

▶ Chapter 2

The Middle-Income Trap Verified by Data

—The Exit Key is Developing Institutions

Nariyasu Yamazawa
Professor, Atomi University

Key Points

- Data were confirmed focused on the conditions in each ASEAN country regarding the reality of the middle-income trap. Surprisingly few economies, just South Korea and Taiwan, made the transition to being high-income countries/regions within 30 years after the per-capita GDP reached \$2000 (on a 2005 PPP basis). Of the major five ASEAN countries excepting Singapore, only Malaysia has reached \$10,000.
- Examining the middle-income trap from the perspective of a stagnating growth rate, there are many countries which reached this stagnation around a per-capita GDP (on a 2005 PPP basis) of around \$10,000. However, many Asian countries stagnated in the 1990s, and there is the possibility of an influence from other regions such as Japan's economic slump.
- In order to escape from the middle-income trap, it is necessary to develop the institutions of each country. In an investigation of the institutional factors in each country, areas to improve are seen in the political institutions in Thailand, the institutions pertaining to entrepreneurship in Indonesia and the Philippines, and the like.



The levels of each ASEAN country having many areas of improvement
(comparison of “institutional quality”)

	Institution evaluation index (deviation values)					
	Overall	Politics	Openness	Gender	Entrepreneurship	Labor
Japan	54	60	49	41	49	62
S. Korea	52	53	53	40	49	40
China	38	43	35	50	38	44
Malaysia	45	48	42	40	45	55
Thailand	44	38	48	48	48	57
Indonesia	40	43	41	44	34	43
Philippines	42	42	44	61	36	43
Vietnam	39	46	34	50	40	53

Note: The light shading indicates a deviation value of at least 40 and less than 50.
The dark shading indicates a deviation value of less than 40.

Source: JCER “Global Long-Term Forecast and Three Futures.”

1. Defining “middle-income”

In order to analyze the “middle-income trap,” it is first necessary to define “middle-income.” The World Bank classifies countries into income levels on the basis of per capita gross national income (GNI).

The classification baseline is altered one time per year. It is made public on July 1 of every year based on the per capita GNI from the previous year, and is not changed for the duration of the year. It is based on the nominal exchange rate, and so is revised annually so that the real value does not change.

Data from 2011 were used until June 30, 2013, and “middle-income” was defined as a per capita GNI of at least \$1025 and less than \$12,475. The 2012 data have been the baseline since July 1, 2013, and “middle-income” is defined as a per capita GNI of at least \$1035 and less than \$12,615.

Analyses of the middle-income trap also, at times, use per capita gross domestic product (GDP) depending on the person performing the analysis. GNI includes the net receipts of income from abroad by the general concept of the “populace,” but GDP does not include those net receipts as part of the general concept of “domestic.” Although GNI, based on the general concept of income, is preferable for classifying income compared to GDP, based on the general concept of product, GDP is often used as data are more easily obtained compared to GNI.

When comparing GNI or GDP among countries, it is not possible to make a comparison based on the currency of each country, and so it is necessary to adjust to a common unit. It is common for US dollars to be the baseline, but there are a number of methods for converting to US dollars represented primarily by two types: nominal exchange rate, and purchasing power parity (PPP).

The nominal exchange rate applies market exchange rates as-is, and so straightforwardly represents the value on a dollar basis at a particular point in time. However, it changes greatly when exchange rates fluctuate, even if the real state of the economy in the country in question remains the same. It is not suitable for continuous comparisons between countries, and so purchasing power parity is more often used for the exchange rate.

Purchasing power parity does not indicate the market exchange rate, but rather a ratio of common commodity prices between a particular country and the US. Annual fluctuations in commodity prices are reflected in it, but these are not large fluctuations, and so it is used as an index better representing the purchasing power in each country.

Middle-income has been defined using a variety of units and baselines, but to what degree are each of these consistent? What will be compared here are per capita GDP (on a 2005 PPP basis) and per capita GNI (in nominal dollars).

Figure 1 plots the values for each country/region in 2011 with per capita GNI (in nominal dollars) on the horizontal axis and per capita GDP (on a 2005 PPP basis) on the vertical axis.

Here, let us consider the relationship between nominal exchange rates and purchasing power parity. Purchasing power parity on a dollar basis is a ratio between commodity prices in the US and commodity prices in a given country, and is represented by the following formula:

$$\begin{aligned} &\text{Purchasing power parity (domestic currency / dollars)} \\ &= \text{domestic commodity prices (domestic currency) / US commodity prices (dollars)} \quad (1) \end{aligned}$$

The ratio between domestic commodity prices and US commodity prices in terms of the domestic currency is the domestic/foreign price difference. The cheaper commodity prices in a country are compared to those in the US, the lower the domestic/foreign price difference.

$$\begin{aligned} &\text{Domestic/foreign price difference} \\ &= \text{domestic commodity prices (domestic currency) / (US commodity prices (dollars) } \times \\ &\quad \text{nominal exchange rate (domestic currency / dollars))} \quad (2) \end{aligned}$$

Substituting formula (1) into formula (2) results in the following:

$$\begin{aligned} &\text{Purchasing power parity (domestic currency / dollars)} = \text{domestic/foreign price difference} \\ &\quad \text{(multiplicative factor) } \times \text{nominal exchange rate (domestic currency / dollars)} \end{aligned}$$

If there is no domestic/foreign price difference, the two match, but if there is such a difference and domestic commodity prices are cheaper than those overseas, purchasing power parity moves in the direction of appreciation of the domestic currency. In general, domestic commodity prices compared to those abroad tend to be lower in low-income countries and higher in high-income countries. As a result, purchasing power parity and nominal exchange rates do not have a linear relationship when incomes increase (Figure 1).

Figure 1: The relationship between GDP and GNI (1 of 2)

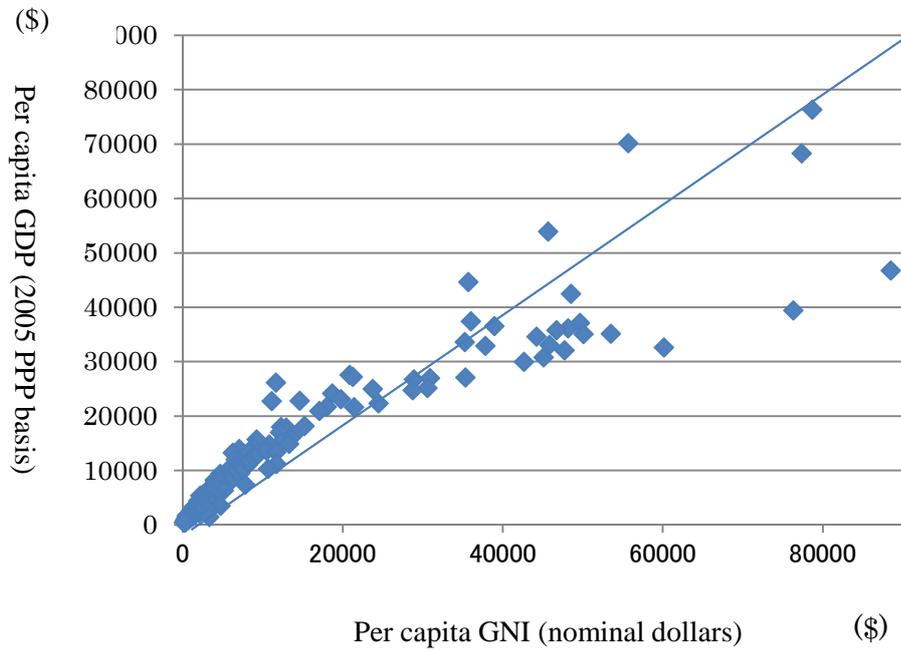
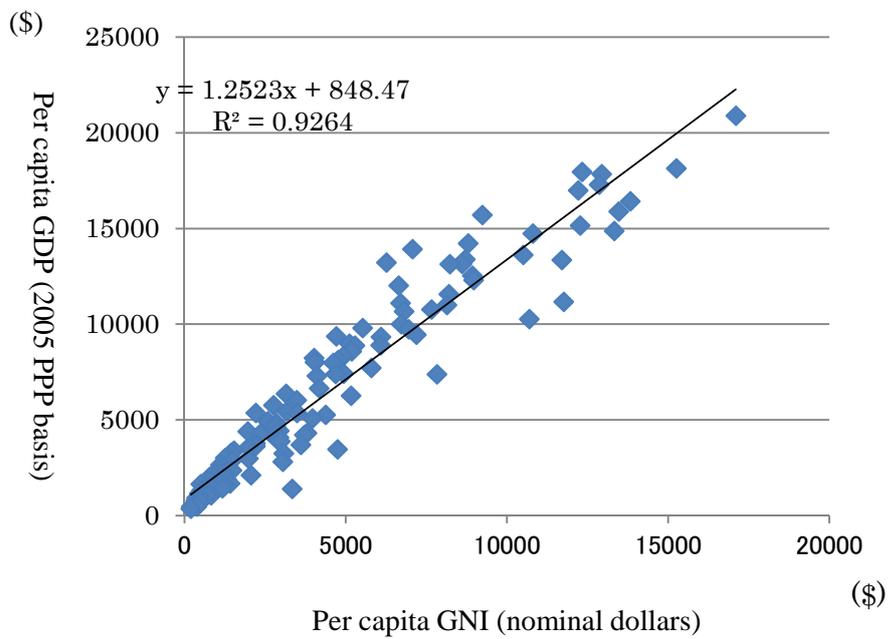


Figure 2: The relationship between GDP and GNI (2 of 2)



However, for countries with a per capita income up to approximately \$20,000 which are the topics here, this seems to approach a linear relationship (Figure 2). Examining the data from 2011, the following formula can be inferred:

$$\text{Per capita GDP} = 1.3 \times \text{per capita GNI} + 850$$

The standard for middle-income countries in Alyar et al. (2013) is similar to the result of substituting the World Bank standard in the inferred formula above. If the World Bank per capita GNI (on a nominal dollar basis) is estimated as per capita GDP (on a 2005 PPP basis), the upper limit for low-income countries becomes \$2132, which is a value approximately double the \$1000 per capita GNI (on a nominal dollar basis). The upper limit for lower-middle-income countries becomes \$5902 and the upper limit for upper-middle-income countries becomes \$16,471. The standard in Alyar et al. (2013) has an upper limit for low-income countries of \$2000 and an upper limit for upper-middle-income countries of \$15,000, which is broadly speaking similar to the World Bank standard.

In Felipe (2012), the PPP baseline differs by being from 1990, but the upper limit for low-income is similar to that of the World Bank. Nevertheless, the upper limit for lower-middle-income countries is higher than that of the World Bank, and the upper limit for upper-middle income countries is lower than that of the World Bank.

Figure 3: Definitions of middle-income countries

Source	Index	Upper limit for low-income countries	Upper limit for lower-middle-income countries	Upper limit for upper-middle-income countries
World Bank (FY2012)	Per capita GNI (nominal dollars)	1025 (2132)	4035 (5902)	12475 (16471)
Felipe (2012)	Per capita GDP (1990 PPP)	2000	7250	11750
Aiyar et al. (2013)	Per capita GDP (2005 PPP)	2000	-	15000

Note: The values in parentheses are estimated conversions to per capita GDP.

2. The reality of the middle-income trap

2.1 The middle-income trap depending on differences of definition

As seen in chapter 1, there are many definitions for “the middle-income trap.” Here, the reality of the middle-income trap as seen from income levels and as apprehended as the stagnation of growth is examined focusing on the ASEAN countries.

2.2 The middle-income trap as seen from income levels

IMF (2013), Chapter 3, “Is Middle-Income Asia at Risk of a Sustained Growth Slowdown?” makes the analysis that after reaching a per capita GDP on a PPP basis of \$3000, there are countries that grow and countries that stagnate. This way of thinking uses the point in time that a particular income is reached as a baseline, investigates how much income increased thereafter, and determines whether or not the country was caught in the trap. For example, after reaching a per capita GDP of \$3000, failing to reach \$10,000 after 30 years would be considered being caught in the trap. The analysis results notes Taiwan and South Korea as countries/regions that succeeded, and Brazil, Mexico, and Peru as countries that stagnated.

In IMF (2013), the boundary between low-income countries and middle-income countries is considered to be \$3000, but as seen in the previous section, the boundary between low-income and middle-income is often taken to be \$2000 on a PPP basis. Therefore, the income movements of countries/regions after reaching \$2000 was examined (Figure 4). The per capita GDP (on a 2005 PPP basis) data from the Penn World Table (PWT 7.1) were used.

The data start in 1950, and so many of the Western countries that had reached \$2000 by that time are not included in the table. Japan’s per capita GDP in 1950 was \$2787, and so Japan is also not included. Also, for countries for which data started to be collected later on, those which started above \$2000 are not included.

Although the lowest standard for a middle-income country to become a high-income country, which is in Felipe (2012), is \$11,750, a classification was performed with an even lower standard of having reached \$10,000. This is because looking at the movements of each country after reaching \$2000, there are not that many countries that even reached \$10,000.

After reaching \$2000, the only two countries/regions that reached \$10,000 within 30 years were South Korea and Taiwan. Countries which reached \$10,000 later, and grew steadily thereafter were St. Christopher and Nevis, Malaysia, and Panama. In 2012, the population of St. Christopher and Nevis was 54,000, and that of Panama was 3.4 million, and so both are small countries. After reaching \$2000, Malaysia exceeded \$10,000 after 35 years, standing at \$11,956 after 41 years in 2010, but has not reached the \$15,000 standard for being a high-income country according to Aiyar et al.

There are also many countries which have not reached \$10,000 for a long period of time. The countries which reached \$2000 but have not reached \$10,000 in the subsequent 60 years are South Africa and Bolivia. The Latin American countries of Chile, El Salvador, and Peru can be cited as countries which have taken over 50 years.

Figure 4: Income level trends in various countries after reaching \$2000

Classification	Countries
Reached \$10,000 by 30 th year	Taiwan (25 years), South Korea (24 years)
Other countries that reached \$10,000	St. Christopher and Nevis (34 years), <u>Malaysia</u> (35 years), Botswana (36 years, declined thereafter), Romania (44 years, declined thereafter), Panama (49 years)
Did not reach \$10,000 after at least 60 years	Nicaragua
Did not reach \$10,000 after at least 50 years but less than 60 years	Brazil, Dominica
Did not reach \$10,000 after at least 40 years but less than 50 years	Syria, Tunisia, Fiji
Did not reach \$10,000 after at least 30 years but less than 40 years	Swaziland, <u>the Philippines</u> , <u>Thailand</u> , Mongolia, Morocco, the Congo
Did not reach \$10,000 after at least 20 years but less than 30 years	Egypt, <u>Indonesia</u> , Maldives
Did not reach \$10,000 after at least 10 years but less than 20 years	Sri Lanka, Bosnia and Herzegovina, Armenia, <u>China</u> , Bhutan, Cape Verde
Less than 10 years after reaching \$2000	India, <u>Vietnam</u> , Pakistan, Uzbekistan, Laos, Sudan, Kyrgyzstan, Ghana

Source: classified using the PENN World Table

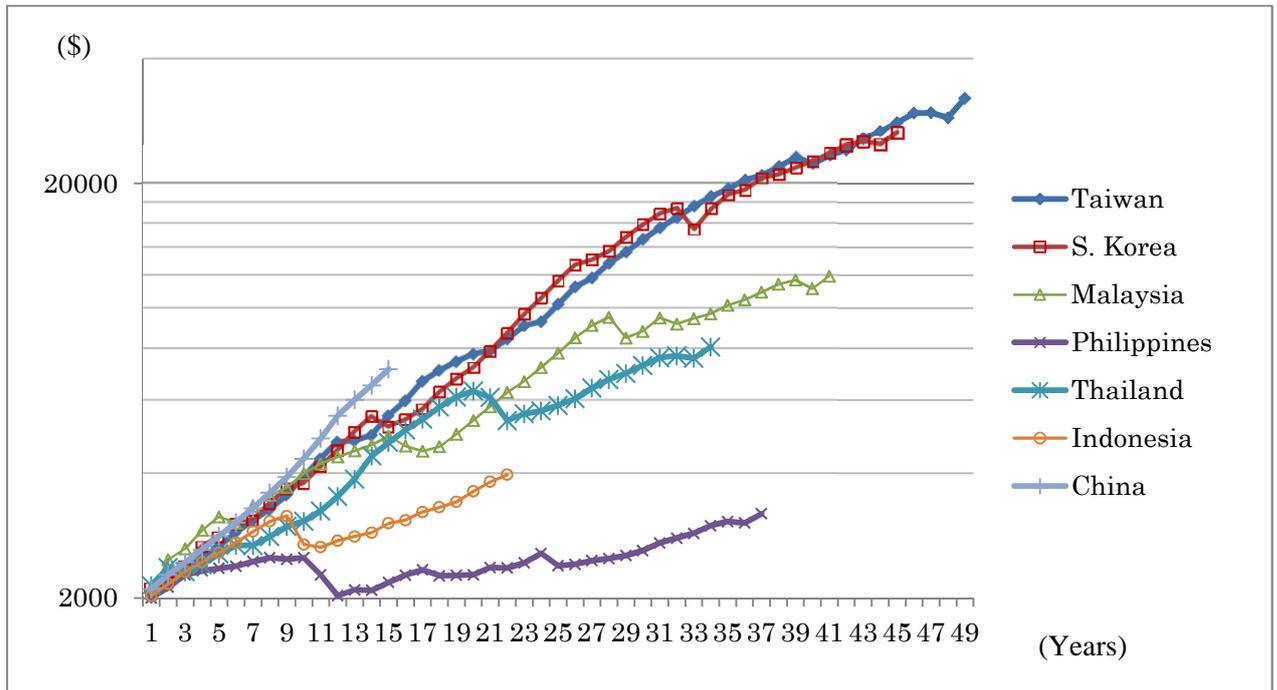
Figure 5 indicates the movements of per capita GDP after reaching \$2000. Thailand and the Philippines have not reached \$10,000 after over 30 years. Indonesia was at \$3966 on the 22nd year, China was at \$7130 on the 15 year, and Vietnam was at \$2780 on the second year.

The vertical axis is on a logarithmic scale, so the slope of the graph represents the growth rate. China had a growth rate exceeding that of South Korea and Taiwan, which were able to become high-income countries/regions. There is a high likelihood that China will reach \$10,000 soon. However, it is unknown whether the steady high growth rate will continue thereafter.

Malaysia continued with high growth until the fifth year, but its growth rate thereafter has not been as high as that of South Korea and Taiwan. Thailand, the Philippines, and Indonesia have even lower growth rates.

It is true that there are many countries that have not become advanced nations after becoming middle-income countries, and countries where incomes have steadily increased are the exception.

Figure 5: Per capita GDP in Asian countries/regions



Note: The per capita GDPs (PPP 2005 basis) are plotted from when \$2000 level was reached.

2.3 The middle income trap as the stagnation of growth

Meanwhile, Eichengreen et al. (2013) considers the situation of growth stagnation to be the middle-income trap. The conditions for stagnation are as follows: from a point in time t , the average growth rate in per capita GDP is calculated for a seven-year period before and after, and stagnation is diagnosed when 1) the average growth rate in the first half of the period is at least 3.5%, 2) the average growth rate in the second half of the period is at least two percentage points lower than that in the first half, and 3) the per capita GDP at time period t is at least \$10,000 (2005 PPP basis; below referred to as the “\$10,000 baseline”).

On this basis, the conclusion was that stagnation occurs when the per capita GDP reaches around \$10,000-\$11,000, and around \$15,000-\$60,000.

However, when considering the ASEAN countries, Malaysia is the only country that recently met these conditions. This is because the others do not fulfill the \$10,000 baseline criteria in 3).

Therefore, whether or not there was a stagnation in growth rates was examined excluding the condition in 3), and the years in which Japan, South Korea, Taiwan, Hong Kong, and the ASEAN countries met the conditions were listed.

Figure 6 has shading during the periods in which stagnation occurred for each country/region. The crosshatching is applied to stagnating growth including the \$10,000 baseline. The circles indicate the years in which per capita GDP reached \$10,000.

Looking at the table, it can be understood that the \$10,000 demarcation asserted by Eichengreen et al. (2013) is appropriate even when considering only Asia.

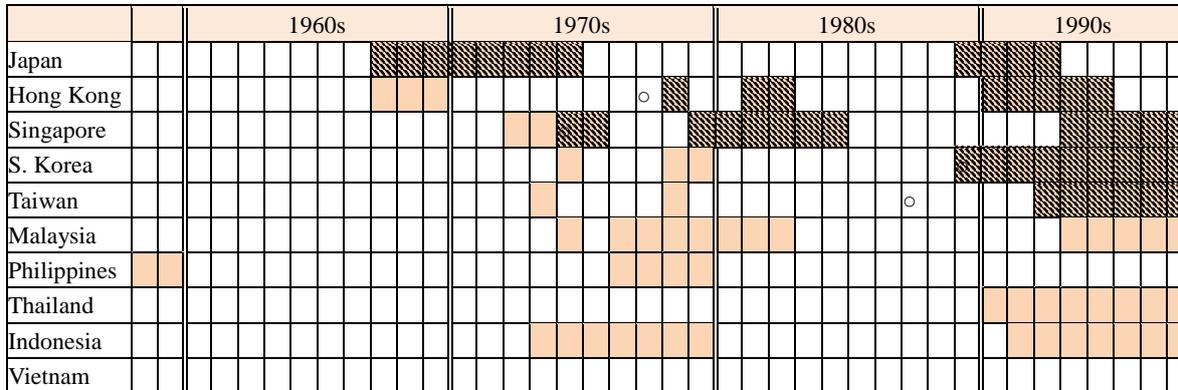
The per capita GDP in Singapore exceeded \$10,000 in 1974, and in Hong Kong in 1977. It can be understood that stagnation occurred around when \$10,000 mark was exceeded. A similar tendency can be noted for South Korea and Taiwan. There was a period of stagnation in the 1970s, but not in the 1980s. Taiwan exceeded \$10,000 in 1987 and South Korea did in 1989. Both countries/regions stagnated in the 1990s, at which point they had exceeded \$10,000.

Looking at the ASEAN countries, Malaysia, the Philippines, and Indonesia stagnated in the 1970s. In the 1990s, Malaysia, Thailand, and Indonesia stagnated. The reason there is no sign of the Philippine stagnation in the 1990s is that the growth rate was less than 3.5%, and so high growth has not been continuing.

Meanwhile, data are available from 1977 onwards for Vietnam, but the country has continued high growth, and has not experienced stagnation. Malaysia reached \$10,000 in 2004, and based on past experience, there is a possibility that it will stagnate in the future.

From the start of the 1990s, Japan, Hong Kong, Singapore, South Korea, Taiwan, and the ASEAN countries experienced stagnating growth. In Japan, the bubble burst and there was the Asian currency crisis in 1997. Looking at Figure 6, it would appear that Japan escaped stagnation the fastest in the 1990s, but this is due to ceasing to fulfill the requirement of an average growth rate of at least 3.5% in 1), and the growth rate actually dropped. It also seems that Japan's stagnation and the like depressed business in the Asian countries.

Figure 6: Stagnating growth



Note: The shading and crosshatching indicate satisfying the conditions for stagnation. The shading indicate satisfying the conditions excepting the \$10,000 baseline. The circles indicate the years in which per capita GDP reached \$10,000.

3. The relationship between institutions and growth

3.1 Forming an institution evaluation index

Institutional factors have recently been garnering attention as elements of economic growth. In addition to the production factors of labor and capital, institutions affect total factor production, and have the possibility of creating a difference in growth rate.

In JCER’s “Global Long-Term Forecast and Three Futures,” an “institution evaluation index” was formed by combining variety of institutional factors. Based on the results thereof, tactics for ASEAN to escape from the middle-income trap in the future are considered below.

“Global Long-Term Forecast and Three Futures” is an analysis using growth statistics. A Cobb-Douglas-type production function is envisioned for GDP. With Y being GDP, K being capital stocks, A being total factor productivity and H being the amount of labor input taking into consideration human capital, there is the following relationship:

$$Y = K^\alpha (AH)^{1-\alpha}$$

For human capital efficiency, the years of education E function (from Barro and Lee (2013)) is used.

$$H = e^{\phi(E)}L$$

For total factor productivity, the institution evaluation index function is used.

$$\text{Log}(A_t) = 8.44 + 1.21(0.4Z_{1t} + 0.35Z_{2t} + 0.05Z_{3t} + 0.15Z_{4t} + 0.05Z_{5t}) + e_t$$

The institution evaluation index is a newly introduced index, and combines five indices pertaining to institutions from Z_{1t} to Z_{5t} . The coefficient applied before each index is the weighting. Z_{1t} to Z_{5t} are indices selected by investigating the correlation with per capita GDP (Figure 7).

Z_{1t} (“politics”) is political risk, and the basis of the evaluation is the strength of bureaucratic institutions, the presence/absence of conflicts, and the like. Z_{2t} (“openness”) is economic openness, and represents to what degree trade, investment, and financial activities can be freely carried out with other countries. Z_{3t} (“gender”) is the gender gap, indicating the degree of equalization between men and women in the economy and politics, with the value rising the more equality there is. Z_{4t} (“entrepreneurship”) is the ease of starting a business, and is evaluated on the basis of the procedures, time, capitalization, and the like required to start a business. Z_{5t} (“labor”) is the degree of labor freedom, and evaluates ease of hiring and firing from the point of view of businesses.

The institution evaluation index influences total factor productivity, and total factor productivity influences economic growth. In this relationship, an improvement in institutions leads to an increase in growth rate.

Figure 7: The wellspring of growth; a summary of the institution evaluation index.

	Index	Summary	Presenting Institution	Document Name
Physical capital	Capital stock as a percentage of GDP	Capital stock is the cumulative value of investment minus depletion	OECD, etc.	
Age structure	Aging rate	The elderly as a percentage of population	World Bank	World Development Indicators
Years of education	Years of education	Average number of years in educational institutes		Barro and Lee (2013)
Quality of institutions	Aggregate of the indices below	Weighted calculation from the relationship between each item and per capita GDP	JCER	Global Long-Term Forecast and Three Futures
Politics	Political risk	Government stability (government unity, strength of the judiciary, national support), socioeconomic conditions (unemployment rate, consumer confidence, poverty), investment environment (contract executability, payment delays, repatriation of profits), internal conflict (civil war, terrorism/political violence, civil disorder), external conflict (war, border issues, external pressure), corruption, politics and the military, religious tensions, law and order, national tensions, accountability, quality of administration	Political Risk Services	International Country Risk Guide
Openness	Open markets	Trade freedom, investment freedom, financial freedom	The Heritage Foundation	Index of Economic Freedom
Gender	Gender gap index	Political authority, economic participation, opportunities	World Economic Forum	Global Gender Gap Index
Entrepreneurship	Starting business	Start-up period, minimum capital, costs, etc.	World Bank	Doing Business
Labor	Labor freedom	Ratio of minimum wage to average added value per worker, barriers to employing new workers, strictness of working hours, difficulty in eliminating surplus labor, legal notice period, retirement benefits	The Heritage Foundation	Index of Economic Freedom

3.2 The correlation between institutional factors and per capita GDP

Whether is possible to escape the middle-income trap is the same question as whether per capita GDP will continue to rise. First, in order to increase GDP, the state of production factors such as labor and capital is important. Institutional factors have a concomitant effect on growth. It is difficult to change the preconditions of labor and capital stocks, and so in many ways these must be taken as a given. However, there is room for improvements in institutions, including the number of years of education, which has an effect on human capital. Looking at the relationship between per capita GDP and the institution evaluation index for 2010, there are

many countries where the per capita GDP exceeds \$10,000 when the index exceeds 50. There are also countries such as Egypt where the per capita GDP is extremely low at \$1492 even with an index of 49.1, but it can be said that once the index exceeds 50, the path towards becoming a high-income country opens up.

3.3 An evaluation of growth factors in each country

What are the weak points of the ASEAN countries etc. from the perspective of economic growth factors, institutions, and the like? An index was compiled with two evaluation axes in order to observe the characteristics of each country (Figure 8).

The subjects were Japan, the US, China, South Korea, and the nine ASEAN countries excluding Brunei. Each index is represented as a “deviation” with a standard deviation of 10 from a global average of 50.

The first evaluation axis is the wellspring of growth. A variety of factors that form the GNI are used. As production factors, there are labor and capital. Age structure (the population over age 65 as a percentage of total population) and the number of years of education are used as having an effect on the quality of the labor force. Physical capital refers to capital such as stores and factories, and its degree of fullness is represented by a capital coefficient (capital stock/GDP). Furthermore, total factor productivity is considered to be influenced by the quality of institutions, and so the quality of institutions is also an important factor. The second evaluation axis is a breakdown of the quality of institutions. As explained above, these are politics, openness, gender, entrepreneurship, and labor.

Figure 8: The wellspring of growth and institution evaluation index for the ASEAN countries

	The wellspring of growth (deviation values)					Institution evaluation index (deviation values)				
	GNI	Quality of institutions	Physical capital	Age structure	Years of education	Politics	Openness	Gender	Entrepreneurship	Labor
US	63	61	49	46	66	60	57	57	61	70
Japan	60	54	78	27	61	60	49	41	49	62
S. Korea	50	52	46	51	59	53	53	40	49	40
Malaysia	44	45	46	61	51	48	42	40	45	55
Thailand	42	44	51	55	42	38	48	48	48	57
Indonesia	41	40	48	60	39	43	41	44	34	43
Philippines	41	42	44	62	49	42	44	61	36	43
Vietnam	40	39	48	59	38	46	34	50	40	53
China	42	38	49	56	46	43	35	50	38	44
India	41	31	46	60	34	25	39	43	32	47
Laos	40	33	41	62	33		33		44	48
Cambodia	40	40	34	62	39		47	46	31	38
Bangladesh	40	32	41	61	36	27	35	49	42	44

Note: The light shading indicates a deviation of at least 40 and less than 50, and the dark shading indicates a deviation of less than 40.

Source: JCER “Global Long-Term Forecast and Three Futures”

Malaysia

Although Malaysia ranks slightly above South Korea in terms of physical capital (capital coefficient), with a deviation value of 46, it is below average from a global perspective. Like the other ASEAN countries as well, the age structure is younger than that of South Korea, with a deviation of 61. The number of years of education is the highest after the US, Japan, and South Korea among the countries listed.

Malaysia has an institution evaluation index for 2010 of 45. This is the highest value within ASEAN. Although ranking higher than South Korea for labor, the deviation for gender is 40, the lowest alongside South Korea. The other values are inferior to those of South Korea. Its openness value of 42 is lower than that of the other ASEAN countries.

Thailand

Thailand has a high value for physical capital (capital coefficient) indicating advancements in capital accumulation. Despite an age structure deviation of 55, it ranks lowest within ASEAN, and so the aging of the population has progressed, relatively speaking. The number of years of education is lower than that in Malaysia, the Philippines, and China, and is relatively short compared to the size of the GNI.

Thailand's institution evaluation index for 2010 is 44, the next highest in ASEAN after Malaysia. The labor value of 57 is the highest after the US and Japan. The values for openness and gender also exceed those in Malaysia. The fact that the value of the institution evaluation index, which is a comprehensive index, is lower than that for Malaysia is solely caused by the low value for politics.

The Philippines

The Philippines has a deviation value for physical capital (capital coefficient) of 44, which is low among the ASEAN countries. The value for age structure is the highest after Cambodia at 62, and the number of years of education is average, with a deviation value of 49. The institution evaluation index is 42, ranking third after Malaysia and Thailand among the ASEAN countries. Due to a low gender gap, the gender value ranks highest among the countries listed at 61. The value for the ease of starting business is extremely low, at 36.

Indonesia

Indonesia has a value for physical capital (capital coefficient) of 48, which is average, and with an age structure value of 60, an aging problem has not arisen. Meanwhile, the deviation value for number of years of education is 39, which is low among the ASEAN countries.

The institution evaluation index is 40. The deviation for entrepreneurship is in the range of 30. An overall improvement in institutions is necessary.

Vietnam

Vietnam has similar tendencies to Indonesia. The physical capital (capital coefficient) value is average at 48. The age structure value is high at 59. The number of years of education has a deviation value of 38.

The institution evaluation index is one lower than Indonesia, at 39. In particular, efforts are needed to raise openness (deviation of 34) and entrepreneurship (deviation of 40).

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