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**New Structural Economics:
The Third Generation of Development Economics¹**

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Abstract

Development economics is a new sub-discipline in modern economics. The first generation of development economics is structuralism, focusing on market failures in developing countries and advising their governments to adopt import-substitution strategy for developing modern advanced industries. The second generation of development economics is neoliberalism, focusing on government failures in developing countries and advising their governments to implement Washington Consensus reform with a shock therapy. Most developing countries followed the above two generations of development economics and failed to achieve industrialization and modernization. This article introduces the third generation of development economics, called new structural economics, which advises governments in developing countries to play a facilitating role in the development of industries in a market economy according to the country's comparative advantages. The paper also discusses how the government may use industrial policies to play this facilitating role.

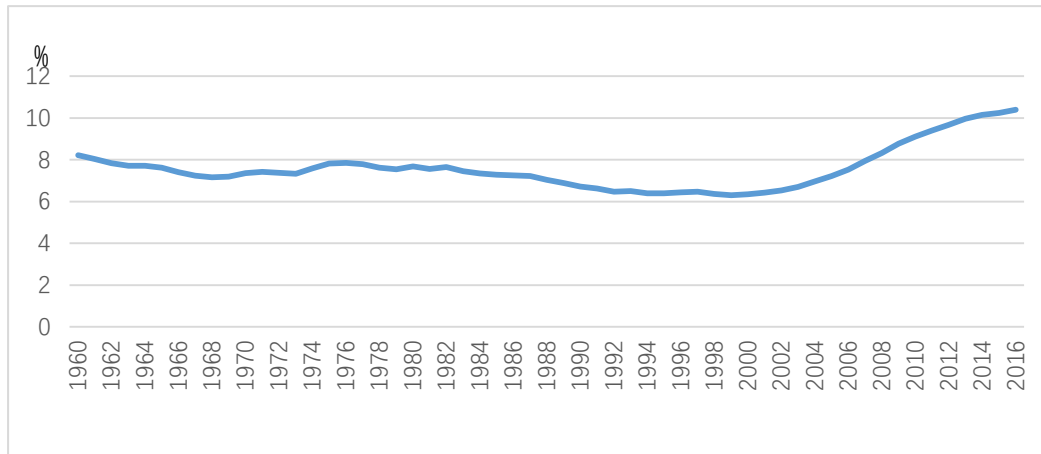
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After the Second World War, many former colonies and semi-colonies in the world obtained political independence from colonial powers and started their industrialization and modernization drives with the goal of quickly catching up the developed countries. In response to the need, development economics emerged as a new sub-discipline of modern economics, aiming to advise the developing countries about how to achieve their modernization dreams. This article reviews the ideas and failures of previous generations of development economics, introduces the main ideas of the third generation of development economics, the new structural economics, and discusses how to apply the new structural economics to formulate industrial policy for accelerating economic development to achieve the industrialization and modernization dream in a developing country.

I. The failures of the early generations of development economics

The first generation of development economics is structuralism. The development economists' understanding after the Second World War was as follows: If a developing country wants to be as rich as a high-income country, it needs to have the same high level of productivity as the high-income country, which in turn requires the country to develop the same advanced capital-intensive industries as those in the high-income country. Similarly, if a developing country wants to be as strong as the high-income country, it needs to have the same advanced military industries, which are also capital-intensive industries, as in the high-income country. However, the fact is that those advanced industries could not develop spontaneously in the market in a developing country. The structuralism believes that the failure to develop advanced capital-intensive industries spontaneously in a developing country is due to market failures caused by various structural rigidities, such as the household's low saving propensity and irresponsiveness to price signal in a developing country (Arndt 1985). Hence, structuralists advocate that the state overcome market failures by adopting an import substitution strategy to develop the advanced capital-intensive industries with direct, administrative resource mobilization and allocation. Most developing countries followed this strategy after WWII. Such a strategy helped them enjoy a period of rapid investment-led growth, but firms in those advanced industries in general became white elephant after they were established. Subsequently, the countries stagnated and were hit by frequent crises (Lin 2009). As shown in **Figure 1**, the income gap between developing countries and developed countries widened in the 1960s and 1970s in spite of various development efforts by the developing countries.

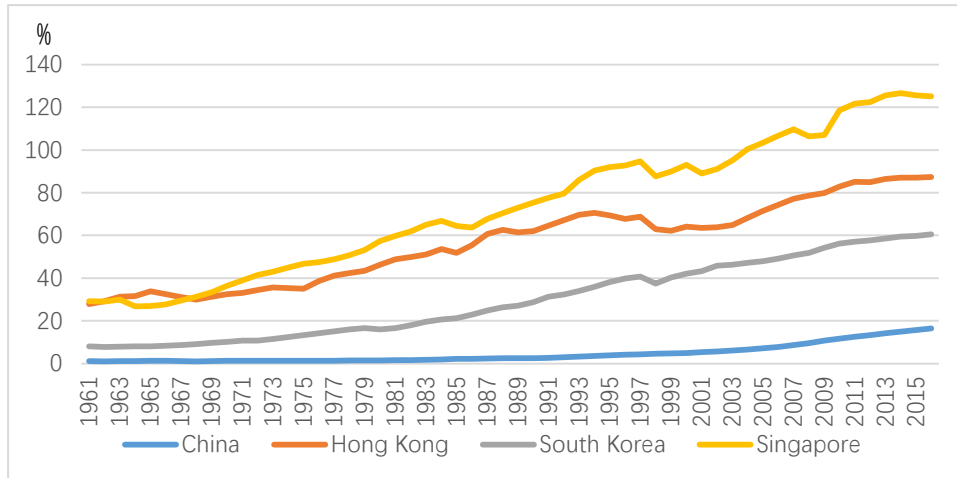
Figure 1: Per Capita GDP of Developing Countries over High-income Countries



Data source: World Bank, World Development Indicators

Due to the failure of structuralism policies, the neoliberalism, the second generation of development economics, replaced structuralism as the dominant developing thinking by the time of 1980s. According to neoliberalism, the main reason for the failure of developing countries to catch up with developed countries was too much state intervention in the market, causing misallocation of resources, rent seeking and so forth. Neoliberalism advises that developing countries overcome “government failures’ by adopting the Washington Consensus, which advocates privatization, marketization and stabilization with a shock therapy to build up a well-functioning market economy as in advanced countries (Williamson 1990). Most developing countries, both socialist and non-socialist, followed this recipe in the 1980s and 1990s. However, this policy framework failed again. As shown in figure 1, the gap between per capita GDP in developing countries and that in developed countries further widened. In fact the frequency of crises in developing countries in the 1980s and 1990s were even higher than that in the 1960s and 1970s. Therefore, some economists refer to the 1980s and 1990s as the lost decades for the developing countries (Easterly 2001)

Figure 2: Per Capita GDP of High-Performing Economies over High-income Countries



Data Source: World Bank, World Development Indicators

A few developing economies, such as China, Hong Kong SAR, South Korea and Singapore were able to achieve great success in their development efforts and narrow their gap with or even overtake developed countries in per capita income as shown in **Figure 2**. There is one thing in common among these high-performing economies. That is, they did not follow the mainstream development economics in their development efforts. Hong Kong, South Korea, and Singapore adopted an export-oriented development strategy instead of the import substitution strategy advocated by structuralism and China achieved a dynamic growth in its transition from a planned economy to a market economy by adopting a dual-track, gradualist approach instead of shock therapy as advocated by neoliberalism (Lin 2009). Against this background, it is natural to ask why those economies that followed the mainstream development thinking in their development or transition policies failed while those that succeeded in their development and transition adopted wrong policies from the perspectives of mainstream structuralism or neoliberalism.

II. New Structural Economics

In coming up with new structural economics as a response to these puzzles, I propose to go back to Adam Smith. What I mean is not to go back to ideas popularized by *the Wealth of Nations*, which reflected Adam Smith's findings from his reflections of economic phenomena in the 18th century but to go back to his methodology exemplified in the full title of his book, *An Inquiry into the Nature and Causes of the Wealth of Nations*. Firstly, we need to understand the nature of modern economic growth. According to Kuznets (1966), rapid, sustained income growth is a modern phenomenon, which occurred only after the industrial revolution in the 18th century. Before that, the size of an economy might expand but per capita income in the economy did not increase. The nature of modern economic growth with its

ever-increasing per capita income is a process of continuous structural transformation. This process involves continuous technological innovation in the existing industries, emergence of new, high value-added industries, and improvements of hard infrastructure, such as power supply and road network, and institutions (soft infrastructure). As Rodrick (2011) explains “... developing countries are qualitatively different from developed ones. They are not just radially shrunk versions of rich countries. In order to understand the challenges of under-development, you have to understand how the structure of employment and production - in particular the large gaps between the social marginal products of labor in traditional versus modern activities - is determined and how the obstacles that block structural transformation can be overcome.”

New Structural Economics proposes to use the neoclassical economic approach to study the determinants and impacts of economic structure and its evolution, which are the nature of modern economic growth, in an economy's development (Lin 2011). By convention, the research and finding based on the above approach should be referred as structural economics, but “new” is added to distinguish it from the structuralism.

The main idea of new structural economics is that economic structures, including the structure of technology and industry, which determines labor productivity, and hard and soft infrastructure, which determines transaction costs, are endogenous to the endowment structure, which is given at any specific time and changeable over time, in an economy.

Endowments and the endowment structure determine the economy's total budgets and relative factor prices at any specific time. These in turn determine the industries that the economy has comparative advantage. If all the industries in the economy are consistent with the economy's comparative advantage, the economy has the optimal industrial structure at that specific time. Such a structure enables the economy to have the lowest factor costs of production in domestic and international markets. From the perspective, a high-income country's industries are mostly capital-intensive industries because their factor endowments are relatively abundant in capital whereas low-income countries' industries are mostly resource-intensive or labor-intensive industries because their factor endowments are relatively abundant in nature resources and/or labor. Therefore, as an economy's structure of factor endowments evolves from one level of development to another, the optimal industrial structure of the given economy will evolve accordingly. When the industries in an economy move from traditional natural resources-intensive or labor-intensive industries to modern capital-intensive industries, a continuous improvement in hard infrastructure, such as power supply, road network, and port facilities, and soft infrastructure, such as financial institution and legal system, is required to reduce transaction costs so as to turning the industries of an economy's comparative advantages into the economy's

competitive advantages.

Income growth depends on increasing labor productivity by upgrading the industrial structure from natural resources- or labor-intensive industries to capital-intensive industries, which in turn depends on the upgrading of the endowment structure. With the upgrading of industrial structure, improvements in hard and soft infrastructure are required as well to reduce transaction costs.

From the above analysis, the best way to achieve dynamic growth in an economy is to develop the economy's industries by following the comparative advantages determined by its endowment structure. The economy with such industries and appropriate hard and soft infrastructure will be most competitive, produce the largest surplus, have the highest possible returns to capital and thus savings, ensure the fastest upgrading of the endowment structure, and achieve the most rapid industrial upgrading and income growth (Ju, Lin and Wang 2015). In this process, a developing country can have latecomer advantages and thus have a faster technological innovation and industrial upgrading than high-income countries, which leads to convergence with high-income countries (Lin 2009).

The question then is how to ensure that the economy grows in a manner that is consistent with its comparative advantages. The goal of firms is profit maximization, which is, all things equal, a function of relative prices of factor inputs. The criterion for a firm's industrial selection is typically the relative prices of capital, labor, and natural resources. Therefore, the precondition for a firm to follow the comparative advantage of the economy in its decision to stay in or to enter into an industry is to have a market system that provides the price signals reflecting the relative scarcities of factors of production in the endowment structure. Such a system exists only in a competitive market. In a developing country where a competitive market usually does not exist, the state must take steps to improve market institutions so as to create and protect effective competition in the product and factor markets. In the process of industrial upgrading, firms need to have information about production technologies and product markets. If that information is inadequate, each firm will need to invest resources to collect and analyze it. First movers that attempt to enter a new industry may either succeed (because the industry is consistent with the country's new comparative advantage) or fail (because they have targeted the wrong industry). In the case of success, their experience offers valuable and free information to other prospective entrants. They will not have monopoly rent because of competition from newly entering firms. Moreover, these first movers often need to devote resources to train workers in the new business processes and techniques, but competitors may hire those experienced workers with higher wages. In the case of failure, the experience of failing firms still provides useful information to other firms, advising them not to enter or what mistakes to avoid. Yet they must bear the costs of failure. In other words,

the social value of the first movers' investments is usually much larger than their private value, and there is an asymmetry between the first movers' gain from success and the cost of failure. In addition, successful industrial upgrading in an economy also requires new types of financial, legal, and other "soft" and "hard" infrastructure to facilitate production and market transactions so as to allow the economy to reach its production-possibility frontier by reducing transaction costs. Improving the hard and soft infrastructure requires coordination beyond individual firms' own capability. Economic development is therefore a dynamic process marked with externalities and one that requires coordination. While the market is a basic institution for effective resource allocation at each stage of development, the state must play a proactive, enabling role to facilitate an economy to move from one stage to another.

III. New Structural Economics and Recipe of Development Success

According to the World Bank's Growth Report by the Commission on Growth and Development (2008), after WWII 13 economies among about 200 economies in the world achieved an outstanding performance of growing on average at seven percent or more continuously for 25 or more years. The high-income countries on the average grow at a rate of 3-3.5%. Therefore, these 13 economies were able to achieve substantial convergence in their income level to that of high-income countries. The Commission finds that these successful economies had the following five characteristics: (1) They were open economies; (2) They maintained macroeconomic stability; (3) They had high savings and high investment rates; (4) They had a largely well-functioning market, or were moving towards a market economy; (5) They all had a credible, committed, and proactive state.

Michael Spence, Chairman of the Commission on Growth and Development, points out that those five characteristics are ingredients of success but not a recipe for success. However, without a recipe how can the state in a developing country formulate its development policy? In fact, the new structural economics' principle of following a country's comparative advantages, determined by its factor endowments, to develop the country's industries is the recipe for success.

According the new structural economics, an efficient market and a facilitating state, characteristics 4 and 5 in the Growth Commission Report's findings, are the two institutional preconditions for a country to develop according to the comparative advantages determined by its endowment structure. If a country follows its comparative advantage in their development, it will be an open economy, exporting whatever it has comparative advantages and importing whatever it has no comparative advantages (characteristics 1). The economy due to its competitiveness will not have indigenous macroeconomic crisis and has a strong ability to withstand external shocks and thus achieve macroeconomic stability (characteristics 2). Moreover, as last

section argues, an economy following comparative advantages in industrial development will generate the largest economic surplus and have highest incentives for savings and investments (Characteristics 3). Therefore, following comparative advantage is a recipe for development success.

IV. The Failure of Structuralism and Washington Consensus: A New Structural Economics Perspective

From the perspective of new structural economics, structuralism failed because it ignored the endogeneity of economic structure of a developing country and recommended an import-substitution strategy to develop industries that were too capital intensive for the country's level of development and defied the comparative advantages determined by its factor endowment. The firms in the priority industries of such a strategy were non-viable in open competitive markets and required state subsidies and protection for their initial investment and continuous operation. The state's protection and subsidies led to interventions and distortions, causing misallocation of resources, rent seeking, corruption, and political capture.

The successful East Asian economies instead adopted an export-oriented development strategy to develop initially labor-intensive manufacturing, exploiting the comparative advantages determined by their abundant labor supplies in the 1950s and 1960s and moved up the industrial ladder step by step with gradual accumulation of capital in the development process.

The Washington Consensus, based on neoliberalism, failed because it neglected the fact that the distortions in a developing country were designed to protect nonviable firms in existing industries established by the previous comparative advantage-defying strategy and advised the state to eliminate all distortions immediately, causing the collapse of old priority industries and deindustrialization. The shock therapy totally ignored the cost of transition. Moreover, the Washington Consensus opposed the state adopting a sector-targeted policy to provide externality compensation and taking steps to improve hard and soft infrastructure, needed for businesses' moving into industries in accordance with changes in the country's comparative advantages.

Transition economies, which have achieved stability and dynamic growth during their transition processes, such as China, Vietnam and Cambodia in the 1980s and Mauritius in the 1970s, typically adopted a pragmatic dual-track approach. In each case, the state provided transitional support to nonviable firms in the old priority industries and removed support only when firms in those sectors became viable. At the same time, the state often facilitated private firms' entry into previously repressed industries on evidence that they enjoy comparative advantage. The state also typically

played a facilitating role by setting up special economic zones/industrial parks to overcome infrastructure bottlenecks, providing one-stop service to improve the business environment and engaging in active investment promotion to attract foreign investment (Lin 2013a). Such a transition strategy contributed to economic stability and dynamic growth and was favorable to domestic capital mobilization and FDI. Ironically, the mainstream transition thinking in the 1980s and 1990s regarded the dual-track approach to transition as the worst transition approach (Murphy, Shleifer and Vishny 1992).

V. Industrial Policy and New Structural Economics

New Structural Economics argues that the state has an essential role in facilitating industrial upgrading in the process of economic development because of the need to address externalities and solve coordination problems in the improvement of infrastructure and institutions. Industrial policy is a useful instrument for the state to play the facilitating role. This is because the required coordination for improvements in infrastructure and institutions may differ across industries and locations, and the state's resources and capacity are limited so the state needs to use them strategically.

However, for an industrial policy to be successful, it should target industries that conform to the economy's latent comparative advantage. Latent comparative advantage applies to an industry that, while enjoying low factor costs of production in the international comparison, i.e., consistent with the country's comparative advantage determined by its factor endowments, the transaction costs are nevertheless too high due to inadequate hard and soft infrastructure to be competitive in domestic and international markets.

Firms in an industry with latent comparative advantages will be viable and the industry can be competitive once the state helps reduce the transaction cost by improving the hard and soft infrastructure. How can the state pick the industries that are in line with the economy's latent comparative advantages? Depending on a targeted industry's distance to the global technology frontier, New Structural Economics classifies industries in a developing country, especially a high-middle income country like China, into five categories and recommends state's facilitation according to their respective bottlenecks for growth (Lin 2017):

(1) For an industry that the country still has a distance to the global technology frontier, the state should identify the binding constraints in infrastructure, financing, human capital, etc., and remove them for helping firms' catching up.

(2) For an industry that the country is already on the global technological frontier, the state should support firms' R&Ds, especially the basic research needed for product and technology development, to maintain the industry's technological leadership

globally.

(3) For an industry that has already lost comparative advantage, such as the labor-intensive industry in China, the state should help firms either to shift to branding, product design and marketing management, of which the value-added are high, or relocate to countries with low wages.

(4) For a short innovation-cycle industry, which relies more on human capital than physical capital, in a country with abundant human capital, and especially like China with its large domestic market, the state can set up incubation parks, encourage venture capitals and protect intellectual property to facilitate innovations.

(5) For a long innovation-cycle industry, needed for national defense, even though the industry is not in line with the country's comparative advantage, the state should subsidize its R&D directly with direct fiscal support instead of price distortions and other market interventions.

A developing country is typically imbedded with poor infrastructure and weak institutions nationwide. Instead of trying to improve infrastructure and strengthen institutions for the whole nation without industry- and location-specific focus, as mainstream advisors advocate, the state may use the above pragmatic approach to support the technological innovation and industrial upgrading in specific industries and locations and generate quick wins for competitiveness, job generation, export diversification, capital accumulation and fiscal revenue expansion. The quick wins will set forth a virtuous cycle of development that may well spread to the whole nation.

VI. New Theoretical Insights

Most existing mainstream economic theories see only the quantitative but not the qualitative differences between a developing country and a developed country. They also take the structure of advanced countries as the optimal structure, deviation from which is perceived as a distortion and suboptimal. However, the economic structures of countries in different stages of development are qualitatively different and thus may entail different principles for economic operation. For example, technological innovation for a developed country on a global technological frontier means invention but for a developing country within the global technological frontier may mean imitation (Gerschenkron 1962). Similarly, financial arrangements, such as stock market, venture capital, big bank and corporate bonds, suitable for an advanced country dominated by capital-intensive large firms may not be appropriate for a developing country with firms in service, manufacturing and agricultural sectors being predominantly small scale (Lin, Sun and Jiang 2013). For a developed country, the fiscal stimulus may encounter the constraint of Ricardian Equivalence while a developing country may use the stimulus to invest in bottleneck-releasing, growth-enhancing infrastructure and thus overcome the constraint (Lin 2013b). The

endogenization of economic structure for countries at different stages of development is a gold mine for research. The result of such research will make economic theories more applicable to address economic issues and guide policies in developing countries.

VII. Concluding Remarks

It is the dream for every developing country to become a prosperous high-income country. To bring prosperity to a nation is consistent with a political leader's personal goal of staying in power and leaving a memorable legacy (Lin 2009). After WWII, most developing countries, having gained political independence from colonial powers, started to pursue industrialization and modernization following the ideas of structuralism first and then neoliberalism but most failed. Only a few developing countries were able to narrow substantially their income gap with high-income countries or even to overtake high-income countries. Their policies were wrong policies from the perspectives of mainstream structuralism or neoliberalism. As Keynes (1935, p. 384) said, "It is ideas, not vested interests, which are dangerous for good or evil." The article introduces the new structural economics, the third generation of development economics. I hope the ideas embodied in the new structural economics will assist the developing countries, which still consist of 85 percent of the world population, realize their dream of becoming prosperous modern advanced industrialized high-income countries.

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