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Development Strategies for Inclusive Growth in Developing Asia *

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* Paper prepared for Asian Development Bank's Distinguished Speakers Program to be delivered at Manila, Philippines on October 11, 2004. This paper draws heavily on my previous papers "Development Strategy, Viability, and Economic Convergence," Economic Development and Cultural Change, Vol. 51, No. 2 (January 2003): 277-308; and "Development Strategy, Transition and Challenges of Development in Lagging Regions" (forthcoming). Please send the correspondence of the paper to Justin Yifu Lin, China Center for Economic Research, Peking University, Beijing 100871, China; Email: jlin@ccer.pku.edu.cn.

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I. Introduction

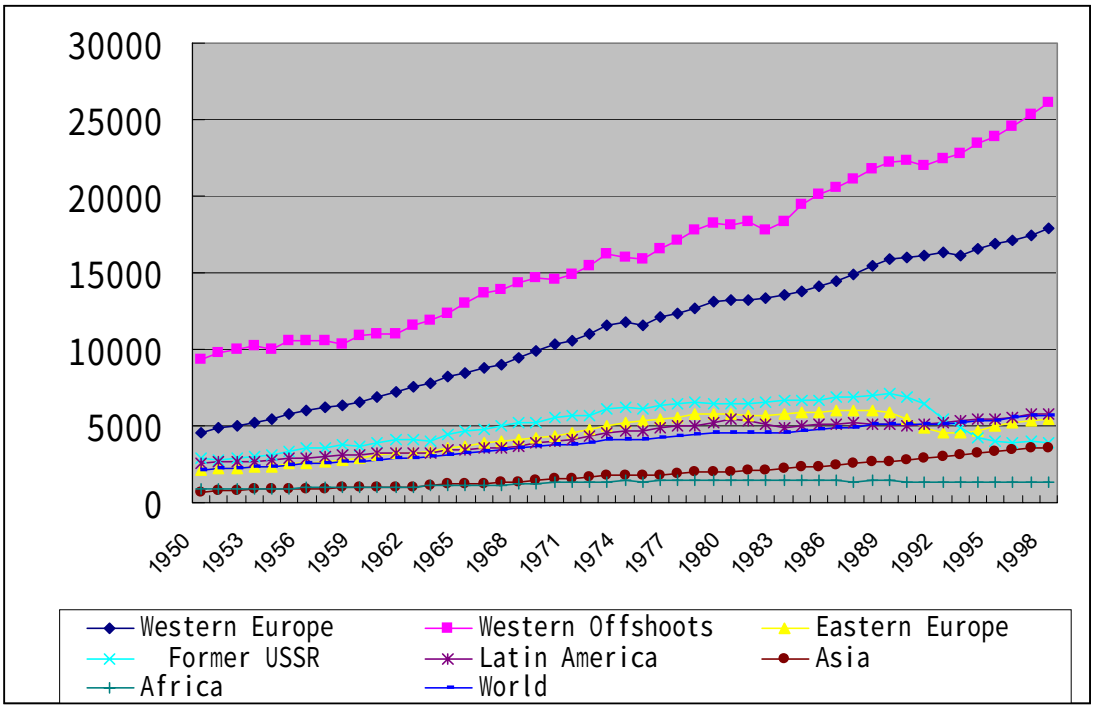
One of the most outstanding achievements in the history of world economic development in the 20th century was that several of Asia's countries and regions were able to create economic miracles and caught up the western developed countries. Table 1 shows that Japan and the four Small Dragons in East Asia, including Korea, Singapore, Taiwan and Hong Kong, whose initial conditions after the World War II were not more favorable than other developing countries in other parts of the world (Maddison 2001), have become the only group of economies successfully reaching the per capita income level of developed countries or becoming newly industrialized economies and substantially narrowing their income gaps with the western developed countries. However, as shown in Figure 1, for Asia as a whole, like most other parts of the world, the gaps between their per capita income and that of the developed countries in effect have widened after World War II. In 2002, there were about 690 million people in Asia still in extreme poverty, living on less than US$ 1 a day. If a more generous standard of US$ 2 a day was used, 1.9 billion Asian, about half of the population in Asia, were poor in that year (ADB 2004). Those poor people have no guarantee for the basic daily nutrition needs, access to improved sanitation, and so on. How to eradicate poverty and how to close the income gaps between the developing Asia and the developed countries are daunting challenges in Asia.

Table 1: Per Capita GDP in 1970 and 2003 (current US$)

	1970		2003	
	Per Capita GDP	Per Capita GDP as a Percentage of the Level in North America (%)	Per Capita GDP	Per Capita GDP as a Percentage of the Level in North America (%)
Asia	237	4.95	2416	6.71
Japan	1982	41.37	33819	94.00
Hong Kong, SAR	978	20.41	22618	62.87
Korea, Republic	275	5.74	11059	30.74
Singapore	914	19.08	21195	58.91
Taiwan Province	386	8.06	12680	35.24
Africa	233	4.86	759	2.11
Europe	1854	38.70	16772	46.62
Northern America	4791	100.00	35977	100.00
World	881	18.39	5751	15.99

Source: United Nations, Statistical Division.

Figure 1: Per Capita GDP in 1990 International Geary-Khamis Dollars, 1950-1998



Source: Angus Maddison, 2001, p. 330.

In this lecture, I would like to argue that for the countries in developing Asia, like developing countries in other parts of the world, if their governments adopt a right development strategy, they have good opportunities to achieve dynamic growth and equitable income distribution in their process of development. However, many of them followed an inappropriate strategy and impeded their opportunities to realize this growth potential. I would also like to propose an approach for the developing countries to transit from the old to the new development strategy smoothly.

My main arguments are as follows: A continuous flow of technology/industrial innovation is the key to a sustained dynamic growth of any country. The developing country has an "advantage of backwardness" as they can borrow technology/industry from the developed countries. However, in an open, competitive market, the optimal technology/industrial structure of a country is endogenously determined by the country's endowment structure, which is exogenously given at any specific time. Therefore, to benefit from the advantage of backwardness, a developing country needs to have an appropriate strategy that guide their technology/industrial borrowing from the developed countries. However, the governments in most developing countries after World War II adopted an inappropriate development strategy that attempted to defy their comparative advantages, determined by their endowment

structures, for the purpose of building up the developed country's capital-intensive industries on a relatively capital-scarce endowment structure. This strategy made firms in the priority sectors nonviable in an open, competitive market and was responsible for many policy distortions in the developing countries and the failures of the developing countries' attempt to catch up with the DCs and to achieve an inclusive growth. A transition to a policy regime that facilitates the industrial development along the countries' comparative advantages is necessary for the developing countries to improve their growth performance and to allow the poor to benefit from the growth. However, many distortions in the developing countries are endogenous to the viability problem of firms in the priority sectors of previous development strategy. Their governments have to find a way to resolve the exogenous cause of those endogenous distortions for their transition process to be smooth.

The lecture is organized as follows: Following the introduction, Section II reviews the literature on the determinants of economic growth. Section III analyzes the impacts of comparative advantage-defying strategy, adopted by a developing country's government, on the viability of firms, the distortions, and the economic and social consequences. Section IV discusses the effect of comparative advantage defying strategy on the poor in developing Asia. Section V explores an alternative comparative advantage following strategy and what the government role in this strategy. Section VI discusses the appropriate approach for transiting from a comparative advantage defying strategy to a comparative advantage following strategy. Some concluding remarks are provided in Section VII.

II. Literature Review

Why a developing country cannot catch up with the DCs has been a challenging question and puzzling phenomenon to economists. The neoclassical growth theory (Solow 1956) with its assumption of exogenously given technology predicts that a developing country would grow faster than the DCs, the per capita income in LDCs would converge to the level of DCs, and the GDP growth rate in any country will eventually be the same as the population growth rate. However, with a few exceptions in East Asia most developing countries' per capita income failed to converge to the level in DCs (Pearson, et al. 1969; Romer 1994), and the economic growth rates in DCs continue to exceed their population growth rates. Unsatisfied with the neoclassical growth theory, Romer (1986) and Lucas (1988) pioneer the new growth theory, which treats technological innovation as endogenously determined by the

accumulation of human capital, research and development (R&D), learning by doing and so on, and argues that the failure of LDCs to converge to DCs is due to their lack of investment in those factors that are important for technological innovations. The argument of this theory is insightful for the continuous growth of per capita income in DCs, nevertheless the new growth theory fails to provide a satisfactorily explanation for the extraordinary growth and convergence of the newly industrialized economies (NIEs) in Asia, including South Korea, Taiwan, Hong Kong, Singapore and recently China, during the last three decades of the twentieth century (Pack 1994; Grossman and Helpman 1994). During the catching up process, these NIEs' investments in R&D, human capital, and learning by doing were much lower than those of the DCs.

Many economists now believe that the developing countries failed to catch up with the DCs because of bad institutions due to the government's interventions and regulations, including widespread corruption, weak protection to the investors, and a high degree of social conflicts (Shleifer et al., 1998; Rodrick, 1998; Acemoglu et al., 2001a, 2001b, 2002a, 2002b; Djankov et al., 2003). As Rodrick (2003, p7) stated, "institutions have received increasing attention in the growth literature as it has become clear that property rights, appropriate regulatory structure, quality and independence of the judiciary, and bureaucratic capacity could not be taken for granted in many settings and that they were of utmost important to initiating and sustaining economic growth."

Many economists have tried to understand how government's intervention and regulation occurs and how and whether it can be subsequently sustained (Rodrik 1996). The classical theory for the role of government (Pigou, 1938) has been called the helping hand view. An alternative strand of the grabbing-hand view (Shleifer and Vishny 1998) holds that the government interventions are pursued for the benefits of politicians and bureaucrats. Politicians use regulation to favor friendly firms and other political constituencies, and thereby obtain campaign contributions and votes. In addition, "an important reason why many of these permits and regulations exist is probably to give officials the power to deny them and to collect bribes in return for providing the permits" (Shleifer and Vishny 1993, p. 601). A recent paper presented by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002) provided an empirical test on the theories of grabbing hand, say, the barrier for business entry might arise from the corruption of bureaucrats.[1] Other economists attribute the government's

[1] This grabbing hand hypothesis may not be appropriate for most interventions and regulations in developing countries. Suppose that the government's regulations in the developing countries could arise from the grabbing hand of government, or political elites, the unsolved question in the literature is how to understand the evolution of institutional structure under the government's interventions. In the developing countries, the institutional structure

interventions and regulations to the legal origin (La Porta et al., 1998, 1999) and colonial institutional inheritance (Acemoglu et al., 2001a, b; Engerman and Sokoloff 1997).[2]

III. Comparative Advantage-Defying Strategy, Viability and Endogenous Distortions

I agree that inappropriate interventions and regulations are attributable for the poor economic performance in the developing countries. However, I would like to propose an alternative hypothesis for the existence of government's interventions and regulations in the developing countries. My argument is based on the conflicts between the government's development strategy in a developing country and the country's endowment structure (Lin 2003).

As suggested by Simon Kuznets (1966), a continuous innovation and upgrading of technology and industries is the key to a dynamic growth in any economy in modern times. A developing country could have an advantage in the speed of technology innovation than the developed country because the developing country could have a low cost, low risk technology "borrowing" from the developed country whereas the developed country needs to engage in high cost and high risk invention to obtain technology innovation (Hayami 1997). The higher speed of technology innovation will enable the developing country to have a higher return to capital, resulting in a high rate of capital accumulation, industrial upgrading, and a larger room to reallocate labor and other resources from low value-added industries to high value added industries. Consequently, a developing country could potentially have a higher economic growth rate than the developed countries and achieve the convergence to the developed countries. However, whether or not a developing country could benefit from the "advantage of backwardness" very much depending on the government's development strategy and the resulting economic policy regimes.

Generally speaking, the government is the most powerful and important institution in a developing country. Its economic policies shape the macro incentive structure for every

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shaped by the government's interventions is so complicated. We wonder what the incentives for political leaders to design such complicated systems are, because the increase of costs of expropriations and political control due to the complexity of institutions would diminish the gains of the grab. Corruptions induced by the special interest groups might not be a good answer for this question either, because the benefited groups are often taxed or suppressed alongside with the protections/subsidies. Moreover, many interventions do not have obvious beneficiary groups.

[2] If a developing country' existing institution that is detrimental to economic growth is endogenous to colonial heritage or natural endowment, the knowledge is not useful for the development policy as we can do nothing at the present times to the colonial heritage or natural endowment of several hundred years ago.

economic agent in a developing country. However, the development strategy and its resulting interventions and regulations adopted by the governments in most developing countries after the World War II denied their opportunities to benefit from the "advantage of backwardness".

Many of the early generation of political leaders in both socialist and non-socialist developing countries, such as Nehru in India, Nasser in Egypt, Sukarno in Indonesia, Mao Zedong in China, and Ho Chi Minh in Vietnam, were elites taking part in the independent movements or revolutions for the purpose of nation building. The institutions laid down by the early generation of political leaders were endogenously shaped by the conflicts between the elites' ambitious drives of industrialization/modernization for nation building and their nations' economic realities. The key to the argument is the viability issue of firms in the priority sectors of government's industrialization drives.[3]

The term *viability* is defined as follows: "If, without any external subsidies or protections, a *normally managed* firm is expected to earn socially acceptable profits in a free, open, and competitive market, then the firm is viable. Otherwise the firm is nonviable" (Lin 2003, p. 280). It is obvious that no one will invest in a firm if it is not expected to earn a socially acceptable normal profit. Such a firm will exist only if the government gives it financial supports or protections.

In an open, competitive market, the management of a firm will affect its profitability, which is a known proposition. However, the expected profitability of a firm also depends on its industry/technology choice.

To illustrate this idea, I will discuss the case of a simple economy that possesses two endowments, capital and labor, and produces one product. As shown in Figure 2, each point on the isoquant represents a production technology or a combination of capital and labor required to produce a given amount of a certain product. The technology represented by A is more labor intensive than that of B. C, C_1, D, D_1 are isocost lines. The slope of an isocost line represents the relative prices of capital and labor. In an economy where capital is relatively expensive and labor is relatively inexpensive, as

[3] The bureaucrats in lower levels of government in a developing country may subsequently use the interventions/regulations endogenous in the nation-building attempt for their personal grabbing-hand purpose. However, the grabbing hand of bureaucrats should be viewed as a consequence instead of the cause of the distortions and regulations that was created by the first generation leaders who did not have much personal purposes other than the dream of nation building. Similarly, various groups may subsequently take advantages of these interventions/regulations and seek rents to benefit themselves. However, the vested interest group's rent seeking was an unintended consequence instead of the first generation leaders' motivation for the interventions/regulations.

represented by isocost lines, C and C_1, the adoption of technology A to produce the given amount of output will cost the least. When the relative price of labor increases, as represented by the isocost lines by D and D_1, production will cost least if technology B is adopted.

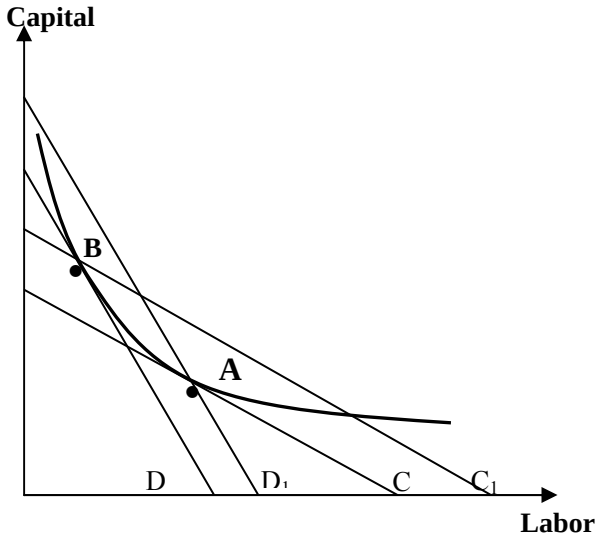

Fig.2.－Relative price of production factors and technique choice

In a free, open, and competitive market economy that produces only one product as illustrated in Figure 1, a firm will be viable only if it adopts the least-cost technology in its production. In Figure 1, if the relative prices of capital and labor can be presented by C, the adoption of technology A costs the least. The adoption of any other technology, such as B, will have a higher cost. The market competition will make firms that adopt technologies other than A nonviable. Therefore, in a competitive market with given relative prices of labor and capital, the viability of a firm depends on its technology choice.

In a competitive market, the relative prices of capital and labor are determined by the relative abundance/scarcity of capital and labor in the economy's factor endowments. When labor is relatively abundant and capital is relatively scarce, the isocost line will be something like that of line C in Figure 2. When capital becomes relatively abundant and labor relatively scarce, the isocost line will change to something like line D in Figure 2. Therefore, the viability of a firm in an open, competitive market depends on whether its choice of technology is on the least cost lines determined by the relative factor endowments of the economy.

The above analysis can be extended to a multi-product and multi-industry case and that in an open, competitive market, whether or not a firm is viable depends on whether or not the firm's industry, product, and technology choices are consistent with the comparative advantages determined by the economy's endowment structure.[4] If a firm's choices are not consistent with this condition, the firm cannot earn acceptable profit in an open, competitive market even under normal management and its survival relies on government subsidies and/or protections.

It is important to note from the above discussion that in an open, competitive market, without government's interventions, only viable firms will exist. Therefore, an economy's structure of industry, product and technology in an open, competitive market is in effect endogenously determined by the economy's endowment structure.

Most developing countries are characterized with relative abundance of labor and scarcity of capital.[5] As such, in an open, competitive market, the structure of industry and technology in a developing country will be relatively labor intensive. However, unaware of the endogeneity of the industrial/technology structure and inspired by the dream of nation building, the political leaders, economists and social elites alike in a developing countries often attempt to build up capital-intensive industries and adopt advanced technologies similar to those of the most developed countries within the shortest periods of time as the objective of their development drives. I call such type of development approach in a developing country as the comparative advantage-defying (CAD) strategy because the government attempts to encourage firms to ignore the existing comparative advantages of the economy in their choice of industry and technology.[6] Most firms in the priority sectors of a CAD strategy are not viable in open, competitive markets. Therefore, the developing country's government has to subsidize and protect those firms through various interventional measures.

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[4] It is worthy noting that the viability of a firm and the comparative advantages of an economy are highly related. The viability is a concept focuses on a firm's technology, product, industry choices in a competitive market, whereas the comparative advantage refers to the competitiveness of an economy's product/industry in an open economy. However, both are determined by the country's endowment structure.

[5] The other possibility for an LDC is relatively abundant in natural resources and relatively scarce in capital and labor. The discussions and conclusions in this paper can be easily extended to cover such case.

[6] The CAD strategy includes the heavy-industry-oriented development strategy in the socialist countries and in developing countries, such as India, and the secondary import-substitution strategy in many Latin America and African countries. The strategy also includes the protection of certain industries that has lost comparative advantage due to the development of the economy, such as the protection of agriculture in many OECD countries.

If a government adopts a CAD strategy and the deviation of the firms' choices of technology/industry from the optimal ones determined by the economy's endowment structure is small, and the number of nonviable firms that the government attempts to support is limited, the government may subsidize the firms directly by tax transfers as in the case of agricultural protection in many OECD countries. However, when a developing country's government adopts a CAD strategy, the distance of deviation from their comparative advantages is often very large, the number of nonviable firms numerous, and the government's taxation capacity very weak. The developing country's government often turns toward implicit measures of subsidies through price distortions, limitations on market competition, directly administrative allocation of resources, and so on.[7] As a matter of fact, the traditional planning systems existed before economic transitions in the socialist economies were typical institutional arrangements for supporting and protecting the non-viable heavy industrial firms (Lin, Cai and Li 2003, chap. 2).

Moreover when a developing country's government adopts the CAD strategy, the government cannot exactly know how large the subsidies would be enough due to information asymmetry. The firms in the priority sector will have incentives to use their viability problem as an excuse and use resources to lobby the government officials not only for more *ex ante* policy favors, such as access to low-interest loans, tax reductions, tariff protection, and legal monopolies but also for *ex post* ad hoc administrative assistances, such as more preferential loans or tax arrears. The economy will be full of rent-seeking activities and corruptions. Because the firms can use the viability problem as an excuse to bargain for more government support and because it is hard for the government to shun such responsibility, the firm's budget constraints become soft (Lin and Tan 1999).[8] When the soft budget constraint exists, the firm will face no pressure to improve productivity and the firm's efficiency will be low. Moreover, with the subsidies/protections and soft budget constraints for the firms in the priority sectors, the entries into those sectors become a privilege. The political leaders in a non-socialist

[7] From the above perspective, the root of interventions in a developing country is not the grabbing hands of government officials or the manipulations of interest group but the dream of nation building of political elites. The corruptions may be an endogenous phenomenon of the distortions and interventions arising from the conflict between the economy's endowment structure and the political leaders' ambitious and unrealistic development attempts. From this perspective, the political target should be separated from the corruption view of grabbing-hand approach or the "Leviathan" approach.

[8] The soft budget constraint is a term coined by Kornai (1986) to explain the problem in the socialist countries. According to Kornai, the soft budget constraint arises from the paternalistic nature of the socialist government toward the state-owned firm. His argument cannot explain why the soft budget constraint exists in non-socialist economies and why the soft budget constraint still exists 10 years after privatization in Russia and Eastern European transitional economies (World Bank 2002). Dewatripont and Maskin (1995) argue that the soft budget constraint arises from the bank's imperfect information on investment project and the time inconsistent problem of the project. However, this argument cannot explain the prevalence and persistence of soft budget constraint phenomenon in the developing countries.

developing country may select their own close friends or political supporters to invest in those priority sectors, resulting in the phenomenon of crony capitalism.

Besides, if the government in a developing country adopts the CAD strategy, the economy will become more inward-oriented than otherwise. This is because the CAD strategy attempts to substitute the import of capital-intensive manufactured goods by domestic production, causing the reduction of import. The export will also be suppressed due to the inevitable transfers of resources away from the industries for which the economy has comparative advantages to the priority sectors of the CAD strategy. The exchange rates are likely to be overvalued to facilitate the import of technology/equipment for priority industries, effectively hampering export opportunities. In addition, under the CAD strategy, the carriers of a government's development strategy are normally large-sized firms. To support the financial needs of nonviable large-sized firms, the government often nationalizes the firms and uses direct fiscal appropriation, skipping financial intermediation, to support these firms. Such was the case in the former socialist planned economies and continues to be the case in many developing countries. Even if the government relies on private firms to carry on the CAD strategy, the financial needs of large-sized firms will be large and can only be met by a heavily regulated oligopolistic banking system or an administratively intervened stock market, resulting in the phenomenon of financial depression (McKinnon 1973 and Shaw 1969). In either case, the financial system in the country will be very inefficient. The development of the nonviable firms relies heavily on external financial supports. The government first mobilizes domestic resources to support these firms through the above interventions in the financial system. Once domestic financial resources deplete, the government often allows the nonviable firms turn to international financial markets for supporting their further development. Fiscal deficits, bad loans, external debts, and financial fragility will exacerbate and macroeconomic stability will become unsustainable, leading to eruptions of financial crises (Lin 2000), which may also trigger serious social conflicts and political instability (Rodrik1998; Caselli and Coleman 2002).

From the above discussions, we can see that many of the interventions and regulations and their resulting inefficiency in developing countries are endogenous to the viability problem of the firms in the government's priority sectors.

IV. Comparative Advantage-Defying Strategy and the Poor in Developing Asia

The adoption of a CAD strategy is most detrimental to the poor in Asia, most of them

living on agriculture. Table III shows that, like other developing countries in the world, more than 70 percent of population in developing Asia lived on agriculture in 1961. However, the arable land per agricultural labor force in developing Asia was only about 45% of the world average, and was 20% less than the average of the developing countries as a whole.

Table 3: Population and Arable Land in 1961 and 2002

	Population (Million)			Agricultural Labor Force (Million)	Arable Land (Million Ha.)	Arable Land Per Agr.Labor (Ha.)
	Total	Rural	Agriculture			
2002						
Asia	3,776	2,321	1,956	1,051	512	0.49
Asia Developing	3,568	2,253	1,934	1,040	474	0.46
Developed Countries	1,325	352	94	45	612	13.51
Developing Countries	4,900	2,882	2,495	1,288	793	0.62
World	6,225	3,234	2,588	1,333	1,404	1.05
1961						
Asia	1,702	1,348	1,243	613	410	0.67
Asia Developing	1,605	1,312	1,214	598	404	0.68
Developed Countries	981	382	253	114	648	5.66
Developing Countries	2,099	1,647	1,542	736	631	0.86
World	3,080	2,030	1,795	850	1,279	1.50

Source: FAOSTAT data, 2004.

In addition to the scarcity of arable land endowment, developing Asia is facing another challenging issue. Deforestation, desertification, depletion or contamination of groundwater, soil salinity, soil erosion, and so forth are common problems in many parts of Asia, making environment fragile.

The above two problems are interweaved with each other. Most poor people live in the environmentally stressful marginal areas and, the poorer are the people, the more likely they live on the type of agricultural production that is detrimental to environment. Therefore, in most areas the problem of environmental sustainability and problem of rural poverty need to be solved simultaneously.

In solving the poverty issue it is important to understand that the most important asset of the poor is their own labor force. For the rich, they have other assets: land, capital,

good education, personal relations and political-economic network. But for the poor, except for their labor force they may not have other assets that could bring them income. Because of this, unless their labor becomes relatively scarce and valuable, it's impossible to increase their income and improve their social status.

The production activities of rural people living under poverty line have their own characteristics as well. Because they are poor, they produce mainly farm products, such as grain, which have low income and price elasticity. Because of the low elasticity of income, overall economic growth will have only minimum effects on the demand for farm produce. Because of the low price elasticity, the production increase of an individual rural household may increase its income. However, when most of them increase production, the price will go down, resulting in little effect on the increase of farm income.[9] These two characteristics make the attempt to increase the rural poor people's income by increase agricultural production through investments in infrastructure and technology ineffective.

In my view the most important way to win the anti-poverty war and achieve environment sustainability in developing Asia is to reduce the rural labor force. When rural labor force reduces, people live on agriculture in rural areas will have more land and resources to work on. At the same time, when the farm workers become non-farm workers, they will change from suppliers to consumers of agricultural products. The supply curve of agricultural products will thus shift to the left and demand curve to the right. Consequently, the prices of agricultural products will go up and so do the marginal product value of farm labor and its earnings. The income of rural people will in this way increase as the farm labor keeps on decreasing. Apart from this, the reduction of rural labor and rural population will also help to ease the tension between population and environment, avoiding over pressure on environment due to the production and living activities, destroying the environment's ability of self recovery and making environment become unsustainable.

To reduce the rural population and labor force, it is necessary to ensure that people stopped farming could find jobs in non-agricultural sectors in urban areas. Otherwise,

[9] If the increased produce could be exported to international market, it will help to increase the price elasticity of farm produce. Unfortunately, most countries have imposed various barriers for the import of farm produce. Therefore, the opportunity for a developing country to increase its export is pessimistic. In addition, the overvalued exchange rate in most developing countries further impairs the competitiveness of their export of farm produce.

the labor migrated from rural areas will only turn into unemployed urban poor. The overall social welfare will not improve.

Unfortunately, as argued in the Section III, the governments of many developing countries in Asia as well as in other parts of the world adopted the CAD strategy to build up the capital-intensive industries. These industries required a large amount of investment but created only a small number of job opportunities, making little room for the absorption of out-migrated rural labor. This will result in either of the following consequences:

1. The government puts restrictions on the migration from rural areas to urban areas, and let the population under poverty line stay in rural areas, just as China did before the transition to the market economy in 1979. As such, not only the rural poverty will stay but also, with the increase of rural population and the intensifications of living and production activities, the environment becomes worsening.
2. The government allows rural people to migrate to urban areas. But since industries in urban areas cannot create enough jobs and job opportunities in the tertiary industries are also depressed due to the slow income growth, most rural out-migrants only change from the status of rural poor to urban poor. The urban living environment will also be deteriorating.

The operation of nonviable firms in the CAD strategy needs continuous financial supports. When the domestic funds were exhausted, the government often allows the nonviable firms to borrow from international sources. But since they are in the comparative advantage-defying sectors, it is hard for them to export profitably their product to international markets. When they have to repay foreign loans, financial and monetary crisis may occur. Furthermore, due to the development of the non-comparative advantage industries, domestic industries that have the comparative advantages cannot be fully developed for the lack of investments. Under these circumstances, if the country is forced to open its door and adopt the free trade policy, it will be a big shock to the domestic economy. Then, the poor, no matter where they are, will be the group that is most seriously hurt as what happened in the recent Asian financial crisis (Lin 2000). Therefore, in order to catch up the developed country, to

win the anti-poverty war in rural areas, and to achieve environmental sustainability, it is imperative to find a new development strategy.

V. The Comparative Advantage-following Strategy and the Role of Government

The government in developing Asia as well as in other developing countries could adopt an alternative strategy, which I call a comparative advantage following (CAF) strategy, to encourage firms in the country to enter the industries for which the country has comparative advantages and to adopt the technology in production that will make these firms viable.

When the government adopts a CAF strategy, all the firms exist in the markets are viable and in sectors that are the country's comparative advantages. The firms have no excuses for the government's subsidies and protections, reducing the possibility of firms' rent seeking, and the possibility for the government to have financial depression as a way to mobilize resources for the priority sectors. The market competition will force the managers of firms to improve their management or facing the danger of being competed out of the markets. Therefore, the competition pressure will force existing firms to be competitive domestically and internationally, which in turn enhance the economy's ability to withstand outside shocks. The international trade will be more important under the CAF strategy than under the CAD strategy, as the economy under the CAF strategy will import whatever are not their comparative advantages and export whatever they have comparative advantages. The openness of the economy will facilitate the firms to borrow technology from the developed countries, contributing to the realization of advantage of backwardness. The economy will have a larger surplus, accumulate more capital, and have a faster upgrading of endowment structure than what are possible under the CAD strategy. The economy will also have a better income distribution as well because the CAF strategy will create more job opportunities for the poor than the CAD strategy and, with a dynamic growth and faster accumulation of capital, the labor force will turn from relatively abundant to relatively scarce and the wage income will increase faster than the alternative CAD strategy, creating the desirable consequence of "growth with equity" (Fei, Ranis, and Kuo 1979; Hasan and Quibria 2004).

As discussed in Section III, the industries for which the economy has comparative

advantages and the technologies that are appropriate for production are all endogenously determined by the country's factor endowments structure. However, the managers of firms, as micro agents, have no knowledge or concern of the actual endowments. Their only concerns are the prices of their outputs and the costs of their production. They will enter the industry and choose the technology of production appropriately only if the relative factor prices correctly reflect the relative factor abundances, which can be achieved only if the markets are competitive. Therefore, when the government in a developing country adopts a CAF strategy, its primary policy is to remove all possible obstacles for the function of free, open, and competitive product and factor markets, as suggested by the neoclassical economics.

However, the government in a developing country that adopts the CAF strategy can play a role that is larger than what is required by a minimum government. When the factor endowment structure of the economy is upgraded, the firms should upgrade their products/technologies accordingly from a less capital-intensive industry to a relatively more capital-intensive industry. Such technology and industry may already exist in the more developed countries. However, the information for what exact technology and industry to borrow from the advanced countries may not be freely available. It is necessary to invest resources for the information search and analysis. If a firm carries out the activities on its own, it will keep the information private, and other firms will be required to make the same investment to obtain the information. There will be repetition in the information investments. However, the information has a public good nature. After the information has been gathered and processed, the cost of information dissemination is close to zero. Therefore, the government can collect the information about the new industries, markets, and technology, and make it available in the form of an industrial policy to all firms.

The upgrading of technology and industry in an economy often requires coordination of different firms and sectors in the economy. For example, the human capital or skill requirements of new industries/technologies may be different from that used with older industries/technologies. A firm may not be able to internalize the supply of the new human capital. Therefore, the success of a firm's industry/technology upgrade also depends on the existence of an outside supply of new human capital. In addition to human capital, the firms that are upgrading their technology and industries

may also require new financial institutions, trading arrangements, marketing, and distribution facilities, and so on. Therefore, the government may also use the industrial policy to coordinate firms in different industries and sectors to make necessary investments for the upgrade of industry/technology in the economy.

The upgrading of industry/technology is an innovation, and it is risky by nature. Even with the information and coordination provided by the government's industry policy, a firm's attempt to upgrade its industry/technology may fail due to the upgrade being too ambitious, the new market being too small, the coordination being simply inadequate, and so forth. The failure will indicate to other firms that the targets of the industrial policy are not appropriate, and, therefore, they can avoid that failure by not following the policy. That is, the first firm pays the cost of failure and produces valuable information for other firms. If the first firm succeeds, the success will also provide externalities to other firms, prompting these firms to engaging in similar upgrades. These subsequent upgrades will also dissipate the possible rents that the first firm may enjoy, so there is an asymmetry between the costs of failure and the gains of success that the first firm may have. To compensate for the externality and the asymmetry between the possible costs and gains, the government may provide some forms of subsidy, such as tax incentives or loan guarantees, to the firms that initially follow the government's industrial policy.

It is worthwhile to note that there is a fundamental difference between the industrial policy of the CAF strategy and that of the CAD strategy. The promoted industry/technology in the CAF strategy is consistent with the comparative advantage determined by changes in the economy's factor endowments, whereas the priority industry/technology that the CAD strategy attempts to promote is not consistent with comparative advantage. Therefore, the firms in the CAF strategy should be viable, and a small, limited-time subsidy should be enough to compensate for the information externality. By contrast, firms following a CAD strategy are not viable, and their survival depends on large, continuous policy favors/support from the government.[10]

[10] The dynamic comparative advantage is an often-used argument for the government's industrial policy and support to the firms (Redding 1999). However, in our framework it can be clearly seen the argument is valid only if the government's support is limited to overcoming information and coordination costs and the pioneering firms' externality to other firms. The industry should be consistent with the comparative advantage of the economy and the firms in the new industry

A comparison of the successes and failures of industrial policies on automobile production in Japan, Korea, India, and China is a good illustration of the differences between the CAF and CAD industrial policies. The automobile industry is a typical capital-intensive heavy industry. The development of an automobile industry is the dream of every developing country. Japan adopted an industrial policy to promote its automobile industry in the mid 1960s and achieved great success. Japan's experience is often cited as a supporting argument by advocates of an industrial policy for heavy industries in developing countries. Korea instituted an industrial policy for automobile production in the mid 1970s. Korea has also achieved a limited degree of success in automobile production. The automobile industries in China and India were started in the 1950s, and the industry in both countries has required continuous protection from the government since that time. What can explain why a similar industrial policy can yield success in one instance and failure in another? This will be clear once we compare the per capita income of these countries with the per capita income of the United States at the time when they initiated their policies (see Table 4).

Table 4: Level of Per Capita Income (Unit = 1990 Geary Khamis Dollars)

	US	Japan	Korea	India	China
1955	10,970	2,695	1,197	665	818
1965	14,017	5,771	1,578	785	945
1975	16,060	10,973	3,475	900	1250

Source: Maddison, Angus. Monitoring the World Economy, 1820-1992, Paris: OECD, 1995, pp. 196-205.

Per capita income is a good proxy for the relative abundances of capital and labor in an economy. Capital is abundant and wage rates are high in a high-income country. In a low-income country, the opposite holds true. Table 3 indicates that when Japan initiated its automobile production policy in the mid 1960s, its per capita income was more than 40 percent of that in the United States. The automobile industry was not the most advanced, capital-intensive industry at that time nor was Japan a

should be viable, otherwise the firms will collapse once the government's supports are removed

capital-scarce economy. The Ministry of International Trade and Industry (MITI) only gave support to Nissan and Toyota. However, more than ten firms, ignoring MITI's prompting to not enter the industry, also started automobile production and were successful, even though they did not receive any support from MITI. The above evidence indicates that the Japanese automobile firms were viable, and MITI's promotion of automobile industry in the 1960s was a CAF strategy. When Korea initiated its automobile industry development policy in the 1970s, its per capita income was only about 20 percent of that of the United States and about 30 percent of that of Japan. This may explain why the Korean government needed to give its automobile firms much greater and longer support than the Japanese government did their firms. Even despite the support, two of the three automobile firms in Korea recently fell into bankruptcy. When China and India initiated their automobile industry development policies in the 1950s, their per capita incomes were less than 10 percent of that of the United States. The automobile firms in China and in India were not viable at all. Even until today, their survival still depends on heavy government protection.[11]

VI. Viability and the Economic Reform and Transition

Empirical evidences show the adoption of CAD strategy is detrimental to the growth, macro stability and income distribution in a developing county (Lin 2003; Lin and Liu 2002; Lin and Liu 2004). However, the CAD strategy with its resulting government interventions is good at mobilizing scarce resources initially for investing in a few clear, well-defined priority sectors (Ericson 1991). The countries that adopt the CAD strategy can also enjoy a period of investment-led growth so long as it is possible to mobilize resources administratively for investing in the priority sectors from domestic or international sources. Therefore, because of the lack of knowledge about the long-term consequences of the CAD strategy, the aspiration for quick nation building, or the concerns for immediate performance during their tenures in offices, the CAD strategy was attractive to political leaders in the LDCs and had been adopted by almost all governments in the LDCs after the World War II (Chenery 1961). However,

[11] Most big push attempts by the LDCs in the 1950s and 1960s failed. However, there is a renewed interest in the idea after the influential articles by Murphy, Shleifer, and Vishny (1989). Their papers show that a government's coordination and support are required for setting up a key industry and that the demand spillovers from the key industry to other industries will enhance economic growth. However, for the "big push" strategy to be successful the pushed industry must be consistent with the comparative advantage, which is determined by the relative factor endowment of the economy, and the firms in the pushed industry must be viable after the push. Deviation from comparative advantage in the pushed industries and the consequent lack of viability of the chosen firms are the reasons why so many big-push attempts by the LDCs in the 1950s and 1960s failed..

once financial resources from domestic and international sources depleted, the economy stagnated and the inherited problems of the CAD strategy started to appear.[12] The economy would encounter all kinds of difficulties, and voluntarily or involuntarily market-oriented reforms have become an unavoidable choice in the LDCs, socialist and non-socialist alike, since the late 1970s (Krueger 1992).

When the reform started, most LDCs focused their attention on the distortions and government interventions and attempted to establish institutions that were considered essential for markets to function efficiently (Williamson 1997, Kolodko 2001). However, except for China, Vietnam and a few other countries, the growth performance of socialist economies in their transitional periods is miserable. The disappointing performance of transition in the former Soviet Union and Eastern Europe (FSUEE) is especially striking. When the transition started in the FSUEE in the late 1980s and early 1990s, most economists were optimistic about their expected outcomes due to the fact that these countries adopted a shock therapy,[13] which attempted to restore the market institutions as soon as possible. Ten years have elapsed since the transition started. However, contrary to the early optimism, the countries that implemented the countries in FSUEE experienced a prolonged period of rampant inflations, output collapses, sharp widening of inequality and worsening of other social indicators (World Bank, 2002; Blejer and Skreb, 2001; and Roland, 2000). The cumulative output declines were much more serious in all countries in the Commonwealth of Independent States and in most countries in Central and Southern Europe and the Baltics than the decline in the United States during the Great Depression (World Bank, 2002).

Not only the performance of transition to market economy in the FSUEE disappointing but also in other developing countries. The poor performance is puzzling because, as the study of Easterly (2001) shows, variables that are considered important in the growth regressions, such as financial deepening, trade and exchange rate liberalization, health, education, fertility, and infrastructure generally improved compared the situation before the transition/reform in 1960-79. Easterly speculates that worldwide factors like the increase in world interest rates, the increased debt burden of developing countries, the growth slowdown in the industrial world, and the

[12] How long the CAD strategy can be sustained in a country depends on how rich the natural resources per capita in the country are (Ranis and Syed, 1992). In addition, the length may also depend on the size of population in a country. In the early 1950s, East Asian economies, such as Korea, Taiwan and Singapore, also followed the CAD strategy. However, due to their poor natural endowments and small population sizes, their economies encountered immediately huge fiscal deficits, high inflations, and external imbalances. Therefore, they were forced to give up the CAD strategy. Due to their governments' inability to subsidize the non-viable firms, the CAF became *de facto* strategy. This may explain the successful development experiences of these economies.

[13]. The key elements of shock therapy include price liberalization, privatization and macro stabilization.

skill-biased technological change contribute to the developing countries' stagnation in the lost decades of the 1980s and the 1990s. However, Easterly's hypothesis is not consistent with China's remarkable annual GDP growth rate of 9.6% in 1980-2000 and Vietnam's 6.5% in 1985-2000.

As argued in section III, many distortions and government regulations in the socialist economies and developing countries, which are considered detrimental to economic performance from the viewpoint of neoclassical economics, are in fact endogenous to the viability problem of firms in the priority sectors of the CAD strategy previously adopted by the governments. Since the neoclassical economics implicitly assumes that all firms existing in the market are viable, the reform advice, based on the neoclassical economics and capsulized in the Washington Consensus, attempts to get rid of the distortions and interventions directly (Lin 2004). However, without first appropriately addressing the viability problems of firms in the priority sectors in the transition, eliminating or liberalizing those endogenous distortions or regulations may result in changing institutions from the second best to the third best, causing economic performance to deteriorate after the reform/transition. This is because if all the distortions and regulations are removed, the viability problems of firms in the priority sectors will turn from implicit to explicit. Those nonviable firms will bankrupt immediately if they do not receive any subsidy or protection. If the number of nonviable firms and the number of workers employed are both small and the political determination for giving up the CAD strategy is strong, a shock therapy can succeed. The elimination of distortions and protections may cause the few firms to bankrupt but the viable firms in the previously depressed sectors may grow rapidly after the liberalization and overcompensate for the losses of outputs and employments from the bankruptcy of the nonviable firms.[14] However, if the number of nonviable firms and the number of workers employed are large, a forceful elimination of those distortions and protections will lead to widespread unemployment, resulting in economic collapse instead of recovery, such as what happened in the FSUEE and recently Indonesia. Social and political stability would be difficult to maintain. To prevent the dreadful consequences, after the initial attempt to forceful implementation of the reforms, the government often find other ways to subsidize or protect the nonviable firms, resulting in a half way reform and a worse economic performance than that in the pre-reform situation. The failure of some countries in the FSUEE is such an example and deserves further analysis.

[14] Bolivia is such a case for Washington consensus. It was a small economy with only 5.6 million populations in 1980. The number of nonviable firms that government could support was small. Therefore, the shock therapy recommended by Jeffrey Sachs was successful.

Most developing countries are bestowed with a large number of nonviable firms, set up under the previous CAD strategy, when they start the reforms. The direct implementation of many policy reforms based on the existing neoclassical economics, which implicitly assumes that firms are viable, may not be appropriate. There is a need to find a way to revive the economic dynamism while solving the viability issues of firms in the priority sectors and allow the economy to move toward a well-functioning market system gradually. China's experience may provide a useful example for other economies in the transition processes or about to start their transitions.

China started the transition in 1979 with a piecemeal, gradual, dual-track approach. At the beginning of reforms, the Chinese government gave partial autonomy to managers of the SOEs and decollectivized the farms to improve the incentives but the government still provided protections and supports to nonviable SOEs in the traditional sectors to buffer them from the threat of bankruptcy. This incentive improvement resulted in productivity increase in both agriculture and industrial sectors (Lin, 1992; Li 1997; Grove et al, 1994: World Bank, 1992). At the same time, the government relaxed its strict control of entries to sectors that were consistent with China's comparative advantages and were depressed under the previous CAD strategy, resulting in the rapid growth of labor-intensive, small and medium-sized non-state-owned firms, such as township and village enterprises (TVEs), joint-ventured firms and private enterprises. The rapid development of TVEs is illustrative. In the period of 1978 to 1996, the number of TVEs increased from 1.52 millions to 23.36 millions; and the number of workers hired increased from 28.27 millions to 135.08 millions, or in terms of percentage of total rural labor force, increased from 9.5% to 29.8%. Equally remarkably, TVEs have become one of the major forces behind China's overall sustained growth. The industrial output value of the TVEs increased from 9.1% of the national total in 1978 to 57.9% in 1997. Rural industry is no longer merely a supplement to the agricultural production, but has become an indispensable source of growth nationwide. It is widely acknowledged that export has been one of the leading factors contributing to China's recent success; and TVEs' share of exports in total exports increased from 9.2% in 1986 to 45.8% in 1997 (Lin and Yao 2001).

Vietnam is another country that has achieved dynamic growth after the transition. As in China, Vietnam started the transition with the decollectivization of agriculture, the enlargement of SOEs' autonomy, and the promotion of small and medium-size non-state enterprises in sectors that were previously repressed in the planned economy.

SOEs maintained its dominant role in the industrial sector.[15] Through this cautious and gradual approach, the average annual GDP growth rate in Vietnam reached 6.5% in 1985-2000.

In FSUEE after the initial transition recession, the recovery also came mainly from the entry of small and medium size enterprises into the previously repressed labor-intensive sectors. In 1998 new small enterprises, which employed fewer than 50 workers, contributed about 50 percent of employment in the leading reformers such as Czech Republic, Hungary, Latvia, Lithuania and Poland, whereas in the poor performing countries, such as Belarus, Kazakhstan, Russia, and Ukraine, the employment share of small enterprises was only between 10 and 20 percent (World Bank 2002, p. 39).

The entry of small and medium-size firms to the repressed sectors in CAD strategy allows China and a few other economies to enjoy dynamic growth in the transition process. However, a country's completion of transition and reform to a market economy will not complete until the viability issue of firms in the priority sectors of CAD strategy is solved. Otherwise the government needs to maintain its interventions in markets in order to protect/subsidize the nonviable firms and the inevitable distortions of such actions will ensue. For example, along with the rapid economic growth in China's transition, the share of non-performing loans looms large and the corruption is widespread (Lardy 1998). These problems have their roots on the viability problem of the SOEs. After 1983, the approach adopted by the Chinese government to support the SOEs changed from direct fiscal appropriation to offering of low interest-rate loans from the state-owned commercial banks. Currently, over 70% of the bank loans are lent to the SOEs, but due to their poor performance, many SOEs were unable to repay the loans. Therefore, the banks accumulate large amounts of non-performing loans. To support the SOEs, the government also limits market entry to certain sectors so that the SOEs can enjoy monopolistic rents. Many SOEs (and non-SOEs) seek rents from the government to acquire more low-interest loans or licenses for market entry to those regulated sectors, thus adding fuel to the widespread of corruption.

The effective approach to resolve the viability issue of the existing SOE may be

[15]In fact, in Vietnam the GDP share of SOEs increased from 33 percent in 1989 to 39 percent in 1996 (Sun 1997).

different from a country to another. For the case of China, my coauthors and I recommend four measures, depending on the nature of SOEs' outputs (Lin, Cai and Li 1998): First, if the SOE's output is essential for national defense, the government is required to use fiscal appropriation continuously to support the operation of the firm. Second, if the SOE's output has a large domestic market, the SOE can get access to internal capital by either forming a joint venture with multinational company or listing in international equity market. Third, if the SOE's output does not have a large domestic market but the SOE has good engineer and management capacity, the SOE can rely on its strength in human capital and shift to produce those types of products that are consistent with China's comparative advantage and have large domestic market. Forth, if the SOE's output does not have large domestic market and the SOE does not have engineer and managerial strength either, the SOE should be allowed to bankrupt. As long as the economy can maintain dynamic growth, the economy should be able to create enough jobs to absorb workers released from the bankrupted firms and enough resources to compensate for losers in the transition process.

Only after the problems of viability are solved, whether or not a SOE can earn acceptable profit in competitive market becomes the manager's own business.[16] The government will no longer need to find ways to intervene in the markets in order to protect or subsidize the firms. Only then can the elimination of distortions and government interventions, as stipulated in the Washington Consensus, be carried out wholeheartedly and successfully. However, whether the government will follow the required policy reforms for a well-functioning market system also depends on whether the government has the wisdom and determination to give up the CAD strategy and switch to the CAF strategy. [17]

[16] In the case of China, the SOEs have another burden, which I call the social burden, including redundant workers and pension for retired workers. The Chinese government was responsible for providing jobs to urban residents. However, in spite of large investments each year, the CAD strategy could not create enough jobs for the urban residents. To solve the employment problem, the government assigned several workers for one position at the SOEs. Before the reform, the redundant workers were not a burden on the SOEs because the SOEs submitted all revenues to the State and the State covered all SOEs' expenditures, including the wage bills, by fiscal appropriation. After the reform, the SOEs stop submitting their revenues to the State but they have to pay their own wage bills. Therefore, the redundant workers become a burden on the SOEs. Similarly, before the reforms the government paid low wages to SOEs workers and provided old age pensions directly by the fiscal appropriation. After the reform, the responsibility of providing old age pension switches to SOEs. Therefore, the older the SOEs are, the heavier the pension burden. If the SOEs' social burden is not eliminated, the government will be required to give SOEs protection or subsidies. The social burden will become a source of SOEs' soft budget constraints. The Chinese government now adopts a policy, called Xiagang, allowing SOEs to lay off their redundant workers and helping the laid-off workers with training and reemployment. The government also sets up a social pension system to resolve SOEs' burden of old age pension.

[17] The traditional heavy industries may not be attractive to the developing countries any more. However, in many societies the obsession for heavy industries is replaced by the information, biotechnology, and other high-tech industries. If a developing country's government wants to accelerate the growth of these new industries in its economy, firms in these industries will be nonviable and require government's subsidies and protections as the

V. Concluding Remarks

In this lecture, I argue that many development efforts in the developing countries after the World War II failed because of their political leaders' failure to understand the endogeneity nature of industry/technology structure in an economy and adopting a CAD strategy to build up modern capital-intensive sectors on the basis of their capital-scarce endowment structure. For carrying out such a strategy, the government introduced various interventions and distortions to protect and subsidize the nonviable firms in the government's priority sectors. I also argue that the reforms and transitions in the 1980s and 1990s in many socialist and non-socialist developing countries failed to set their economies on a new dynamic growth path because their reformers, based on the teaching of existing neoclassical economics which assumes all firms existing in the market are viable (Lin 2004), failed to understand that many interventions and distortions are endogenous to the needs of protecting nonviable firms in the priority sectors of the previous development strategy. The countries in developing Asia could benefit from the "advantage of backwardness" and achieve a dynamic, inclusive growth if their governments could find ways to address their existing firms' viability issue properly and successfully switch to an alternative CAF strategy and adopt required institutions accordingly.

In this lecture I only focus on the issues related to the government's development strategy on technology and industry. Currently 63% of population in developing Asia still live in rural areas and 54% still rely on agriculture for living. If the countries in developing Asia successfully switch to the CAF strategy, it is expected that agricultural employment will reduce quickly and urbanization will proceed rapidly. The governments should have an appropriate education strategy for the rural population in order to increase their ability to cope with the challenges of non-agricultural jobs and urban living. The governments should also invest in agricultural technology and rural infrastructure in order to help those people still staying in the rural agricultural sectors. The governments also need to cultivate an environment that encourages indigenous innovations in various social, economic, and political institutions in order to facilitate their countries' transition from traditional agriculture to modern industrial societies. With the joint efforts of governments, all walks of people, and the international community, the developing Asia will have a new era of dynamic, inclusive growth.

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case in the traditional CAD strategy. The institutional reforms toward a well-functioning market economy cannot be completed successfully.

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