

# **Success and Failure of the Korean Economy and Its Prospects**

by

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## **V. Future Prospects and Suggestions**

## I . Introduction

The Korean economy experienced a dramatic transition from one of an unprecedented rate of economic growth to one under the IMF bail out package program. The recent currency crisis has vitiated in a way the glory of rapid economic growth in the past, and brought about hardship and agony to Koreans as well, which they have never experienced in recent years.

Further, some economists raised quite skeptical views on the future of the Korean economy, although, Korea has been a symbol of the most successfully developing country. One of the most significant arguments supporting these negative views is that the ability of economic growth of Korea has reached its limit, since Korean economic development has depended excessively on increases of labor and physical capital inputs. Some economists even jumped to the conclusion that the Korean miracle was a simple illusion, and thus Korean development experiences can no longer serve as a model for development plans in LDC's.

Others consider the current crisis as just a transitional phenomenon caused by insufficient and delayed structural adjustment, and speculative foreign investors.<sup>1</sup> These conservative believers try to maintain their views by pointing out strong economic fundamentals, a high rate of savings and private investments, effective human capital development, and successful implementation of sound economic policy (including export-oriented strategy, well-managed industrial policies, SOC development, promotion of development-oriented financial system, etc.).

The fact is that, as the world's 11th largest economy, Korea became a member of OECD in 1996. The inflation rate measured in terms of GDP deflator was stabilized within 5%. There was no real concern over the government budget, since the government maintained a balanced budget over the years. A current account deficit persisted but did not seem to cause alarm. In fact, in the previous ten years it never rose above 5% of GDP until the end of 1996.

The debate on this issue seems to go on for the time being. Instead of being a premature

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<sup>1</sup> Some people define the former as an internal factor, and the latter, an external factor. But I believe such classification does not provide any significant implications in this study.

judge, we should start by gathering obvious facts such as the following.

First, most Koreans believed that Korea would not be contaminated by the South-East Asian countries' currency crisis. It was thus a surprise to them when Korea was caught by the crisis. They thought then that it might just be the outcome of some financial mismanagement, and so it could soon be overcome. But the situation was much worse than everybody thought. In a word it was a disaster. And its impact still goes strong.

Second, any stylized macro model is not good enough to incorporate the complex structural imbalances that contributed to the breakout of the crisis. A model that focuses on key macroeconomic variables and external conditions is unlikely to be adequate to derive reasonable answers. Further, any indicator approach to forecast the possibility of another crisis loses its meaning in this sense.

Third, there were some key immediate causes of the crisis such as the irrational government guarantee of deposits and loans of all financial institutions, ineffective handling of the failed Kia Motors and Hanbo steel corporations, the government's insistence on the strong won policy in times of the ASEAN crisis, rapid movement of international capital flow, etc. But none of them alone or as a whole can provide convincing explanations<sup>2</sup>.

By all these facts, we should employ somehow an approach that can offer general descriptions and analyses of factors that have played a key role in the evolution of the recent crisis. To accomplish this goal, I intend to adopt a new economic development model approach which can explain both the past success and current failure of the Korean economy. In other words, this study will be based on the institutional approach coupled with historical perspectives on the development process of the Korean economy.

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<sup>2</sup> Many other factors have been provided such as over-lending and over-investment due to moral hazard, high growth and low profits, boom-bust cycle and asset bubble busting, poor corporate governance, overvalued exchange rates, deterioration of terms of trade, high proportion of short-term debts in total foreign debts, large government directed and connected loans, weak financial sector, poor supervision and regulation of financial institutions by the government, lack of transparency in the financial statements of financial institutions and corporations, prevalent corruption and crony capitalism, high cost and low efficiency economy, etc..

## II. Major Sources of Economic Growth in Korea

### 1. Krugman vs. Lucas

Krugman (1994) did not point out East Asian countries' development strategies as a direct cause for the recent East Asian economic crisis. His argument however has been often utilized to provide a fundamental cause of the East Asian economic crisis.

The essence of Krugman's assertion is that the newly industrializing countries of Asia have achieved rapid growth in large part through an astonishing mobilization of resources. In other words, Asian growth seems to be driven by extraordinary growth in inputs like labor and capital rather than by gains in efficiency. He even argued that he could find surprising similarities between the Asian success stories of recent years and the Soviet Union of three decades ago. Finally he jumped to a conclusion that the myth of Asia's miracle is simply a fallacy or an illusion and that the NICs are nothing but paper tigers.

On the other hand, Lucas (1993), in his article "Making a Miracle", referred to the continuing transformation of Korean society (in comparison with the Philippines) as a miracle, and applied this term to the very similar transformations that are occurring in Taiwan, Hong Kong, and Singapore. He pointed out the fact that never before have the lives of so many people (63 million in these four areas in 1980) undergone so rapid an improvement over so long a period, nor is there any sign that this progress is near its end.<sup>3</sup> By adopting the so-called learning-by-doing model, he tried to explain why it happened in Korea and Taiwan, and not in the Philippines. In fact he put emphasis on the accumulation of human capital and in particular on human capital accumulation on the job: learning-by-doing as the single most important factor of successful economic growth.

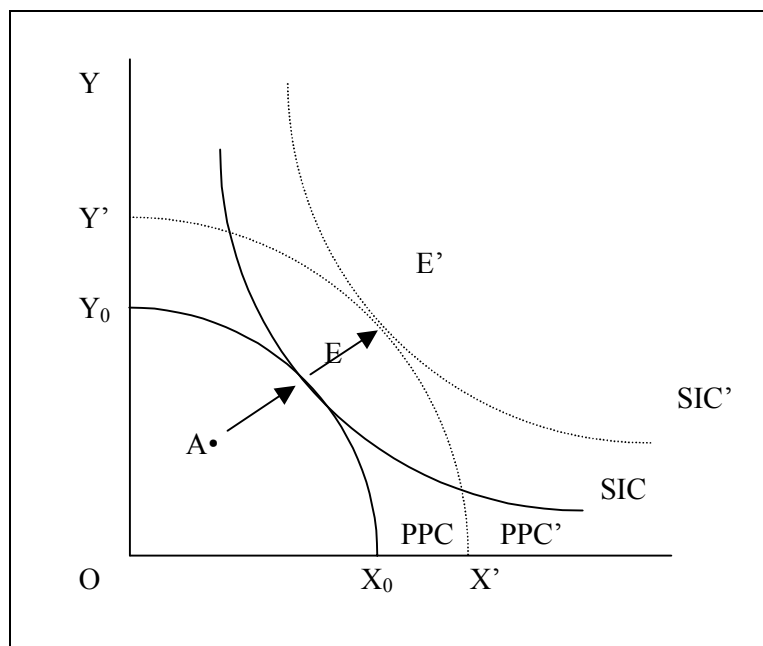
From two prominent economists we heard extremely conflicting views on the Korean economic development, although both of them were actually based on neo-classical growth theories.

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<sup>3</sup> The recent economic crisis that Korea has been experiencing can now be considered as a tragic exception.

It is obvious that we can expect to hear different arguments from alternative economic development theories or dependency theories of underdevelopment. I won't get into the discussions on these arguments in detail here, since it is not a major concern of this study. Instead I will try to consider major sources of economic growth extensively by firstly utilizing the following diagram.

**Figure 1. Sources of Economic Growth**



Production possibility curves (PPC hereafter),  $X_0EY_0$  and  $X'E'Y'$  represent different levels of production, while social indifference curves, SIC and SIC' represent different levels of social satisfaction. Economic theories tell us that the point E, an intersection point between PPC and SIC guarantees the maximum satisfaction for the society. If PPC moves outward to PPC' for some reason, a new equilibrium is obtained at point E' where a higher level of social satisfaction can be attained. This improvement is called economic growth.

We can thus see that economic growth can be achieved either through more inputs or through technological progress. In fact classical growth models emphasized the former factor, while neo-classical models include the latter in their consideration of economic

growth.

Traditional economic growth models put the emphasis on capital formation as a major engine for economic growth. This philosophy, which I refer to as capital fundamentalism, has been long and widely accepted by most developing countries including Korea. Naturally there has been a tendency that economic development through technological progress has been neglected in most development planning processes.

Technological progress can be achieved through extending general education, OJT, adaptive or inventive technology investment. Lucas emphasized the role of OJT in developing countries, while Krugman blamed developing Asian countries for the lack of inventive technology.

At any rate, there is one important aspect of economic growth or development that I would like to emphasize at this point. The truth is that none of the developing countries can produce at the point E or E' in reality. The actually possible point of production of developing economies is like point A, due to pre-modern conditions of their economic system such as irrational shift system especially in traditional work places, lack of monopoly regulation, unstable labor relations, etc. Few economic development plans seriously consider institutional improvements as a major source of economic growth.

## **2. Endogenous growth model approach**

Even when we have to rule out institutional factors of economic growth, we need to employ a model which can incorporate both technology level factors and input quantity factors. What I have in mind is that the capitalistic development is achieved not only through more inputs but also through technology and human development. In this regard I tried to concentrate on the question of whether economic development of Korea largely depended on employment of more inputs or not. To accomplish this goal, I employed the Romer's endogenous growth model.

In fact, there are two major approaches dealing with the relationship between technology and economic growth. One is the Growth Accounting Analysis approach (GAA, hereafter), which was developed by Solow (1956) and Griliches (1973). This method is the one that determines a sort of contribution ratio of major inputs. But, the

contribution ratio of technology is computed by simply extracting the contribution ratios of labor and capital from the total output growth rate. It is just arithmetic calculation technique, and thus neglects considering a dynamic economic aspect in consequence. Besides, although we can measure the relative importance of the technological factor, we cannot examine in what ways technology contributed to economic growth.

Nevertheless, Denison and Chung (1976), Young (1995), Kim and Hong (1997) and Kim(1998) used this GAA approach to analyze the Korean economic growth. And this is the very approach which Krugman's argument is based on.<sup>4</sup>

The other approach is the so-called New Economic Growth Theory model (NEG, hereafter), which regards technology as an endogenous factor in economic growth and which emphasizes technology as one of the most important factors in economic growth. Sengupta(1991), Pyo(1995) and Jang(1995) used similar approaches to this to evaluate the development of Korean economy. But they neglected the dynamic role of technological change for economic development. So, I employed here the Romer(1990)'s Endogenous Technological Change Model(ETCM, hereafter) in order to overcome the weaknesses of GAA and some limitations of previous NEG based studies. With the Romer's ETCM, We can consider technological development as a core source for development of capitalistic economy and an endogenous factor for economic growth as well.

We can derive the following implications based on the analysis of this model.<sup>5</sup>

First, it is human capital that plays a more important role than physical capital.

Second, the diminishing-returns-to-scale principle can be applied only for capital and labor but not for technology and human capital.

Third, accumulation of human capital and technological change can be accelerated by the expansion of international trade. In other words, the expansion of international trade can have positive effects on the accumulation of human capital and technology through

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<sup>4</sup> The major conclusions reached in these studies are as follows: contribution ratios calculated by Young(1995) for capital, labor and productivity change for the 1960-1961 period in Korea are 3.3%, 4.8% and 0.6%. Those for the 1985-1990 period are, however, found to be 3.1%, 5.1% and 2.7%. And those ratios calculated by Kim(1998) were 1.8%, 2.6% and 1.7%. Similar results were obtained by Bosworth-Collins-Chen(1995). Kim and Hong(1997). Denison and Chung(1976), and Denison(1985). When contribution ratio of technology for Korea(1979-1995) is compared to those for Japan(1951-1971) and USA(1929-1982) in terms of standardized contribution ratio to GNP, we can not tell the difference. Those for three countries are 21.3%, 22.4%, and 21.9% respectively. See Lee and Yu(1998) for details.

<sup>5</sup> See Lee and Yu(1999) and Roemer(1990) for details.



importation of advanced technologies from abroad. This model in a way argues for the export-led growth strategy.

Anyway, from the ETCM based production function, I derived the following the estimation equations in order to analyze major factors of economic growth in Korean economy. In other words, I set the estimation equation by differentiating equation.

$$Y(H_y, L, K) = (H_y A)^\alpha (LA)^\beta (K)^{1-\alpha-\beta} \eta^{\alpha+\beta-1}$$

with respect to time t, where  $0 < \alpha$ ,  $\beta < 1$ ,  $0 < \alpha + \beta < 1$ ,  $H_y$  is human capital and A is technology level.

And I actually set two different production functions for estimation, one with a international trade variable in it, the other without it.

So, the first equation to be estimated becomes:

$$\dot{Y} = f(\dot{L}, \dot{H}, \dot{K}, \dot{A})$$

(where,  $\dot{Y}$ : growth rate of GDP,  $\dot{L}$ : growth rate of labor,  $\dot{H}$ : growth rate of human capital,  $\dot{K}$ : growth rate of physical capital,  $\dot{A}$ : growth rate of technology level )

The second estimation equation is specified so as to test whether the expansion of international trade has a positive effect on the economic growth through improvement of human capital and technological advancement. So, the second estimation equation becomes:

$$\dot{Y} = f(\dot{L}, \dot{H}, \dot{K}, \dot{A}, \dot{T})$$

(where,  $\dot{T}$ : degree of international trade expansion)

Annual data for the period of 1975-1996 was used for the empirical study of Korean economic growth. The real per-capita GDP growth rate(PRGDPR) is employed as a

dependent variable.<sup>6</sup> Explanatory variables are separated into five groups: physical capital, labor, human capital, technology, and degree of international trade expansion.

**Table 1**  
**Major Variable Lists**

	Variable Names	Definition of Variables
Output (Y)	PRGDPR	Real GDP per capita growth rate(%)
Physical Capital (K)	RGKSR	Total fixed capital growth rate(%)
Labor (L)	WPLR	Labor force growth rate(%)
Human Capital (H)	HY	Weight of professional, technical workers in labor force(%)
	RSEW	The relative ratio of the number of scientists and engineers in R&D activities to labor force
	OJTR	Growth rate of the workers on-the-job training(%)
	OJTRLF	Weight of the workers on-the-job training in labor force(%)
Technology (A)	RRNDNR	Real R&D investments growth rate(%)
Degree of International Trade Expansion (T)	TAR	Effective rate of tariffs(%)

Data Sources:

Bank of Korea, *National Accounts, Annual Statistics*, each volume.

Bureau of Science and Technology, *Year Book of Statistics of Science and Technology*, each volume.

Bureau of Statistics, *Year Book of Statistics*, each volume.

Department of Labor, *Yearly Labor Statistics*, each volume

ILO, *Year Book of Labor Statistics*, each volume.

Korea Association of Promotion of Industry and Technology, *Statistics of Industry and Technology*, each volume.

Growth rate of the total fixed capital(RGKSR) is used for the total physical capital variable. In case of human capital, the weight of professional, technical workers in labor force(HY), the relative ratio of scientists and technicians related to R&D activities to

<sup>6</sup> The estimation period was limited to the 1975-1996 period due to the availability of data, regarding the number of professional, technical workers for the human capital variable, and severe structural change

labor force(RSEW) and the growth rate of the workers on-the-job-training(OJTR) are used in turns. For labor, labor force growth rate(WPLR) is used. For technology, real R&D investments growth rate in the nation(RRNDNR) is used. In the case of the degree of international trade expansion, effective rate of tariffs(TAR) is used.

I carried out an empirical study to test whether three major implications drawn from the ETCM model can be straightforwardly applied to the process of Korean economic development. In other words, we tried to analyze the major factors of Korean economic growth, the influence of the labor input on Korean economic growth, and the impact of international trade expansion on Korean economic growth.

First, of all, let's look at the estimation results on the major sources of economic growth in the Korean economy, using four basic production factors: physical capital, human capital, technology and labor. (see estimation equation (1) in <table 2>). In short, the estimation result showed that Korean economic growth was highly related to the increase rate of real total fixed capital(RGKSR), the weight of professional and technical workers in the total population(HY) and the growth rate of the total R&D investments of the nation(RRNDPR). But, it was not so much related to the labor force growth rate. The growth rate of the labor force turned out to be positively related to economic growth. The significance level was however quite low. This means that the influence of this variable is weaker than those of other variables. This result implies that high and rapid Korean economic growth has been accomplished rather through accumulation of human capital and improvement of technology rather than through the increase of labor inputs.<sup>7</sup>

To examine what type of human capital has contributed to Korean economic growth most, we made estimations by using three variables(HY, RSEW and OJTR) as alternatives(see estimation equations (2)<sub>1</sub>-(6)). We found out that the OJTR variable was consistently inferior to others in terms of the size of t-values. The result implies that the technology effect of on-the-job training had a positive effect on Korean economic growth, but with less significant impact on economic growth in Korea. Lucas' argument loses its meaning in part in this respect

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caused by the financial crisis since the end of 1997.

<sup>7</sup> If the data for the 1960's were available for empirical study, the result could however be different.

**Table 2**  
**Estimation Results of the ETCM without a Foreign sector**

Dependent Variable: Real GDP per Capita Growth Rate (RPGDPR)						
Estimation Period: 1975-1996						
Estimation method: OLS						
Explanatory Variables	Estimation Results					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant Term	9.652 (33.031)	9.876 (33.396)	9.362 (30.630)	9.696 (35.430)	9.923 (33.977)	9.356 (37.870)
Total Fixed Capital (RGKSR)	0.318 (6.311)	0.332 (7.862)	0.336 (5.818)	0.308 (6.710)	0.317 (8.040)	0.337 (7.076)
Professional, technical Workers(HY)	0.012 (2.704)	-	-	0.012 (2.709)	-	-
Scientists and Engineers(RSEW)	-	0.401 (3.025)	-	-	0.372 (2.874)	-
Workers on-the-job Training(OJTR)	-	-	0.000 (0.648)	-	-	0.000 (0.725)
Total R&D (RRNDNR)	0.189 (6.269)	0.146 (4.807)	0.208 (6.286)	0.196 (7.296)	0.159 (5.868)	0.208 (7.479)
Labor Force (WPLR)	0.002 (0.518)	0.003 (1.002)	-0.000 (-0.036)	-	-	-
R <sup>2</sup>	0.996	0.997	0.996	0.996	0.997	0.996
D/W	1.168	1.321	0.892	1.087	1.078	0.896

Note: Values in parentheses are t values.

The second group equations are estimated in order to examine the role of international trade in Korean economic growth. As shown in <table3>, tariff variable was found to strongly and negatively influence economic growth in each estimation equation. This implies the decrease of tariff rates or expansion of international trade has played a very strong role in economic growth in Korea.

**Table 3**  
**Estimation Results of the ETCM with a Foreign sector**

Dependent Variable: Real GDP per Capita Growth Rate (RPGDPR)						
Estimation Period: 1975-1996						
Estimation method: OLS						
Explanatory Variables	Estimation Results					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant Term	9.762 (37.970)	9.794 (36.132)	9.734 (40.184)	9.842 (37.861)	9.885 (35.056)	9.833 (43.324)
Total Fixed Capital (RGKSR)	0.316 (7.230)	0.332 (8.664)	0.310 (7.275)	0.294 (6.911)	0.309 (8.096)	0.288 (7.526)
Professional, technical Workers(HY)	0.008 (1.790)	-	-	0.008 (1.719)	-	-
Scientists and Engineers(RSEW)	-	0.212 (1.413)	-	-	0.219 (1.376)	-
Workers on-the-job Training(OJTR)	-	-	0.000 (1.487)	-	-	0.000 (2.020)
Total R&D (RRNDNR)	0.191 (7.300)	0.167 (5.703)	0.209 (8.641)	0.206 (8.225)	0.182 (6.082)	0.221 (10.382)
Tariff (TAR)	-0.016 (-2.567)	-0.013 (-2.110)	-0.020 (-3.894)	-0.013 (-2.112)	-0.010 (-1.541)	-0.018 (-3.704)
Labor Force (WPLR)	0.005 (1.475)	0.005 (1.732)	0.003 (1.114)	-	-	-
R <sup>2</sup>	0.997	0.998	0.998	0.997	0.997	0.998
D/W	1.596	1.787	1.688	1.204	1.194	1.369

Note: Values in parentheses are t values.

With all these estimated results I may conclude that Korean economic development was achieved not merely through more inputs, but through human capital and technological development as well.

In addition, human capital was found to play a more important role than physical capital in the continuous economic development of Korea.

Further, the role of labor turned out to be quite limited due to its characteristics of diminishing return to scale.

Lastly, the human capital variable was found to play a big role consistently in

comparison to other factors when international trade variable was included in the estimation equation. It is a natural result when we consider the fact that accumulation of human capital and technological change were found to be accelerated by the expansion of international trade. This result in part proves the efficiency of the export-led growth strategy in LDC's

### **3. Socio-Economic Factors**

Major sources for rapid economic growth in Korea can be found through different approaches. For example, socio-economic factors can be considered in comparison among developing countries. I made an inter-country comparison by utilizing the 1994 Barro-Lee data and the 1991 Summers and Heston data. Twelve countries such as Nics(Korea, Taiwan, Singapore and Hong Kong), New South-East Asian Nics(Philippines, Thailand and Indonesia), leading Latin American(Brazil, Chile, and Mexico) and African(Ghana and Kenya) developing countries are used for comparison. Also, ten categories are selected as a standard of comparison. For example, initial conditions of physical and human capital, physical capital accumulation ratio, human capital accumulation trend, labor condition, illiteracy ratio, level of technology progress, international trade policy, government role in public financing, and socio-economic conditions, etc. are considered.

Korea ranked high in most of the categories. But the most significant characteristics of Korea turned out to be its superiority of its initial human capital, heavier investment on human capital and faster improvement of technology. This provides consistent results with the above empirical study, and other conducive factors to Korean economic success at the same time.<sup>8</sup>

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<sup>8</sup> See Lee and Yu for details(1998, pp. 211-242)

### **III. Characteristics of the Development Strategies and Foreign Currency Crisis**

In the Previous section we found that Korean economic growth was achieved by technological development, human capital accumulation as well as accumulation of physical capital. The popular pessimistic views on the future of the Korean economy lose their meaning in this respect. The remaining question is then what has brought about the foreign currency crisis in the Korean economy, in spite of all those positive aspects revealed in the above estimation results.

My intuition is that the crisis is a natural consequence of Korea's development plans, policies and processes no matter how they are characterized. Furthermore, I believe that all those contributing factors to the crisis can be related to a certain fundamental cause. Tentatively I believe that the major cause has something to do with characteristics of Korea's development strategies. And the single most important feature of Korean development plans is I believe, based on the government-led centralized management system.

Up to 1960, Korea had been busy trying to rehabilitate its economy from the ruins of the disastrous Korean war but suffered from the vicious circle of poverty. It was 1961 when Korea could start its formal long-term economic planning. In the early stage, due to the poor basis for development, lack of SOC's and key industries, Korea could not but stick to the principle of government-led centralized management planning. And thus emphasis has been put on building up a strong government-led economic operating system in order to form and accumulate large capital stocks needed for economic development, and adopting development strategies to accomplish this task.

In general, economic development largely depends on who owns key production inputs(i.e., capital in case of capitalistic society) and how to produce with them. The power of ownership of capital in the case of Korea can not but be subject to government and bureaucrats, since the government has been a prime contributor to the formation of capital, no matter whom they belong to. In fact, the bureaucratic managerial system has played a more powerful role than legal ownership of capital.



In order to pursue government-led development planning, Korea established a strong bureaucratic system. For example, Economic Planning Board(EPB) was created in 1961. Since then it has taken charge of economic planning, financing and budgeting. The Minister of EPB, whose status was elevated to deputy premier, has come to play the most important role in all the economic development related tasks.

Following the establishment of a strong bureaucratic managerial system, the government started to have a financial system, through financial reforms, at its hand as a next major step. The government thought it was indispensable for a vast capital formation needed for economic development and for financing key projects. By so doing, the government became a sole and key operator of capital ownership and management.

In this process, the Bank of Korea the central bank in Korea became downgraded and lost its authority in independent monetary policy operations. In addition, several new government-owned banks were created for special strategic financing such as foreign currency transaction, housing, farming, etc. Further, ownership of the major commercial banks were taken over by the government, and the voting power of civilian stock owners was restricted to 10% at the maximum by law. With a full control power over the financial system, the Korean government could freely operate the so-called "policy financing" mechanism which is a government directed credit rationing system.<sup>9</sup>

The government's control over the real sector has also been so powerful that almost all the prices of major commodities and wages were under government control.<sup>10</sup>

By all these facts, we can conclude the following. Even though business firms were privately owned, they were managed by both the government and owners. Actually the government has been a principal manager which has superior status over private owners. Such a strong power came from the fact that the government had full control over financing sources. And this is the very reason why I characterize the Korean economy as "(government-led) centralized management economy".

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<sup>9</sup> As of the end of 1985, there were 70 different kinds of policy financing. Very low interest rates were applied to those special loans. For example, interest rates applied to the export financing were only about one quarter to one-half of those to the usual commercial loans. Who gets this special policy loans is totally up to the decision of government bureaucrats. During the 1963-1985 period, such policy loans consisted of about 60% of all the new bank loans.

<sup>10</sup> See detail Lee and Yu(1998, Ch. 4.) for details on real sector control policies. Still we have to admit that the core of the CME system is the government control of financial sector.

Such characteristics of the centralized management economy(CME hereafter) were clearly depicted in the major objectives for the first and second five-year economic development plans in Korea : i.e. ① disequilibrium development doctrine was adopted to overcome the so-called "bottlenecks to growth" through industrial targeting policy especially for those industries whose backward and forward linkage effects are believed to be great. In the beginning, most of official financial and monetary supports were concentrated on SOC industries(electricity, coal, railroads, highways, harbors etc.) and key industries(cement, fertilizer, oil refinery, etc.). And the emphasis moved toward labor-intensive light(manufacturing) industries in the late 1960's and capital-intensive heavy industries in the 1970's. ② "Development through industrialization" policy was adopted. So, agriculture related sectors have been neglected from the beginning ③ Export-led growth principle was employed. ④ Funds needed for industrialization were raised mostly through foreign loans. ⑤ In order to accomplish the above stated objectives, government-led economic planning and operation principle was declared.<sup>11</sup>

Such government-led CME principle played some positive roles in the early stage of economic development in Korea. For example, it contributed to the fast building up of organized markets, fast accumulation of capital stocks, and credit rationing for strategic sectors. It also made it possible for the Korean economy to achieve rapid economic growth. Average annual GNP growth rate for the first 5-year economic development plan period(1962-1966) was 7.8%, while that for the second period(1967-1971) was 9.6%.

During the first decade of economic development planning, the major industrial policy was an export-led growth principle. And this objective was achieved by most which was achieved by utilizing low-wage-high-quality labor force and borrowed capital from abroad.<sup>12</sup> However around the end of the 1960's, many of the foreign-loan business firms went bankrupt. It was the time when Korea should have turned toward intensive growth policy through productivity improvement. President Park, however, strengthened industrial targeting policy instead. Simply, emphasis was shifted from light industry to heavy industry. In spite of the irrational policy selection, Korea could achieve unexpected high economic growth(average annual economic growth rate for the

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<sup>11</sup> Futhermore, the priority was given to growth rather than to distribution. In a way, this growth-priority principle was based on Kuznet's reverse hypothesis.

<sup>12</sup> Krugman's argument makes sense up to this point, but does not anymore in later years.

3rd 5-year economic development plan period 1972-1976 was 9.7%), thanks to the boom of the Middle-East based Korean business companies. God did not allow fortune to Korea twice. President Park was assassinated on Oct. 26, 1979 in the middle of deep and serious stagflation and the Korean economy came to experience a negative growth rate for the first time since the Korean War(1950-1953). It was not a surprising consequence when we consider the fact that around 79% of the gross business investment was made only for heavy industries in 1978, and thus that people even experienced difficulty acquiring daily necessities such as soap, toothpaste, etc..

The sudden fall of the long-lasting regime made Korean people realize the importance of economic stability and technological progress. In addition, Korea began to show interest in market-oriented economic policy, restoration of liberal monetary policies, tightening fiscal expenditure, more investments in technology and extension of R&D, etc.. Such efforts were however not strong enough to make a successful structural reform.

On the other hand, thanks to the benefits from the unexpected "three-low price phenomenon" in the late 1980's (low oil price, low interest rate and low foreign exchange rate), and the spillover effects from the 1988 Olympic Games in Seoul, Korea could enjoy BOP surpluses for three consecutive years(1987-1989). Unfortunately, being carried away by this windfall gain, Korea neglected pursuit of incessant structural reform.<sup>13</sup> Instead Korean people began to dissipate their money away at home and abroad. They became over-confident with their economic capability without realizing the bubbling-up aspect of the swollen economic indicators.

It is, however, true that during the 5th and 6th 5-year economic development plan periods(1982-1991), the principle of the so-called government-led CME began to change, although the depth and strength of restructuring was not good enough to keep the Korean economy back on track.

When Y. S. Kim took over presidency, he stopped the 30-year old economic development planning, and established a New Economy 5-year plan with catch phrases such as "decentralization, deregulation, and globalization". He tried to make seemingly ambitious structural reforms but unsuccessfully. The natural consequence was the

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<sup>13</sup> What was done for structural reform in this period was simply speeding-up of its open-door policy. This, however, simply expedited extravagant consumption of foreign currencies.

financial crisis which struck Korea at the end of 1997. We have to admit however that during Kim's Presidency, the principle of the so-called government-led CME deteriorated to a certain degree especially through decentralization processes, although the restructuring was not strong enough to prevent Korea from economic crisis.

Table 4 is the summary of the above discussions on the characteristics of the Korean Economic development process.

**Table 4**  
**Characteristics of the Korean Economic Development Process**

Period		1 <sup>st</sup> 5-year EDP (1962-1966)	2 <sup>nd</sup> 5-year EDP (1967-1971)	3 <sup>rd</sup> 5-year EDP (1972-1976)	4 <sup>th</sup> 5-year EDP (1977-1981)	5 <sup>th</sup> 5-year EDP (1982-1986)	6 <sup>h</sup> 5-year EDP (1987-1991)	New EDP (1993-1997)
Ef	Growth Rate	8.5(7.1)	9.7(7.0)	10.1(8.6)	5.5(9.2)	9.8(7.6)	9.4(8.2)	6.9(7.0)
	Inflation Rate	18.1	8.3	21.1	22.0	0.1	3.3	3.1
	BOC	-3.2	-26.5	-49.0	-151.9	-19.0	181.6	-469.5
Eq	Gini-coefficient 1	0.3439(65)	0.3322(70)	0.3908(76)	-	0.3368(86)	0.3226(90)	-
	Gini-coefficient 2	0.2719	0.2876	0.3458	0.3502(79)	0.3771	0.4017	0.3883(92)
	Gini-coefficient 3	0.289	0.266	0.326	0.312(81)	0.313	0.302	0.282(95)
President		Park			Choi	Chun	Noh	Kim, Y.S.
Development of Economic system		Establishment and Development of the CME System			Transition of the CME System		Deterioration of the CME System	
		Establishment Period		Development Period		Initialization of Privatization	Extension of Free Trade	Initialization of Decentralization
Target Industry		Labor-intensive Light Industry		Capital-intensive Heavy Industry		Technology-intensive Hi-tech Industry		
Characteristics of Growth		Extensive Growth			Intensive Growth			

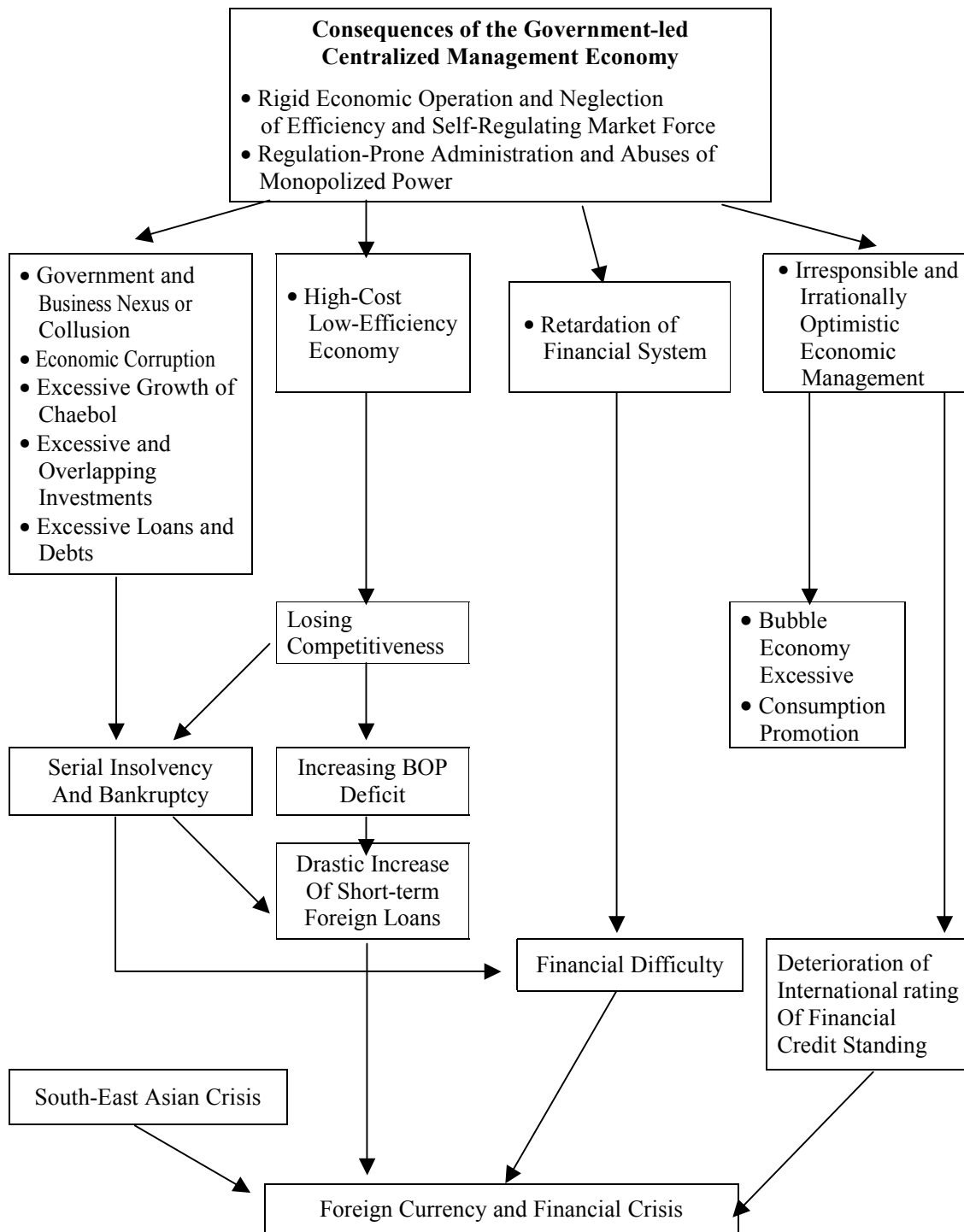
Note: EDP is Economic Development Plan

Ef. is efficiency, while Eq. is equity

BOC is balance of current account

And the Figure 2 is a sort of flow chart designed to show causal links of the CME to the recent crisis in Korea.

**Figure 2. Causes of Foreign Currency Crisis**



In order to prove the main argument of this paper, I utilized once again a Romer-type production function approach to economic development. But this time, a standard Cobb-Douglas production function is utilized at the same time for comparison. In other words, a new explanatory variable, GERGDP is added to both a Romer-type production function and a usual Cobb-Douglas production function in such a way as the following.

$$\begin{aligned}\dot{Y} &= f(\dot{L}, \dot{H}, \dot{K}, \dot{A}, \dot{G}) \\ \dot{Y} &= f(\dot{L}, \dot{H}, \dot{K}, \dot{A}, \dot{T}, \dot{G}) \\ \dot{Y} &= f(\dot{L}, \dot{K}, \dot{G})\end{aligned}$$

Where  $\dot{G}$  represents the ratio of government expenditure to GDP, i.e.,  $\dot{G} = \text{GE}/\text{GDP}$ . This new variable is included in the estimation equation to test the influence of the so-called CMES(Centralized Management Economic System) on economic growth in Korea. In order to quantify the CMES, the ratio of government expenditure to GDP(GERGDP), the ratio of central government expenditure to government expenditure(CGERGE) and the ratio of strategic preferential loans to general commercial loans(PLRCL) were utilized alternatively. Annual data for the 1970-1996 period was used again to study the characteristics of Korean economic development process.

But this time estimation was made for two-separate periods of time, 1970-1980 and 1981-1996. What I expect to find out was whether change of strength of CMES had a significant impact on economic development in Korea. Of course this test was made on the basis of the above-stated production functions.

Table 5 shows the estimation results on the Cobb-Douglas type production functions. RGKSR(total fixed capital growth rate) and KSR(capital stock growth rate) variables used alternatively for  $\dot{K}$ , while WPLR(labor force growth rate) was used for  $\dot{L}$ .

As shown in Table 5, when the CMES variable was included in the C/D type production function, it was proved to have a positive effect on the economic growth for the 1970-1980 period(see estimation equation(1) in table 5). Its impact, however, turned out to be negative for the 1981-1996 period(see estimation equation(3) in table 5). All these results support major implications drawn from the above discussions and conclusions. In other words, the CMES is proved to have a positive influence on economic growth only in the early stage of development, but a negative influence in the later stage. This argument can be sustained even stronger when KSR variable was employed in stead of RGRKSR variable in the estimation(see estimation equations(2) and (4) in table 5).

On the other hand, similar line of empirical study was carried out but with utilizing the ETCM model. In other words, I employed the Roemer-type production function approach to test whether same conclusions can be drawn from with the CMES variable included in the estimation for the two divided periods of time.

As was in section II, RSEW and OJT variables were used alternatively for the human capital variable, while the international trade expansion variable was included alternately.<sup>14</sup>

Estimation results were not as persuasive as in the case of C/D type production function estimation. Simply I could barely maintain the major conclusion reached above. In other words, I could observe positive signs for the CMES variable for the 1970-1980 period and negative signs for the 1981-1996 period in all four basic estimation equations(see equations (1)<sub>j</sub>-(4) in table 5). But some of the explanatory variables were either estimated statistically insignificant(low t values) or with wrong signs.

So CGRGE and PIRCM were used in stead of GERGDP variable. Somewhat worse estimation results, however, were obtained. On the other hand, I tried to estimate again all the equations with variables measured in current terms. I could obtain better results in all estimations, although they were not presented here.<sup>15</sup>

However, I could not present very strong empirical evidence for the major conclusion of this paper, when the ECTM model was employed. But when we consider the data shortage problem, I don't need to be disappointed.

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<sup>14</sup> OJTRLF=OJT/LF is used instead of OJTR this time.

<sup>15</sup> Traditionally, economic growth models have been, estimated by using variables measured in constant value. So the results with current variables are not introduced in spite of the slightly more significant estimation results.

**Table 5**  
**Estimation Results of the Cobb/Douglas Type Production Functions**

Dependent Variable: Real GDP per Capita Growth Rate (RPGDPR)				
Estimation method: OLS				
Explanatory Variables	Estimation Period			
	1970-1980		1981-1996	
	(1)	(2)	(3)	(4)
Constant Term	-15.754 (-3.938)	-4.885 (-3.801)	-3.501 (-2.681)	-2.506 (-0.714)
Capital Stock (RGKSR)		0.154 (3.387)		0.473 (3.820)
(KSR)	0.470 (1.352)		0.597 (9.626)	
Labor Force (WPLR)	2.644 (9.046)	1.563 (8.697)	0.832 (3.793)	1.019 (2.030)
CMES (GERGDP)	0.470 (1.352)	0.149 (0.531)	-1.008 (-3.727)	-1.418 (-2.711)
R <sup>2</sup>	0.996	0.998	0.998	0.993
D/W	2.862	3.057	2.314	0.885

Note: Values in parentheses are t values.



**Table 6**  
**Estimation Results of the ETCD with a CMES Variable**

Dependent Variable: Real GDP Per Capita Growth Rate (RPGDPR)								
Estimation method: OLS								
Expect Variables	Estimation Periods							
	1970-1980				1981-1996			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant Term	-5.423 (-3.043)	-5.136 (-3.099)	-3.571 (-1.661)	-2.803 (-1.371)	1.360 (0.756)	1.615 (0.966)	1.505 (0.722)	1.769 (0.910)
Capital Stock (RGKSR)	0.163 (2.981)	0.173 (3.337)	0.226 (3.285)	0.228 (4.031)	0.283 (4.085)	0.303 (4.577)	0.285 (3.879)	0.304 (4.348)
Labor Force (WPLR)	1.640 (7.056)	1.603 (7.119)	1.344 (4.368)	1.282 (4.583)	0.568 (2.311)	0.486 (2.095)	0.550 (1.976)	0.469 (1.801)
Human Capital (RSEW)	0.099 (0.106)		-0.532 (-0.540)		0.271 (1.434)		0.266 (1.322)	
(OJTRLF)		0.026 (0.741)		0.038 (1.434)		0.079 (2.000)		0.078 (1.867)
R&D (RRNDNR)	-0.021 (-0.676)	-0.025 (-0.939)	0.007 (0.195)	-0.010 (-0.432)	0.153 (2.810)	0.182 (5.254)	0.155 (2.644)	0.184 (4.940)
TARIFF			-0.008 (-1.347)	-0.008 (-1.611)			-0.001 (-0.166)	-0.001 (-0.186)
CME (GERGDP)	0.117 (0.268)	0.135 (0.451)	0.358 (0.808)	0.164 (0.626)	-0.519 (-0.927)	-0.793 (-1.430)	-0.565 (-0.867)	-0.843 (-1.312)
R <sup>2</sup>	0.998	0.998	0.998	0.999	0.998	0.999	0.998	0.999
D/W	3.224	3.280	3.001	2.993	2.348	2.188	2.344	2.189

Note: Values in parentheses are t values.

$$OJTRLF = OJT / LF$$

### **III. IMF's Policy Suggestions**

As soon as Korea was caught by the foreign currency crisis, the IMF made some policy suggestions, which was in fact uniform policy conditionality for any country in crisis. Major guidelines are as follows :

- Downward adjustment of GDP growth rate
- One-digit inflation rate
- Tight monetary policy
- High interest rate
- Government budget deficit
- Stability of exchange rate and BOP surplus
- Increase of foreign reserves

Disputes on whether the IMF's mandatory policy guideline was a proper solution for the Korean crisis are still going on strong.

However, the fact is that Korea did not have any other alternatives but to accept the IMF's advice.

## IV. Korea's Reform Policies

The Next question then is whether Korea's reform policies faced with the crisis are appropriate and desirable. Not a few economists say that Korea's reform policies are short-term remedies in nature. In other words, they are not long-term structural adjustment measures but simply a short-term allopathy.

Anyway we can safely say that Korean government policy measures have been taken in three stages.

The first stage(January, 1998-April, 1998) was to overcome the urgent foreign currency liquidity shortage. In order to accomplish this objective, the government adopted a high interest rate policy, borrowed loans from the IMF, World Bank, ADB, etc., rescheduled matured foreign debts through government sponsorship, and issued foreign exchange stabilization bonds(4 billion dollars).

In the second stage(May, 1998-September, 1998), the government concentrated on how to alleviate credit crunch problems. The government lowered interest rates on the one hand and rescheduled the maturity to prevent nonpayment on the other. In addition, the government executed the long-awaited financial restructuring policy for which structural adjustment funds were supplied as much as 41 trillion won(10% of 1998 GDP). In this process, 94 financial companies were closed.

At the third stage(Oct., 1998- ), the government embarked on a Chaebol restructuring policy together with a further decrease of interest rates and increase of government expenditure to alleviate the mass unemployment problem. The initial five principles for Chaebol restructuring were ① prohibition of cross investments ② core-sector oriented restructuring(big-deal between 5 great Chaebols) ③ improvement of financial status ④ adoption of extended B/S for transparency and ⑤ adoption of corporate governance through outside executive members and auditors.

Later three more principles were added : ① prohibition of circular investment among Chaebol group subsidiaries, ② reconsideration of ownership of non-banking financial institutions, and ③ taxation on inheritance and donations.

In this process, one of the big 5 Chaebols, the Daewoo group finally ran into bankruptcy.

The important thing about Chaebol restructuring is that the Korean government does not necessarily intend to dissolve Chaebol groups. The basic position of the government is that as far as Chaebols abide by the government policy guidelines, honor fair competition rule(non-monopolistic competition or no-inside trading), and pursue separation of management from ownership, Chaebols can be allowed to exist.

With these policy measures, somehow Korea could escape from the disastrous crisis, even with a strikingly high growth rate(?% in 1999), which is obviously a lot higher than expected by specialists. The major contributing factors to this recovery are stabilized foreign exchange rates, lowered interest rates and flexibility of labor markets. With these, Korea could enhance its international competitiveness.

## V. Future Prospects and Suggestions

Apart from politicians(especially of the leading party), few people in Korea believe that Korea has graduated from the crisis forever. Everyone knows that there are many things that should be done in the years to come. In fact, the government reform policies have been concentrated so far on corporate firm restructuring(including the financial sector and Chaebols). Korea has not yet begun its reform for the public sector as well as the household sector. For continuous economic growth, Korea should consider the following agenda.

First of all, better education and training should be supplied so that most of the people can have a chance to work in modern sector industries.

Second, in addition to the corporate sector reform, the public sector should go through a thorough reform, which is, I believe, the major and ultimate solution to the current crisis, since I believe that the fundamental cause of the crisis stemmed from the government-led CME system.

Third, Korea should open up its economy and learn how to survive and win in a globalized world.

Fourthly, in order to accomplish the above objectives, emphasis of future economic policies should be put on ① knowledge-information industry rather than manufacturing ② qualitative development rather than quantitative growth ③ human capital rather than physical capital stock, and finally ④ private sector-led economy rather than centralized management economy.

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