level data, there are many evidences from East Asian Countries documenting the economic impact of implementing financial repression. The results are rather disappointing, instead of promoting growth, financial repression often retarded economic growth and distorted resource allocation. Nam (1989) reported the evidence on the effects of Korea directed credit policies. He found that, cheap credit policy in the 1970s led to excessive and inefficient investment in heavy and chemical industries. Chou (1991) assessed the efficiency of resource allocation in Taiwan by estimating bank behavior. The study revealed that the ratio of bank loans to external funds in particular sectors of the economy is affected positively by fixed assets/total assets and fixed assets/external funds ratios, while sales/assets, profit/sales and industry's growth are not significant. The conclusion is that the banking system allocated credit solely on the basis of safety factors and not on performance. In this respect Bigg (1988) found a strong bias on the part of the Taiwanese banking system in favor of large firms. These findings are also consistent with Shea and Yang (1990) who found selective credit and financial repressive policies in favor both public and private large firms resulted in over-investment in capital intensive industries with lower rates of return.

3.1.1. Financial Repression and Income Distribution

Selective credit and financial repressive policies also have detrimental impact on income distribution. Cho (1984) for example conducted a comparative analysis of Korea and Taiwan over

⁷ Some of empirical review in this section is drawn from excellent review by Maxwell J. Fry; Money,

period 1966-1977. Korea in this period is good example of country pursuing financially repressive policies by adopting a virtually zero real interest rates and selective credit policies that channeled subsidized funds to priority sectors. Taiwan, on the other hand, characterized by positive real interest rates and its selective credit policy is limited to export oriented sectors. Korean in this respect shows higher industrial concentration and higher Gini coefficient compared to Taiwan. This result demonstrates that low interest rate and selective credit policy lead to industrial concentration and to a less equal income distribution. The reason is that the low interest rate policy in caused the transfer of wealth from small depositors to large borrowers who used it to develop capital intensive production techniques, which eventually lowered demand for labor.⁸

3.2. Financial Liberalization and Allocation of Saving

The evidence presented above indicates that in East Asian Countries, financial repression resulted in the less than optimal of saving allocation. One way to appreciate the role of financial intermediary in channeling saving is to recognize that with the low interest rate policy, there is no incentive to use capital efficiently. In 1973 McKinnon and Shaw developed model of economic development in which financial liberalization and development accelerate economic growth. This development challenged the merit of financial repression. They cited the negative impact of financial repression, interest rate ceiling and directed credit policy on economic growth.

In this respect, McKinnon (1973) and Shaw (1973) proposed an idea that if financial intermediaries allocate funds more efficiently than other allocating mechanism then raising real interest rate to its competitive free market level (financial liberalization) will improve the quality of investment and thus fostering economic growth. The financial reforms in Taiwan (1950) and Korea (1960) provide empirical support for financial liberalization (Fry, 1950). It is not too long before other East Asian countries jumped on the ban wagon of financial liberalization.

The McKinnon-Shaw model that expects financial liberalization will exerts positive impact on economic growth found many empirical supports. Using 22 developing countries, Sanyi and Saracoglu (1983) estimated a cross-country regression equation. The sample also includes Taiwan, Singapore, Korea, Malaysia, Philippines and Thailand. The regression result supports the argument that positive real interest rate policies stimulate output growth and this stimulus is transmitted mainly through the intermediation of financial asset accumulation.

There are several studies attempt to asses the impact of regime changes before and after liberalization on resource allocation, efficiency of investment and firm's investment behavior.

Interest, and Banking in Economic Development, John Hopkins, 1995.

⁸ In the case of Indonesia, such policy was counterbalanced by the government program to develop basic infrastructure such as road, drainage, health facility, primary school, agriculture irrigation project not only in rural areas but also in urban poor areas.

Cho (1988) examined the efficiency of credit allocation in Korea over the period 1972-1984. It turned out that the allocative efficiency of credit has been improved substantially since the Korean government adopted its financial liberalization policy. Other studies for example Asian Development Bank (1985) attempted to assess the impact of increasing real interest rates toward the equilibrium rates on investment efficiency. The sample also includes Korea, Malaysia, Singapore, Taiwan and Thailand. The result reveals that there is a positive association between incremental output/capital ratio as a measure for investment efficiency and disequilibrium in real interest rates. Using an alternative method to measure investment efficiency which is termed as "effective capital stock", Fry (1979) conducted statistical analysis for 10 developing countries, which also include Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand. The study indicates that the effective capital stock increased significantly by a rise in real interest rates on deposit towards its competitive free-market equilibrium level.

At the micro level, there is also an attempt to assess the firm behavior before and after liberalization. To estimate the model, ideally one should possess a panel of firms, which contains information on investment flows, cash flows or sales, and financial information. In developing countries often the data is only available for manufacturing firms. Even with the availability of annual survey on (manufacturing) firms it is not easy to construct a panel of firms since a valuable information on firm's identifier is often censored to protect individual firm's secrecy. Other problem is how to construct capital stock data. First, there is a need for the data on the initial capital stock. If this is not the case then some estimates must be made. The next task is to convert annual investment purchases to a real value by using appropriate deflators. Then, the capital stock series can be constructed by using the perpetual inventory method. The task will be much simplified if the investment data is broken down into several components such as land, machinery, vehicles and other capital goods. This will allow the assignment of different physical depreciation rates to each type of asset when constructing the capital stock series.

Empirical specification of a firm's decision to invest follows Tobin's q-theory approach in which changes in a firm's investment opportunities can be captured by the market valuation of the firm's capital stock. For a panel of firms the model is specified as follows

$$(I/K)_{it} = a_i + bQ_{it} + c(CF/K)_{it} + e_{it}$$

where, I is investment, K is capital stock, Q is an estimate of Tobin's q, CF is internal fund (cash flow) and e is error term, i is subscript for a firm and t is the time subscript. If the coefficient c is positive and significant then it is interpreted that financial constraint is binding on the firm. In addition to a cash-flow variable, a variable measuring firm leverage is usually added to the model.

In practice some difficulties are encountered to estimate investment function particularly to find a suitable proxy for Tobin's q. As alternative, the Tobin's q is replaced by a

traditional sales-accelerator model of investment. Following Harris et.al, 1994, the specification is as follows

$$(I_{it}/K_{i,t-1}) = \beta_1(\Delta S_{it}/K_{i,t-1}) + \beta_2(CF_{it}/K_{i,t-1}) + \beta_3(D_{it}/K_{i,t-1}) + v_{it}$$

where, $v_{it} = e_{it} + \lambda_i + \eta_t$, I is investment, K is capital stock, S is sales, CF is cash flow, D is debt, v is error term, λ is the time invariant firm specific effect, η is a common time effect, e_{it} is the idiosyncratic component of the error term, i is a firm's subscript and t is time subscript. If β_3 turns out to be significant, then it is an indication of the presence of finance constraints. The coefficient β_3 reflects the premium above the save rate that must be paid as the debt to capital ratio increases and it may vary across groups of firms. Various interactive dummy variable can be introduced to capture the behavior of different types of firms and a structural break as a result of significant policy changes.

Fazzari, Hubbard, and Peterson (1987) used this methodology to investigate financial constraints due to asymmetric information in US small firms. In developing countries the application of this methodology is rarity perhaps due to the data requirement. Among those few are Harris, Schiantarelli and Siregar (1994) investigating the impact of financial liberalization on Indonesian manufacturing firms. They found that the banking system, in the pre liberalization era had preference for large and politically connected firms. It was revealed that compared to large firm, small firms were facing capital market imperfection in the form of liquidity constraint. In the post liberalization, such financial constraints were relaxed. In this respect, although interest rates were higher in the post liberalization period, access to external finance greatly improved. Evidently, the cash flow variable became less important and the premium on external finance decreased substantially. Thus, liberalization has helped to reallocate domestic credit toward smaller establishment albeit still at higher cost of borrowing compared to large firms. The net effect in this instance seems to be positive.

3.2.1. Linking Saving, Investment and Growth

Several empirical works drawn from East Asian countries' support the assertion that increasing real interest rate toward its market equilibrium level (financial liberalization) will foster economic growth. Two factors that link financial asset accumulation and economic growth are financial intermediation and investment. In other words, if financial liberalization increases the availability of credit for investment, then the positive effect of credit availability on investment may constitute an indirect mechanism by which financial liberalization stimulated economic growth. The lifting of financial repression has also positive impact on income distribution.

IV. Performance Measurement at Industry and Firm Levels

4.1. The Role of Urban Manufacturing Firms

East Asian economies are known for their outward-looking orientation. The exposure to foreign competition necessitates domestic firms are forced to operate efficiently. Here, productivity improvement is a norm. East Asian economies vary in their degree of openness. Hong Kong adopted the principle of *laissez-faire*. Singapore, Malaysia and Thailand have long history of openness, while the Philippines was relatively closed for most of the period. The openness of Taiwan, Korea and Indonesia are somewhere between Singapore and the Philippines. The main players in these economies are export-oriented firms, usually in the manufacturing sector. With their outward looking attitude, it does not necessarily mean East Asian governments adopt hand-off policy. Rather, in their drive to become export oriented economies, East Asian used various methods of intervention. Korean focussed on reverse engineering and licensing, Singapore rely very much on FDI firms. Taiwan, on the other hand uses export promotion policy directed at small and medium enterprises. It is very interesting to examine how the exposure to foreign competition affects firm or industrial productivity.

What kind of economic agents do play in the creation of export-oriented manufacturing industry in East Asia? It is hard to imagine other kind of firm, other than manufacturing firms locating in urban areas. The location behavior of manufacturing firm in East Asia has been investigated for example in Kittiprapas and McCann (1999) for Thailand, Henderson and Kuncoro (1996) for Indonesia, and Lee (1990) for Korea. Those studies found that the nature of agglomeration behavior in East Asia takes the form of concentration in single or very few primal cities. This process of localized investment growth has accelerated particularly in Southeast Asia during the more liberalized era in 1980s and 1990s. The process of industrial concentration has taken place along with a large migration from the predominantly rural outlying regions. The concentration process has made Southeast Asia as one of the most skewed urban hierarchies of any region in the world. This is somewhat little different from the industrial agglomeration in the US where the presence of primal cities is much more decentralized and also much longer distance is involved (Henderson et.al (1995).

What factors drive manufacturing firms to concentrate in single primal cities. Firms operate where they can easily meet their needs for various inputs. The availability of information, infrastructure services, industrial environment, business service, the quality of work force differ from one location to another. Firms will not decentralize to outlying regions if they are less productive in those places. One finding from the firm location behavior in East Asia shows that the need for information input is the most important factor. Firms need information input in order to maximize their market potential. Interestingly, this requirement is less binding for larger firms.

Other findings, emerged from East Asian's firm location behavior is that the local historical industrial environment itself affects location decision, an association attributed to

dynamic externalities. This explains why hinterland locations that lack a particular industry have trouble attracting that industry, even when government policies encourage decentralization. New firms strongly prefer locations with mature plants in related industries that offer a built-up stock of local trade secret concerning local institutions and politics, and technology. Although it may also apply to other developing countries, the problem of over concentration in few primal cities is the negative side of rapid industrialization in East Asia, especially in Southeast Asian countries like Malaysia, Thailand, Indonesia and the Philippines. Although, the industrialization process itself is growth enhancing, with more or less equitable income distribution, it also creates spatial imbalance.

4.2. Measurement of Productivity Growth

The relationship between savings, investment, capital stock and output growth has been explained before. Based on this we presume as classical economists that higher saving is the precursor of economic growth so that the key to raising economic growth rates is to design incentive to encourage saving by first examining the determinants of saving. From the point of view of output determination however, capital stock is only one determinant of output growth. Thus saving can affect economic growth through the expansion of capital stock. The neoclassical framework provides starting point to decompose economic growth itself into three sources; capital, labor and residual factor which is often interpreted as technological progress or productivity growth.

Often it is useful to relate firms' or industrial performance with its environment. A firm may not survive in its environment if it is not conducive for production activities. A number of factors such as the degree of openness, competitive pressure, government regulation, the presence of foreign direct investment (FDI) firms, are often linked to firm or industrial performance. For this purpose some measure of firms'/industry' performance is needed. One popular measurement is total factor productivity growth.

The importance of productivity growth for overall economic growth and people' welfare has been increasingly acknowledged. This has led to efforts to improve measurement of productivity at the aggregate and industry levels and even at firm level. In a simple fashion, measurement of labor or capital productivity is computed by dividing total output or value added by labor or capital. From the way it is computed, this measurement may be misleading since it does not control for changes in other factors of production. The better way to calculate productivity growth is by taking into account the growth of all relevant factors of production overtime. This index obtained from this computation is referred as total factor productivity growth (TFPG) or multi factor productivity growth. The simplest procedure to calculate TFPG is by subtracting the average growth rates of capital (GK) and labor (GL) from the observed

average growth rate of output (GY), then weighted by its share in value added (SK and SL respectively),

$$TFPG = \Delta A/A = GY - SK.GK - SL.GL$$

The interpretation of the above formula is that the effects of improvements in the quality of inputs of capital and labor would be included in the residual term, the measure of total factor productivity growth. In the developing countries, the problem is often how to measure capital stock. Thus, the figure of TFPG is very sensitive to the kind of proxy used to estimate capital stock. Aggregate TFP growth calculation shown above requires assumption of the existence of production function, a constant return to scale technology and a shift in technology is neutral.

At first the measurement of TFP growth is performed at the national or aggregate level. Implicitly, it is assumed that the production functions of different sectors are identical. It was proved then that this assumption was invalid especially if the time horizon involved in the study is longer than five years (for example Jorgensen (1990) and Jorgensen and Gollop (1992)). In various opportunities, they suggested the use of more comprehensive econometric approach, where separate production functions are estimated for each sector or industry. This is made possible with the availability of data at industry level or even firm level. Since then, the measurement of TFP growth is then extended to individual sectors of an economy or even to the firm level within a specific industry or sector. There is also a suggestion to capture the role of energy and raw materials as additional inputs, and estimating the contribution of each type of input to output econometrically rather than simply based on factor shares in GDP.

Tybout (1992) extended the method of TFP growth measurement to take into account the impact of firms' entry and exit. Previous studies show that differences in productivity between entering and exiting firms affect aggregate TFP growth significantly. Exiting firms tend to be less productive than entering firms that displace them. It also appears that scale heterogeneity is also significant since the size of incumbent firms is different from either entering or exiting firms. Tybout applies this method to Chilean manufacturing data. The measures of TFP growth is then linked to the index of trade regime across industry. He found that the effects of trade regimes on productivity growth are interrelated with market concentration, although admittedly the nature of this association is unstable.

Kawai (1999) using the same procedure as Tybout's, is able to decompose the effect of net entry on productivity growth into two components; direct effect and indirect effect. The direct effect of new entry is based on the assumption that the new entrants have some efficient technology and their productivity is higher than the incumbent. He applied the procedure to Japanese sectoral data and the finding was that the effect of new entrant contributes only 3 percent of aggregate TFP growth while for several sectors, the effects are negative. One explanation of the trivial effect of new entrants is some learning effect for new entrants. The

new entrants embodied some advance technology, which requires several years to attain the full capacity of production.

The indirect effect, on the other hand, captures the competitive pressures exerted by new entrants on incumbents. To cope with increasing competitive pressures, incumbents have to improve productivity to survive. To examine the impact of new entry on incumbents' technology, a cost function is estimated econometrically. The results suggest that for most sectors the total impact of entry on the variable cost is negative hence new entry tends to decrease average variable cost.

4.2. Productivity Growth and Its Determinants

After measuring TFP growth, the next task is to examine its determinants. Estimates of TFP growth enable us to relate variation of TFP growth across industry with various industry characteristics government's trade and industrial policy (for example protection, access to external financing) and also perhaps to some measurement of quality of labor and capital. One example is a model from Lee (1999) who applies the Solow-type growth regression to the industry level data set. The estimating equation is as follows

$$Y_{it} = \alpha_{it} + \beta X_{it} + \chi I_{it} + \delta Z_{it} + u_{it}, i = 1, \dots, N, t = 1, \dots, T$$

Subscript i refers to a specific industry and t is time.

The vector of independent variables X_{it} denotes a set of initial levels of state variables, while I_{it} captures a set of industry characteristics including variables that enhance learning by doing process, variables that promote firms absorptive capacity to incorporate new technologies. In this group of variable we include

- investment rate in machinery and equipment in net terms (ratio of net investment to output), capital intensity (ratio of capital to labor) as the variables that induce learning by doing.
- firm size (measured in terms of labor or assets), quality of raw material (ratio of imported input to domestic raw materials) and human capital measure as the ratio of technicians to total workers as the variables that promote firm's technological absorptive capacity.
- Markups coefficients and product differentiation represented as ratio of promotion and advertising to value added as the variable that expands firm's capabilities to engage in innovation activities

The vectors Z_{it} represent all variables that influence productivity but beyond firm's strategic decisions. In this group of variables we include trade policy variable such as tariff and protection rates, ratio of funds from external sources to total investment funds as variable that capture industry's access to external sources of funds (banking and stock market etc). The

sources of external funds can be obtained directly from the government or from subsidized credit scheme from the state owned bank. In this respect this variable also capture one form of government intervention through banking system.

In the above equation, the intercept can vary over industry and over period. In order to capture the industry and time-specific fixed effects, the intercept is specified as follows:

$$\alpha_{it} = \alpha + \mu_i + \lambda_t$$

The industry and time-specific constant terms may capture unmeasured disturbances to TFP growth, while the industry intercept μ_i is likely to capture unobserved industry-specific elements, such as the share of trade and the geographical location of each industry. Finally, the time intercept λ_t may reflect period-specific disturbances such as terms of trade shock.

4.2.1. Degree of Openness and TFP Growth

The measurement of TFP growth is very useful to relate industry performance with industry's environment. Regarding industry's environment, one important variable is degree of openness. There are more than one way to define the degree of openness. One can define it as the absence of tariff and/or non-tariff barrier. One can also to use the degree of export-orientation. Another possibility is to use the presence of FDI firms in the industry.

In the cross-country growth regression one, there is also attempt to link TFP growth at the country level with its degree of openness. The work of Hhan and Kim (1999) found that openness affect TFP growth positively. In this respect, the openness of East Asia (72 percent openness) is an important factor that enables countries in this region to outgrow Latin America (30) openness and Sub-Sahara (9 percent openness).

At the industry level, the empirical application of this procedure model can be found for example in Lee (1999), Kuncoro (1999), and Cororaton (1999). Using Korean data, Lee (1999) examined the impact of government industrial policy and trade protection on the productivity growth of manufacturing sector. He found that trade protections such as tariffs and import restrictions are negatively correlated with the growth rates of value added, capital stock and total factor productivity. These findings suggest that the excessive trade protection have never brought about higher productivity growth in the protected industries.<Table 13>.

In Kuncoro (1999), TFP growth is determined by several factors such as export-orientation, the presence of foreign direct investment (FDI) firms and access to external finance.<Table 14>. The results indicate that TFP growth is negatively correlated with export-orientation. This is in contrast with the Philippines result (Cororaton (1999)) where the correlation is positive. In this respect, the Indonesia's result seems rather counter intuitive. However, judging from Indonesian pattern of international trade in which the country specializes on low value-added and labor-intensive products this result seems plausible. Another

interesting result is the positive correlation between the presence of FDI firms and TFP growth. Finally, access to external finance affects TFP growth positively.

Kawai's study (1999) mentioned above also investigated some relationship between TFP growth and several determinants. However instead looking at the direct relationship between TFP growth and its determinants he focused on the relationship between net entry and several factors. In other words, since the net entry has favorable effect on TFP growth, he only examined the relationship between the net entry and several determinants. He found that profitability, market size, and sales growth are significantly positive, while entry barriers, minimum efficient scale, capital-output ratio, R&D, and advertisement to sales ratio are significantly negative, which are consistent with the expectation. The estimated coefficient on concentration is negative but insignificant. Another interesting finding is that the impact of policy loans is negative, which suggests that policy loans tend to protect incumbents.

4.2.2. Data and Measurement Problem

TFP growth estimates are very sensitive to the data, methodology and period used. Given the measurement problems, it is very difficult to do a comparative analysis across countries since each country has different way in measuring capital and labor. For example, in Indonesia and Malaysia, information on man-hours is not available and instead number of workers is used. Similarly, The data on capital input is usually non-existent as alternative, capital stock is usually calculated from information on fixed assets such as building, machinery/other equipment and transportation equipment.

To be able to estimate TFP growth and to examine its determinants one should have access to annual manufacturing survey. The annual manufacturing survey usually provides information on output, value added, labor input, other inputs such as raw materials and the cost structure. For those who prefer to use non-econometric method, information on firm or industry cost structure is useful to construct input shares in total cost which are used as the weighting factors for the growth of factors of production in the TFP growth calculation. Information on variables that affect TFP growth but beyond firm's control often have to be collected from independent data sets outside annual manufacturing surveys. The protection rates for examples have to be constructed from the country's Input-Output table and the Book of Tariff. Another example is credit allocation across industries that have to be collected from the Central Bank Annual Reports.

Conclusion

For a decade or so East Asian economies are known for their remarkable economic growth. From macroeconomic point of view the good result is achieved simply by getting the basic right.

But this assertion often conceals many other important factors. This paper tries to identify several important contributing factors to economic growth from the point of view of microeconomic agents. We pick up two important players; household and firm. Several important stylized facts behind East Asia remarkable growth are high saving, high productivity growth and high educational attainment and relatively equitable income distribution from the point of view of household and firms and we try to explain why these are so.

From our observation the most important player behind the East Asian phenomenal growth is manufacturing firms in urban areas, especially in export-oriented sectors. These firms are able to exploit opportunities created by a conducive investment climate. Governments in East Asia are credited for creating such investment climate, which is based on prudent management of macroeconomic affairs and high degree of international openness. Outward looking strategy pursued by East Asian countries has exerted positive pressure on the firm sector. Outward orientation gives the opportunities for domestic firms to learn about foreign market and to bring in new technology through imports of capital goods, management and professional skills. The exposure to foreign competition also necessitates domestic firms to operate efficiently. All these factors combined have favorable impact on total productivity growth. In contrast protection and restrictions on entry of goods, capital, professional services tend have little or even negative impact on total productivity growth.

The firm sector is responsible for making physical and also human capital investments. One can argue that the economic growth in East Asia is driven by investment. To finance investment, manufacturing firms are very active in doing the saving. Our observation reveals that corporate sector contribution to private savings in East Asia is very substantial. In many instances, it reaches more than 50 percent of total private savings. In this way, savings respond to the need to finance investment.

This does not mean that household savings are unimportant. In fact, without household saving, the saving investment gap in East Asia will be much higher. Beside active in human capital investment, the household sector does save in financial assets. We identify several factors that might explain why East Asian tends to have high saving rates. Although the interest rates effect on saving rates seems to be small due the possible influence of borrowing constraint, it is still important to have real interest rates very close to the free market value. Over period of time Most East Asian countries have abandoned much of financially repressive policies. It is true that some of selective credit policies remain. However, this is no longer dominant policy in fostering economic growth. One should not forget that macroeconomic stability in East Asian countries in the form of low inflation might also lead to household to save their wealth in the form of financial savings.

Although firms do save to finance their investment often it is enough so that external financing is also needed. In this respect, financial factors often become formidable obstacle for firms to finance their productive investment. As a result the availability of saving external to the firm, is not sufficient to produce growth. What also matters is how saving can be channeled into productive use. There is no guarantee that individual firms can use saving to finance their productive projects without the existence of efficient intermediary.

One salient feature of East Asian economies is the relative absence of financial repression. After decade or so experimented with financially repressive policy, one after another East Asian economies opted for some kind of financial sector liberalization. In this case increasing real interest rate toward its market equilibrium level (financial liberalization) is proved to foster economic growth. Two factors that link financial asset accumulation and economic growth are financial intermediation and investment. In other words, if financial liberalization increases the availability of credit for investment, then the positive effect of credit availability on investment may constitute an indirect mechanism by which financial liberalization stimulated economic growth. Furthermore, as several evidences indicated, the absence of financially repressive policy exerts positive impact on income equality. The reason is that financially repressive policy caused the transfer of wealth from small depositors to large borrowers, which eventually perpetuates income inequality.

Manufacturing firms benefit greatly from the availability of labor with good basic education. Again here, we give credit to government. By emphasizing on primary and secondary education governments in East Asia has helped to bring more or less equitable economic growth. Non only that, in the earlier stage of economic development governments in East Asia also were also willingly to adopt labor intensive industrialization. Some like Indonesia, made mistakes by focusing first on import-substitution industrial policy with the emphasis on the heavy industry. Later on, however, the industrialization strategy shifted back to labor-intensive path. Only in the later period, capital intensive industries were gradually introduced.

In the labor intensive industrialization strategy, The household sector's role in providing good quality of labor is also important. In this case the household sector's is responsible for investing in human capital i.e. in education and health. In the case oh households' decision to invest in human capital we are able to identify several factors that are supposed to explain relatively high level of human capital in East Asia. People are willing to invest in at least in basic education simply because the rates of return are good. There are evidences that education is considered more as investment good rather than consumption good. This might give a partial answer why most East Asian people are so willing to invest in education even among the less fortunate. Again, the role of labor-intensive industry and outward orientation are crucial. They raise demand for labor with sufficient skill produced by the education system. By using labor-

intensive techniques, the export-led growth strategy in one way was responsible for pulling millions people out of poverty and thus growth is achieved with more or less with equitable income distribution.

In this paper we also discuss the proposition that the East Asian miracle is the results of the demographic transition in this region that produced the army of working-age population. There is no doubt, that the demographic transition itself produced the future supply of educated labor to work at export oriented industries. However the force of demographic transition only creates a good potential for economic growth. The realization of growth potential depends on economic, social and political factors. In order to transform the potential into economic growth, the supply of working age population needs to be balanced by the growing demand of labor. Perhaps this is only possible if governments adopt prudent macroeconomic policies and sufficient degree external openness.

This paper focuses on behavior of microeconomic agents in affecting economic growth. However, from time to time it is obvious that the role of government is inseparable from the East Asian success story. The role of government in East Asia is crucial in achieving "economic growth with equality." East Asian government did not adopt redistribution policies that create distortion and possibly social tension. Instead economic growth and relatively equitable income distribution of income are achieved through more even distribution of opportunities. They take export-led growth industrialization strategy that takes advantage the pool of adequately educated labor, which helps narrowing income differences.

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Table 1: Economic Performance of Selected East and S. East Asian Countries

Country	Annual GNP Growth 1975-95	Gross Domestic Saving (% GDP) 1997	Gross Domestic Investment (% GDP) 1997	Average annual inflation rate 1985-1996
China	9.1	43	38	9.2
Hong Kong, China	7.6	31	34	7.6
Indonesia	7.1	31	31	8.6
Japan	3.5	30	30	1.0
Korea	8.3	34	35	6.0
Malaysia	7.1	44	43	3.2
Singapore	7.8	51	37	3.1
Philippines	3.0	15	25	7.8
Thailand	7.8	36	35	4.8
Vietnam	na	21	29	85.4

Sources: Human Development Report 1999

Table 2: Economic Performance by Region

Region	Annual GNP Growth 1975-95	Gross Domestic Saving (% GDP) 1997	Gross Domestic Investment (% GDP) 1997	Average annual inflation rate 1985-1996
All developing countries	4.4	27	27	88.8
Least developed	2.3	11	20	94.9
Sub-Saharan Africa	2.0	17	18	44.7
Arab States	3.2	24	21	n.a.
East Asia	8.8	39	37	8.0
East Asia (exc. China)	8.1	33	35	6.4
S. East Asia and the Pacific	6.6	34	34	6.4
South Asia	3.7	18	23	8.9
South Asia (exc. India)	2.2	13	19	8.6
Latin America and Caribbean	2.8	21	22	263.7
Eastern Europe and CIS	na	22	23	n.a.
Industrialized countries	2.6	21	21	2.0

Sources: Human Development Report 1999

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Table 3: Saving rates in selected East Asian countries (% of GDP)

Country	Saving Components	1980	1985	1990	1994	1996
China	Domestic	34.6	34.3	38.0	42.2	41.4
	Private	26.2	28.0	36.3	44.5	42.3
	Public	8.4	6.4	1.7	-2.3	-0.9
	Saving-Invest. gap	-0.3	-4.2	2.8	1.4	2.1
Hong Kong	Domestic	34.1	31.1	35.8	33.1	30.7
	Private	29.4	30.0	35.2	32.0	28.5
	Public	4.7	1.0	0.7	1.1	2.2
	Saving-Invest. gap	-0.9	9.4	8.5	1.2	-1.7
Indonesia	Domestic	24.8	20.8	25.4	25.9	26.2
	Private	14.2	14.5	20.4	19.6	20.2
	Public	10.6	6.3	7.9	6.3	6.1
	Saving-Invest. gap	3.9	-2.3	-4.1	-1.5	-3.3
Japan	Domestic	31.1	31.7	33.6	31.3	31.7
	Private	27.9	26.8	24.7	25.8	27.6
	Household	17.3	15.3	12.4	13.8	14.2
	Corporate	10.6	11.6	12.3	12.0	13.4
	Public	3.2	4.9	8.9	5.5	3.9
	Saving-Invest. gap	-0.9	3.7	0.1	0.8	1.6
Korea	Domestic	24.8	30.9	36.4	35.3	34.2
	Private	18.1	23.7	27.4	26.0	23.7
	Public	5.1	6.1	8.5	9.3	10.8
	Saving-Invest. gap	-10.8	-2.1	-1.2	-1.5	-4.8
Malaysia	Domestic	29.3	25.4	29.3	34.0	36.0
	Private	19.7	18.0	17.2	16.5	21.4
	Household	10.5	15.4	10.9	6.1	7.9
	Corporate	9.2	2.6	6.3	10.4	13.5
	Public	9.5	12.6	12.2	17.5	14.6
	Saving-Invest. gap	-1.2	-2.2	-2.1	-6.4	-5.2
The Philippines	Domestic	26.3	19.2	19.0	16.1	17.9
	Private	20.5	18.6	17.9	12.0	13.8
	Household	13.1	10.9	9.8	1.5	2.6
	Corporate	7.4	7.7	8.1	10.5	11.1
	Public	5.8	0.6	1.1	4.1	4.1
	Saving-Invest. gap	-0.3	1.1	-3.1	-4.9	-3.6
Singapore	Domestic	37.5	40.1	44.7	49.7	50.5
	Private	23.9	11.7	25.9	26.5	28.8
	Public	13.6	28.4	18.8	23.2	21.7
	Saving-Invest. gap	-12.4	1.2	9.5	18.1	16.3
Taiwan	Domestic	32.2	34.1	30.0	26.4	25.2
	Private	30.3	32.8	27.5	19.8	19.3
	Household	11.4	16.8	14.4	11.6	
	Corporate	18.9	15.9	13.1	7.9	
	Public	1.9	1.4	2.6	6.6	5.9
	Saving-Invest. gap	-1.6	15.1	7.0	2.6	3.8
Thailand	Domestic	23.7	23.1	33.2	34.8	33.2
	Private	21.7	20.7	20.6	20.3	19.7
	Household	13.3	11.8	10.0	6.8	5.5
	Corporate	9.0	9.4	12.3	17.1	16.4
	Public	1.4	1.9	11.0	10.9	11.2
	Saving-Invest. gap	-7.1	-4.4	-8.8	-6.4	-8.5
Vietnam	Domestic	n.a	n.a	8.0	17.1	16.0
	Private	n.a	n.a	8.8	15.5	13.3
	Public	n.a	37	n.a	-0.8	2.7
	Saving-Invest. gap	n.a	n.a	-3.2	-8.4	-11.9

Table 4: Saving rates in selected Latin American countries (% of GDP)

Country	Saving Components	1980	1985	1990	1994	1996
Chile	Domestic	13.9	7.8	24.2	25.4	23.3
	Private	3.5	2.4	17.2	19.3	16.1
	Public	10.4	5.4	7.0	6.1	7.1
	Saving-Invest. gap	-7.1	-9.4	-2.0	-1.4	-4.4
Colombia	Domestic	19.6	17.1	21.4	18.6	12.9
	Private	15.0	12.9	14.1	9.2	7.0
	Household	9.0	7.1	6.6	5.3	
	Corporate	6.0	5.8	7.6	3.9	
	Public	3.2	4.1	7.2	9.4	5.9
	Saving-Invest. gap	0.5	-2.0	2.8	-4.7	-5.6
Mexico	Domestic	20.5	20.5	20.3	15.0	20.5
	Private	14.6	15.1	13.5	11.0	16.1
	Public	5.9	5.4	11.3	16.7	17.5
	Saving-Invest. gap	-5.0	0.4	-2.8	-6.7	-0.5
Peru	Domestic	27.0	18.0	16.0	14.1	14.0
	Private	24.5	15.4	-4.7	2.6	3.4
	Public	2.5	2.6	18.8	23.2	21.7
	Saving-Invest. gap	-1.9	-0.3	-4.3	-5.3	-5.9

Source: Pacific Economic Outlook: Domestic Savings on the Pacific Regions

Table 5: Saving rates in selected Industrialized countries (% of GDP)

Country	Saving Components	1980	1985	1990	1994	1996
Australia	Domestic	22.1	19.6	20.6	17.0	18.5
	Private	22.6	21.4	18.5	20.3	
	Public	-0.5	-1.8	2.1	-3.3	
	Saving-Invest. gap	-1.6	-4.1	-5.8	-3.9	-3.4
Canada	Domestic	25.3	22.6	20.4	19.6	21.2
	Private	27.0	27.7	23.5	24.3	22.5
	Household	9.2	9.1	7.4	5.2	3.7
	Public	-1.7	-5.1	-3.1	-4.7	-1.3
United States	Saving-Invest. gap	-0.9	-1.0	-3.6	-2.7	0.6
	Domestic	19.4	17.2	15.5	16.0	16.6
	Private	17.6	17.5	15.0	14.8	14.7
	Household	6.1	5.2	3.9	3.0	3.1
	Corporate	11.5	12.3	11.0	11.8	11.6
	Public	2.0	0.4	0.7	0.7	1.9
Saving-Invest. gap	0.7	-2.4	-1.1	-1.4	-1.2	

Source: Pacific Economic Outlook: Domestic Savings on the Pacific Regions

Table 6: Determinants of Private Saving Rates

Country	Explanatory Variables							
	GDP Growth	Wealth	Public Savings	Real Int. Rate	Liquidity Constraint	Depend. Ratio	Foreign Savings	TOT Change
Australia	yes			no		weak		
Canada	yes							
Chile	yes	yes	yes(-0.3)				yes(-0.2)	
Hong Kong, China	yes		weak	yes (+)		yes		yes
Indonesia	yes		yes(strong)	yes (+)	yes		yes(-0.5)	
Japan	yes			yes (-)				
Korea	yes		yes(-0.7)	no				
Malaysia	yes	yes	yes(-0.6)				yes(-0.3)	
Mexico	yes		yes(-0.5)	yes(+)		yes		
Peru	yes		yes(-0.4)		yes			yes
Singapore	yes		yes(strong)	no			yes(-0.1)	yes
Chinese, Taipei	yes				yes	weak		no
Thailand	yes				yes	yes	yes	

Source: PEC Structure Project: Domestic Savings in the Pacific Region: Trend and Prospect
Mmm

Table 7: Average Years of Schooling by Region, 1960-85 (population age 25 +)

Region	Number of Countries	Average Years of Schooling						
		1960	1965	1970	1975	1980	1985	
Middle East & North Africa	12	1	1.2	1.6	2.2	2.8	3.5	
Sub-Saharan	21	1.5	1.6	1.9	2	2.3	2.7	
Latin America & Caribbean	23	3	3.2	3.5	3.7	4	4.5	
East Asia and Pacific	10	2.3	2.8	3.4	3.8	4.4	5.2	
South Asia	7	1.3	1.5	1.8	2.2	2.5	2.8	
All developing countries	73	1.8	2	2.4	2.7	3.1	3.6	
OECD	23	6.7	7	7.4	7.9	8.7	8.9	
Centrally-planned economies	10	6.8	7.3	8	8.3	8.8	9.2	

Source: H.S. Rowen, Behind East Asian Growth table 8.1

Mm

Table 8: Average Gross Enrolment Ratios by Region, 1960, 1980, 1992
(total enrolment as percent of population in the relevant age range)

Region	Primary			Secondary			Tertiary		
	1960	1980	1992	1960	1980	1992	1960	1980	1992
Middle East & North Africa	51	81	97	11	42	56	2	10	15
Sub-Saharan	40	85	67	7	15	18	0	1	4
Latin America & Caribbean	88	105	106	14	40	45	3	15	18
East Asia and Pacific excluding China	101	116	117	19	36	52	1	4	5
South Asia excluding India	77	101	108	14	41	43	3	10	13
South Asia excluding India	56	74	94	18	26	39	3	7	n.a.
South Asia excluding India	39	66	67	1	18	25	1	34	n.a.
All developing countries	77	97	102	19	34	42	1	6	n.a.

Source: H.S. Rowen, Behind East Asian Growth table 8.2

Mm

Table 9: Profile of Public Education Expenditure in Selected East Asian Countries

Country	As % of	as % of	Primary	Higher
	GNP	total govt. expend.	and secondary	as % of all levels
	1997	1997	1997	1993-96
China	2.3	11.9	68.3	15.6
Hong Kong, China	2.9 ..		56.4	37.1
Indonesia	1.4	7.9	72.9	25.1
Japan	3.6	9.9	78.8	12.1
Korea	3.7	17.5	81.1	8.0
Malaysia	5.2 ..		76.3	16.8
Singapore	3.0	23.4	60.3	34.8
Philippines	2.2
Thailand	3.6	10.5	60.3	15.9
Vietnam	2.7	7.4

Sources: Human Development Report 1999

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Table 10: Country categorization according to efficiency in educational budget allocation

LOW EFFICIENCY		HIGH EFFICIENCY	
Continent	Country	Continent	Country
Africa	Ethiopia	Africa	Algeria
	Ghana		Cameroon
	Ivory Coast		Kenya
	Morocco		Madagascar
	Senegal		Malawi
	Sierra Leone		Mauritius
	C. America		El Salvador
Guatemala			Rwanda
S. America	Bolivia		Tanzania
	Venezuela		Uganda
South Asia	Bangladesh		Zaire
	India		Zambia
	Israel		Zimbabwe
Europe	Pakistan		C. America
	Finland		Haiti
	Ireland		Honduras
	Netherland		Jamaica
		N. America	Mexico
			Panama
		USA	
	S. America	Argentina	
		Chile	
		Colombia	
		Ecuador	
		Peru	
		Uruguay	
		Asia	Burma
			China
			Indonesia
			Iran
			Japan
			Korea
			Malaysia
			Philippines
			Singapore
			Sri Lanka
			Thailand
		Europe	Austria
			Begium
			Cyprus
			Denmark
			France
			Germany
			Greece
			Italy
			Norway
			Portugal
			Spain
			Sweden
			Turkey

Source: Judson (1998), table 7⁴²

Table 11: The Contribution of Demographic Change to Past Economic Growth, by Region 1965-90

Region	Average grow.rate real GDP per capita	Average grow. Rate of population	Avg. gr. rate of ec. Active population	Avg. gr. rate of dependent population	Estimated Contribution				
					sp1	sp2	sp3	sp4	
Asia	3.3	2.3	2.8	1.6	1.0	1.6	0.9	0.7	
East Asia	6.1	1.6	2.4	0.3	1.7	1.9	1.6	1.4	
Southeast Asia	3.8	2.4	2.9	1.7	1.3	1.8	1.1	0.9	
South Asia	1.7	2.3	2.5	2.0	0.7	1.3	0.5	0.4	
Africa	1.0	2.6	2.6	2.9	0.1	1.1	-0.1	-0.1	
Europe	2.8	0.5	0.7	0.2	0.4	0.5	0.4	0.3	
South America	0.9	2.1	2.5	1.7	1.0	1.5	0.9	0.7	
North America	1.6	1.7	2.1	1.1	0.9	1.3	0.8	0.7	
Oceania	2.0	1.6	1.9	1.0	0.7	1.1	0.6	0.5	

Sources: Bloom and Williamson (1998), tabel 7

sp1,sp2,sp3,sp4: refer to differnt regression specification

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Table 12: distribution of income in developing countries, by major region and income group

Group 1	GDP per capita < 1000 dollars						
Country	Year	Africa		Country	Year	Asia	
		Highest	GDP			Highest	GDP
		20%	per capita			20%	per capita
Ethiopia	81-82	41.3	322	Nepal	84-85		
Tanzania	91	62.7	534				
Uganda	89-90	41.9	554				
Guinea-Bissau	91	58.9	593				
Zambia	91	49.7	699				
Rwanda	83-85	38.9	776				
Mauritania	87-88	46.3	788				
Ghana	88-89	44.1	821				
Kenya	92	61.8	914				
Lesotho	86-87	60.0	949				
Nigeria	92	49.0	978				
Average							
Group 2	GDP per capita 1000-4000 dollars						
Senegal	91-92	58.6	1120	India	89-90	41.3	1264
Zimbabwe	90-91	62.3	1248	China	90	41.8	1324
Botswana	85-86	58.9	2662	Bangladesl	88-89	38.6	1375
South Africa	93	63.3	3068	Pakistan	91	39.7	1394
		60.8		Philippines	88	47.8	1676
				Indonesia	90	42.3	1974
				Sri Lanka	90	39.3	2096
				Thailand	88	50.7	2972
Average		60.8				42.7	
Group 3	GDP per capita > 4000 dollars						
				Malaysia	89	53.7	4674
				Korea	88	42.2	5607
				Singapore	82-83	48.9	8360
				Hong Kong	80	47.0	8719
Average						48.0	

Sources: Rowen (1998), table 13.5

Table 12: distribution of income in developing countries, by major region and income group

Group 1	GDP per capita < 1000 dollars			Latin America			
Country	Year	Highest	GDP	Country	Year	Highest	GDP
		20%	per capita			20%	per capita
Ethiopia	81-82	41.3	322				
Tanzania	91	62.7	534				
Uganda	89-90	41.9	554				
Guinea-Bissau	91	58.9	593				
Zambia	91	49.7	699				
Rwanda	83-85	38.9	776				
Mauritania	87-88	46.3	788				
Ghana	88-89	44.1	821				
Kenya	92	61.8	914				
Lesotho	86-87	60.0	949				
Nigeria	92	49.0	978				
Average							
Group 2	GDP per capita 1000-4000 dollars						
Senegal	91-92	58.6	1120	Nicaragua	93	55.3	1294
Zimbabwe	90-91	62.3	1248	Honduras	89	63.5	1432
Botswana	85-86	58.9	2662	Bolivia	90-91	48.2	1696
South Africa	93	63.3	3068	Guatemala	89	63.0	2137
		60.8		Dominican	89	55.6	2430
				Jamaica	90	48.4	2545
				Panama	89	59.8	2785
				Peru	85-86	51.4	2838
				Columbia	91	55.8	3297
				Costa Rica	89	50.8	3451
Average		60.8				55.2	
Group 3	GDP per capita > 4000 dollars						
				Brazil	89	67.5	4271
				Chile	92	60.4	4890
				Mexico	84	55.9	5524
				Venezuela	89	49.5	5907
Average						58.3	

Sources: Rowen (1998), table 13.5

Table 13: The Impact of Trade Protection on Productivity Growth: Korean Case

Independent Variables	Dependent Variables	
	TFPG	CSGR
log(initial value added)	-1.44E-01 [0.146]	3.50E-02 [0.013]
log(initial capital)	7.10E-02 [-0.017]	-1.95E-01 [-0.015]
Non-tariff barrier	-7.20E-02 [-0.032]	-1.31E-01 [-0.028]
Tariff	-7.90E-02 [0.069]	5.60E-02 [0.062]
Tax incentive	4.40E-02 [0.110]	3.82E-01 [0.122]
Bank loan	-1.90E-02 [-0.138]	-1.18E-01 [-0.138]
Number of observations	146	146

TFPG: total factor productivity growth

CSGR: growth rate of capital stock

figures between parentheses are standard error