

THE MIDDLE-INCOME TRAP AND EAST ASIAN MIRACLE LESSONS*

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Abstract

The “middle-income trap” has recently become a powerful catchword in the international development community. Nonetheless, despite using the same phrase, the existing literature considerably varies. The objective of this chapter is twofold. First, it provides a classification of this burgeoning area of research. Based upon differences in theoretical underpinnings and policy implications, the literature is categorized into three groups: (i) getting education and institutions right; (ii) changing export compositions through comparative advantage; and (iii) industrial upgrading through State intervention. Second, the chapter examines the validity of these three bodies of literature through the East Asian development experience. Deduced from the successful catching-up of the Republic of Korea, Singapore and Taiwan Province of China, structural transformation rather than education and institutions is a key driver of long-term growth. While changing a country’s productive structure often goes against static comparative advantage, industrial and technology policies require clear yardsticks and compatible macroeconomic measures. The chapter also suggests conceptual grounds for future policymaking and research agendas to make the debate more relevant to today’s developing countries.

Introduction

The term “middle-income trap” (MIT) is a recent powerful catchword in the international development community, becoming widespread shortly after being coined by Gill and Kharas (2007) in their *East Asian Renaissance* report. The status of middle-income countries is defined by the World Bank as those who had a GNI per capita between \$1,036 and \$12,615 in 2012.¹ From 101 middle-income economies in 1960, only 13 economies managed to reach the high-income level in 2008, namely Equatorial Guinea, Greece, Hong Kong (China), Ireland, Israel, Japan, Mauritius, Portugal, Puerto Rico, the Republic

of Korea, Singapore, Spain and Taiwan Province of China (World Bank, 2013). Given that the lion’s share of them has been stuck in the same income category for over half a century, this has attracted attention from academics and policymakers to explore whether there is such a thing as a “trap” that deters these middle-income countries from moving forward.

However, there is neither apparent nor growing consensus in the literature. Despite using the same phrase, the MIT literature considerably varies in the cases studied, the research methods employed, the

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underlying causes of the trap asserted and the policies suggested. To make this issue more tractable and particularly pertinent to today's developing countries, this chapter has two objectives: first, it provides one of the earliest attempts at categorizing this burgeoning area of research; and second, it examines the validity of each strand of MIT literature through the catching-up experience of East Asia.

The following discussion is organized into five sections. Section I elaborates upon the three variations within the literature. Based upon the differing theoretical assumptions and solutions provided, the existing works on the MIT can be categorized into three groups, labelled by their policy stances: (i) getting education and institutions right; (ii) changing export composition through comparative advantage; and (iii) industrial upgrading through State intervention. The three succeeding sections examine each of these three bodies through the East Asian development experience. Section II discusses why the focus on education and institutions cannot guarantee successful catching-up unless it is particularly designed to support the country's industrial targets. Section III examines the role of structural transformation and export in long-term economic development, enquiring whether East Asia has succeeded by following its comparative advantage. Section IV revisits the

State-centred approach to the MIT and discusses various recipes for industrial and macroeconomic policies pursued in East Asia. Section V summarizes policy lessons and suggests certain conceptual grounds for future policymaking and research agendas.

It is worth noting that by East Asia, this chapter means the policy lessons learned, mainly – yet not exclusively – from the first-tier newly industrializing economies (NIEs), namely the Republic of Korea, Singapore and Taiwan Province of China.² These lessons are based upon their experience during the catching-up period, approximately between the 1960s and the 1980s, as this is most relevant to the debate concerning the transition from middle- to high-income levels. While East Asia has usually been at the centre of the contemporary debate over economic development, as symbolized in the World Bank's *East Asian Miracle* report (1993), it has surprisingly been missing from the current MIT debate. Of course, today's middle-income countries differ in their characters and situations, economically, socially and politically. Although we cannot make a sweeping generalization, the lessons from East Asia warrant detailed discussion because among the only 13 countries who could escape from the MIT as mentioned above, East Asia comprises the major group of those non-European countries without natural resource wealth.

I. Three approaches to the middle-income trap³

Generally speaking, the term MIT refers to the situation in which countries have failed to grow further into a high-income level despite attaining middle-income status for certain periods. Nonetheless, there is no accepted definition of the MIT. One group of literature sees the trap as “growth slowdowns”; for example, Eichengreen et al. (2013) define MIT countries as those who had undergone average GDP growth of at least 3.5 per cent for several years and subsequently stepped down by at least 2 per cent between successive seven-year periods (in the same vein are Felipe et al., 2012; Aiyar et al., 2013). Another group puts the MIT into the broader debate concerning the economic “catching up” of developing countries in relation to such developed countries as the United States or Japan (e.g. Lin and Rosenblatt, 2012; Lee, 2013).

The MIT literature is even more diverse when analysing the causes of the trap and proposing policy solutions. According to their differences in the analytical approach to, and the solution for, the MIT, they can be classified into three groups, namely: (i) getting education and institutions right; (ii) changing export composition through comparative advantage; and (iii) industrial upgrading through State intervention. While none of the existing MIT studies deny the importance of education, institutions and exports, each work differs in its emphasis placed upon the *fundamental causes* of the MIT, as well as the extent to which *the State* should be involved in remedying the problems (functional, facilitating, or proactive). Indeed, both are the criteria that I used for this categorization.

A. Getting education and institutions right

The first strand is distinctive in terms of its principal focus on the causal mechanisms of education and institutions. It considers inadequate quality of education and institutions as the main causes that impede middle-income countries from sustainable economic growth. In terms of policy suggestions, this strand prefers the role of the State to be kept to a *minimum*, particularly when comparing with the other two strands. For example, Aiyar et al. (2013) conducted a comprehensive study through probit regressions covering 138 countries from 1955 to 2009. Defined as strong rule of law, small government and light regulation, high-quality institutions are among significant factors that prevent growth slowdowns in middle-income countries. In terms of policy suggestions, this and related studies maintain that the State should concentrate on the so-called functional intervention by making the right incentive systems for private sectors, investing more in education and institution building (e.g. Jimenez et al., 2012; Jitsuchon, 2012; Tran, 2013; Aiyar et al., 2013).

B. Changing export composition through comparative advantage

Rather than education and institutions, the second and third strands are more concerned with the country's structural transformation. Specifically, they point to a country's *export composition* as being particularly critical to its catching-up success and failure. For example, Felipe et al. (2012) argue that successful catching-up is found in those with a "diversified, sophisticated, and non-standard level export basket". Put differently, while the Republic of Korea was able to gain comparative advantage in a significant number of sophisticated products, Malaysia and the Philippines were only able to gain comparative advantage in electronics. From their perspective, countries have fallen into the MIT because they have inadequate capabilities to produce and export higher-technology products. The disparity between these two groups lies in the role the State should play in solving the exports problem.

The second strand has reservations about State intervention. While policy suggestions vary within this group, they generally prefer the State to function as no more than a *facilitator* who supports a country's transformation towards higher value-added exports. Whereas some works recommend that developing countries should pay attention to their export compositions, they offer no clear instruction concerning how the State can achieve this (e.g. Felipe et al., 2012; Eichengreen et al., 2013). Another work within this strand goes further and maintains that the State should play a facilitating role by supporting sectors in accordance with the country's current comparative advantage. For example, Lin and Treichel (2012: 48) assert that: "To achieve dynamic growth, a developing country should develop industries according to its comparative advantage, which is determined by the country's endowment structure, and tap into the potential advantages of backwardness in industrial upgrading."

C. Industrial upgrading through State intervention

Similar to the second group, the third strand of MIT literature emphasizes exports and production structures. Nevertheless, it explicitly supports the active role of the State in acquiring indigenous technology for latecomers, even against the country's comparative advantage when necessary. Put otherwise, for this group, comparative advantage is not a matter of concern, and especially comparative advantage in trade determined by initial endowment conditions. This group makes it clear that the MIT problem is mostly about the inappropriate or insufficient role of the State in enhancing the country's capabilities to produce and export higher-technology products. As a result, the State should be proactive, paying close attention to capability accumulation and industrial upgrading (e.g. Ohno 2009; Paus, 2012; Lee, 2013).

In summary, those who used the term MIT hold different underlying assumptions about the trap, thereby deriving a different set of policy suggestions. In the subsequent sections, we examine each strand through the catching-up experience of East Asian NIEs.

II. Education and institutions as magic bullets?

While the first strand of MIT literature considers education and institutions as holding the key to reaching a higher-income level, the East Asian experience tells us that neither guarantees successful catching-up. In order to contribute significantly to economic growth, education and institutions need to be closely linked with specific industrial targets.

A. Education needs to link with industrial targets

In contrast to conventional wisdom, a number of cross-country studies find that the relationships between education and economic growth are weak (Benhabib and Spiegel, 1994; Pritchett, 2001) or take place in the opposite direction, namely from economic growth to a higher quality and quantity of education (Bils and Klenow, 2000). When comparing East and Southeast Asia, it was found that the literacy rates and average years of schooling of the first-tier NIEs were below those of the Philippines in 1960.⁴ Even as late as 1994, the average years of schooling of Indonesia, Malaysia and Singapore were still lower than that of the Philippines (Collins and Bosworth, 1996). However, the Philippines is the least successful catching-up country among them.

Why might this be the case? The reason is that despite having value on its own, much of the knowledge gained in education is not necessarily relevant for productivity enhancement, not only because many subjects have almost no impact on most workers' productivity (such as literature, history, and philosophy), but also because education tends to promote individual betterment to a greater extent than national prosperity (Chang, 2010: 189). The causal link from (more or higher quality) education to (higher, more continuous) growth is indirect at best, and requires many more things in the causal process. To ensure that education contributes substantially to economic growth, educational policy has to be tailored to support the national development strategy, rather than simply increasing literacy rates, average years of schooling or even gross tertiary enrolment.

For example, in Singapore, the human resource system was restructured in 1981 when the country decided to shift from import-substitution to export-oriented industrialization. The new system was aimed

at specific industrial goals and not only encompassed improving formal education, but also upgrading the abilities of the existing workforce in the industry through training and vocational education (for the Skills Development Fund, see Kuruvilla, 1996). By contrast, while Thailand and the Philippines were able to create educated workers, their university–industry linkages have been porous and neglected, which in turn has impeded the utilization of labour forces and hampered the economic development of both countries (Yusuf and Nabeshima, 2010).

B. Growth-enhancing governance is more relevant than “good governance”

While no one would reject the contribution of institutions to economic development, the question about which kind of institutions matter remains debatable. In this regard, the existing MIT literature is influenced by the so-called “good governance” institutions meant for minimizing the role of the State, as well as rent-seeking activities. According to Aiyar et al. (2013), better institutional quality is meant to comprise less government ownership of enterprises, lower income tax rates, fewer regulatory restrictions on the sale of real property, as well as fewer trade taxes and non-tariff trade barriers.

However, methodologically speaking, the argument for “good governance” institutions is based upon flawed research methodology, as in fact many of the explanatory variables in empirical research are not really institutions (e.g. tax rates and trade barriers). However, in theory, institutions are supposed to be something more fundamental and deeply rooted, providing the basic scaffolding for human interactions, such as constitutions or widely held norms. Even assuming away the problematic use of such proxies, cross-country regressions are poor tools to determine which particular institutions are necessary for a country to develop, because we still lack good aggregate measures of complex institutions or an understanding of how these institutions interact with specific country characteristics (Shirley, 2008).

More importantly, from an empirical perspective, the first-tier NIEs were able catch up with advanced economies despite their institutions being highly deficient by modern standards, in such areas

as democracy, bureaucracy and judiciary, property rights, western-style corporate governance and financial institutions (Chang, 2002). In the Republic of Korea, for example, rent-seeking was rife throughout the high-growth period under the Park Chung Hee regime. The assumption that rents and rent-seeking are always counter-productive and thus should be eliminated at all costs is problematic because there are different types of rent. For example, the Schumpeterian rents, or the above-average profit that

the firm earns due to innovation, are vital to ensure sustained efficiency and growth. The implication is that it is the way in which rents have been created and managed holds greater relevance for consequent economic performance (see Khan and Jomo, 2000; Kang, 2002). Specific to the task of escaping from the MIT, growth-enhancing institutions, namely those that focus on the country's structural transformation and export compositions, are more relevant than good governance ones.

III. Structural transformation through comparative advantage?

Beyond education and good governance institutions, the second strand of MIT literature emphasizes structural transformation, export composition and comparative advantage. First, it revives the old tradition of development economics by reaffirming that *structural transformation* is the key to sustaining economic growth. Second, it has shifted the focus from export expansion to *export composition* as a prime indicator of structural transformation. Third, it renews the concept of *comparative advantage* as a guideline for a developing country to follow. The experience of East Asia is supportive of the first two statements, yet is at odds with the third one.

A. Long-term economic development requires structural transformation

To begin with, the definition of “development” has always been subject to controversial debate. The current UNDP human development index may underscore the non-income dimensions of human welfare, such as health and gender equality. However, another group of development economists has tried to draw academic attention back to the “old school” cannon in the tradition of, inter alia, Arthur Lewis, Simon Kuznets and Nicholas Kaldor. Before the rise of neo-liberalism in the 1980s, there was a general consensus that development is largely about the transformation of the productive structure. Emphasis is placed on manufacturing as the source of national prosperity because it offers greater returns to scale and spillovers from learning and productivity potential (e.g. Rodrik, 2007; Cimoli et al., 2009; UNIDO, 2013). In human history, only a few countries have

achieved high-income status without industrializing, and merely because they were endowed with an extraordinary abundance of natural resources.

This “productionist” tradition of development is based upon the world history of industrialization. Among the catching-up economies, Latin America remained the most industrialized region until 1975, while Africa has been the least industrialized region. However, the most transformative change took place in Asia, whose manufacturing continuously surged throughout the last half of the century, particularly from 1965 to 1980. Moreover, by 2010, the three most successful economies in East Asia, namely China, the Republic of Korea and Taiwan Province of China, together accounted for approximately one-fifth of world manufacturing's value-added share and world manufactures trade (UNIDO, 2013).

In short, since the Industrial Revolution, long-term growth has required a country's structural transformation in which resources are transferred to higher-value-added sectors (i.e. from agriculture to industries and services), production is diversified continuously and labour productivity is significantly increased. The successful catching-up of first-tier NIEs also results from such transformation, albeit in a faster and more intense manner than any other developing region (Szirmai, 2012).

In addition to reviving the old definition of development, the second body of MIT literature brings a fresh empirical insight by shifting the focus from export expansion to export composition as the crucial determinant of sustainable structural transformation.

Export expansion alone is not sufficient for sustaining growth. What separates export-led industrialization in Latin America and East Asia is export composition. The study by Palma (2009) finds that between the 1960s and the 1990s, Latin American countries' capacity to move into the "high-tech" products was much lower than that of the East Asian ones.⁵ Although Latin American countries managed to reach East Asian levels of market penetration in OECD markets (matching export expansion) in the 1990s, they only did so in their traditional export products, while NIEs were able to increase remarkably the share of high-tech products in their exports to the same markets (different export composition). In sum, exports can be used as both a development tool and a test of a country's success (see also Hausmann et al., 2007).

B. Changing export compositions usually goes against comparative advantage

However, the extent to which the role of the State is needed in changing the country's export composition remains controversial. Although overly deviating from comparative advantages might be damaging, it is almost impossible for a backward economy to accumulate capabilities in new industries without defying comparative advantage and actually entering the industry before it has the "right"

factor endowments. Theoretically speaking, the concept of comparative advantage, which underlies Justin Lin's policy advice, is based upon *unrealistic* assumptions, including: (i) the "no" conditions, such as no externalities; no increasing returns to scale; no factor mobility between countries; no technological change; and (ii) the "necessary" conditions, such as the perfect competition in all markets in both countries (Fine and Waeyenberge, 2013). Empirically, high-speed structural transformation in first-tier NIEs was a result of various mixtures of proactive State intervention aimed at upgrading their industrial structures. For example, the Republic of Korea set up the State-owned steel mill, POSCO, and initiated the Heavy and Chemical Industrialization (HCI) programme, which promoted shipbuilding, automobiles and machinery in the early 1970s when its per capita income was only 5.5 per cent that of the United States. Given that per capita income has been used as a proxy to compare capital abundance between the United States and the Republic of Korea, the latter should have specialized in labour-intensive sectors such as the apparel industry rather than the HCI programme (see detailed discussion in Lin and Chang, 2009). Of course, changing export composition and going against comparative advantage can do more harm than good if industrial and technology policies are not well implemented, which is an issue to which we now turn.⁶

IV. Industrial policy without yardsticks and macroeconomic stability?

The third strand of MIT literature gives strong weight to industrial and technology policy. Although the East Asian experience seems to concur with this view, the Achilles heel of this approach is its lesser emphasis on the pragmatic guidelines on effective State intervention and, more importantly, macroeconomic policymaking (e.g. Ohno, 2009; Lee, 2013). This section discusses the carrot-and-stick ingredients of industrial policy, as well as the macroeconomic measurements pursued by the first-tier NIEs.

A. East Asian policies entailed variation in carrot-and-stick incentives

Despite the East Asian experience always representing a strong case for the proponents of industrial

policy, detailed analysis of how the first-tier NIEs succeeded in operation is usually missing. The fruits of such policy vary considerably across time and space. In general, the first-tier NIEs used *export performance* and the *discrepancy* between domestic costs and international prices to guide subsequent government policies for the targeted industries. The role of exports is underestimated by both sides of the industrial policy debate: while its proponents do not fully appreciate how critical exports are to the success of industrial policy, its opponents do not recognize that selective industrial policy is required for local firms to be capable of competing in global markets (Chang, 2011).

At the micro level, the Republic of Korea and Taiwan Province of China ran a tight ship and took

punitive actions whenever necessary. In Taiwan Province of China, the recipients of policy support were threatened with a penalty if the prescription was not followed. Control instruments included quantitative import restrictions and export licensing, foreign investment screening, approval for capital goods imports for new plants, no private borrowing of foreign funds and restrictions on entry to certain sectors. Likewise, the Republic of Korea strongly deployed the tight performance monitoring system, set by industry associations in concert with the Government. Its punitive measures included the withdrawal of subsidized credit and import licences, income tax audits, while even prison sentences could be put in place for some serious issues. Moreover, the Korean State usually set up State-owned enterprises to accomplish the tasks that private firms could not be forced to undertake. Singapore is less punitive than the Republic of Korea and Taiwan Province of China, given its FDI-led strategy. However, firms would only be granted potential rewards when their activities matched the country's specific targets at a given time (see Amsden, 1989; Wade, 1990; Lall, 2004).

The intensity of the carrot-and-stick measures outlined above is in marked contrast with the industrial policymaking of other State-led economies. For example, in Malaysia, technology transfer did not involve any *ex post* monitoring and appraisal, while the *ex ante* screening was poorly managed, as exemplified in the case of Proton, the "national car" project. Despite having been granted substantial protection through high tariffs and excise duties since 1983, Proton has yet to develop engine-manufacturing capability because the Malaysian Government has had no rigorous mechanisms to monitor and improve performance to adjust tariffs downwards according to levels of efficiency (Doraisami and Rasiah, 2001). Political factors aside,⁷ the lack of effective carrot-and-stick incentives warrants close attention, as it draws a fine line between successful and failed catching-up.

B. Macroeconomic stability matters, but in unconventional ways

Another shortcoming of the proponents of proactive State intervention is the downplaying of macroeconomic policy in relation to industrial upgrading. East Asia reminds us that the stability of macroeconomy was instrumental in gearing a country

towards successful catching-up. However, it is worth noting that for the first-tier NIEs, macroeconomic policies were considered part of, and subordinated to, the overriding goal of structural transformation and enhancing export performance.

In the Republic of Korea, fiscal and monetary policies were employed to sustain a high level of investment by creating an expansionary environment, even through inflationary measures if necessary (Chang, 1993). During the 1960s and 1970s, annual per capita income in the Republic of Korea was growing at 9.5 per cent, in parallel with an average inflation rate of around 15.5 per cent (Jeon, 1995). Overall, the majority of financial resources were directed towards targeted sectors. The Republic of Korea ran budget deficits to finance government investment or re-lend to private sectors. Fiscal support by the government to favoured firms and industries was far greater than officially shown in budget expenditures (Haggard et al. 1994). One of the most important means was "policy loans", which accounted for 57.9 per cent of total bank loans made approximately between 1962 and 1987 (Heo, 2001). Monetary policies were also used to manage credit allocation in the targeted industries and increase household savings. Real deposit interest rates were increased to raise the low national saving rate, thus helping to close the saving gap. To control resource allocation, the government repossessed a major portion of equity shares of nationwide commercial banks in 1961 and exercised tight control over the lending activities of these institutions until the early 1980s (Dornbusch et al., 1987).

Macroeconomic policy in Taiwan Province of China may be more "conventional" than that of the Republic of Korea. Throughout its catching-up period, Taiwan Province of China attained surplus budgeting, high real interest rates, low money supply and stable foreign exchange rates (Auty, 1997). Nonetheless, during the high-growth period of 9.7 per cent from 1960 to 1979, Taiwan Province of China still had an average inflation rate of 7.2 per cent (Jeon, 1995). The balance of priority between macroeconomic stability and industrial upgrading was readjusted at times. When confronting external shocks, the top priority was placed on macroeconomic stability, although once the economy was stabilized growth would return to the top of the agenda. For example, whenever export growth slowed down, Taiwan Province of China's central bank would lower the rediscount rate on export loans to stimulate investment. Despite a

relatively restrictive monetary policy, the economy had a significant informal, unregulated financial sector, which has been a major supplier of funds for small- and medium-sized firms. Private enterprises in Taiwan Province of China borrowed up to 34 per cent of annual funds for investment and operations from the informal financial sector in the 1964–1991 period (Lin et al., 1996).

At a glance, Singapore's macroeconomic policy seems the most conservative among these first-tier NIEs, with low inflation, high savings and investment and small government expenditures. It had an inflation rate of only 4.3 per cent between 1965 and 1979, while growing at 10.2 per cent on average (Jeon, 1995). However, these conventional figures were only made possible because the island State engineered the “unconventional” tools to encourage industrial investment. For one thing, the use of government budget surplus is a misleading indicator of Singapore's fiscal stance as it rules out the gigantic resources spent by the State-owned enterprises, known as the government-linked companies (GLCs). On the one hand, these GLCs hold *majority shares* in a wide range of areas, including Singapore Airlines, telecommunications, financial services, energy and natural resources, transport, shipping, semiconductors, health care, and engineering. As a result, the public sector share of gross fixed capital formation in Singapore was 35.6 per cent in the 1960s, 26.7 per cent in the 1970s and 30.3 per cent in the 1980s, which were even much higher than in Taiwan Province of China and the Republic of Korea (Shin, 2005). Singapore often used these GLCs to

pump-prime the economy whenever there was any sign of economic downturn. Furthermore, profits from GLCs were used to subsidize deficits in government priority areas like housing, which kept up the effective demand (Chowdhury, 2008).

On the other hand, the major source of Singapore's public sector investment stems from the country's compulsory social security scheme that forces every employee to save, named the Central Provident Fund (CPF). Between 1974 and 1985, government savings rose from 23 to 67 per cent of gross national savings. The CPF provided a ready and non-inflationary source of finance for government spending, including fiscal incentives for foreign investors, with lower than market interest rates (Huff, 1999). Together, the use of GLCs and the CPF functioned as an “automatic stabilizer for inflation” in Singapore. Meanwhile, certain monetary policies have been utilized to restrict short-term capital flows; for example, withholding tax on interest earned by non-residents and preventing banks from making Singapore dollar loans to non-residents or residents for use outside Singapore (Chowdhury, 2008).

In summary, although macroeconomic stability was a necessity, it should be defined in a broader way as part of national development strategy, rather than a narrow, unfounded focus on single-digit inflation and budget balancing. To the greatest extent possible, macroeconomic policy should focus on the variables of ultimate concern, such as efficiency, growth and equity, rather than an intermediate variable like inflation (see Herr and Prieue, 2006; Stiglitz et al., 2006).

V. The middle-income trap: Future research agenda

This chapter has explored the growing body of literature on the MIT, providing reflections and policy lessons drawn from the catching-up experience of the Republic of Korea, Singapore and Taiwan Province of China, the so-called first-tier NIEs. First, with some oversimplification, I classified the existing MIT literature into three groups, labelled by their policy statements, namely: (i) getting education and institutions right; (ii) changing export composition through comparative advantage; and (iii) industrial upgrading through State intervention. Although the

factors studied and policy suggested overlap across those works who used the term MIT, they differ in their emphasis on the factors that engendered the “trap”, as well as the extent to which the State should play a role, which are the main benchmarks that I have used for this classification.

The chapter subsequently examined each of the above three strands in relation to the East Asian development experience. Regarding the first strand, I argued that education and good governance institutions cannot

guarantee successful catching-up; rather, both have to be designed to tailor specific industrial targets of the country at that time, as exemplified in East Asian economies. If the subject matter is about long-term economic growth, transforming the productive structure and export compositions of a country should be at the centre of policymaking, as the second MIT strand suggested. If anything, these East Asian economies have achieved the fastest industrialization in human history. However, in doing so, the role of the State rather goes beyond a comparative-advantage-following strategy, with this theory heavily relying on unrealistic assumptions. Of course, moving against comparative advantage demands well-designed industrial and technology policies. The third strand of literature, which advocates proactive State intervention, typically underestimates the nitty-gritty details of incentives needed for industrial upgrading, as well as the compatible macroeconomic policies required to maintain economic stability.

To make the future debate on the MIT more relevant to, and policy advice more realistic for, today's developing countries, the chapter ends with two conceptual grounds for policymaking and one crucial research agenda.

To begin with, we should have reached a consensus that industrial policy can work – although it can also fail – before moving on to the productive debate. In other words, both God and the devil of industrial policy are in the details. In doing so, two conceptual points should give grounds for policymaking. First, industrial and technology policymaking should be posited on the same level as other types of policymaking, whether education, health or social policies, in the sense that it will certainly be confronted with problems and difficulties in terms of implementation. However, the tasks of policymakers are to minimize such problems and maximize the benefits through processes of policy evaluation and refinement. Second, targeting should not imply

an automatic negative connotation. The debate over “functional” versus “selective” intervention is almost meaningless at the operational level. Those who support functional intervention of the State may draw the line of intervention at education, R&D and infrastructure that benefits all industries equally. Nonetheless, almost all interventions in reality *inevitably* favour some sectors and actors over others, and thus have discriminatory effects that amount to targeting (Rodrik, 2008; Chang 2011).⁸ Accordingly, designing a systemic selective policy *ex ante* should be a more productive and accountable enterprise than deploying it with blind prejudice.

Nevertheless, one of the crucial yet under-researched areas in the field concerns the potential *criteria for effective targeting*. Although targeting is almost inevitable, we still lack a set of well-developed measures to be employed by developing countries. Among recent studies in this thread is Lee (2013), which argues that leapfrogging is more likely to take place in the sectors characterized by rapid technological change. Lee argues that the success of the Republic of Korea and Taiwan Province of China is largely due to their overarching strategy towards “short-cycle”, technology-based sectors.⁹ Short-cycle technologies mean that the sector not only has less reliance on existing technologies but also has a greater opportunity for the continued emergence of new technologies. For example, the Republic of Korea's catching-up with Japan in high-definition TVs would not have been successful if in the 1980s Korean electronics companies had not targeted the emerging digital technology-based products more aggressively than Japanese companies, which decided to continue manufacturing the then-dominant analogue products. In summary, to distil useful policy lessons, an exploration into criteria for targeting such as Lee's technological cycle time should be one of the crucial themes of future MIT research (also in this vein are Hausmann et al., 2011; Lin and Treichel 2011).

Notes

- 1 According to the country's GNI per capita in 2012, countries have been classified as follows: low income, \$1,035 or less; lower-middle income, \$1,036–\$4,085; upper-middle income, \$4,086–\$12,615; and high income, \$12,616 or more. Note that the World Bank measures and categories have been repeatedly adjusted.
- 2 Hong Kong (China) is dropped from my discussion, as it is the only economy in East Asia that has been prosperous mainly due to free trade and a *laissez-faire* industrial policy. However, Hong Kong (China) had never been an independent State. As a British colony from the mid-19th century until 1997, it was used as a platform for Britain's financial and trading interests in Asia. It has subsequently become China's financial and trading centre.
- 3 It is worth noting that my review here is limited to those that explicitly use the term "middle-income trap". Seemingly related works, such as those on middle-income countries or the East Asian development, are not included if they have not used that specific term.
- 4 In 1960, the Philippines had a literacy rate of 72 per cent, while it was 71 per cent for the Republic of Korea, 68 per cent for Thailand, 54 per cent for Taiwan Province of China and 53 per cent for Malaysia (Sarel, 1996).
- 5 High-tech products are defined as products with high R&D content (see Palma, 2009).
- 6 How the role of globalization and the changing patterns of international trade have affected the path of structural transformation is discussed at greater length by Yang in the volume *Development Strategies – Country Studies in Comparison*.
- 7 Nonetheless, the deeper causes of second-tier NIEs' mediocre catching-up lie in their political and institutional deficiencies; for example, the Philippines' oligarchic structure (see Hamilton-Hart and Jomo, 2003).
- 8 For example, granting R&D subsidies implicitly favours R&D-intensive high-tech sectors. Building railways (rather than roads) implicitly favours the steel industry (over the auto industry). Among a few policies that could be regarded as "general" are basic education and health care (Chang, 2011).
- 9 Lee (2013) measures the cycle time of technologies by the mean citation lag, which is the time difference between the application year of the citing patent and that of the cited patents.

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