

**ECONOMIC DEVELOPMENT  
AND  
STRUCTURAL CHANGE**

**Justin Yifu Lin**  
**Senior Vice President and Chief Economist**  
**The World Bank**

## 1. INTRODUCTION

It is a great honor to address this distinguished audience at such a crucial time in world economic affairs. Emerging from the worst international financial and economic crisis since the Great Depression, the global economy appears to be on the path to recovery, pulled up by strong policy response, particularly by emerging countries, mainly in Asia. Nonetheless, the pace of expansion is still very slow, and levels of economic activity and industrial production remain well below their pre-crisis levels in many countries. Economists and policymakers around the world broadly agree the global recovery is likely to be sluggish. Rebound in the industrialized economies is largely driven by policy stimulus and restocking, with underlying private demand remaining weak. Prospects appear to be much better in emerging economies, though the strength and sustainability of their recovery will also depend on the resurgence of global trade and private financial flows.

We need to think differently about what drives economic growth. The challenges before us are enormous. In many countries, financial systems often remain impaired, excess capacity still is present, unemployment remains on the rise, and there have been setbacks to progress in poverty reduction. Designing and implementing safe exit strategies from the highly expansionary monetary and fiscal policies that have supported demand and helped contain the crisis is a delicate task. At a time where economics as a discipline is being questioned, sometimes for good reasons, it is our responsibility as professional and academic economists to rise to the challenge, to revisit some of the frameworks and approaches that have guided our work, and to propose new ideas where they can make a difference.

In my remarks today, I want to focus on moving beyond the crisis, consider medium- and long-term challenges, and reflect on a strategy for achieving sustainable and inclusive growth in developing countries. This is because poverty reduction is still the most challenging development issue in our time. There were 1.4 billion people living under \$1.25 international poverty line before the crisis. Eighty nine million more people may be trapped in poverty because of the crisis. A sustainable and inclusive growth is essential for poverty reduction globally.

## 2. A BRIEF HISTORY OF DEVELOPMENT THINKING

From Adam Smith to the early 20<sup>th</sup> century, most economists believed that a *Laissez faire* approach was the best way to achieve sustainable growth. It was assumed that in dynamic growing economies, all decisions about resource allocation are made by economic agents interacting in markets free of government intervention. The price system determines not only what is produced and how, but also for whom. Households and firms pursuing their own interests would be led, “as if by an invisible hand,” to do things that are in the interests of others and of society as a whole. This approach to economic development assumed that productivity increases in the agriculture and manufacturing sectors are due mainly to incremental refinement of old, traditional technologies for the purposes of exploiting widened markets and specialization. The *laissez faire* approach basically

ignored the possibility of successive introduction of big innovations that create new industries or radically alter methods of production.

While this view was challenged by Marxist economists, it was the dominant intellectual framework for the study of growth in all countries for a long time. It took Rosenstein Rodan's well-known 1943 paper<sup>1</sup> to bring development economics into the mainstream. Laissez faire economics suggested that the virtuous circle of development depended essentially on the interaction between economies of scale at the level of individual firms and the size of the market. Specifically, it assumed that modern methods of production can be made more competitive than traditional ones only if the market is large enough for their productivity edge to compensate for the need to pay higher wages. On the other hand, the size of the market itself depends on the extent to which these modern techniques are adopted. Therefore, if the modernization process can be started on a very large scale, then the process of economic development will be self-reinforcing and self-sustaining. If not, countries will be trapped indefinitely in poverty.

Rosenstein Rodan's framework sparked a wave of similar ideas from Arthur Lewis, Gunnar Myrdal, Albert Hirschman and others, which came to be known as the structuralist approach to economic development. In Latin America for instance, political leaders and social elites were influenced strongly by the deterioration in the terms of trade, the economic difficulties encountered during the Great Depression in the 1930s and the thesis developed by Raul Prebisch in 1950. They believed that the decline in the terms of trade against the export of primary commodities was secular, which resulted in the transfer of income from resource-intensive developing countries to capital-intensive developed countries. They argued that the way for a developing country to achieve high growth rates was to develop domestic manufacturing industries through a process known as import substitution.

Yet, the results were disappointing. Instead of converging to developed countries' prosperity levels, the income levels in most developing countries stagnated or even deteriorated and the income gap with developed countries widened. This was the case across the developing world, including in Latin America, Africa, South Asia in the 1960s and 1970s. During this period, import substitution policies intended to promote industrialization by protecting domestic producers from the competition of imports became the source of high tariffs, quotas or restrictions on foreign trade and led to distortions, rent-seeking and economic inefficiencies.

As government-led strategies based on the structuralist teachings failed in many countries, the market-led growth model appeared to triumph and to influence development thinking. This trend was reinforced by a new revolution in macroeconomics. The prevailing Keynesian macroeconomic model was challenged by the emergence of stagflation in the 1970s, the Latin America debt crisis and the collapse of socialist planning system in the 1980s. Multilateral lending institutions and bilateral lenders—especially the United States—soon called for a comprehensive set of reforms

---

<sup>1</sup> P. Rosenstein Rodan, "Problems of Industrialization of Eastern and Southeastern Europe," *Economic Journal*, vol. 111, nos. 210-211, June-September 1943, pp. 202-211.

and advocated a set of policies labeled “neoliberal”, which follow the canons of rational expectation macroeconomics, later known as the Washington Consensus. Such reforms were pursued according to different degrees of conviction and actual implementation in developing countries.

Finally, the collapse of socialist economies in the 1980s, which prompted Francis Fukuyama to proclaim “the end of History”, seemed to mark the complete victory of free market economics over proponents of structuralist state interventions and centrally-planned economic systems. Most mainstream economists explained at the time that Government intervention in the economy was bound to fail because of the inevitable distortion of the allocation of resources, supply and prices, and the absence of a viable incentive system for economic agents. They interpreted the economic collapse in Eastern and Central Europe and Former Soviet Union and the stagnation and frequent crises in Latin America and other developing countries as evidence that the state should refrain from playing a leading role in initiating industrialization. These views fueled the sense that capitalism had triumphed, and neoliberal, Washington Consensus policies came to dominate development thinking. This school of thought promoted economic liberalization, privatization, and the implementation of rigorous stabilization programs. Unfortunately, the results of these policies were at best controversial.

The story of economic development in the past half-century has often been one of disappointments. But there are also a few success stories. The contrast in economic strategies and performance among developing countries has been intriguing to economists. On the one hand, many countries that followed dominant economic theories of the time in formulating their policies often failed to change their economic structures and narrow the gap with industrial countries. On the other hand, some other countries such as Japan and the four dragons (Korea, Singapore, Taiwan, Hong Kong), started from a low agrarian foundation and were able to quickly climb the industrial ladders and achieve convergence with advanced industrialized countries by the 1980s in terms of economic structure and income level. Likewise, China, Vietnam, and Mauritius achieved rapid and sustained growth by following a gradual transition approach to a market economy in the 1990s, instead of the “shock therapy” prescribed by certain proponents of the Washington Consensus.

In all the successful cases, the market was the fundamental mechanism for resource allocation as predicted by neo-liberalism. However, the state also played an active role in the development and transition process as the Keynesian theories and structuralism envisioned. Still, economists do not seem to have derived the same lessons from these experiences. It is therefore important to take a closer look at the fundamental reasons for success in economic development.

### **3. THE STRUCTURAL DYNAMICS OF ECONOMIC DEVELOPMENT**

What policies and factors make it possible for some countries to attain sustained and inclusive growth, while others languish? To answer this question, which is at the heart of development economics, it is useful to start from the observation that, throughout history,

modern economies have moved successively from subsistence agriculture to light industry, then to heavy industry, high-tech industry, and eventually to the post-industrialization phase. This evolution proves the basis for an understanding of economic development as:

- (i) a process of continuous technical innovation leading to improved quality and/or lower production costs of the same goods, ; and
- (ii) a dynamic process of industrial upgrading and structural change with new and, different goods and services produced continuously.

The economic literature has devoted a lot of attention to the analysis of technological innovation, but not enough to the equally important issue of industrial upgrading and its corollary, structural change. While no economist believes that all rich countries are alike and all poor countries are alike, growth models feature only minimal differences between countries. Some models focus on only one sector and completely overlook the industrial differences between developed and developing countries. Even the well known Kuznets three-sector model assumes that all countries produce the same goods, with only differences in their relative weight. Clearly it is a modeling choice to introduce a suitable level of abstraction. Nevertheless it can have misleading implications for growth analysis.

One consequence of such modeling choices is that they pay little heed to structural factors. These structures and the differences they imply between countries should be the starting point for the enquiry of economic development. It is crucial to consider the fact that countries at different stages of development tend to have different economic structures due to differences in their endowments. An economy's factor endowments at any given time determine budget levels and relative factor prices – the two most important economic parameters at any given time. Thus, given preferences and available technologies in an economy, the structure of its factor endowments determines endogenously its optimal industrial structure and the economy's production possibility frontier. When the endowment structure is upgraded, the country's industrial structure must be upgraded too. And, these changes in industrial structure necessitate changes in the social and economic structure so as to reduce transaction costs (such as transportation or financial costs) for production and exchanges.

The analysis of growth dynamics should, therefore, begin with an economy's endowments, and its evolution over time. Following classical thinking, economists tend to consider a country's endowments as consisting only of its land (or natural resources), labor, and capital (both physical and human). These are simply factor endowments, which firms can use for production. Conceptually, it is useful to add infrastructure as one more component of an economy's endowments.<sup>2</sup> Infrastructure can be *hard* (tangible) or *soft* (intangible). Examples of *hard* infrastructure are highways, port facilities, airports, telecommunication systems, electricity grids and other public utilities. *Soft* infrastructure

---

<sup>2</sup> The difference between factors of production and infrastructures is that in a market economy the former are supplied mostly by individual households, whereas the latter are supplied by the community or the state.

consists of institutions (legal, regulatory, political, security etc.), laws and regulations, social capital, culture, value systems, and other social and economic arrangements. Both of these types of infrastructures are critical to the viability of domestic firms: they affect individual firm's transaction costs and the marginal rate of return on investments. Most hard infrastructure and almost all soft infrastructure- is exogenously provided to individual firms and cannot be internalized in their production decisions.

As industrial structure is endogenous to an economy's endowment structure, for the developing countries to upgrade their industrial structure, they must first upgrade their endowment structures, especially in terms of physical and human capital.<sup>3</sup> For instance, developing countries can upgrade by increasing their relative share of physical and human capital. The best way to do this is for developing countries to develop industries and adopt technologies that are consistent with their comparative advantage and their level of economic development. This is because when firms choose their industries and technologies according to comparative advantages determined by local factor endowments, the economy is most competitive.<sup>4</sup> As competitive industries and firms grow, they claim a larger market share and create the greatest possible economic surplus, in the form of profits and salaries. Furthermore, reinvested surpluses earn the highest return possible, because the industrial structure is optimally organized given the endowment structure. Over time, this strategy allows the economy to accumulate physical and human capital and upgrade the factor endowment structure as quickly as possible. As capital becomes more abundant and hence relatively cheaper, production shifts to more capital-intensive goods and labor-intensive goods are gradually displaced. This process generates perpetual V-shaped industrial dynamics—the so-called “flying geese” pattern of economic development.<sup>5</sup>

For firms to follow the economy's comparative advantage in their choices of industries and technologies in the manner outlined above, a price system is required whereby the

---

<sup>3</sup> See J. Ju, J., J.Y. Lin, and Y. Wang, “Endowment Structures, Industrial Dynamics, and Economic Growth,” World Bank Policy Research Working Paper, No. 5055, 2009.

<sup>4</sup> M.E. Porter made the notion of ‘competitive advantage’ popular in his book *The Competitive Advantage of Nations*. New York, Free Press, 1990. According to him, a nation will have competitive advantage in the global economy if its industries in the nation fulfill the following four conditions: 1. They intensively use the nation's abundant and relatively inexpensive factors of production, 2. Their products have large domestic markets, 3. Each industry forms domestic clusters and 4. Markets are competitive. The first condition reflects the fact that the industries are consistent with the economy's comparative advantage, which is determined by the nation's endowments. The third and the fourth conditions hold only if the industries are consistent with the nation's competitive advantage. Therefore, the four conditions can be reduced to the following two independent conditions: comparative advantage and domestic market size. Among these two independent conditions, comparative advantage is the more important because if an industry is the nation's comparative advantage, the industry's product will have a global market. This is the reason why many of the richest countries in the world are very small. See J.Y. Lin and R.N. Ren, “East Asian Miracle Revisited,” (in Chinese) *Jingji Yanjiu (Economic Research Journal)*, vol. 42, no. 8, 2007, pp. 4-12.

<sup>5</sup> This pattern, which was documented in the literature by K. Akamatsu, “A Historical Pattern of Economic Growth in Developing Countries,” in *The Development Economies*, Tokyo, Preliminary Issue No. 1, 1962, pp. 3-25; H.B. Chenery, . “Patterns of Industrial Growth,” *American Economic Review*, vol. 50, September 1960, pp. 624-654; and is formalized in J. Ju, J., J.Y. Lin, and Y. Wang, “Endowment Structures, Industrial Dynamics, and Economic Growth,” mimeo, 2009.

relative factor prices reflect the relative abundance of endowment factors . Only a competitive market can have a price system with such characteristics. Therefore, only by embracing the market and its resource allocation mechanisms can a developing country ensure that the right price signals are in place to encourage firms to promote those industries whose development is optimal for the country.

As capital accumulates and as the endowment structure is upgraded and the country climbs up the industrial and technological ladder, many other changes must take place as well. First, the technology needed by firms becomes more sophisticated and riskier as they move closer to the global frontier. Second, capital requirements become more important, just like the scale of production and the size of markets. Third, market exchanges increasingly take place at arm's length. It then becomes clear that a flexible and smooth process of industrial and technological upgrading also requires simultaneous improvements in education, financial, and legal institutions, as well as other infrastructures. Yet, individual firms cannot internalize all these changes cost-effectively, and coordination among many firms to achieve these changes will often be impossible. At that point, the only entity that can coordinate the desirable investment or change is the state. It has to play a facilitating role in dealing with market externalities.

Despite their insights on issues of market failures, old structuralist economists treated industrial structure as exogenous and recommended that developing countries change their industrial structure through direct intervention and other administrative measures. This caused all kinds of distortions. Neoclassical critics rightly highlighted the importance of government failures. However, by treating the distortions introduced previously under the structuralist policies to protect nonviable firms in designated priority sectors as exogenous, they recommended an approach to eliminate those distortions without sufficient consideration of the endogeneity of those distortions. They also ignored the structural differences between the developed and developing countries and missed the specific responsibilities of a facilitating state in the process of industrial upgrading and structural changes.

#### 4. THE RESPECTIVE ROLES OF MARKETS AND STATE

It is now time to draw from a structural approach to development some key lessons which will further our quest for sustainable and inclusive growth. The first and most important policy insight relates to the respective responsibilities of the market and the state in sustaining the dynamics of structural change. The market's role is clear and often easily understood: for firms to enter the profitable industries and choose the appropriate technology, the economy must exhibit relative prices that reflect the relative scarcity of factors in the country's endowment. This only happens in an economy with competitive markets.<sup>6</sup> Therefore, a competitive market should be the economy's fundamental mechanism for resource allocation.

---

<sup>6</sup> See J.Y. Lin, *Economic Development and Transition: Thought, Strategy, and Viability*, Cambridge: Cambridge University Press, 2009; and J.Y. Lin and H. Chang, 2009. "DPR Debate: Should Industrial Policy in Developing Countries Conform to Comparative Advantage or Defy It?", *Development Policy Review*, Vol. 27, No. 5, pp. 483-502.

By contrast, the state's role seems less clear and remains subject to controversy. Yet, it becomes more apparent when one focuses on the need to sustain the dynamics of infrastructure development. With the upgrade in factor endowment and industrial structure, infrastructures and other social and economic institutions need corresponding improvement in order for the economy to achieve x-efficiency. Firms that were once viable<sup>7</sup> under the previous endowment structure become nonviable. To become viable again, firms need to upgrade to industries with higher capital intensities. And, as mentioned above, this upgrading process is an innovative and unavoidably risky venture. Successful upgrading requires that firms overcome issues of limited information regarding which industries are viable. It also requires coordinated investments—including by other firms. In addition, issues of information externalities may arise from the success or failure of pioneering firms because no one is willing to be the first mover.

*But within this broad categorization of the respective roles of markets and the state, the specific policies and concerns will vary depending on a country's stage of economic development.* For countries at the early stages of development, factor endowments are typically characterized by a relative scarcity in capital, and a relative abundance in labor or resources. The industries that will have comparative advantage in open, competitive markets tend to be labor-intensive or resource-intensive (mostly in agriculture and the mining sector) and usually rely on conventional, mature technologies, and produce “mature”, well-established products. Except for mining and plantations, production in the earlier stages of development tends to have limited scope for economies of scale. Their firm sizes are usually relatively small, with market transactions often limited to personalized local markets. The types of *hard* and *soft* infrastructure required for facilitating this type of production and market transactions are limited, relatively simple, and rudimentary.

At the other extreme of the development spectrum, high-income countries display a completely different endowment structure. Their relatively abundant factor is typically capital, not natural resource or labor. Therefore, these countries tend to have comparative advantage in capital intensive industries with large-scale production. Because they are situated on the global technology frontier, their economies rely on the invention of new technology and products for sustained growth. Their firms must engage in risky R&D activities. In that context, the appropriate financial arrangements are big banks and sophisticated equity markets that can mobilize large amount of capital and are capable of diversifying risks. The types of *hard* infrastructure such as roads and port facilities, and *soft* infrastructures such as regulatory and legal frameworks must comply with the necessities of national and global markets where business transactions are long distance, large in quantity and value, and based on rigorously designed and implemented contracts. In developed countries where industries are already on the global frontier, what will be the next frontier is uncertain. Therefore government's policies to sustain industrial

---

<sup>7</sup> A firm is viable if with a normal management it can survive in a competitive market without external subsidies. Lin (2003, 2009) shows that a firm will be viable if it is operated in the optimal industry determined by the economy's endowment structure.

upgrading, or “vertical innovation”<sup>8</sup>, are typically in the forms of general support to research in universities, which has externalities to R&D in private firms, patents, preferential taxes for capital investments, defense contracts, and access to procurement opportunities.

When moving up the industrial ladder in, developing countries must increase their scale of production. Larger firms proliferate and the need for a bigger market becomes evident. In such situations, infrastructure deficiencies are often a bottleneck to economic development. The growth process tends to render existing institutional arrangements obsolete, as it induces shifts in the demand for institutional services, which have the nature of public good. Changes in institutions require collective action and often fail because of free-rider problems.<sup>9</sup> For this reason, governments need to play a proactive role in facilitating timely improvements of *hard* and *soft* infrastructure and the changing needs arising from industrial upgrading.

In developing countries, their industrial upgrading moves within the global frontier. At each stage of their development, firms in developing countries can acquire the technologies and enter into those industries appropriate for their endowment structure, rather than having to reinvent the wheel by themselves. When the capital accumulation necessitates the upgrading of their industrial structure, the state could potentially play a proactive role to facilitate the process:

- Providing information about the likely new industries of comparative advantage;
- Coordinating investments in related industries and providing the required improvements in soft and hard infrastructure;
- Subsidizing activities with externalities; and
- Catalyzing the development of new industries by incubation or attracting foreign direct investment.<sup>10</sup>

---

<sup>8</sup> See D. Acemoglu, P. Aghion, R. Griffith, and F. Zilibotti, “Vertical Integration and Technology: Theory and Evidence,” forthcoming in the *Journal of the European Economic Association*, 2009.

<sup>9</sup> See J.Y. Lin, “An Economic Theory of Institutional Change: Induced and Imposed Change,” *Cato Journal*, vol. 9, No. 1, Spring/Summer, 1989, pp. 1-32.

<sup>10</sup> An important caveat here is the need to recognize the downside risks associated with serious governance problems and political capture by certain corrupt elements and powerful groups in many developing countries. However, if the industrial upgrading facilitated by the state follows its comparative advantage, the government only needs to compensate the externalities generated by the pioneer firms in the upgrading. The required compensation should be very small. The political capture in developing countries is more likely to occur when the industries promoted by the government’s industrial policy go against the country’s comparative advantage. As such, firms in the government’s priority industries are not viable in open, competitive market. The government needs to introduce various distortions to protect and subsidize the nonviable firms and is thus subject to political capture (See J.Y. Lin and F. Li, “Development Strategy, Viability and Economic Distortions in Developing Countries,” World Bank Policy Research Working Paper, No. 4906, 2009; and J.Y. Lin and G. Tan, “Policy Burdens, Accountability, and the Soft Budget Constraint”. *American Economic Review: Papers and Proceedings*, Vol. 89, No. 2 (May 1999), pp. 426-31). The effectiveness of the facilitating role also relies on the government capacity. If the industries promoted by the state’s industrial policy are consistent with the country’s comparative advantage, it will be more likely to be successful and the requirement for the state’s capacity will be smaller. Moreover, the success may increase the government’s confidence and enhance its capacity.

This ability to use off-the-shelf technology and to enter into existing industries and the possibility for the state to facilitate the process of industrial upgrading has enabled the sustained annual GDP growth rates of 8 and even 10 percent achieved by some of the East Asian NIEs.

## **5. SOME ADDITIONAL POLICY IMPLICATIONS**

An approach to economic development which is centered on structural change may have wide ranging implications, because of the additional insights they provide. These go well beyond the policy implications about the relative roles of markets and state which I just discussed and which follow directly from this approach. I will discuss now a number of additional policy implications which are not usually thought of as being related to issues of structural change. In doing so, we should be mindful of the fact that specific policy measures to be derived from any particular framework will depend very much on country context and circumstances.

### **Macroeconomic Management**

When the government in a developing country plays the role of a facilitating state to promote industrial development that is consistent with its comparative advantage, the country's fiscal position and external account can be expected to be strong. This is due to the likelihood of strong growth of the economy, good trade performance, and the absence of nonviable firms that the government has to subsidize. As such, the country may face fewer internal policy-driven economic crises.

Strong fiscal and current accounts also provide a cushion for turbulent times. In situations of crisis such as what we are encountering now, macroeconomic policy could be less neutral than suggested by traditional approaches to development thinking. When the country is affected by external shocks, its government would be in a good position to implement counter-cyclical policies. The good fiscal and external positions would allow for a fiscal stimulus to invest in infrastructural and social projects, which in general are in great need of improvement. Such investments can enhance the economy's growth potential, reduce the private sector's transaction costs, raise the returns to their investments, and generate enough tax revenues in the future to repay the investments.<sup>11</sup> Monetary policy can also be more proactive in a time of crisis. Even if all the existing industries are beset with excess capacities, there will always be scope for industrial upgrading in a developing country. Therefore, the private sector's investment will be responsive to a reduction in interest rates during a crisis.

---

<sup>11</sup> See J.Y. Lin, "Beyond Keynesianism", *Harvard International Review*, June 2009. This approach also recognizes that active fiscal policies tend to yield different outcomes depending on the structure and size of the economy, the initial fiscal balance, the exchange rate regime in place, the rational expectations of private agents and their view of intergenerational concerns, interest rate premiums, policy credibility and uncertainty. If the country has a large fiscal deficit, either because the government has deviated from the role of a facilitating state or for other reasons, its ability to apply counter cyclical fiscal policies will be limited. This will particularly be the case in situations of prolonged recessions.

### **Financial Structure**

Developing countries with abundant labor force and relatively scarce capital have comparative advantage in labor-intensive industries which would be dominant in the economy. Businesses in these sectors tend to be small and typically require limited amounts of external finance. These firms usually adopt mature production technologies that are more proven and less risky. The lack of standard financial information makes them more opaque. The screening of these firms and the monitoring of their managers are therefore the main concern for external fund providers. In that kind of environment, banks (especially small local banks) are stronger and better suited than stock markets for providing financial services, especially lending services. As the country's economy develops and capital accumulates, the endowment structure also gets upgraded. The leading industries will become more capital-intensive and the appropriate technology for the economy will approach the world technology frontier. As a result, viable firms will tend to be of larger size and assume more technological innovation risk and product innovation risk. Big banks and equity markets, which are suitable for mobilizing large amount of capital and reallocating risks, become more suitable for providing financial service to such large firms. Therefore, differences in industrial structures for countries at different stages of development also imply different financial structures.

### **Capital Flows**

The structural difference between the developed and developing countries may help explain the so-called Lucas paradox. Observing that the central idea of virtually all postwar development policies is to stimulate transfers of capital goods from rich to poor countries, Robert Lucas wondered why capital does not flow from rich to poor countries despite the fact that the latter have lower levels of capital per worker.<sup>12</sup> Theoretical explanations for this puzzle usually include differences in fundamentals that may affect the production structure (government policies, missing factors of production, technological gaps) or imperfections in international capital markets.<sup>13</sup> By focusing on the dynamics of structural change, one can provide a more specific explanation to the puzzle: economic development as a process of industrial upgrading requires the continuous improvements to hard and soft infrastructure. Countries where both components of infrastructure are not simultaneously modernized tend to exhibit diminishing returns to capital, which alters the composition of financial flows they can attract.

The focus on structural change highlights the relative importance of foreign direct investment (FDI) to developing countries: it usually flows to industries that are consistent with the recipient country's comparative advantage. It is also less prone to sudden reversals in a panic than bank loans, debt financing and portfolio investment, and does

---

<sup>12</sup> R.E. Lucas, "Why Doesn't Capital Flow from Rich to Poor Countries?", *American Economic Review*, vol. 80, no. 2, May 1990, pp. 92-96.

<sup>13</sup> See L. Alfaro et al, "Capital Flows in a Globalized World: The Role of Politics and Institutions," in: S. Edwards (ed.), *Capital Controls and Capital Flows in Emerging Economies: Policies, Practices, and Consequences*, Chicago, The University of Chicago Press, 2007.

not generate the same acute problems of financial crises as do sharp reversals of debt and portfolio flows. In addition, foreign direct investment tends to bring technology, new managerial practices, access to market, and social networking, which are often lacking in a developing country and yet crucial for the industrial upgrading process. Thus, liberalizing inward direct investment should generally be an attractive component of a broader industrial policy. By contrast, portfolio investment tends to target speculative activities (mostly in equity markets or the housing sector), which creates bubbles and fluctuations. Because they are volatile by nature, they often contribute to Dutch disease and currency crises. Therefore, they are not as beneficial as FDI for developing countries' development.

### **Human Capital**

Modern growth theorists are almost unanimous on the importance of the accumulation of human capital to economic development. Economic growth is theorized as the result of synergies between new knowledge and human capital, which is why big gains in education and training have accompanied major advances in technological knowledge in successful countries. But while micro studies very often show a positive relationship between educational levels of individuals in the labor force and their employment rates, lifetime earnings and productivity, cross-country studies tend to produce inconclusive results.<sup>14</sup> Many developing countries have devoted large amounts of resources to educate and train workers. However, without upgrading in industrial structure, many educated members of the labor force are often left unemployed or compelled to migrate. Improvements in human capital must therefore be part of the overall strategy to accumulate physical capital and upgrade the industrial structure. For developing countries to make full use of human capital resources, human capital policies must be an integral part of the overall development policy.

### **Resource Management**

The general consensus in the existing literature on natural resource management is to adhere to principles of good governance. It is also recommended that foreign reserves in resource-rich countries be managed prudently to ensure resilience to shocks. This is achieved more easily when foreign exchange reserve management should support a wide range of objectives, including to: maintain confidence in monetary and exchange rate policies; mitigate the risks of external vulnerability by maintaining foreign currency liquidity to absorb shocks during times of crisis; provide confidence to markets that a country can meet its external obligations; ensure the backing of domestic currency by external assets; and provide reserves in case of national disasters or emergencies<sup>15</sup>. In recent years, many countries have gone further, creating sovereign wealth funds, which

---

<sup>14</sup> See L. Pritchett, *Where Has all the Education Gone?*, Policy Research Working Paper no. 1581, Washington, D.C., World Bank, 1996.

<sup>15</sup> IMF, *Guidelines for Foreign Reserves Management*, Washington, D.C., September 20, 2001.

are government entities funded by foreign currency reserves but managed separately from official currency reserves and used for profitable investments abroad.<sup>16</sup>

Again, looking at such economies from the perspective of structural change, one can see that the resource sector often creates only limited job opportunities. This is due to the fact that it is usually an enclave in economies where the majority of population earns their living from subsistence agriculture or from the non-traded goods and services sectors. Good governance, prudent management of foreign reserve and the creation of sovereign wealth funds are desirable in a resource-rich country. However, from the point of view of structural change, it is also desirable to invest a portion of the wealth generated from resource exploitation in education and infrastructure, and to support economic diversification.

## 6. CONCLUDING REMARKS

Various growth-cum-development models have attempted to understand the respective roles of a wide range of economic, political and social factors. Neoclassical models have focused on the accumulation of capital and the importance of diminishing (and non-diminishing) returns. The need to better explain the mechanics and channels of technological progress has been the main focus of endogenous growth models. Mathematical modeling of technology, human capital, knowledge spillovers, and incentives has allowed economists to explore rigorously the issues of market failure and policy interventions. In recent years these models have been extended in new directions, particularly to allow for international trade, finance, labor and knowledge flows. Nevertheless, despite many new insights, these sophisticated models have yielded very few specifics in terms of policy guidance. This is partly due to the fact that much of the empirical research has been dominated by cross-country analysis. The micro analysis and country studies of the recent years have led to a new set of insights, but also to more questions and some contradictions. In that context, new areas of future research focusing on new empirical methodology and structural dynamics of industrialization, growth and development might be productive.

Lucas concluded his 1985 Marshall lectures by saying that “a successful theory of economic development clearly needs, in the first place, mechanics that are consistent with *sustained growth and with sustained diversity of income levels*”<sup>17</sup> (emphasis added). The structural change framework proposed here attempts to complement previous approaches to the search for growth strategies, and to follow Lucas’ recommendations. It is based on the following observations:

- First, the economy’s structure of factor endowments (defined as the relative composition of natural resources, labor, human capital and physical capital) is

---

<sup>16</sup> In September 2007, the International Monetary Fund estimated that sovereign wealth fund control about \$3 trillion and that this tally could reach \$12 trillion in 2012—though their fortune has declined substantially the bust in commodity prices and the financial turmoil of 2008.

<sup>17</sup> R.E. Lucas, “On the mechanics of Economic Development,” *Journal of Monetary Economics*, vol. 22, 1988, p. 41.

given at each stage of development and differs from one stage to another. Therefore, the optimal industrial structure of the economy will be different at different stages of development. Different industrial structures imply, in addition to differences in capital intensity of industries, differences in optimal firm size, scale of production, market range, transaction complexity, and also different nature of risks. As a result, each industrial structure requires corresponding *soft* and *hard* infrastructure to facilitate its operations and transactions.

- Second, each stage of economic development is a point in a wide spectrum from a low-income agrarian economy to a high-income industrialized economy, not a dichotomy of two economic development stages (“poor” versus “rich” or “developing countries” versus “industrialized countries”). Due to the different industrial structure of economies at different stages of development, the targets of industrial upgrading and infrastructure improvement should not necessarily refer to the industries and infrastructure that exist in high income countries.
- Third, at each given stage of development, the market is the basic mechanism for effective resource allocation. However, economic development as a dynamic process of moving from one stage to the next requires industrial upgrading and corresponding improvements in hard and soft infrastructure, which have large externalities to firms’ transaction costs and returns to capital investment. Thus, the government should play an active, facilitating role in the industrial upgrading and in infrastructure improvements.

The implications of bringing economic structure and its evolution into the research on development are challenging but exciting. We need to better understand the roles of the market and state and how they interact in the process of economic development.