

I Introduction

I.1 DE-GLOBALIZATION AND THE NEED FOR NEW THINKING

Once the dominant paradigm, globalization has faced a series of setbacks. The first was the 2008–2009 global financial crisis, which was the first red flag indicating a crisis of finance-led globalization. This was followed in 2016 by the first referendum on Brexit and public support for Great Britain exiting the European Union (EU). The second setback was the beginning of trade de-globalization triggered by struggles over hegemonic dominance between the United States and China following Trump's election in 2017 and his imposition of tariffs on Chinese exports to the United States. The third setback was the de-globalization of manufacturing (and value chains) caused by the COVID-19 pandemic that began in early 2020. The pandemic revealed the vulnerabilities of global value chains (GVCs), which are fragmented globally and rely on production operations in multiple countries. The most recent setback has been the 2022 Russian invasion of Ukraine, which disrupted the global supply of agricultural products, oil and other minerals, as well as foreign exchange settlement systems, such as SWIFT. Consequently, the paradigm of free trade and production has been thrust into a state of uncertainty, and countries are rebalancing GVC efficiency and resiliency by pursuing new modes of production and value chains while reconsolidating alliances with key allies (Stiglitz, 2022). In general, the trend has been toward more in-sourcing than out-sourcing and promoting domestic production over foreign imports. This sudden and radical change in the environment of global capitalism has left emerging countries struggling to find a solution.

Once a strong promoter of globalization and free trade, the United States has now switched to protectionism and alliance-based

economic coalitions. China, in contrast, continues to advocate free trade and multilateralism while also employing strategic interventions to promote specific industries. For emerging economies, this new global environment seems to have disavowed the “one-size-fits-all” model for economic growth that is associated with international integration and the so-called Washington Consensus. This shift away from the conventional economic paradigm can also be interpreted in terms of the so-called “globalization paradox” raised by Rodrik (2011), which highlights the trilemma of being unable to simultaneously pursue economic globalization, national sovereignty, and democracy. Therefore, given the constraints facing globalization, countries have become freed from this trilemma and are seeking to focus on national autonomy. Each economy and government is free to operate according to the new premise that markets and governments are not adversarial but rather complementary, and that economic prosperity can be achieved through diverse institutional arrangements (Rodrik, 2011, xviii). Each country has suddenly been given the freedom to pursue its own economic policies, including protecting domestic industries as a form of industrial or innovation policy.

Some have predicted that there will be a return to globalization. However, the world is currently split into two blocs of similar economic sizes, with the US-led bloc on one side and the China-led bloc on the other with their respective GVCs. This bifurcation of the world economy will likely continue to act as a structural force keeping the world decoupled for some time (Lee, 2021a). The next several decades will continue to be influenced by the two opposing forces of integration and disintegration. Regardless of the direction in which the pendulum swings, the role of the state is expected to increase either to counterbalance the costs of past globalization or to respond to the challenge of de-globalization. In this context, the role of the state may go beyond the regulatory or welfare state to include preemptive investments and interventions not only at the pre- and postproduction stages but also at the production stage (Rodrik & Stantcheva, 2021). Currently, we are witnessing the reinforcement of

developmental states conducting industrial policies (Johnson, 1982), as well as progress toward entrepreneurial states conducting mission-oriented innovation policies (Mazzucato, 2011).

Regardless of the roles they assume, governments around the world are placing additional emphasis on keeping manufacturing value chains within their own territory, and agriculture and other primary industries are also gaining importance. Simultaneously, manufacturing, agriculture, and other industries have been undergoing digitalization, a trend that has been further reinforced by the COVID-19 pandemic and value-chain disruptions. From an emerging or latecomer economy perspective, this global paradigm shift points to the need to identify a new model of economic development and strike a balance within various global–local interfaces while giving more weight to domestically owned and controlled firms as well as resource and value chains. Therefore, this book focuses on the following three points.

First, there are several alternative development pathways for latecomers who currently either do not have to or cannot follow the standard paths of forerunners. Even before the advent of de-globalization, many emerging economies were having difficulty generating growth beyond the middle-income stage or obtaining high-income status. Whereas market opening and international integration have been the typical prescriptions for growth, such approaches have largely failed in the Global South. Meanwhile, success stories of economic catch-up in East Asia indicate that opening should be more strategically managed and combined with policy interventions.

Second, although developing and emerging economies have to be open to global forces and knowledge by inviting foreign direct investment (FDI) and multinational corporations (MNCs), latecomers should strategically manage global–local interfaces to promote domestically owned firms that can eventually generate value added and domestic jobs. Otherwise, latecomers will remain stuck in low value-added sectors or value segments with no hope of transitioning into high-end value segments. This is because technology transfers

and market access become more difficult as a country gets closer to the frontier. Additionally, foreign capital is constantly on the move and seeking to enter low-wage territories to secure higher margins.

Third, although the prevailing view is that no country has obtained high-income status without nurturing a sizable manufacturing sector, obtaining high-income status and sustaining a robust economic catch-up drive requires generating a certain number of domestically embedded big businesses that command some export power in world markets regardless of the sector. This is because breaking through the barriers to entering medium and high-end manufacturing requires the consolidation of available resources and competencies within big businesses. This is also because non-manufacturing industries and some agricultural and resource-based industries are becoming more knowledge-oriented and could emerge as sources of export-based profit in global markets.

I will elaborate on these three arguments in my explanation of the innovation–development detours framework that follows.

1.2 INNOVATION–DEVELOPMENT DETOURS

1.2.1 *Problems with the Linear View: The More, the Better?*

Many developing countries continue to face difficulty initiating and sustaining economic development, and this situation has been exacerbated by the COVID-19 pandemic, resulting in a larger divergence between rich and poor countries. One important economic development question for latecomer countries is whether they should follow the similar trajectories of present-day rich countries or follow a different path (Lee, 2019).

While it would appear to be a fundamental question, economists studying latecomer development have not explored this question adequately and have simply indicated that latecomers should follow the trajectories of forerunners. For example, the policy prescriptions of the Washington Consensus advocate for an immediate and comprehensive liberalization of trade and investment and privatization of

state-owned enterprises, given that all rich countries are liberalized economic systems with few publicly owned enterprises. Although this term – Washington Consensus – is now seldom used, even by the World Bank, no workable alternative has been identified.

There is another stream within the development literature that includes the structural transformation school. Scholars in this group tend to offer linear prescriptions and advocate that latecomers should follow a similar path to that of mature economies, meaning they should begin with primary sectors and subsequently develop their manufacturing and service sectors. According to this perspective, latecomers should first achieve an economic structure in which manufacturing constitutes a significant share of the economy. Another example of the linear view would be those who base their policy suggestions on the concept of economic complexity, which holds that latecomers should attempt to enter the same product spaces as advanced economies. This approach, however, does not consider entry barriers to some product spaces.

The early studies on the technological development of latecomers, such as those by Lall (2000) and Hobday (1995a, 1995b), have observed that latecomers have tried to catch up with advanced countries by assimilating and adapting the incumbents' obsolete technology. However, in a previous co-authored paper (Lee & Lim, 2001), a colleague and I asserted that latecomers have not always followed advanced countries' path of technological development; rather, they sometimes skip certain stages or even create their own paths that differ from those of the forerunners. In a previous book (Lee, 2019), I suggested an explicit nonlinear alternative centered around the concept of detours and leapfrogging that is responsive to the catch-up paradox of "You cannot catch up if you just keep catching up." Indeed, once a country reaches the middle-income stage, several barriers to entering high-end sectors and industries emerge that justify the need for latecomers to attempt detours and leapfrogging (Lee, 2019; Saviotti & Pyka, 2011). These barriers include restrictions on intellectual property rights, counteractive or protectionist measures by incumbent

countries, and the limitation of latecomers' policy spaces by the World Trade Organization (WTO).

This book attempts to propose an effective alternative to mainstream development thinking by focusing on nonlinearity and multiplicity in pathways for economic development by latecomers, especially those in the middle-income stage. Given that innovation is considered to be both a bottleneck for continued growth beyond the middle-income stage and the solution for the middle-income trap (MIT) (Lee, 2013c; World Bank, 2010), this book explores detour paths of economic development pursued by latecomers that rely on the power of innovation, and therefore the title of this book employs the term "innovation–development detours." Detours are necessitated by the presence of the various barriers latecomers face in their efforts to use innovation to aid development. In my previous work (Lee, 2019), I suggested three specific detours as solutions to the obstacles latecomers face when attempting to enhance their innovation capabilities.

The first detour involves adopting imitative innovation under a loose IPR (intellectual property rights) regime in the form of utility models (or petty patents) and trademarks instead of promoting and strengthening regular patent rights. The second detour is directly opposed to the linear view of GVCs (Baldwin, 2016), which argues that the more participation in GVCs, the better, and rather promotes a GVC-related detour whereby an economy initially learns by participating in GVCs but later reduces its reliance on these chains by building increased domestic value chains and entering high-end segments. Without such a detour, latecomers will remain stuck in low value-added sectors, which is a symptom of the MIT. The third detour involves specializing first in short-cycle technology sectors and products (e.g., IT) and later in long-cycle sectors and segments (e.g., pharmaceuticals). Long-cycle technologies are highly profitable and desirable but also enable existing knowledge to be utilized for a long period of time, thus acting as an entry barrier against latecomers. Therefore, latecomers are advised to first target short-cycle technologies – where entry barriers are low, but growth prospects

are high – because high innovation frequency often disrupts the dominance of the incumbent.

This book seeks to offer new insights regarding detours to economic growth that have become more viable in the age of de-globalization, with a focus on non-manufacturing industries, global–local interfaces, and the coevolution of firms and surrounding systems. Regarding the book’s theoretical framework, it applies a Schumpeterian approach, with a focus on the concept of innovation systems, which have been theorized at the national, sectoral, regional, and firm levels (Lundvall, 1992; Nelson, 1993). This book explores the following three issues, which have been relatively neglected in the existing literature: (1) the possibility of multiple linear and non-linear pathways for latecomers to upgrade their innovation systems; (2) the importance of strategically managing global–local interfaces and, by extension, the necessity of domestic ownership and knowledge for long-term growth; and (3) the coevolution of firms, in particular domestically owned firms, with several tiers of innovation systems, including national innovation systems (NIS), sectoral innovation systems, regional innovation systems, and even corporate innovation systems (Granstrand, 2000).

1.2.2 Multiple Pathways and Detours

First, this book applies the innovation systems perspective to the context of latecomer economies and focuses on the possibility of latecomers following multiple nonlinear pathways. The term “non-linear” implies that latecomers will not necessarily follow the same paths as advanced economies and may not increase the key variables of innovation systems in a linear fashion. This book also intervenes in the longstanding debate on balanced versus imbalanced economic development paths and compares the utility of balanced versus imbalanced NIS for latecomers attempting to achieve sustained economic catch-up. The book also discusses the “trapped NIS” responsible for the catch-up failure that leads to countries becoming caught in the MIT (Lee, Lee, & Lee, 2021).

Various NIS have been measured and analyzed in diverse ways. In a previous paper (Lee, Lee, & Lee, 2021), colleagues and I adopted a definition from Lundvall of NIS as the “elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge” (Lundvall, 1992). This approach uses the five key variables of knowledge localization, diversity of knowledge portfolio, decentralization of innovators, the cycle time of technologies (CTT), and knowledge combinations (originality). National innovation systems in mature and advanced economies tend to be well balanced, scoring high values for all five variables. Their innovations tend to be strongly based on local knowledge (high knowledge localization) and dispersed over a large number of firms (decentralization) and sectors (technological diversification). They also often specialize in long CTT-based sectors where entry barriers and profitability are high. Therefore, a balanced, catch-up NIS pathway for latecomers may focus on improving in a linear and balanced manner five indices of NIS, such as in the cases of Spain, Ireland, and most recently, Russia and India. Contrastingly, imbalanced catch-up NIS pathways may refer to cases in East Asia. That is, in some East Asian countries, a handful of big businesses rather than a large number of small- and medium-sized enterprises (SMEs) have led specialization in short rather than long CTT while attaining a level of technological diversity and knowledge localization commensurate with advanced economies.

This understanding of the imbalanced catch-up NIS pathway is consistent with the concept of nonlinearity in the sense that latecomers do not follow the path of forerunners (or adopt long CTT and decentralized NIS) but rather forge their own paths and seek out their own niches. Such nonlinearity can be rationalized in terms of the existence of entry barriers in long-CTT sectors and the need for latecomers to concentrate their resources within a few big businesses that successfully enter low barrier-to-entry (short-CTT) sectors and technologies (Lee, 2013c; Han & Lee, 2022). In short-CTT sectors, “creative destruction” (Schumpeter, 1942) occurs more

frequently, and therefore, the knowledge base of existing technologies is more quickly destroyed or made obsolete.¹ In this sense, short CTT-based sectors have lower barriers to entry because existing technologies owned by incumbents either become quickly outdated or are frequently disrupted. In contrast, the trapped NIS pathway is discussed in terms of its “too early” specialization in long-CTT technologies without achieving substantial commercial success from innovation and failing to sustain economic growth while being stuck in the MIT.

Late latecomers facing higher entry barriers to high-end sectors and technologies may seek diverse entry points in knowledge-intensive IT services or resource-based sectors rather than hard manufacturing by adopting a detour or leapfrogging strategy. Such possibilities are also consistent with the idea of the multiplicity and nonlinearity of development paths. Figure 1.1 summarizes the above discussion on innovation–development detours, which is further explored in Chapter 2. The top of Figure 1.1 features a box of multiple pathways, including imbalanced (short cycle) and balanced (medium cycle) catch-up pathways as well as the imbalanced, trapped pathway. The same box also lists services and resource-based sectors that are alternatives to manufacturing-based catch-up. The potential of these alternative trajectories will be discussed in Chapter 2 with reference to the examples of Chile and Malaysia (resource-based development) and India (IT service-based development).

Given that all economies around the world, both developing and developed, have undergone several decades of opening up and globalization, competing successfully in international markets is a crucial factor that determines the fortunes of economies. Due to the

¹ Schumpeter (1942, p. 73) explains creative destruction as follows, “The opening of new markets, ... the organizational development ... illustrate the same process of industrial mutation – I may use that biological term – that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.”

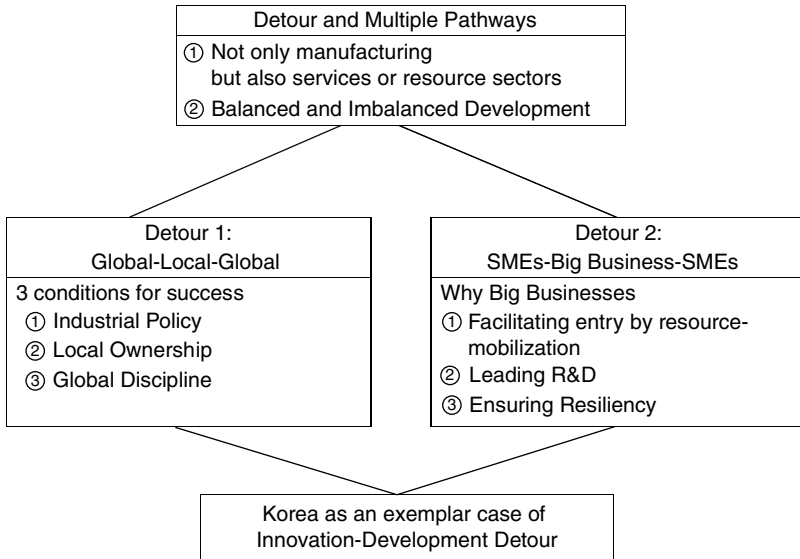


FIGURE 1.1 Innovation–development detour

lack of stable sources of export earnings and convertible currencies, export competition is vital for latecomer economies to be able to earn dollars to pay for imported capital goods. However, the innovation system literature has been somewhat sluggish in exploring the international dimension of innovation systems and articulating such concepts as global innovation systems (Binz & Truffer, 2017) in discussions over building technological capabilities.

To address this gap in the literature, this book argues that managing successfully global–local interfaces is a key condition for building up technological capabilities. This is represented by the box on the left marked as “Detour 1: Global–Local–Global” in the middle tier of Figure 1.1. The first term, “global,” indicates that all latecomer economies have been open to global knowledge and know-how in the form of inviting FDI for development. However, they have experienced difficulty leveraging FDI to enhance domestic capabilities in production and innovation. When this dimension of the global–local interface is poorly managed, latecomers often

fall into the liberalization trap where local capabilities fail to grow, and MNCs become dominant to command market power in local economies (Bresser-Pereira et al., 2020; Rodrik 2006). Billmeier and Nannicini (2013) report many cases of trade liberalization leading to decline or stagnation of economic growth in emerging economies in Latin America or Africa.² The worst consequence of this trap is premature de-industrialization and falling into an MIT.

Domestic ownership becomes important during the middle-income stage or later because FDI firms tend to become increasingly reluctant to transfer or sell technology and are prepared to move to other production sites with lower wages. Therefore, the focus should shift from the global to the local, as noted in the box for Detour 1. The success of Taiwan's catch-up was also supported by the growth of domestic firms (Amsden & Chu, 2003). Moreover, the spillover effect of FDI does not occur if the host country does not focus on the linkages between FDI and the domestic economy (Chang & Andreoni, 2020; Fu et al., 2011; Marin & Bell, 2006). These observations are consistent with the so-called "in–out–in again" hypothesis (Lee et al., 2018). That is, it is not sufficient for latecomers to integrate themselves into GVCs by inviting FDI or MNCs at an early stage of development; they must also enhance domestically owned production and innovation capabilities, thereby increasing domestic value added and reducing the backward linkages to GVCs (the share of foreign value added in gross exports). During the final stage, latecomers must utilize their enhanced local capabilities to engage with more GVCs. Therefore, the box for Detour 1 is titled "Global–Local–Global."

The key message of the box for Detour 1 is that successful catching-up requires meeting the following three conditions: the enactment of public initiatives, including industrial policy, the emergence of domestic ownership, and discipline by world markets.

² Chile is such a case in Latin America, and African cases include Cameroon, Gambia, Kenya, Niger, South Africa, and Zambia, as well as Ivory Coast.

The importance of domestic ownership and knowledge is discussed in Chapter 3, where I apply the GVC framework to several cases, including three IT sectors in Asia (Kim & Lee., 2022), auto sectors in Thailand, Malaysia, China, and South Korea (Lee, Qu & Mao, 2021), and several resource sectors in Chile and Malaysia (Lebdioui et al., 2021). The above studies on IT clusters, auto sectors, and resource sectors are based on separate regional, sectoral, and national innovation systems perspectives; however, in this study, they will be re-interpreted with a new focus on global–local interfaces.

Next, the box titled “Detour 2: SMEs–Big Businesses–SMEs” indicates that although latecomer economies tend to have only SMEs at the initial stage, it is critical to generate and establish big businesses during the catch-up stage. During the final stage, SMEs will emerge and grow, interacting with and following big businesses. It is also necessary for a latecomer to generate more big businesses than is normally expected from an economy of its size as a prerequisite for achieving growth beyond the middle-income stage. My colleagues and I proved this in a previous econometric study (Lee et al., 2013) that used the data of countries at upper-middle and high-income stages, with Korea as the prime example. In addition to big business-friendly Korea, SME-friendly Taiwan was also able to generate eight Global Fortune 500 firms by 2010. This is a considerable feat, considering that the economy had just two or fewer such firms in the 1990s. In contrast, Turkey, South Africa, and Thailand have had either one or no such firms since the 1990s up until now. Interestingly, a study by Beck et al. (2005) funded by the World Bank failed to identify a robust causal link between SME growth and economic growth. Indeed, it only found a positive correlation, which implies that SMEs are not a trigger for growth but rather a result of economic growth.

The importance of big businesses for driving economic growth via large-scale R&D (research and development) has been observed in the United States and Germany during the nineteenth and early twentieth centuries. Whereas young Schumpeter emphasized the

role of entrepreneurship primarily in the form of startups and SMEs,³ the older Schumpeter (1942) recognized the importance of big businesses (pp. 71–72). One prevailing view in the development literature is that no countries have successfully achieved a high-income economy without generating a relatively sizable manufacturing sector. In particular, this argument has been made by scholars who emphasize structural transformation, such as Szirmai and Verspagen (2015). Somewhat breaking with this approach, this book argues that no successful catch-up has ever occurred without generating a certain number of big businesses, which are needed not only to overcome latecomer disadvantages regarding entry barriers at the middle-income stage but also to secure a certain degree of resiliency against crises. This leading role of big businesses is consistent with the nonlinear pattern of increasing rather than decreasing the degree of the concentration of innovation during the catching-up stage in latecomer economies.

Of course, it is important not to apply binary thinking to SMEs and big businesses. That is, the key is not to achieve a large number of startups and SMEs but rather to have them grow quickly into big businesses. If a country is able to generate a certain number of big businesses, it means that a country has been able to grow its SMEs into big businesses either by maintaining a market-friendly economy or engaging in public intervention and promotion. The United States may have succeeded without market intervention; however, latecomer countries, such as Korea, often experience a higher degree of market failure, especially in capital markets, and therefore often require public intervention. When big businesses do emerge in a country, they tend to serve as umbrellas for supplier SMEs while generating many spinoffs. In this sense, the generation of startups and

³ Schumpeter (1911/1934) discussed the role of entrepreneurs in economic development. His shift in emphasis from entrepreneurship to large businesses was later developed into concepts like Schumpeter Mark I and Mark II, which differentiate between two different types of sectors. The Mark I sector is composed of small firms and has high entry rates for new firms; the Mark II sector is composed of large firms and has high industrial concentration (Malerba & Orsenigo, 1996).

their growth into big businesses depend on the effective coevolution of firms with surrounding institutions and innovation ecosystems.

Thus, Chapter 4 focuses on the issue of coevolution and discusses how firms, in particular privately owned domestic firms, grow faster than foreign-owned firms by exploiting surrounding institutions. This chapter also addresses how the rise of a single core firm can change surrounding regions' innovation systems. Additionally, as indicated in the box for Detour 2, big businesses are important in terms of their role in overcoming entry barriers by mobilizing resources and competencies, carrying out the R&D necessary for entering high-end sectors, ensuring resiliency against external disruptions, and serving as an umbrella for SMEs. These four roles will be elaborated further in Chapter 5 (Innovation–Development Detour in South Korea).

In summary, in this emerging era of de-globalization, exploring innovation–development detours according to the aspects outlined above is particularly relevant. This is a nontechnical book that draws upon new and existing empirical evidence from my own research and that of other scholars.

1.3 FURTHER ELABORATION OF KEY THEMES

1.3.1 The Possibility of Non-Manufacturing-Based Development

In Chapter 2, I first provide an overview of the history of economic growth in diverse economies. Next, I group economies into several clusters according to the diversity of NIS, followed by a discussion of multiple pathways for emerging economies. Then, I discuss the potential of non-manufacturing-based development as a solution to the MIT. More specifically, Chapter 2 discusses Chile and Malaysia as examples of resource-based development and India as an example of IT service-based development.

The per capita incomes of Chile and Malaysia have recently exceeded 40% of that of the United States; this is despite the fact that

both countries used to belong to the group of imbalanced and trapped countries. Chapter 2 demonstrates that both Chile and Malaysia have sustained their economic growth not because of manufacturing but rather because of the success of several leading resource-based sectors – petroleum, rubber, and palm oil in Malaysia and salmon, fruit, wine, and wood-based products in Chile (Lebdioui et al., 2021). To determine which sectors are responsible for growth beyond the MIT, I compare the contributions of different sectors to export performance, including their share of national exports, trade balance, and revealed comparative advantage over time. I focus on export performance because, in the Global South, it is a more important binding factor for economic growth than trade openness measured by the trade-to-GDP ratio (Ramanayake & Lee, 2015). Developing countries must earn hard currency via exports to purchase the imported capital goods that are required for investments and sustained economic growth. Without strong exports, developing countries cannot free themselves from the balance of payment deficit problem, which is a chronic problem in the Global South. Furthermore, I present evidence demonstrating that a progressive downstream value addition has taken place in the exports of these sectors in Malaysia and Chile.

These examples of successful catch-up through specialization in resource-based sectors support this book's argument that latecomers should identify low barrier-to-entry sectors within the international division of labor. For many resource-rich emerging economies, such resource-based sectors represent low barrier-to-entry sectors. Achieving growth by relying on domestically available resources makes more sense in the post-pandemic era when countries are seeking a more resilient model of development that is less constrained by the risks of GVC disruption.

Chapter 2 discusses the case of India, which also belongs to the group of balanced and gradual catching-up economies. India is not yet a high-income economy. However, considering its increasingly faster rate of economic growth and balanced (between short and long CTT) industrial structure, it will likely soon emerge as a fast catching-up

economy. India is also quite different from other trapped economies on account of its high level of technological diversification. I also discuss India's patent portfolio to show that whereas India previously pursued imbalanced specialization into two long-cycle technologies (drugs and chemicals), since the 2000s its economy has become more balanced as a result of increased strength in IT services. The share of the patents from computer and communication technologies rose from less than 15% of total US patents registered by India in the early 2000s to over 60% by the mid-2010s. In this way, India has become a more balanced, medium-cycle, tech-based NIS, and, at the same time, it has steadily increased its level of technological diversification.

1.3.2 From the Global–Local Interfaces to Domestic Ownership and Knowledge

Chapter 3 argues that successful catch-up by latecomers is possible only when they strategically manage the global–local interface to promote domestically owned firms, which serve as the basis for additional domestic value added and jobs. Specifically, the following three conditions are prerequisites for success: (1) the enactment of public initiatives, including industrial policy, (2) the emergence of domestic ownership, and (3) discipline by world markets. To elaborate on these three conditions, I draw on three examples: three regions specializing in the same IT sector in Asia (Kim & Lee, 2022), auto sectors in four countries (Lee, Qu, & Mao, 2021), and several resource sectors in Chile and Malaysia (Lebdioui et al., 2021).

The first case study examines the short CTT-based IT sector in Taipei, Shenzhen, and Penang. I contrast their different paths to development, such as fast catch-up in Shenzhen and slow catch-up in Penang. These deviant pathways are explained with reference to the various patterns of firm ownership in each region. For example, I compare the emergence of strong domestic firm ownership in Shenzhen with the persistent dominance by MNCs in Penang.

Second, using the example of various auto sectors in Asia, the book argues that domestic ownership and knowledge should be

subject to global market discipline. For instance, the auto industry in Malaysia, which is led by Proton, used to be mostly domestically owned and tightly regulated; however, it was not export-oriented and lacked global market discipline. Consequently, it failed to be competitive in markets. In contrast, the auto sector in Thailand achieved mixed success that has been limited in terms of domestic value added due to a lack of domestic ownership. In the end, success depends on whether domestically owned enterprises grow to become successful exporters in global markets.

Third, I discuss how the emergence and growth of several resource sectors in Chile (wine, fruit, and wood products) and Malaysia (palm oil, rubber, and petroleum products) into leading export engines enabled the success of economic catch-up beyond the middle-income stage in both countries. I also show that their emergence and growth did not occur spontaneously but rather as a result of policy interventions by the government. These examples also illustrate that successful catch-up by latecomers can be not based on manufacturing but on resource-based sectors; indeed, for both countries, resource-based sectors drove economic growth beyond the middle-income stage. After South Korea and Taiwan, Chile and Malaysia may be the first economies to successfully escape the MIT.

1.3.3 The Coevolution of Firms with Sectoral, Regional, and National Systems

In contrast to the majority of studies, which tend to study a single innovative system in isolation, this book explores the interactions between various innovative systems. More specifically, this book focuses on the interactions between corporate innovation systems and sectoral, regional, and national innovation systems. In Chapter 4, I study these interactions to outline the importance of firms, in particular big businesses, as the ultimate drivers of economic catch-up in the latecomer context. Thus, the focus is on how the growth of (domestic) firms drives the development of sectors, regions, and nations.

The overarching theme of this book is alternative pathways for latecomers for catch-up development, and one way of exploring this theme at the firm level is to ask whether latecomers use *similar* or *different* technologies from incumbent firms to catch up and forge ahead. Using similar technologies implies that latecomers simply attempt to imitate forerunners, whereas using different technologies indicates that latecomers pursue new technologies and take different technological paths from incumbents. Accordingly, Chapter 4 explores the paths of latecomer firms striving to catch up with incumbent firms. Specifically, Section 1.2 of Chapter 4 addresses the question of whether latecomer firms can catch up with and eventually overtake incumbent firms by merely imitating incumbents or whether they must go beyond imitation by initiating their own technological innovations that differ from those of incumbents. I seek answers to these questions by examining three cases of latecomer firms overtaking incumbent firms – that is, Samsung overtaking Sony, Hyundai Motors overtaking Mitsubishi Motors, and Huawei overtaking Ericsson.⁴

Section 1.3 of Chapter 4 deals with the coevolution of firms and surrounding institutions in the context of post-reform China, where firms with diverse ownership have emerged and formed an ideal setting for examining the interactions between firm ownership and institutions. This section also explores the specificities of the post-reform Chinese experience, such as privately owned enterprises (POEs) catching up with foreign-owned enterprises (FOEs) and state-owned enterprises (SOEs) via POEs' more effective exploitation of the surrounding institutional development, as I discussed in a co-authored paper, Lee and Lee (2022). Although the initial productivity of POEs was lower than that of FOEs when institutional development was low, POEs eventually caught up with FOEs because institutions have improved over time and have been more effectively

⁴ We draw on the quantitative analyses of Joo and Lee (2010), Oh and Joo (2015), and Joo et al. (2016), which have analyzed each pair of a latecomer vs. an incumbent.

utilized by POEs than FOEs. The implication is that although private firms cannot prosper without sound institutions, institutional development may be useless without the existence of domestically owned private firms (rather than FOEs) that can benefit from this institutional development.

Next, I analyze the region of Hsinchu in Taiwan to show that the region's long-term trajectory has been strongly influenced by the rise of leading big businesses, such as Taiwan Semiconductor Manufacturing Company (TSMC), in Hsinchu City (Wong & Lee, 2021). Hsinchu used to be characterized as a Marshallian industrial district with an equal distribution of differently sized firms and diverse sectors. However, with the growth of the core firm TSMC, the region has steadily come to resemble a hub-and-spoke industrial district with increasing centralization in the distribution of firms and innovations.

Finally, the match between the micro and macro dimensions of innovation will be discussed with reference to the changes in the corporate innovation systems of Korean firms. Korean firms used to behave like typical catching-up firms (e.g., firms that prioritize growth over profitability, borrow and invest heavily, and specialize in short-cycle technologies); however, Korean firms have undergone radical changes in their behavioral patterns, which shows that their behaviors are converging with those of mature firms in advanced economies such as the United States (Im & Lee, 2021). They now prioritize profitability and dividend payments over sales growth and re-investment; they are also moving into long CTT-based sectors, such as bio-medicals. This shift from catching up to convergence at the firm level mirrors the macro-level convergence of South Korea with respect to Anglo-American economic systems in terms of the slowing down of employment and growth and rising inequality. Such changes in firms have been driven by the post-1997 crisis reforms imposed by the International Monetary Fund (IMF) as a condition for receiving emergency loans, which forced Korean firms to adopt corporate governance measures typical of shareholder capitalism in the United States and the United Kingdom.

I.4 INNOVATION–DEVELOPMENT DETOUR IN SOUTH KOREA

Chapter 5, which is the longest of the book, is dedicated to South Korea. The long-term evolution of the Korean economy is used to illustrate the three themes discussed above. Beginning as a low-income country in 1960, South Korea underwent a remarkable economic ascent and emerged as a high-income status country by the mid-1990s. The South Korean economy is an exemplary case of taking a nonlinear development detour, in that during its catching-up period, which lasted until the 1990s, it pursued selective opening, promoted big businesses over SMEs, and prioritized domestic value added over simply joining GVCs. South Korea's market used to be mostly closed and protected; however, it is now one of the most open markets in the world. Indeed, it is the only country in the world to have free-trade agreements with the United States, the EU, China, and India. Thus, from the South Korean example, we can generate a paradoxical, nonlinear view of development that says, "To be open, you must be closed for a while."

Yet, the Korean journey also involved some turbulence. Korea experienced a major crisis in 1997 and came close to another crisis during the global economic turmoil of 2008–2009. Whereas the former crisis was linked to excessive indebtedness and investment by big businesses, the latter was a global financial crisis that began in the United States, which led to capital flight from South Korea back to Wall Street and the substantial depreciation of the Korean currency. It is interesting to note that South Korea recovered remarkably quickly from both crises, raising questions over the sources of such resiliency that extend beyond the sources of growth during the earlier period at the MIT range. In pursuit of an answer to this question, this chapter redefines the Korean model of catch-up development.

Scholars have put forth many theories to explain South Korea's miraculous catch-up. Therefore, this chapter first begins by providing an evaluation of existing views and myths regarding the factors

affecting South Korea's miraculous growth and resiliency, such as the role of initial conditions, markets versus government intervention, inclusive versus exclusive institutions, and import substitution versus export promotion. Based on my evaluation of the various myths and misunderstandings of the Korean model, I elaborate and redefine the Korean model as an exemplary case of an "innovation–development detour," focusing on elements that have been seldom mentioned in the literature.

The first element is the role of domestically owned big businesses and their capacity building for export orientation. The second element is smart specialization in low barrier-to-entry, short-CTT sectors during the upper middle-income stage. By combining these two factors, I define the Korean model as "short CTT-sector specialization led by domestically owned and export-oriented big businesses." In this way, the Korean pathway is redefined as an exemplary case of detouring from short-CTT to long-CTT sectors and from big business dominance to SME emergence. This constitutes a detour because advanced economies tend to be dominant in long-CTT or high barrier-to-entry sectors, with sources of growth dispersed among both SMEs and big businesses. This detour reflects the actual path of Korea, in that the dominance of big businesses has now been checked by the rise of SMEs and startups. Beginning in the 2000s, during the post-catch-up stage, this caused the reversal of the existing pattern of the centralization of innovation.

Given that decentralization and diversification are typical attributes of advanced economies in the West, South Korea's long-term detour can also be considered the process of the Korean model converging with the Anglo-American model (Lee & Shin, 2021). However, it is crucial to note that such convergence was only possible for South Korea by taking a detour that took the country in the opposite direction of the current trajectory of advanced economies. Moreover, when discussing Korea's detour, it is important to note that the Korean economy used to be protected by high tariffs and asymmetric support for domestic companies. South Korea now,

however, is a mostly open economy. Therefore, it has also detoured from a closed to an open economy. This convergence via divergence (or detour) constitutes the so-called “catch-up paradox” (Lee, 2019, p. xxi), which can be expressed through the following statements: “You cannot catch up if you just keep catching up.” “To be open, you have to be closed for a while.” And, “A detour can be faster than a straight road.”

Additionally, I discuss the Korean experience to show that most successful catching-up experiences have included strategically navigating the global–local interface in order to promote the emergence of domestically owned big businesses. I also emphasize that no successful catch-up has ever occurred without generating a certain number of big businesses.

I.5 THE ROLES OF GOVERNMENT IN DEVELOPMENT DETOURS

Chapter 6 will be devoted to discussing the role of government in innovation–development detours and related policy implications. Here, the main issue is whether the ideas of detour and nonlinearity are applicable to the roles of the government. Thus, this chapter will discuss the provocative assertion that the role of government should not decrease in a linear fashion over the stage of development but rather may need to increase at the upper-middle-income stage, with the scope of the government intervention forming an inverted U-shaped curve. The theory of comparative advantages holds that during the low-income stage, economic growth does not necessitate direct government intervention in the affairs of firms. However, for a country at the upper-middle-income stage to enter high value-added sectors and catch up with leading countries, governments may need to undertake more direct forms of intervention, such as pursuing public–private R&D initiatives. Such interventions become necessary because firms at this stage face increased difficulty in terms of entry barriers and IPR disputes. Moreover, technology transfer becomes more difficult the closer a country gets to

frontier technologies, and high-end sectors in the global market tend to be oligopolistic or monopolistic in nature, with a strong dominance by incumbents. Thus, this chapter will elaborate on two modes of government involvement – that is, slow and fast modes of catching up – for overcoming the challenge of strategically managing the global–local interface.

Specifically, in overcoming the challenge of strategically managing the global–local interface, the two modes of government involvement are possible, which can be called a slower vs. faster mode of catching up. In a slow but steady mode of catching up, the main focus of public intervention is on re-skilling and up-skilling local labor forces so that FDI or MNCs may not move to other locations but stay in the same localities to engage in high-value activities hiring local labor forces. The other, faster catching-up mode is close to what has happened in Shenzhen city or the auto sector in China, in which asymmetric intervention is mobilized to foster locally owned firms and their R&D activities, as opposed to foreign-owned firms.

Chapter 6 also discusses the issue of how to first generate big businesses as an engine for growth beyond the middle-income stage and then SMEs and startups at a later stage of development. Managing the coevolution of large and small firms is a serious challenge for latecomers, given its high degree of market failures including the thinness and smallness of markets.

I.6 KEY MESSAGES AND CONTRIBUTIONS OF THE BOOK

This book explores the coevolution of firms, sectors, regions, and national economies in the Global South and explains their economic performance as a dynamic outcome of interactions between the multiple levels of innovation systems. The key arguments are as follows. First, multiple pathways for economic catch-up by latecomers are possible, and latecomers do not necessarily follow the trajectories of the incumbent advanced economies in a linear manner in their efforts to overcome entry barriers and other challenges at the middle-income stage. Second, most successful catch-up experiences have

included strategically navigating global–local interfaces to promote the emergence of domestically owned big businesses and bring about a phase of increasing concentration rather than decentralization. Third, the creation of growth poles – whether they be firms, sectors, or regions – has been enabled by effective interactions between the diverse dimensions of innovation systems, including active policy interventions by national and subnational governments.

Based on these findings, this book counters prevailing views on economic development and offers a unique contribution to the literature on economic catch-up. Whereas the traditional linear view of development has taken a “more is better” approach, this book advocates that latecomers should pursue detours or leapfrogging, which conforms with a “less is better” approach. Instead of the conventional prioritization of manufacturing, this book proposes prioritizing domestic ownership and knowledge in specific sectors and regions and asserts that no country has successfully developed a high-income economy without generating a certain number of globally recognized big businesses. Instead of placing priority on free markets as the Washington Consensus does, this book argues that economic catch-up is only possible with active and planned government interventions, which are needed to overcome latecomers’ disadvantages regarding barriers to entry at the middle-income stage.