Chapter 7
Middle-Income Trap in Emerging States

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7.1 Introduction

The middle-income trap refers to a middle-income country's failure to become a high-income country in a timely manner. Many examples are found in Latin America and Middle East. In light of the recent growth slowdown of the Chinese economy, one cannot deny the possibility that even hitherto fast-growing Asian emerging states might fall into the trap. It is no wonder that much has been written about the trap since the pioneering work by Gill and Kharas (2007).

According to Kharas and Kholi (2011, p. 281), trapped countries are "unable to compete with either low-wage economies or highly skilled advanced economies." The economist typically points to the critical need for industrial upgrading, which in turn requires increased innovation capacity and an education system tuned to an innovation-led economy (e.g., Glawe and Wagner 2017; Agénor 2017), while the political scientist rather stresses the difficulty of meeting the need. For example, Tsunekawa (Chap. 2 of this volume) argues that technological upgrading requires the coordination of interests between management and labor. Kanchoochat (Chap. 3 of Volume 3) argues that economic growth inevitably creates winners and losers, which is a source of conflicts, and that unless conflict is managed, growth cannot continue. Shiraishi (Chap. 1 of this volume) argues that Asian emerging states will not be able to keep their economies growing without working on nation building. Hill et al. (2012, p. 1704) argue that innovation as "a painful process of creative destruction" in which old firms and industries are replaced by new ones may be blocked by the "political power of old firms."

This chapter takes part in the discussion on the politics of economic growth. It focuses on middle-income economies, for which rapid economic growth for an

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extended period is needed to avoid the middle-income trap or to realize their dream of entering the ranks of high-income countries. We begin with the question of whether the trap is a real problem for emerging states. Tsunekawa (Chap. 2) identifies 29 countries as emerging states that have a set of defining characteristics. We find that the majority of these emerging states, including several Asian emerging states, are trapped according to frequently used definitions of the trap. Thus, it is really difficult for a middle-income country to become a high-income country in a timely manner.

To understand why it is so difficult to avoid the trap, and to explore a way to make it easier, this chapter develop a framework that accommodates both economic and political views of the economic growth of emerging states. In economics, a common approach to growth is to divide the economy into households or consumers, firms, and the government, and another approach is to classify growth drivers into the input accumulation type and the productivity growth type. These approaches, however, seem to make it difficult to think of political coordination for managing conflicts that economic growth creates, coping with vested interests, and taking care of those who cannot keep pace with changing environments due to economic growth.

As a first step, this chapter tries an uncommon approach that highlights the roles of households, industries or industrialists seeking innovations and overseas operation, vested interests and protectionists, politicians and the government, and the rest of the world in determining economic growth and equity. This trial is motivated by a hope that concrete images will help us form ideas about relevant interactions of economic and political forces.

The household sector contributes to economic growth by providing education for children or accumulating human resources. In recent years, the quality of education rather than the quantity has attracted attention of researchers who empirically analyze the relationship between education and economic growth. Education is also believed to be closely associated with economic equity. How are the quantity and quality of education related with economic growth and equity? Educational reforms are often postponed despite the wide spread belief that education holds the key to long-term growth of the economy and also to successful careers of individuals. We attempt to address these issues.

It is well known that most innovations take place in industrial clusters, where producers of the same goods and intermediate inputs are concentrated, and other economic agglomerations such as large cities and industrial zones. Agglomerations expand faster if they have good connectivity with the rest of the world as it facilitates foreign trade and investment. Innovations and external trade and investment are said to boost industrial development, which in turn contributes to economic growth. This chapter points out that industrial development, unlike educational development, does not contribute to equity and rather aggravates inequality because innovation creates winners and losers and agglomeration creates center and periphery. It discusses the key enabler for innovations and industrial upgrading in the middle-income stage. It then considers how to save innovations and industrial upgrading from the obstruction of vested interests and protectionists.

The emerging states today include both giant countries, such as China and India, and much smaller countries, such as Southeast Asian countries. This chapter applies

the findings and arguments about educational and industrial developments to the discussion of the advantages and disadvantages as well as different behaviors between large and small emerging states.

7.2 How Difficult Is It to Avoid the Middle-Income Trap?

The existing studies propose some detailed definitions of the trap that are used to determine which countries are caught in the trap. This section applies such definitions to the 29 emerging states identified in Chap. 2 to see how common the trap is.

Glawe and Wagner (2017) and Im and Rosenblatt (2013) point out that many studies have defined the middle-income trap as staying for more than 50 years in a middle-income range, which is in turn defined as two thresholds as the percentage of a reference country's income level (usually the US level). Table 7.1 reports the results of applying two slightly different definitions of the middle-income range on a relative basis to a sample of 135 countries. In Panel *A* of this table, the middle-income range in a given year is defined as 6–45% of the US level of GDP per capita.[1] In Panel B, the range is defined as 10–50% of the US level. Many studies use income ranges similar to these ranges.

While the two panels are based on the data from the same sample countries, they exhibit considerably different outcomes. In Panel *A*, 15 countries were low-income countries and 65 were middle-income countries in 1960, while the corresponding numbers in Panel *B* were 35 and 46. This is because there were 20 countries in a narrow income range between 6 and 10% of the US level. By contrast, the number of high income countries is stable. There was only one country in the 45–50% range. Whether a country was a low- or middle-income country depends on the definition of the lower boundary of the middle-income range. There is no theory about where to set this boundary. As a result, the number of countries trapped in the middle-income status varies considerably. In Panel A, 38 remained in this range (that is, M → M) 50 years later and are regarded as trapped under the tentative definition. In Panel B, only 27 countries are regarded as trapped.

The results of applying these definitions to the 29 emerging states are presented in Table 7.2. The first three columns adopt the 6–45% range as in Panel *A* of Table 7.1, while the next three columns adopt the 10–50% range as in Panel *B*. As of 2010, China, Pakistan, and Thailand may or may not be in the trap, depending on whether they had crossed an arbitrary threshold 50 years ago but not on how they have been faring in recent years. This kind of definition is not satisfactory. Currently, however, no alternative is available. Moreover, it is safe to say that many middle-income countries seem to be in the trap and that not only emerging states in Latin America and the Middle East but also some Asian emerging states are suspected

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[1]Real GDP per capita are obtained by dividing the expenditure-side real GDP at chained purchasing power parities (PPPs) in million 2011US$ over population. Both data are taken from the latest version (PWT 9.0) of the Penn World Table (Feenstra et al. 2015).

Table 7.1 Number of countries by income range

Panel *A*	Total	Low	Middle	High
		Less than 6%	Between 6 and 45%	More than 45%
1960	96	15	65	16
2010	135	30	71	34
2014	135	26	70	39
Number of countries that was in the indicated ranges in 1960 and 2010		L → L 9	M → M 38	H → H 16
		L → M 6	M → H 11	H → M 0
		L → H 0	M → L 16	H → L 0
Panel *B*		Less than 10%	Between 10 and 50%	More than 50%
1960	96	35	46	15
2010	135	42	60	33
2014	135	40	61	34
Number of countries that was in the indicated ranges in 1960 and 2010		L → L 23	M → M 27	H → H 15
		L → M 11	M → H 11	H → M 0
		L → H 1	M → L 8	H → L 0

Notes
The 135 sample countries were selected by two criteria. One is that real GDP data are available from the Penn World Table 9.0 (Feenstra et al. 2015). The other is that the countries appear in Tables 1A and 1B of Felipe et al. (2012) so that their income classification can be compared with ours. GDP per capita in 1960 is available only for 96 out of 135 countries

of being trapped.[2] Thus, it is very difficult for middle-income countries to become high-income countries.

7.3 A Conceptual Framework

The economist decomposes economic growth into input accumulation and productivity gains. The political scientist rather thinks of conflicts and vested interests created by economic growth, and the need for taking care of those who cannot keep pace with rapidly changing society. A possible conceptual framework accommodating both views is illustrated in Fig. 7.1. With a view to unleashing our imagination, the framework classifies actors relevant to economic growth into four groups: households, industries, those with vested interests and protectionists in the three boxes in the center of the diagram, and political leaders and bureaucrats in the left box.

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[2]Using a different approach to income classification, Felipe et al. (2012) reach the same conclusion.

Table 7.2 Which emerging states are trapped

	(1)			(2)		
	Middle income = 6–45%			Middle income = 10–50%		
	1960	2014	Trapped?	1960	2014	Trapped?
Argentina	M	M	Yes	M	M	Yes
Algeria	M	M	Yes	M	M	Yes
Brazil	M	M	Yes	M	M	Yes
Chile	M	M	Yes	M	M	Yes
China	M	M	Yes	L	M	No
Columbia	M	M	Yes	M	M	Yes
Egypt	L	M	No	L	M	No
India	L	M	No	L	L	No
Indonesia	L	M	No	L	L	No
Iran	M	M	Yes	M	M	Yes
Iraq	–	M	?	–	M	?
Israel	H	H	No	M	H	No
Kazakhstan	–	M	?	–	M	?
Korea	M	H	No	L	H	No
Malaysia	M	M	Yes	M	M	Yes
Mexico	M	M	Yes	M	M	Yes
Nigeria	M	M	Yes	M	M	Yes
Pakistan	M	M	Yes	L	L	No
Peru	M	M	Yes	M	M	Yes
Philippines	M	M	Yes	M	M	Yes
Poland	–	H	?	–	M	?
Russia	–	H	?	–	M	?
Saudi Arabia	–	H	?	–	H	?
Singapore	M	H	No	M	H	No
South Africa	M	M	Yes	M	M	Yes
Taiwan	M	H	No	M	H	No
Thailand	M	M	Yes	L	M	No
Turkey	M	M	Yes	M	M	Yes
Venezuela	M	M	Yes	M	M	Yes

Notes
The countries are arranged in alphabetical order. The symbols – and ? indicate that data are not available and that whether the country is trapped cannot be determined, respectively
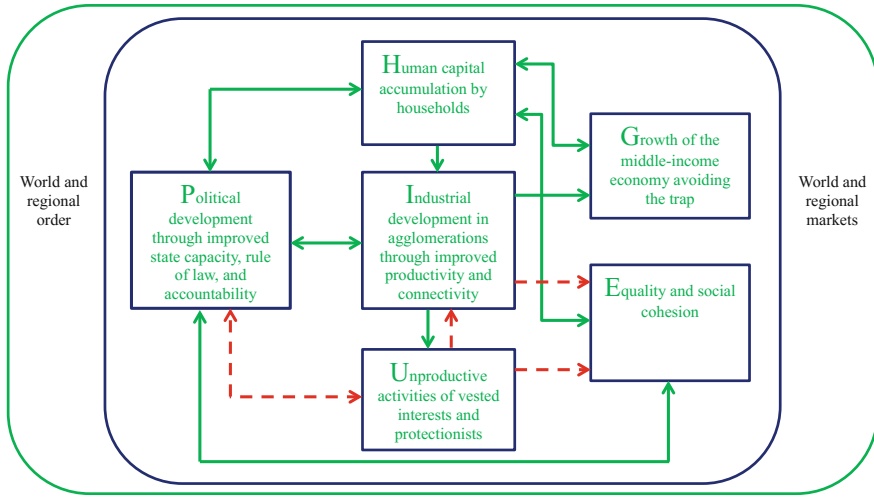
Fig. 7.1 Conceptual framework

Households contribute to economic growth primarily through human capital accumulation, most of which is accounted for by investment in the education of children. Educated individuals work in industries (or more generally, productive sectors including the primary and tertiary sectors) and the government as politicians or bureaucrats. Human capital accumulation contributes to economic growth through industrial development, which is indicated in the figure by the green solid arrows running from Box H to Box I and from Box I to Box G. Households are also owners of financial and physical assets. Their savings contribute to industrial development and economic growth, but this route is not as critically important in the globalized world as productive activities could obtain finance from foreign sources if the economy is open to international finance.

In Fig. 7.1, Box H and Box G are connected with a left-pointing arrow, which is based on the assumptions that economic growth enhances human capital accumulation probably by relaxing the financial constraint on education, and that human capital accumulation does not directly enhance economic growth. The latter assumption may be justified because industry refers here to all directly productive activities.

By contrast, directly unproductive activities, represented by Box U, include rent seeking activities and litigation activities intended to deter new entry of potential rivals. Such activities would be driven by profit motivation and generate incomes, but they are not socially productive. Since they would hinder industrial development and increase income inequality, red dotted arrows (which mean negative effects) extend from Box U to Boxes I and E. Moreover, vested interests, monopolists, protectionists might turn into cronies, capture the state, and hinder the rule of law and accountability on one hand, and if state capacity is increased, on the other hand, it will become possible to implement a competition law, to control rent seeking activities, and to

fight against corruption. Thus, the red dotted arrow between Boxes U and P is pointing in both directions.

The government raises tax revenues and receives human resources from the household and industrial sectors. It provides households and industries with a variety of public services and infrastructure including public education, healthcare, necessary regulations, measures correcting market failures, and so on. Hence, the arrow between Boxes P and I and that between Boxes P and H are pointing in both directions.[3] Since social welfare programs will increase economic equality, and since social cohesion will help political development, Boxes P and E are connected with a green solid arrow pointing in both directions.

Figure 7.1 provides multiple explanations for the difficulty in avoiding the middle-income trap. For example, industrial upgrading may be difficult to take place because of inadequate human capital, inadequate industrial policy, or interference from old firms. Even if industrial development was successful in the past, it might lead to deterioration in equality and social cohesion, which might in turn undermine political stability. Instability may reduce state capacity to collect taxes and to implement policies effectively, thereby hindering human capital accumulation and industrial development. A considerable compilation of empirical studies will be needed to determine which explanation is more relevant. Figure 7.1 can be used to develop hypotheses for such investigation.

7.4 Education

7.4.1 Educational Catch-up and Economic Catch-up

Few readers would hesitate to agree that human capital accumulation is positively related to long-run economic growth. If we take a closer look, the relationship between education and growth is quite complicated. The question, for example, arises as to how concurrently the two development processes occur? Using the data compiled by Godo (2010) and borrowing the idea of Godo and Hayami (2002), the first panel of Fig. 7.2 shows the processes of economic catch-up and educational catch-up in Japan from 1890 to 2000. Here, education attainment is measured by the average number of years of schooling in adult population, and economic development is measured by GDP per capita. The extent of catch-up is measured by the Japanese level as percentage of the US level. The other panels of Fig. 7.2 use the Barro-Lee educational attainment data to show the same ratios in 12 other East Asian countries over a shorter period from 1965 to 2010.

In Japan, educational catch-up accelerated as early as the 1890s, but economic catch-up took place much later. A possible interpretation is that the early spurt in educational development was an investment with a very long gestation period. Korea

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[3]In the same vein, Besley and Persson (2010) emphasize the roles of state capacity to raise taxes (fiscal capacity) and support markets (legal capacity) in state building and economic development.

followed and China is following similar processes, while Taiwan did so to a lesser degree. Although not shown here, many Latin American and Eastern European countries share similar patterns. In Singapore and Hong Kong, however, educational catch-up and economic catch-up took place concurrently; the same happened in Portugal. The question arises as to why the length of the investment gestation period varies so much.

There are at least three possible answers. First, the quality of education may be what really matters to economic growth, but it is missing in the figure. The years of schooling measure the quantity of education, not the quality. It may well be that when the quality of education was low, a gap widened between educational and economic catch-up levels, and the gap narrowed as the quality improved gradually. One may
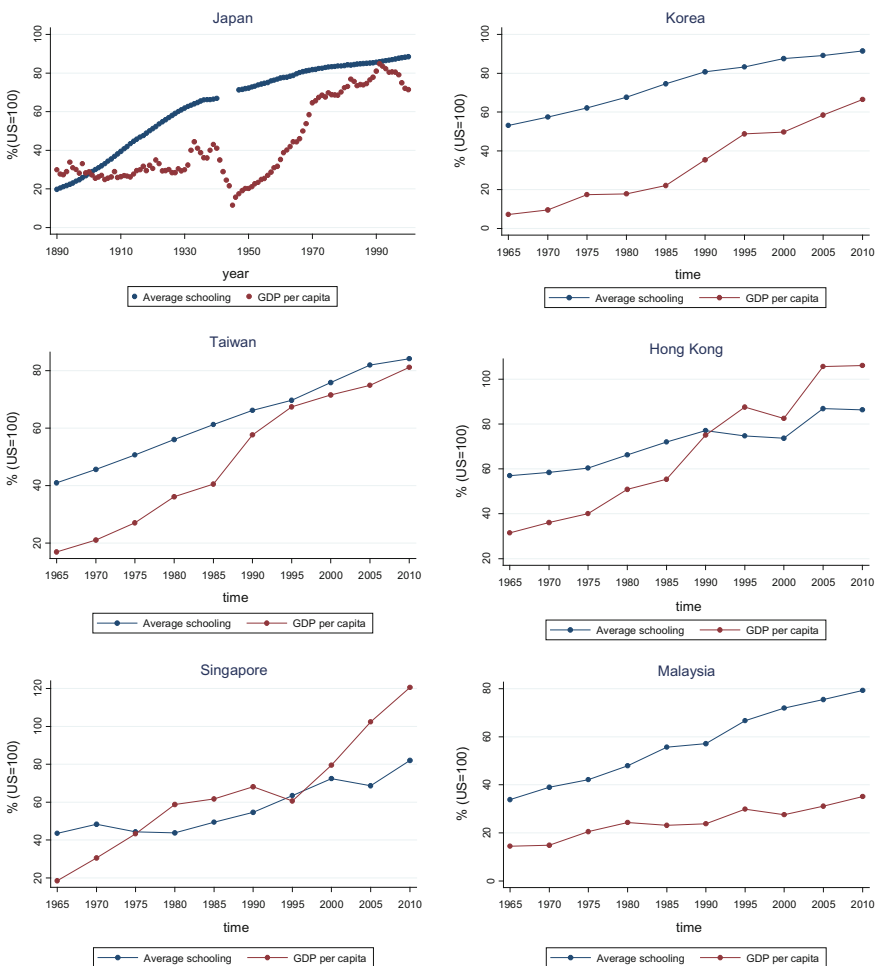
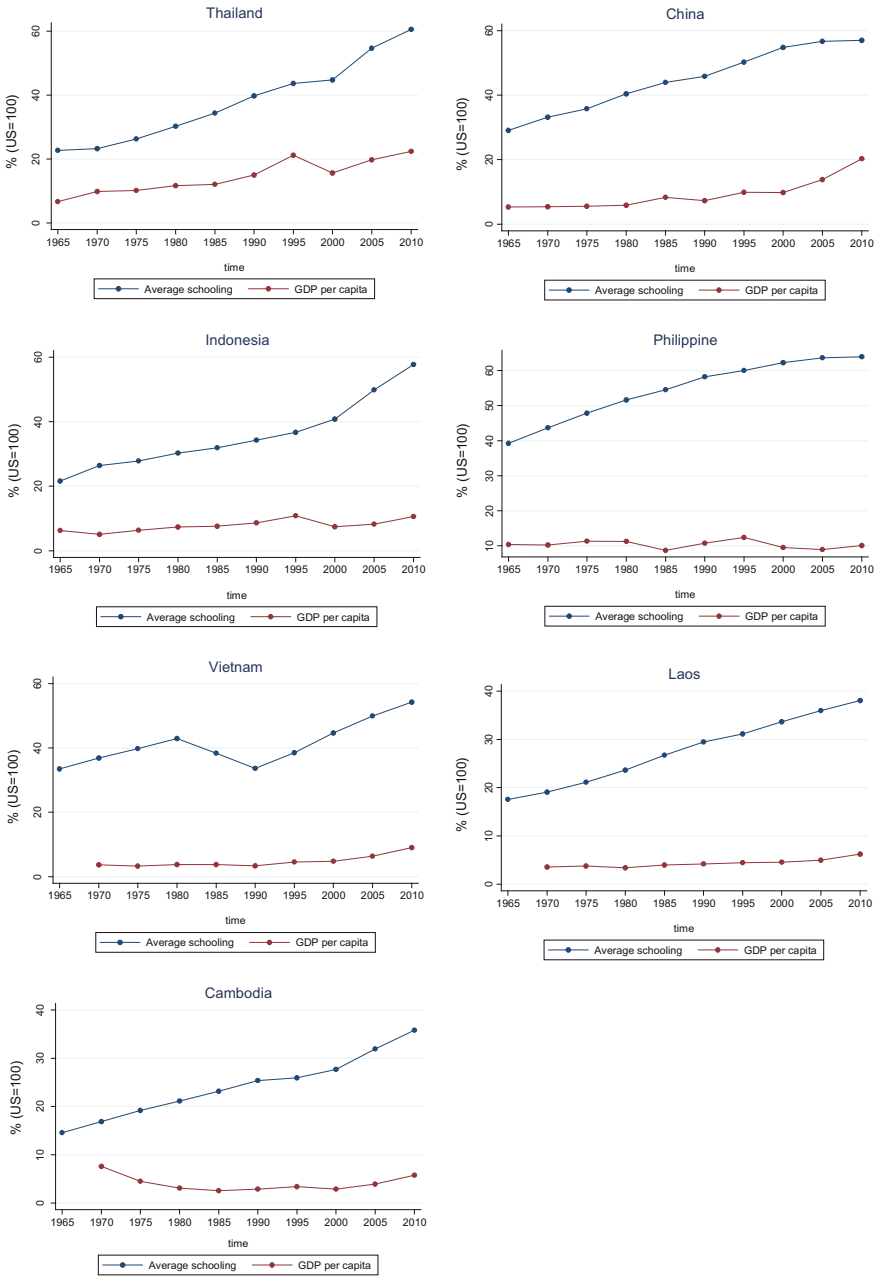**Fig. 7.2** Educational catch-up and economic catch-up in East Asia

Fig. 7.2 (continued)

wonder, however, why people went to school for many years if education was so low-quality that it contributed little to income growth. Similarly one may wonder why the government built many schools that would contribute only little to income growth. These are interesting, open questions. Probably, what people cared was their personal income, not GDP per capita. They might expect that academic credentials would serve as a signal in labor markets and get them high-paid jobs. The government might expect education to help to create a sense of national identity.

Second, international port-city states like Singapore and Hong Kong would have thriving service sectors like international commerce and financial services. They could offer jobs compatible with high education even in early stages of economic development. By contrast, larger countries with vast hinterland tended to start their economic development as agrarian economies, where the effect of education on productivity would be more limited. Taiwan is an island and its population and territory are not large, but it is not like a port-city state. Instead, it achieved rapid economic growth led by the development of labor-intensive, light-manufacturing industries in the 1970s and 1980s. Micro and small enterprises mushroomed to form industrial clusters in and around major cities. Taiwan was called a "boss island" because there were many business owners relative to the population. They tended to be more educated than their employees. Thus, what matters may be the level of industrialization, the industrial structure, or the distribution of jobs types.

Third, international connectivity may be critically important. Portugal is not a city-state, but its location is close to rich Western European countries. Its strong agriculture, forestry, fishery, and diversified manufacturing are all export-oriented. This is at least one reason why this country could have managed to have a relatively high level of economic catch-up for its relatively low level of educational catch-up.

7.4.2 The Quality of Education

Since the late 1980s, economists have developed and used educational attainment data as an indicator of the human capital of economies. As an alternative indicator, Hanushek and his coauthors have developed country-level data of cognitive skills based on the results of 12 international student achievement tests conducted over the period from 1964 to 2003 (e.g., Hanushek and Woessmann 2012).[4] Although the data are available only for 77 countries, most of which are high- or upper-middle-income countries, and of cross section as opposed to panel, Hanushek argues that this index captures the quality of education. The third column of Table 7.3 shows the cognitive skill index for the 29 emerging states listed in Table 7.2, while the first two columns of Table 7.3 shows GDP per capita and educational attainment (the quantity of education) as percentage of the US level. In this table, the countries are listed in the order of GDP per capita. As this table suggests, the cognitive skill index and

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[4]These international student achievement tests include the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA).

Table 7.3 Data on major variables

	(1)	(2)	(3)	(4)
	GDP per capita as % of US	Attainment index % of US	Cognitive skill index	Management score
Singapore	138.8	94.5	533	2.861
Saudi Arabia	91.8	69.9	366.3	–
Taiwan	84.8	85.8	545.2	–
Korea	67.1	96.5	533.8	–
Israel	63.6	99.0	468.6	–
Poland	48.1	89.4	484.6	2.887
Russia	46.0	90.2	499.2	–
Kazakhstan	44.8	85.3	–	–
Malaysia	44.3	79.7	483.8	–
Chile	41.3	81.9	404.9	2.752
Argentina	38.7	79.1	392	2.699
Turkey	36.8	62.9	412.8	2.706
Mexico	30.3	71.9	399.8	2.899
Iran	29.7	61.5	4219	–
Brazil	28.4	73.8	368.3	2.684
Venezuela	27.0	73.1	–	–
Thailand	26.7	71.4	456.5	–
Algeria	24.5	58.7	–	–
Columbia	24.1	66.8	415.2	2.578
China	23.9	66.3	493.9	2.712
South Africa	23.2	71.9	308.7	–
Iraq	23.1	59.7	–	–
Peru	21.0	73.9	312.5	–
Egypt	18.9	67.6	403	–
Indonesia	18.6	63.3	388	–
Philippines	12.7	71.1	364.7	–
Nigeria	10.5	49.7	415.4	2.516
India	10.0	55.2	428.1	2.611
Pakistan	8.9	47.8	–	–

Sources (1) PWT 9.0, (2) The human capital index of PWT 9.0, (3) Hanushek and Woessmann (2012, Table 11), (4) Bloom et al. (2017, Fig. 1)

Note The countries are arranged in order of GDP per capita

GDP per capita are closely correlated. Hanushek finds that the cognitive skill index is also closely correlated with income growth, and that this correlation is closer than that between the educational attainment index and income growth during the period 1960–2000.

To see if Hanushek's finding holds true to a more recent period 2000–2014, the first column of Table 7.4 reports the result of regression analysis that includes both the cognitive skill index and the educational attainment index together with some control variables in a sample of the 67 countries for which data of all variables are available. The coefficient on the educational attainment index would be highly significant if the cognitive skill index were not included in the regression. Once the cognitive skill index is included, however, it becomes only marginally significant whereas the coefficient on the cognitive skill index is significant at the 5% level, as shown in column (1). Column (2) shows that the latter coefficient is even more highly significant if the sample is replaced by a small sample of the emerging economies. As Hanushek (2012) claims, the level of cognitive skill or educational achievement seems to be a crucial component of long-run picture.

Does the quality of education matter to the middle-income trap? Column (3) of Table 7.3 shows this index for the 29 emerging states. According to Table 7.2, the majority of these states are trapped. The trapped states tend to have low values of the cognitive skill index.[5] Latin American countries, South Africa, and the Philippines have very low cognitive skills even though their attainment levels are not very low. Peru and South Africa score extremely low on cognitive skills. These observations indicate that the quality of education is more closely associated with the middle-income trap than the quantity of education.

Even if an emerging state is not in the trap, it may fall into the trap in future. The fate of such a county may depend largely on its current level of human capital. Egypt, India, Indonesia, Iraq, and Nigeria, are not diagnosed as being trapped, but they have considerably low educational attainment and achievement. It seems reasonable to suspect that they are prone to be caught in the trap unless they improve their education systems drastically.

7.4.3 Educational Reform

It is difficult to improve the quality of education. It was more difficult before than now because it was more difficult to identify what made the quality low. It was not clear how poor the quality was, the seemingly low quality could be attributed to the laziness of students, poor skills of teachers, low-quality curriculums, low salaries of teachers, poor management of schools, and so on. Today, an increasing number of counties participate in international student achievement tests, these difficulties are resolving today.

Still, the improvement of education quality remains difficult, probably because of mutually dependent interests among students and parents, teachers and schools, industries that employ graduates, and the government. In many countries, the gov-

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[5]The index is designed so that its mean and one standard deviation among the OECD countries are equal to 500 and 100, respectively. In the past, some countries succeeded in increasing their scores by 30–50 points in 30 years. These achievements are admired by educators in other countries.

Table 7.4 Association between education and growth of income per capital, 2000–2014

	Dependent variable: average annual growth rate (%) in GDP per capita, 2000–2014		
	(1)	(2)	(3)
Log of real GDP per capita in 2000	−2.369***	−2.279***	−1.441**
	(−7.879)	(−5.714)	(−2.269)
Resource rent % of GDP in 2000	0.113***	0.102***	0.183***
	(4.698)	(4.495)	(3.025)
Educational attainment in 2000	1.039*	0.093	−1.107
	(1.775)	(0.119)	(−0.953)
Cognitive skills divided by 100 (mean)	1.183**	1.306***	
	(2.291)	(2.959)	
Management score (mean)			3.829
			(1.531)
Constant	17.251***	18.793***	8.365*
	(7.632)	(6.495)	(1.936)
N	67	24	33
R^2 adjusted	0.575	0.800	0.670

Definitions and data sources:
– The real GDP is the expenditure-side real GDP at chained PPPs in million 2011US dollars. Its data are from Penn World Table (PWT 9.0, Feenstra et al. 2015)
– Resource rent is the total natural resource rent as a percentage of GDP. The data are from World Bank's World Bank Indictors
– Attainment index is the human capital index provided by PWT 9.0. It is based on Barro and Lee's (2013) data on years of schooling and an estimated rate of return to education
– The cognitive skill index is from Hanushek and Woessmann (2012, Table 11)
– The management score is from Bloom et al. (2017, Fig. 1)
Notes
– Numbers in parentheses are *t*-statistics. ***, **, and * indicate the statistical significance at the 1, 5, and 10% levels, respectively
– In columns (1) and (2), the initial GDP per capita has a negative and highly significant coefficient, which is a common result and suggests that hindrances to economic growth tend to be more powerful in higher income countries. The resource rent is included in the regression in order to control for the favorable impact of the natural resource price increase during the 2000s on the economic growth of resource-dependent countries

ernment is expected to coordinate the web of the tangled interests. Policy makers, however, might procrastinate rather than taking initiative since education reforms might require considerable time to become effective compared with their tenure. If they are willing, their capacity to coordinate may be limited. Moreover, the government's ability to finance and oversee the operation of public school systems might be limited.

Another difficulty arises from the fact that the importance of family input to early childhood development is not recognized by poor parents and their parents. This problem may be illustrated by an example from China. This country has vast rural areas where income levels are much lower than in urban areas. The economic gap between the two regions translates into the educational gap. A large number of parents, both fathers and mothers, in the inland region work in the urban region, leaving their children to their parents, who are unfamiliar with modern parenting and provide little input to young children's cognitive development. As a result, cognitive delays are alarmingly common in remote rural areas (e.g., Yue et al. 2016). In such areas, over 30% of lower-secondary school students drop out, and only 37% go to upper-secondary schools, while about 90% in large cities do (e.g., Kor et al. 2016). A substantial portion of youth population may fail to meet the skill requirements of upgraded industries. Urban people, however, are little interested in this problem, and the government has been slow to respond to it.

7.4.4 Education and Income Inequality

One might think that the government should reform education in order to mitigate regional inequality rather than let regional inequality make an education reform difficult. Indeed, the diffusion of knowledge and skills is widely believed to hold the key to economic equality. The central role in this process is played by education. Thus, education is reputed to be a major driver toward equal societies. The question arises, however, as to whether societies with higher education levels are more economically equal than societies with lower education levels. To answer this question, Fig. 7.3 plots the data of the Gini coefficient of income distribution within countries and the data of educational levels.[6] We use Gini coefficient data in or around 2000, just before conditional cash transfer (CCT) programs were spread from Mexico to other Latin American countries, to make the following analysis simple. The *y*-axis measures the Gini coefficient. The *x*-axis measures the cognitive skill index in the upper panel or the educational attainment index in the lower panel.

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[6]The Gini coefficient data are taken from the United Nations University-World Institute for Development Economics Research (UNU-WIDER) World Income Inequality Database WIID3.4, which offers multiple estimates of income inequality for each country. We use the estimates based on disposable or net income data collected from both urban and rural areas. If gross income data are used, the Gini coefficient tends to be high because redistribution is ignored. If data from only urban or rural areas are used, it tends to be low because the urban-rural gap is ignored.
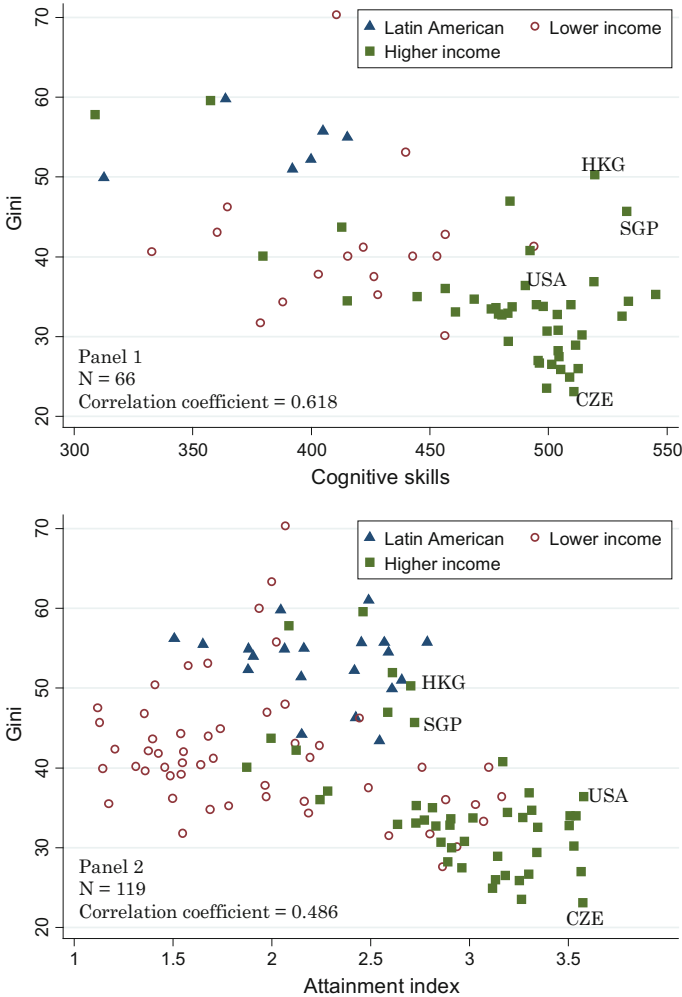
Fig. 7.3 Income inequality and education

Both panels show that education and income inequality are negatively correlated. In both panels, the negative correlation is statistically significant. However, it is not robust. For example, the correlation disappears from the upper panel if Latin American countries and two other countries, South Africa and Botswana, are excluded from the sample. In the lower panel, the negative correlation is not statistically significant among the low- and lower-middle-income countries. Among the upper-middle- and high-income countries, the negative correlation is highly significant, but it disappears completely if France, Germany, Switzerland, the Czech Republic, Finland, Canada, and Japan, which have highly established advanced social security and welfare systems as well as high levels of education.

In Fig. 7.1, Boxes H and E are not just directly linked but also indirectly linked through Boxes I and P. The indirect linkages may offer an explanation why the correlation between education and inequality is not negative among relatively poor countries whereas it is negative among relatively rich countries. Consider an economy that is emerging but still relatively poor. Its accumulation of human capital and successful upgrading of its industries will inevitably create winners and losers. Winners include those who happened to have land titles in prospering economic centers, where land prices and rents soar, and those who happened to have connections with foreign technologies or export markets. Losers are those who cannot keep pace with rapid economic growth for any reasons. In relatively poor countries, losers tend to have no effective social safety nets, which might exist before urbanization and other social changes associated with rapid economic growth took place. Thus, as the red broken arrow indicates, industrial upgrading tends to increase inequality.

Due to the indirect effect, human capital accumulation alone might not lead to substantial reduction in inequality. Although social security and welfare programs would reduce inequality if effectively implemented, such a scenario was seldom realized in relatively poor countries because of the government's weak accountability and ability to finance such programs. The CCT programs in Latin American countries were successful to some extent, but their sustainability is unpredictable. In future, however, some of these countries may have political development of the type that took place in France, Germany, Switzerland, etc., leading to both highly advanced social welfare systems and high national levels of human capital, as mentioned above.

7.5 Industrial Development and Upgrading

7.5.1 Drivers and Obstacles

Openness and connectivity enhance trade and hence the division of labor between economies. Moreover, they enhance technology transfers and foreign investment. Their important roles in industrial development are best illustrated by the recent economic history of East and Southeast Asia. Japan liberalized trade in the late 1950s and then investment. Other Taiwan, Korea, Singapore, Malaysia, China, and Thailand followed suit in the 1970s and early 1980s, when most countries in South Asia, Africa, and Latin America still insisted in the inward oriented industrialization strategy. In the late 1980s, Indonesia and Vietnam began liberalizing trade and investment.

A number of firms in the East and Southeast Asian economies joined international production networks of Western and Japanese multinational firms as suppliers or vendors initially in those sectors that did not require a high level of quality control, such as garments and footwear of mass-production type. Gradually, however, an increasing number of firms in these regions produced electronic parts like basic types of printed circuit boards and assembled personal computers (e.g., Sonobe and Otsuka 2006). When the development of information and communication technology

made the fragmentation of production process possible even in the automobile sector, these regions were ready to participate in automobile supply chains (e.g., Baldwin 2017). It is little wonder that many of the emerging states listed in Table 7.2 belong to these regions.

As a result of rapid economic growth they have enjoyed for an extended period, emerging states have seen wages soaring and their labor-intensive light manufacturing industries losing competitiveness. In many emerging states, moreover, only a small number of cities have good connection with foreign markets and technologies. As industries grew, these cities and especially the primary city grew into thriving and congested agglomerations of manufacturing and commercial activities. However, the problems of huge congestion, such as traffic jam, high rents, and pollutions, reduced the productivity of existing businesses and the probability that new profitable businesses emerge in large cities. In a sense, the result of growth in the past obstructs further growth.

To keep the high productivity of large agglomerations, congestion must be mitigated by developing transportation infrastructure within urban areas and by relocating production and commercial activities from the existing large agglomerations to the surrounding areas. For the latter purpose, industrial zones need to be built in suburban areas and rural areas and to connected with the existing large agglomerations and even export markets with highways, railroads, and sea- and airports. Such infrastructure development would require coordination of interests among stakeholders, such as central and local politicians and business persons in potential locations. It would also require coordination among central government ministries and local governments involved. The process of such coordination, planning, and implementation creates the risk of local captures and state captures of public resources. Thus, successful mitigation of urban congestion depends on the state capacity to manage the risk of state and local captures, to manage efficient operation of different parts of the government, and to coordinate conflicting interests (hence, the green solid arrow between Boxes P and I in Fig. 7.1).

New industries tend to be born in large economic agglomerations (that is, large cities and large industrial areas), where skilled workers, experts, and a variety of intermediate inputs are available and the market for new products is large (e.g., Henderson et al. 1995). As a result, industries tend to be concentrated in the economic center, and rural areas or periphery have relatively few thriving industries. Rural industries are fewer in lower income countries than in higher income countries. Thus, fact that agglomeration plays an important role in industrial development creates the problem of regional inequality or the problem of center and periphery, which is one of the reasons why the relationship between Boxes I and E in Fig. 7.1 is negative.

Rural industrial development is possible because some industries benefit little from large agglomeration but more from the availability of low-wage labor and spacious production site. Those industries with established supply sources, work force, and good reputation of its products and services may locate their production sites from large agglomeration to suburban or rural areas if infrastructure is developed. It is also be possible for rural areas to succeed in brand agriculture which produce and market high-value-added vegetables, horticulture products, dairy products, wine, and

so on. Such successful development in rural areas, however, has been experienced only by some high-income economies. In emerging states, such development has not yet been observed. The government either turns a blind eye to regional inequality or takes care of it in the form of dole-out policies, such as pork-barrel projects, subsidies, and reduced taxes, which may be necessary to keep political stability but are costly.

As already mentioned in Sect. 7.3, industrial development creates vested interests (hence, the solid green arrow from Box I to Box U), but vested interests might interfere further industrial development (hence, the red dotted arrow from Box U to Box I).

To summarize, openness, connectivity, and agglomerations have enhanced industrial development, which have in turn created urban congestion, regional inequality, and vested interests. A condition for avoiding the middle-income trap is to manage to keep the latter problems from decelerating economic growth too much and from causing political instability.

7.5.2 Insufficient Responses to Higher Wage Rates

This subsection asks how industries in emerging economies can counter the negative effect of increased labor costs. According to basic textbooks of economics, ordinary responses to an increase in wage rate are (i) substitution of expensive labor with capital, (ii) other cost reductions, and (iii) product upgrading. The substitution of labor with machinery would provide an opportunity for firms to upgrade their technology because newly imported machinery embodies relatively new technologies developed in advanced economies. To cut production costs, a firm would review the processes of processing, assembly, maintenance, inventory, and so on to eliminate wasteful uses of time, material, and energy. The firm might collaborate with its suppliers to improve the latter's productivity and lower intermediate input prices.

Upgrading products requires collaboration among a developer team, a production team, and a marketing team. The collaboration is coordinated by a manager. Consider a common case in which this manager is the head of the production team and hires the developer team and the marketing team. Developers and marketers may demand exorbitantly high rewards or sell the idea of the new product to other firms. If the expertise in product development and marketing is abundantly available, however, such opportunistic behaviors will be eliminated because troublemakers will be replaced by more conscientious experts. One of the advantages of agglomeration is considered to be abundance with experts.

In reality, however, developers and marketers as well as managers in emerging economies seem neither abundantly available nor well trained compared with their counterparts in high-income economies. The demand for expertise or skills in product development and marketing would be low in the past because firms could earn high profits without differentiating their products. Although managerial capabilities must have been used by every firm, but the recent economic literature offers two sets

of evidence that managerial capabilities of firms in emerging states are rather low. First, small and medium enterprises in India and Vietnam are not familiar with standard management practices, such as lean or *Kaizen* management commonly used by American and Japanese firms, and their business performance improve after receiving management training or coaching from business consultants (e.g., Bloom et al. 2013; Sonobe and Otsuka 2014; Higuchi et al. 2015).

Another set of evidence for low managerial capabilities is provided by Bloom et al. (2017), who systematically obtained management information from 15,489 firms in 35 countries through interviews. Their measure of management practices, averaged over sample firms within countries, is distributed widely from 2.027 in Mozambique to 3.308 in the United States. The data are available for 11 out of the 29 emerging states and presented in column (4) of Table 7.3. Their average score, 2.718, is significantly lower than the average among high-income countries, 3.122.

Bloom et al. (2017) show that the national average of the management score is closely correlated with GDP per capita. How about its correlation with GDP per capita growth? Column (3) of Table 7.4 shows the result of growth regression that includes the national average of the management score. The estimated coefficient on this variable, 3.829, is not statistically significant, but its magnitude is considerably large. If the national average goes up by 0.5 points (so that an emerging state reaches parity with Germany), the GDP per capita growth rate rises by 1.9% points. Presumably the insignificance results from the small size of the sample; that is, if the management score were collected a greater number of countries, the estimate could become significant.

The large coefficient is consistent with a commonsense view that management matters to economic growth. With poor management, productivity and profitability are low, which makes it difficult to finance equipment investment and to hire experts in product development or marketing, and workers are not motivated or guided to learn new practices. Even the seemingly easy responses (i) and (ii) to rising wages, that is, substitution and other cost cutting, may be difficult in poorly managed firms.

The question arises as to why many firms are poorly managed. Bloom et al. (2013) find that owners of medium-scale textile firms in India do not hire any non-family members as managers because of lack of trust, and that firms can make profits without professional managers probably because they are protected from import competition by tariffs and from competition with new entrants by lack of external finance. There is empirical evidence that an increase in competitive pressure due to trade liberalization and deregulation increases the number of firms run by professional managers and improves management practices.[7]

In societies with social contestation, there may be another possible reason for poor management. In South Africa, "contestation between and within racial groups, with class and ethnic overlays has sharpened" recently, and it has been reflected in "workplace conflicts" and "a loss of economic productivity" among other things (Hino et al., forthcoming). This should have been captured by an arrow extending

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[7]See, for example, Bandiera et al. (2015) and Chen and Steinwender (2017).

from Box E to Box I, but it is missing in Fig. 7.1 because no empirical evidence for the effect has been presented even though there are suggestive anecdotes.

7.5.3 The Role of Government in Industrial Upgrading

In several ways, the government can help industries achieve upgrading. First, as discussed in Sect. 7.5.1, high quality education and economic agglomeration play important roles in industrial upgrading. The government can in principle improve the quality of education and mitigate urban congestion through infrastructure development. Second, the government can in principle increase competitive pressure on business owners through rigorous enforcement of competition policy, relaxation of entry regulation, and reduction of trade barriers, so that business owners are motivated to hire professional managers.

Third, the government can in principle support associations and non-profit organizations that establish qualification systems or ability-based grade systems, and those organizations that provide technology extension services and gather and distribute market information. The Industrial Technology Research Institute (ITRI) of Taiwan is one of the successful organizations that have played such roles (e.g., Sonobe and Otsuka 2006; Patarapong and Liu 2019). Fourth, the government can in principle be directly involved in research and development activities rather than supporting the efforts of the private sector.

These four types of policies are possible in theory, but their feasibility and effectiveness in reality depend on the government's administrative capabilities as well as the private sector's technological and managerial capabilities. Among these four types, the most difficult is of course the fourth policy. According to Lerner (2009), the vast majority of governments' attempts to boost innovations and entrepreneurship have failed around the world.

7.6 Emerging States with Large Population and Territory

Today's emerging states, especially BRICs (Brazil, Russia, India, and China), are among the largest countries in terms of population and territory. This section addresses the question of how the size of country affects the path of development and the policy that an emerging state adopts to avoid the middle-income trap.

7.6.1 Similarities and Dissimilarities in Development Paths

Industrial development in BRICs is cluster-based as in the emerging states in Southeast Asia and Japan, Korea, and Taiwan. In China, industrial clusters were few in

number and small-scale during the period of command economy, but they mushroomed and burgeoned in Guangdong Province, Jiangsu Province, and Zhejiang Province after the start of the economic reform began. Industrial clusters continued to grow in size and number in the 1990s and 2000s in other parts of the territory. In the coastal region, they became strung together like beads to form economic agglomerations with population of several million people, which in turn constitute the so-called mega-regions, namely the Pearl River Delta, the Yangtze River Delta, and the Beijing-Tianjin-Hebei area. Each of these mega-regions has the world busiest container ports, such as Shenzhen, Hong Kong, and Guangzhou in the Pearl River Delta, Shanghai in the Yangtze River Delta, and Tianjin in the Beijing-Tianjin-Hebei area.

Incipient mega-regions are found in India. They surround the country's largest cities, such as New Delhi, Mumbai, Kolkata, Bengaluru, and Chennai, and grow rapidly in population and wealth by attracting migrants from rural areas and new businesses. These cities alone have more than 80 million residents. The size of economic agglomeration in China and India is an order of magnitude greater than that in the previously industrialized countries and the other emerging states.

A similar pattern of agglomeration was observed in Japan a half century ago. The rapid economic growth in that era was expected to slow down because of the severe congestion in each of the four major industrial zones that accounted for most of the industrial production in Japan. The remedy was the large-scale infrastructure development under the Income Doubling Plan implemented in the 1960s, which doubled real GDP per capita in seven years. The plan expanded the major industrial zones to suburbs and connected them with each other by highways and high-speed railways. Between the major industrial zones, new industrial zones with petrochemical industrial complexes or large-scale ironworks were built in sea-side districts to receive imported mineral resources and to produce basic materials such as plastic and iron and steel for machinery and other industries in the major industrial zones and other areas. As a result, the old and newly-built industrial zones and industrial cities as a whole formed what was called the Pacific Belt Zone, as they were located on the Pacific Ocean side of the country.

Each of the three mega-regions in China is at least as large as the Pacific Belt Zone in Japan. Note that these huge industrial complexes are clusters of industrial clusters and are located on the seashore. Thus, their successful industrial development is based on the benefits from large economic agglomeration and good connectivity to supply sources and markets. Thus, the logic of success was the same as we have discussed in Sect. 5.1 and common between China and Japan or between large and small emerging economies.

A major difference arising from the size of country is the attractiveness as investment destination. A country with large and growing population is more attractive as the destination of foreign direct investment than a small country, because the former is expected to grow into a large market in future whereas the latter can only be a production site for export. It is often a good idea for multinational firms to invest in a large country to establish their brand names before the market becomes large. If massive investment flows into a host economy, the latter will be boosted in the short

run and in the long run, the latter will obtain learning opportunities useful for future industrial upgrading. For example, local managers employed by multinationals' local subsidiaries can learn standard management practices, and technology transfer from multinational firms to the host country may occur through foreign direct investment if the quality of engineering education is good in the host country. In these respects, large emerging states have advantage over their smaller counterparts. Indeed, China has succeeded in industrial upgrading in many industries, and Brazil and India seem to follow China's success.

Another important difference between large and small emerging states is the extent of regional inequality. In China, Brazil, and India, infrastructure development in remote rural areas is far behind. There is also large educational gap between urban and rural areas. It is easy to imagine that regional inequality can grow faster in gigantic countries than in countries with small territory. With low levels of infrastructure development and educational development, it is practically impossible for rural industrial development to take place. If China, Brazil, or India fell into the middle-income trap, the cause would not be the lack of industrial upgrading but political stability triggered by worsening inequality.

7.6.2 Differences in Behavior

A more notable difference between large and small emerging states is found in external engagement. BRICs are all nuclear nations, major military powers, and permanent members of the United Nations Security Council. Do they use their power for the purpose of avoiding the middle-income trap?

The leader of China proposed the Belt and Road Initiative in 2014 to build transportation, communication, water, and power systems to connect China, especially its inland provinces, with more than 60 countries through the Silk Road Belt and the Maritime Silk Road. It will reduce the regional inequality in China by offering construction worker jobs to the poor in the inland region, by improving connectivity and enhancing commercial activities in the region, and possibly by enhancing industrial development in the region as well. Although job creation for poor workers and improvement in connectivity are just a conventional combination, it is a novel idea to involve as many as 60 countries in domestic development. The idea makes sense because it seems possible to obtain commitments from many countries if not 60.

In recent years, China has built islands and deployed troops in the South China Sea to back its expansive claim that the marine area is its own territory. This behavior may have an effect of taking attention away from inequality to the international issue. As a major military power, China has been promoting the development of artificial intelligence (AI) technology by the private sector in order to divert the technology to military use. The fruit of AI technology development will not just boost domestic industries, but it is also used by the government for surveillance activities intended to maintain political stability. Military-industry complex used to be observed only in high-income military powers. It would be an alien concept for small emerging states.

Thus, the international bargaining power and military power put large emerging states in a better position to avoid the middle-income trap than small one, even though the difficulty in maintaining regional equality due to huge territory puts them in a worse position.

7.7 Conclusion

This chapter has found that it is difficult for middle-income countries, including emerging states, to become high-income countries in a timely manner. The economist tends to argue that the reason lies in the low ability of the private sector to upgrade products, productivity, and industrial structure. By contrast, the political scientist tends to think that industrial upgrading is difficult to take place because of resistance and interference of old firms that have political clout, and that industrial upgrading is difficult to continue because it creates winners and losers which in turn create conflict. Thus, political coordination is expected to be important, and political leadership is expected to play a critically important role in coordination.

To integrate these economic and political views of economic growth and middle-income trap, this chapter has developed a conceptual framework. It is designed to visualize relationships among human capital accumulation by households, industrial development in agglomerations through improved productivity and connectivity, rent-seeking and other unproductive activities of vested interests and protectionists, political development, economic growth, and equality and social cohesion. The power of this framework to generate meaningful hypotheses for empirical analysis will be judged by future studies.

Using this framework as a trial, this chapter made following arguments.

(1) Cross-country data suggest that the quality of education is closely associated with economic growth, but that it is not as closely associated with equality. Our framework suggests that the reason for the latter weak linkage is the negative impact of industrial development on equality.

(2) The recent literature has made it clear that the ability of firms to improve productivity depends much on their managerial capabilities. Unlike industries in low-income countries, those in the emerging states could easily to hire consultants and professional manages to improve managerial capabilities. Nonetheless, industrial upgrading is difficult to take place in the emerging states. Our framework suggests that the reason lies in the negative influence from vested interests and protectionism.

(3) Compared with small emerging states, large ones benefit from their abilities to develop mega-size agglomerations, to attract massive foreign investments, and to use strong international bargaining power. Our framework suggests, however, that they are even more prone to regional inequality, which might induce their leaders to resort to active or aggressive external engagement to keep popularity.

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