APO Productivity Databook 2021

Asian Productivity Organization

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Designed in Tokyo by
Koh Tsuchiya / Perfect Vacuum

Printed in Japan by
Keio University Press Inc., Tokyo

for
ASIAN PRODUCTIVITY ORGANIZATION
1-24-1 Hongo, Bunkyo-ku
Tokyo 113-0033, Japan

978-92-833-2507-9 (Paperback)
978-92-833-2508-6 (PDF format)
978-92-833-2509-3 (e-format)

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Abbreviations

ADB	Asian Development Bank
APO	Asian Productivity Organization
APO21	21 member economies of the Asian Productivity Organization: Bangladesh, Cambodia, Republic of China, Fiji, Hong Kong, India, Indonesia, Islamic Republic of Iran, Japan, the Republic of Korea, the Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand, Turkey, and Vietnam
ASEAN	Association of Southeast Asian Nations, which consists of 10 countries of Brunei, Cambodia, Indonesia, the Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. The ASEAN is separated to two groups in Databook, i.e., the ASEAN6 and CLMV.
ASEAN6	Brunei, Indonesia, Malaysia, the Philippines, Singapore, and Thailand
Asia25	APO21 plus Bhutan, Brunei, China, and Myanmar
Asia31	Asia25 plus GCC countries
CLMV	Cambodia, the Lao PDR, Myanmar, and Vietnam
CPI	consumer price index
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
COE	compensation of employees
DX	digital transformation
ESRI	Economic and Social Research Institute, Cabinet Office of Japan
EU	European Union
EU15	15 member economies of the European Union prior to enlargement: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom
EU28	European Union: the EU15 plus Bulgaria, Republic of Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, and Slovenia
FDI	foreign direct investment
FISIM	financial intermediation services indirectly measured
FTAs	free trade agreements
GCC	Gulf Cooperation Council: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE
GDP	gross domestic product
GFCF	gross fixed capital formation
GNI	gross national income
GVCs	global value chains
ICP	International Comparisons Program
ILO	International Labour Organization
IMF	International Monetary Fund
IOT	Input-Output Table
IPP	intellectual property products
ISIC	International Standard Industry Classification of All Economic Activities
IT	information technology
KEO	Keio Economic Observatory, Keio University
LDCs	less developed countries
M&E	machinery and equipment
NPISHs	non-profit institutions serving households
OECD	Organisation for Economic Co-operation and Development
PPP	purchasing power parity
QALI	quality adjusted labor inputs
QNA	quarterly national accounts
RCEP	Regional Comprehensive Economic Partnership
ROC	Republic of China
R&D	research and development
SNA	System of National Accounts
SUT	Supply and Use Tables
TFP	total factor productivity
UAE	United Arab Emirates
UN	United Nations
UNSD	United Nations Statistics Division
WTO	World Trade Organization

Foreword

The COVID-19 pandemic has had a significant negative impact on Asia-Pacific economies, particularly on trade and supply chains. Some APO members were more vulnerable than others. They have been disproportionately affected and are dealing with severe recessions. Overall, it will be challenging for most economies to fully recover from the global economic downturn.

The 2021 edition of the *APO Productivity Databook* aims at supporting member governments in coping with current challenges, including the pandemic, while helping them to devise timely policy responses to make economies more robust, maintain growth trajectories, and recover quickly.

In the year marking the 60th anniversary of the foundation of the APO, this 14th edition of the *APO Productivity Databook* focuses on the quality of economic growth and productivity with comparisons among countries at different development stages in Asia. This edition covers almost half a century of data, from 1970 to 2019, with projections of economic growth and labor productivity improvement through 2030.

The analyses in this edition are based on comprehensive productivity accounts (APO Productivity Database) for 25 Asian economies along with the USA as a reference. In addition to the productivity accounts of each economy, regional productivity accounts are developed for six economic groups in this edition. The COVID-19 pandemic and its effects on Asian economies are analyzed and discussed in detail.

It is hoped that the *2021 APO Productivity Databook* will serve a useful reference on the current and future status of productivity in the region for all involved in researching, measuring, and designing policies for socioeconomic growth. The APO is grateful for the contributions of Keio Economic Observatory, Keio University, Tokyo, in researching, analyzing, and writing the 2021 edition of this continuing Databook series. The APO also acknowledges and deeply appreciates the invaluable inputs of all contributors who helped in the development of the APO Productivity Database and Databook. The APO will continue working with national statistics offices in its members to improve data quality.

Dr. AKP Mochtan
Secretary-General
Asian Productivity Organization
Tokyo, October 2021

1 Introduction

1.1 Databook 2021

In the 60th anniversary year of the foundation of APO, we present the fourteenth edition of the *APO Productivity Databook*. The Databook aims to provide a useful reference for the quality of economic growth and productivity, which is comparable across countries at different development stages in Asia. This edition covers almost half a century, from 1970 to 2019, with our projections of economic growth and labor productivity improvements through 2030.

The only route to sustainable economic growth in the long run is through productivity gains that enable an economy to produce more for the same amount of inputs, or to consume less to produce the same amount of outputs. Thus, it follows that monitoring and improving national productivity are important targets of public policy.

Baseline indicators on economic growth and productivity are calculated for 31 Asian economies, representing the 21 Asian Productivity Organization member economies (APO21) and the 10 non-member economies in Asia. The APO21 consists of Bangladesh, Cambodia, the Republic of China (ROC), Fiji, Hong Kong, India, Indonesia, the Islamic Republic of Iran (Iran), Japan, the Republic of Korea (Korea), the Lao People's Democratic Republic (Lao PDR), Malaysia, Mongolia, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand, Turkey, and Vietnam. The 10 non-member economies in Asia are: the Kingdom of Bhutan (Bhutan), Brunei Darussalam (Brunei), the People's Republic of China (China), Myanmar, and the Gulf Cooperation Council (GCC) consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). In addition, Australia, the European Union (EU), and the United States (US) are included as reference economies.

The analyses in the Databook series are based on the comprehensive productivity accounts (APO Productivity Database), which have been developed by a joint research effort between the APO and the Keio Economic Observatory (KEO), Keio University, since 2007. In this edition of the Databook, the productivity accounts are developed for 25 Asian economies (Asia25) – the APO21 plus Bhutan, Brunei, China, and Myanmar – along with the US as a reference economy. This edition reflects the revised productivity account for China in APO Productivity Database 2021, based on our study with Professor W. Erwin Diewert (University of British Columbia).

The sources of economic growth in each economy are further decomposed to factor inputs of capital and labor and total factor productivity (TFP). In addition to the productivity account in each economy, the regional growth accounts are developed in the APO Productivity Database for six economy groups: the APO21, the Asia25, East Asia, South Asia, CLMV, and the ASEAN6 (see the Abbreviation for the country list of these country groups). In developing the regional productivity accounts, consideration is given to the price differentials among economies on capital and labor inputs, as well as on outputs, by following the framework in Nomura (2018). The level comparison in this edition is based on the 2017 benchmark estimates on the purchasing power parities (PPPs), which was published in April 2020 by the International Comparisons Program (World Bank 2020a).

The productivity measures in the Databook are based mainly on the official national accounts. In the Asia25, the System of National Accounts 2008 (2008 SNA) by United Nations (2009) has been introduced in 17 economies, either partially or fully. Because the varying SNA adaptions among the economies can result in discrepancies between data definitions and coverage, data harmonization is necessary for comparative productivity analyses. The Databook attempts to reconcile these national account variations which are based on the different concepts and definitions. This is done by following the 2008 SNA and providing harmonized estimates for better international comparison.

To analyze the overall productivity performance (TFP), as well as productivity subsets (capital productivity and labor productivity), the aggregate measure of capital service is developed. Taking into account the composition change of assets, the current database classifies 16 types of assets: 11 types of fixed assets (including IT and R&D capital), four types of land, and inventory. In most Asian countries it is a challenging task to develop the data on average prices of land (for agricultural, industrial, commercial, and residential uses) at the national level. The Databook follows land data, which has been developed at KEO for each of the Asia25 since 2016. However, it is necessary to continuously review it to verify its accuracy. In this edition, two revisions have been made to capital measurement. First, the damages by natural disasters were newly considered in capital stock measurement of produced assets (Box 6). Second, inventory is newly considered as one of the capital inputs (Section 9.2.3).

Since 2013, researchers at KEO have been engaged in the project to develop a comprehensive labor database on number of workers, hours worked per worker, and hourly wages (which are cross-classified by gender, education attainment, age, and employment status). This allowed for measuring the quality-adjusted labor inputs (QALI) for all economies of Asia25. The Asia QALI Database is used to identify the impact of labor quality changes from the gross estimates of TFP and to estimate the total labor share with some assumptions. The first report of the Asia QALI Database was provided in Nomura and Akashi (2017) for six South Asian countries. This edition of the Databook follows the Asia QALI Database 2021, in which some microdata were newly used in Bangladesh, Mongolia, and the Philippines and a comprehensive revision was conducted for Vietnam (Nomura and Shirane 2020).

The structure of the Databook is as follows. The recent trends in global and regional economic growth and the summary of findings are presented in Chapter 2. In order to understand the dynamics of the long-term economic growth within Asia, Chapter 3 details countries' diverse development efforts and achievements through cross-country level comparisons of GDP. Decompositions of GDP, which is defined by three approaches in SNA – production by industry, expenditure on final demand, and income to factor inputs – are valuable in understanding the structure and, in turn, the behavior of an economy. Chapter 4 presents the demand side decomposition, analyzing the sources of countries' expenditure growth.

In Chapter 5, the supply side decompositions of economic growth and productivity improvement are analyzed in each country and region. The different composition of economic activity among countries is one of the main sources of the vast gap in average labor productivity at the aggregate level. The industry structure is presented in Chapter 6. Chapter 7 analyzes the income side of GDP by measuring the growth of real income and evaluating an improvement, or deterioration, in the terms of trade.

Chapter 8 provides the country profiles on productivity indicators from 1970 to 2019 and our projections through 2030 for the APO21 economies and five regions: the APO21, the Asia25, East Asia, South Asia, and the ASEAN. As a new feature of this edition of the Databook, the labor input as the source of economic growth is decomposed to college and non-college labor inputs. Finally, Chapter 9 presents the methodological note on the frameworks and assumptions used in this edition of the Databook.

The official national accounts and metadata information used for constructing the APO Productivity Database 2021 has been collected by national experts in APO member economies and research members at KEO. These contributors are listed in Section 1.2. The submitted data was then examined and compiled at KEO, where further information on labor, production, prices, trades, and taxes was collected. Readers should consider that international comparisons of economic performance are never a precise science. Instead, they are fraught with measurement and data comparability issues. Operating within a reality of data issues, some of the adjustments in the Databook are necessarily conjectural, while others are based on assumptions with scientific rigor. Despite best efforts in harmonizing data, some data uncertainty remains.

This edition effectively reflects the revisions to the official national accounts and other statistical data published through June 2021 and the population prospects published in June 2019 by United Nations (2019). The project was managed by Koji Nomura (Keio University), under the consultancy of Professor Dale W. Jorgenson (Harvard University) and Professor W. Erwin Diewert (University of British Columbia), and with coordination by Asaithambi Manickam (APO). The text, tables, and figures of this edition were authored by Koji Nomura and Fukunari Kimura (Keio University), with support from research assistants Hiroshi Shirane and Shiori Nakayama. The Databook project appreciates Eunice Ya Ming Lau for her contribution to developing the foundation of the Databook series during her stay at KEO and Trina Ott for her review of the draft.

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2 Current Trend

At the time of writing, COVID-19 continues to plague the world. While some countries are showing signs of strong recovery, numerous uncertainties exist. Many countries have a vaccine supply and processes in place, however the progress and distribution is imbalanced throughout the world. Additionally, the emergence of COVID-19 mutations with high infection rates generates cases even in areas with high vaccination ratios, making the achievement of social immunity a challenge. Although restrictions such as lockdowns and social distancing are gradually loosened, tightened borders are likely to continue and uncertainty remains regarding the normalization of the world economy.

Before the COVID-19 outbreak, Asia's growth performance remained strong, though it showed signs of slowing due mostly to the weakening of a rule-based trading regime. In Asia 31 and East Asia, the average annual growth of GDP at constant market prices in 2015–2019 was 4.6% and 4.7%, respectively, while the one-year growth rate in 2018–2019 was 3.3% and 3.6%.

Advanced economies also posted respectable performance. The US economy showed solid growth despite turmoil in the international trading regime. The average annual growth of GDP at constant market prices in 2015–2019 was 2.3%. The unemployment rate went down to 3.7% in 2019, which was historically low by the US standard. The European economy recorded recovery with an average annual growth rate of GDP at constant prices in 2015–2019 in EU15 and EU28 of 1.8% and 2.0%, respectively. The Japanese economy performed well though its potential growth rate stayed low. The annual growth of GDP at constant market prices in 2015–2019 in Japan was 0.8%, while the unemployment rate dropped as low as 2.2% in 2019.

Although the growth slowdown continued, China still achieved 6.0% in the average annual growth of GDP at constant market prices in 2015–2019, with 4.6% in 2018–2019. The impact of the US-China trade war, and a number of structural economic challenges, decelerated the growth. Korea, heavily depending on the Chinese economy, also lost pace, posting 2.8% growth in 2015–2019 with 2.3% in 2018–2019.

Latecomers in ASEAN – Cambodia, Lao PDR, and Myanmar – have maintained growth in the past two decades, reaching $1,760, $2,640, and $820 in the per capita GDP using exchange rate in 2019, respectively. However, rapid and sustained economic growth, will require them to engage in international production networks (Ando and Kimura 2005) more deeply. Vietnam successfully achieved deeper involvement in international production networks and had $2,730 per capita GDP using exchange rate in 2019. However, the ratio of manufacturing value added to GDP was as low as 18.3% in 2019. The development of supporting industry and industrial agglomeration is necessary in order to generate employment and nurture human capital.

The Philippines and Indonesia are in the process of forming efficient industrial agglomeration with $3,520 and $4,230 in per capita GDP using exchange rate in 2019. Thailand, Malaysia, and Singapore reached $8,050, $11,200, and $65,600 in per capita GDP using exchange rate in 2019 though they struggled with the industrial upgrading and new development strategies.

Although the South Asian countries have not taken full advantage of international production networks, some have been successful in connecting with slow global value chains in labor-intensive industries such as garment and footwear. The per capita GDP using exchange rate in 2019 in Nepal, Pakistan, Bangladesh, and India is $1,210, $1,210, $1,820, and $2,100, respectively.

Moving forward into 2020, economies were exposed to what was the worst year in recorded history. Most economies in the world, including advanced and developing economies, experienced negative economic growth. According to the *World Economic Outlook* (International Monetary Fund April 2021), real GDP

growth rates in 2020 were –3.3% in the world, –4.7% in advanced economies, and –2.2% in emerging market and developing economies; in our region, –1.3% in Asia and Pacific, 0.8% in East Asia, –3.3% in Southeast Asia, and –6.5% in South Asia. Although a few countries including China, Vietnam, and Myanmar recorded positive growth, with substantial deceleration from normal pace, most of the countries suffered from negative growth.

Despite such devastating losses, our financial sector maintained, and asset markets did not collapse, which was quite different from our past experience in the Great Depression (1929–) or the Global Financial Crisis (2007–2008). Significant mitigation policies are credited for escaping collapse with governments maximizing relief efforts despite the accumulation of government debt, which marked the emergence of new macroeconomic thought. Series of such unprecedented policies were instrumental in keeping most parts of our economies alive despite massive economic slowdowns.

In the surge of infection in China and the following spread after February 2020, many expressed serious concern on the resilience of global value chains (GVCs). Some journalism claimed this would mark the end of GVCs era, and factories located in newly developed and developing countries must come home, which is called "reshoring." Others argued that further diversification of production blocks could enhance the resilience of supply chains, especially to avoid concentration of production activities in one specific country. Some suggested this new normal requires an adjustment to a "just in case" mentality rather than "just in time," and advised private companies to strengthen their risk management systems. However, supply chains in East Asia, particularly international production networks, or the second unbundling (Baldwin 2016) in machinery industries, remained almost intact. Retrospection may reveal some over-reactions to initial shocks.

Three causes are identified for the overreactions (Ando, Kimura, and Obashi 2021). First, many did not understand the complicated nature of supply chain shocks generated by COVID-19 and anti-infection health measures such as lockdowns and social distancing. Different from crises in the past including the Global Financial Crisis, the East Japan Earthquake, and the Thai Flooding, COVID-19 generated the following three types of shocks at different times in different places: negative supply shocks, positive demand shocks, and negative demand shocks. In countries other than China, negative supply shocks were first perceived in February 2020 as disrupting imports of parts and final products from China. Other countries also generated negative supply shocks themselves due to lockdowns as the disease spread. However, imports from China resumed very quickly, within months, and negative supply shocks in other countries were also terminated quickly. On the other hand, masks and other personal protective equipment (PPE) as well as medical related goods had positive demand shocks due to COVID-19. We temporarily experienced a fear in losing supplies of "essential" goods including food. Some countries introduced export restrictions on those goods in order to prioritize domestic demand, which is perceived as negative supply shocks by importing countries. However, with the exception of the supply of vaccines, such an excess demand situation was resolved relatively early.

Negative demand shocks should have been at the forefront of concerns, due to risk of deep recession throughout the world. However, as previously mentioned, unprecedented mitigation policies implemented by governments worldwide kept the financial sector intact and avoided a collapse of asset markets. Although negative demand shocks were clearly present, economic activities reflected by GDP and international trade mostly bottomed out in the second quarter of 2020, and economies came into the recovery phase. In recovery, another positive demand shock appeared for teleworking-related goods such as personal computers, monitors and stay-home-related goods such as electronics and office furniture, which allowed East Asia to resume active exports to North America and Europe. It is noted that the recovery is in the K-shape in which the performance is widely different across industrial sectors.

International production networks, which are considered the sophisticated portion of GVCs, held strong against temporary supply or demand shocks in past crises (Ando and Kimura 2012). However, these robust statistical analyses were not well recognized by policymakers and journalists. While it is true that international production networks can be shock transmission channels, well-designed relation-specific transactions in international production networks are built on investment in the middle and long-run perspectives and thus more robust (less likely to be interrupted) and resilient (more likely to resume) than other types of transactions. International production networks can actually work as a built-in stabilizer. Companies certainly design and operate international production networks taking into consideration the tradeoff between efficiency due to fragmentation of activities and risk management. As more information comes to light regarding COVID-19 shocks, companies may review and enhance their production networks.

Third, some policymakers overreacted to geopolitical tensions. Combined with initial negative supply shocks due to import interruption and positive demand shocks on medical related goods, some called for the reshuffling of supply chains. With the exception of some operations with sensitive technologies or rare earth, as well as PPE, the massive relocation of production sites is not evident. Although the move of "decoupling" must be carefully monitored, business operations that extended to the whole of East Asia proved critical for many companies.

In order to make international production networks more robust and resilient, it is important to widen and deepen networks by improving investment climate and connectivity. In particular, latecomers in ASEAN and South Asia, including India, can be frontiers of production networks. Although DX (digital transformation) is likely to change the nature of manufacturing production in the future, advantages of task-by-task international division of labor will remain for a decade or two. Developing Asia must take advantage of Factory Asia to accelerate economic growth and poverty alleviation with ample job creation for relatively poor people in the manufacturing sector and related services sector.

The success of Factory Asia was supported by the long-lasting peace and rule-based trading regime. The recent weakening of the latter is a serious concern in the region, because managing geopolitical tension between superpowers is arduous at best. However, the middle-powers in between may want to reduce policy risks and preserve the rule-based trading norm as much as possible. One approach would be the formation of mega-FTAs (free trade agreements). The conventional role of mega-FTAs has been to promote further liberalization and international rulemaking. These roles are continuously important as the World Trade Organization (WTO) cannot take a strong initiative as a negotiating forum to catch up with the globalizing world. Another role of mega-FTAs, recently added, is to reduce policy risks and keep the rule-based trading regime, at least partially. Mega-FTAs are "living" agreements. Negotiations, signing, and entry are not the final goal. Rather, effectively utilizing the agreement and upgrading the contents over time is paramount. In that sense, the deepening of ASEAN economic integration and the expansion of the membership in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) are important for East Asia. The Regional Comprehensive Economic Partnership (RCEP) was signed in November 2020 by 10 ASEAN Member States, China, Japan, South Korea, Australia, and New Zealand. With time RCEP may play an important role in maintaining the rule-based trading regime in East Asia with the ASEAN Centrality. India's fear of a possible increase in trade deficit removed them from the negotiations, though their entry into RCEP could serve as a trigger for India to conduct the necessary reform of trade and industrial promotion policies to join Factory Asia.

COVID-19 is accelerating the introduction of digital technology in both developed and developing economies. Various matching businesses on the internet have flourished in the past two decades. Particularly in newly developed and developing economies, the internet connection through smartphones has explosively increased since the iPhone was introduced in 2008, and internet businesses have expanded at an

exponential rate. Since approximately 2015 or so, the frontier of internet businesses, particularly in China, started shifting from simplistic matching services to tighter integration with traditional industries and businesses. Grabs and Gojek in ASEAN are examples of such business innovation starting from the rejuvenation of transport businesses and further developing to integrated connection services. Disruptive innovation (Bower and Christensen 1995) with digital technology would also change the manufacturing sector that was a champion of gradual innovation with R&D. The introduction of information technology (IT) such as industrial robots in newly developed and developing countries may strengthen their positions in production networks, supplemented by the further reduction in service, links costs with communications technology (CT) (Obashi and Kimura 2020). Factory Asia must keep up with the DX in the world.

Big challenges are on the horizon in the latter half of this year and next.

Box 1 The Cost of COVID-19 Pandemic

The cost of the COVID-19 pandemic consists of two parts: the economic cost and the health cost. Figure B1 presents international comparison in the year-on-year GDP growth rates in the period from the second quarter of 2020 and the first quarter of 2021 and the number of deaths per million people due to COVID-19 as of March 31, 2021. Although many economies are still struggling with multiple waves of infection with mutants, the figure gives us a rough idea of the total cost that we would bear due to COVID-19.

Figure B1 Cumulative Confirmed COVID-19 Deaths per Million People and Economic Growth

Unit: Persons (ppm: parts per million) and percentage (year-on-year growth rate). Sources: Our World in Data (https://ourworldindata.org/coronavirus), OECD stat, and official quarterly national accounts in each country. Note: Cumulative confirmed deaths as of March 31, 2021.

The figure indicates that most of the economies listed here experienced negative economic growth in 2020. Indeed, as the World Bank (2020b) claimed earlier, the COVID-19 crisis was worse than the Great Depression in that a large number of economies, including both developed and developing economies, experienced economic contraction. Few exceptions include ROC, Vietnam, and China that contained the pandemic at minimum and recorded positive growth.

Many Asian economies performed relatively well in limiting the spread of the disease as of March 2021, while the GDP growth rates in 2020 were negative. Although GDP growth rates and the number of deaths per

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million seem to have a clear negative correlation among non-Asian economies, the correlation looks substantially weak among Asian economies. Required health policies such as lockdowns and social distancing restrained economic activities even if the containment of the disease was largely going well. The exit process started in the latter half of 2020, and the so-called K-shape recovery with large disparity across industries and sectors was observed. Tradable sectors came back to normal in general, particularly with positive demand shocks on work-at-home or do-it-yourself type goods. On the other hand, transportation, tourism, and on-site services were hit hard. Such differences across industries or sectors may partially explain diversity in growth rates across economies.

Cutler and Summers (2020) estimated the total loss in the US due to COVID-19 as US$16 trillion, equivalent to 90% of annual GDP or US$200,000 per family with four members, half of which is the economic loss and the rest is the health loss by missing healthy life. The paper was published in October 2020 and estimated losses assuming that the containment of the disease would be completed by Autumn 2021. Counting unemployment insurance claims and mitigation policies borne by government debt as a loss, the estimate of economic loss seems realistic. The health loss counts costs of COVID-19-related deaths vis-a-vis "statistical lives" and reduced quality life due to prognostic symptoms and mental health conditions. Of course, how to translate health losses into monetary terms would be controversial, but the rough magnitude of the estimate is shocking. Although the calculation in the paper may not be applied directly to other economies, it at least confirmed that the COVID-19 crisis was a historical tragedy.

3 Economic Growth

Highlights

- The economic scale of the Asia31 was 32.7 trillion US dollars in 2019 in terms of exchange-rate-based GDP, which is 52% greater than the US (Table 8). Japan was the largest economy in Asia until 2008. In the following year China overtook Japan's position to become Asia's largest economy (Figure 3).
- In terms of PPP-based GDP, the Asia31 was 2.8 times that of the US in 2019 (Figure 5). In this measure, China has overtaken Japan as the largest Asian economy since 2000, and the US since 2016. In 2009, India surpassed Japan, replacing it as the second largest economy in Asia. In the same period, the ASEAN also surpassed Japan (Table 9).
- The economic growth rate of the Asia31 was 4.6% per year on average in 2015–2019 (Figure 6 and Table 10). The growth in China and India accounted for 49% and 19% of this regional growth, respectively. (Figure 7).
- Average per capita GDP of the Asia31 was $14,100 in 2019, which is still 22% of the US level (Table 13). Chinese per capita GDP increased to $17,000 in 2019, 20% greater than the Asia31 average. The regional averages of the ASEAN6, South Asia, and CLMV were $15,000, $6,530, and $6,610, respectively, in 2019 (Figure 11). A huge per capita GDP gap between most of the Asian countries and the US is predominantly explained by an inferior performance of labor productivity (Figure 14).

From the mid-1980s, the story of the world economy belonged to Asia, featuring its steady rise in economic prominence. Figure 1 compares the growth rates of regional economies in the entire observation period 1970–2019 and our projection period 2019–2030 (as drawn with a dotted line). It is no surprise that the center of gravity in the global economy is gradually shifting towards Asia. In 2019, the Asian economy contributed 47% (42% for the Asia25) of world output, compared with the US and the EU28, accounting for 16% and 16%, respectively, as shown in Figure 2. According to our projection for the Asia25 economy and the rest of the world, the Asian share in world output will continue to rise, reaching 51% (47% for the Asia25) by 2030.[1] In contrast, the output shares of each of the US and the EU28 will decrease to 14%.

To better understand the dynamics of long-term economic growth within the region, the remainder of this chapter details countries' diverse development efforts and achievements, through cross-country level comparisons of GDP and other related performance indicators. To facilitate international level comparisons, harmonized GDP for each of the individual countries is expressed in its equivalent, in a common currency unit, customarily in the US dollar, using a set of conversion rates between the individual national currencies. The choices for conversion rates are exchange rate and PPP.

3.1 Economy of Asia

Figure 3 presents the time-series level comparison of Japan, China, and the EU, based on GDP at current market prices using exchange rates,[2] relative to the US. The chart covers the entire observation period 1970–2019 and our projection period 2019–2030 (as drawn with a dotted line). A snapshot-level

1: Our projections of economic growth for the Asia25 are provided in Box 8. These reflect the economic growth in the first quarter of 2021, where available.

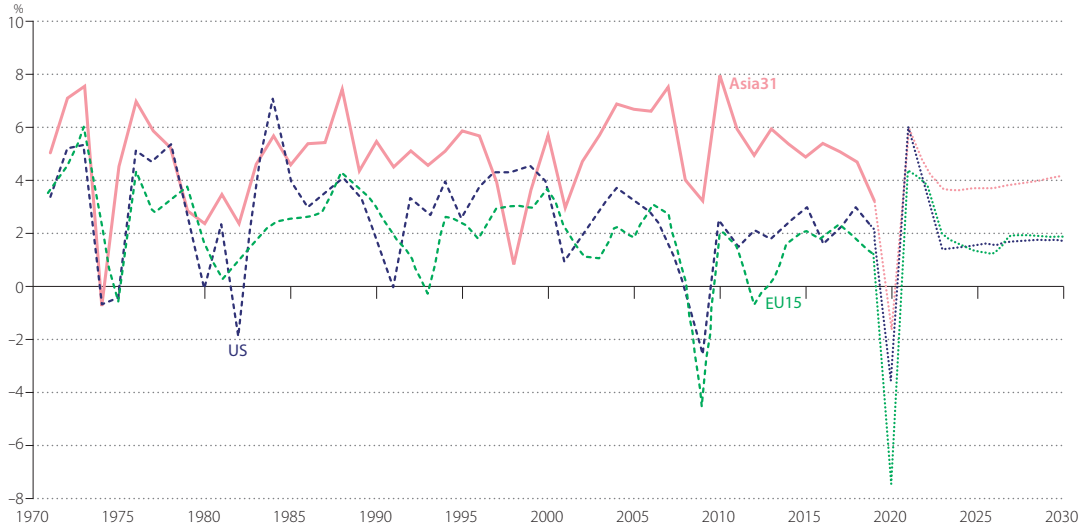

Figure 1 GDP Growth of Asia, the EU, and the US
——Annual growth rate of GDP at constant market prices in 1970–2019 and our projection period 2019–2030

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8). Note: Our projections are drawn with a dotted line.

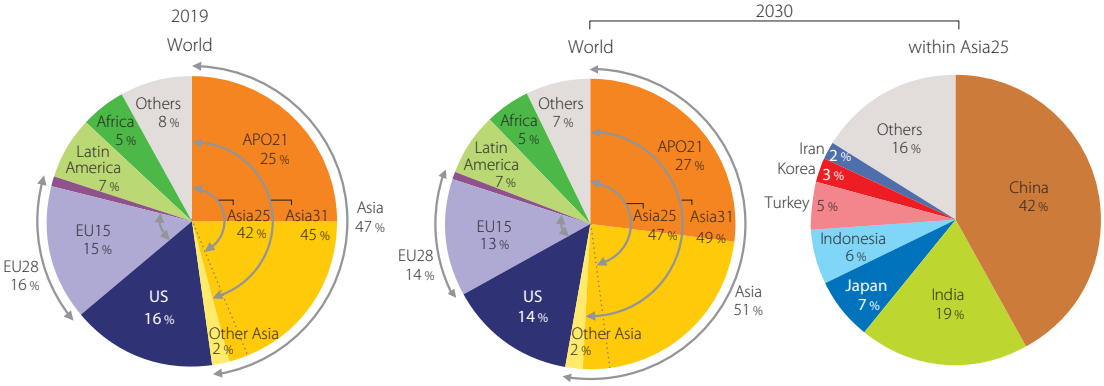

Figure 2 Asia in World GDP in 2019 and Projection for 2030
——Share of GDP using constant PPP

Sources: Our estimates for the Asia25 economies, IMF (2021) for rest of the world, and our projections (Box 8).

comparison of all Asian countries is provided in Table 8 in Appendix 3. By this measure, in 2019 the Asia31 was 52% and 55% greater than the US and the EU15, respectively. Japan was the largest economy in Asia until 2008. In the following years China overtook Japan's position to become the second-largest economy in the world, next to the US. The turn of Japan's fortune came in the mid-1990s. Thereafter,

2: The exchange rates used in this *Databook* are the adjusted rates, which are called the Analysis of Main Aggregate (UNSD database) rates in the UN Statistics Division's National Accounts Main Aggregate Database. The AMA rates coincide with the IMF rates (which are mostly the annual average of market, or official exchange rates) except for some periods in countries with official fixed exchange rates and high inflation, when there could be a serious disparity between real GDP growth and growth converted to US dollars based on IMF rates. In such cases, the AMA adjusts the IMF-based rates by multiplying the growth rate of the GDP deflator relative to the US.

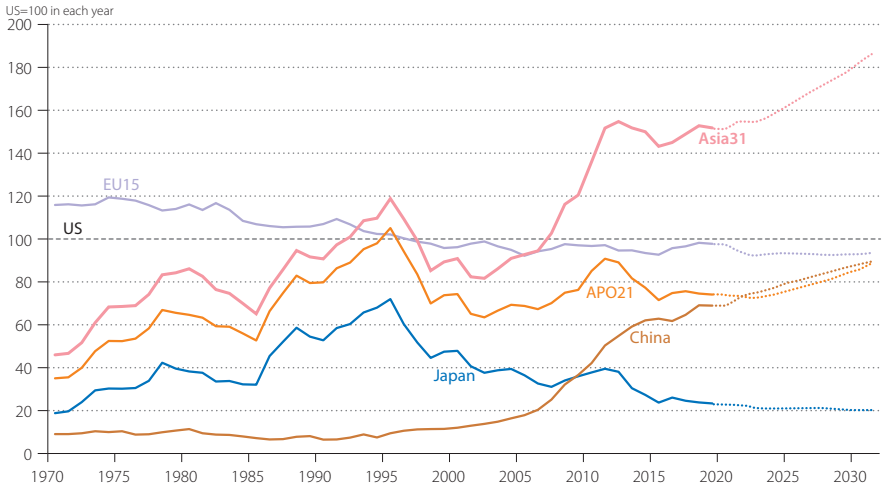

Figure 3 GDP using Exchange Rate of Asia and the EU, Relative to the US
——Index of GDP at current market prices in 1970–2019 and our projection period 2019–2030, using annual exchange rate

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8).
Note: Our projections are drawn with a dotted line (exchange rates are assumed to be unchanged after 2019).

stagnation in Japan, combined with vibrant growth in developing Asia, resulted in the rapid erosion of Japan's prominence in the regional economy.

Comparisons based on exchange rates, however, appear arbitrary as movements in exchange rates can be volatile and subject to short-term or substantial fluctuations of speculative capital flows and government intervention. Furthermore, comparisons based on exchange rates typically underestimate the size of a developing economy and, in turn, the perceived welfare of its residents. The scale of economy ranking changes dramatically when international price differences are taken into account.[3]

Figure 4 shows the extent to which the exchange rates have failed to reflect countries' price differentials, relative to the US, based on the PPP estimates of the 2017 International Comparisons Program (ICP) round, published in April 2020.[4] Except for Australia, exchange rates systematically under-represent the relative purchasing power in 2017 for all the countries covered in this report. Thus, the exchange-rate-based GDP considerably underestimates the economic scales in real terms for those countries. By considering the international price differentials, PPP rectifies the trade sector bias, and in turn the relative size of economies can be more adequately measured.

By correcting international price differentials, the Asia31 has been expanding rapidly. Figure 5 presents the level comparisons of real GDP for Asian regions, using PPP as conversion rates, while Table 9 in Appendix 3 presents cross-country comparisons. Based on GDP using constant PPP, the weight of the world economy is even more tilted toward Asia in Figure 5 than portrayed by GDP using exchange rates in Figure 3. This reflects the fact that nearly all Asian countries increase in relative size after international price differentials have been properly considered. The size of the Asia31 was 2.8 times that of the US in

3: This is because exchange rates embody the trade sector bias (i.e., it is more influenced by the prices of traded than non-traded goods and services) and thus do not necessarily succeed in correcting the price differentials among countries. As developing economies tend to have relatively lower wages and, in turn, lower prices for non-traded goods and services, a unit of local currency has greater purchasing power in the local economy than reflected in its exchange rate.
4: The revision on the PPPs from the ICP 2011 round, which has been used until the Databook 2019, are presented in Appendix 1.

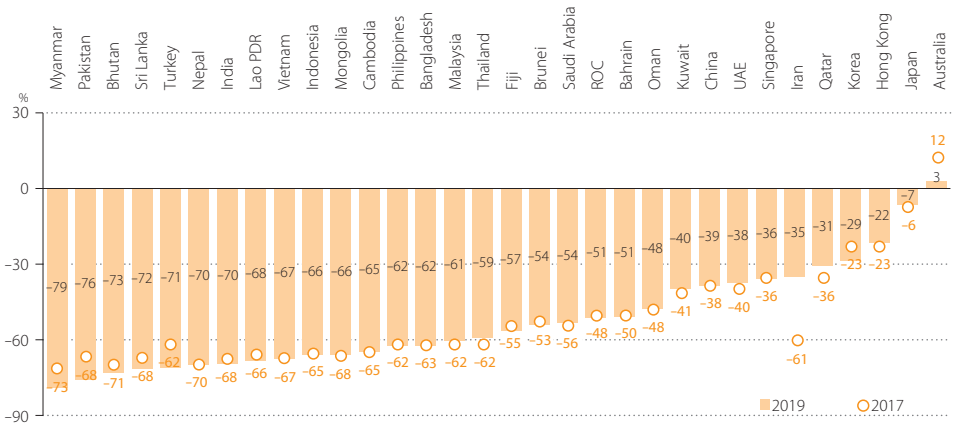

Figure 4 Price Differentials of GDP
——Price Level Index for GDP defined as the ratio of PPP for GDP to exchange rate (reference country=US) in 2017 and 2019

Sources: PPP by World Bank (2020a) and AMA rates by United Nations Statistics Division (UNSD).

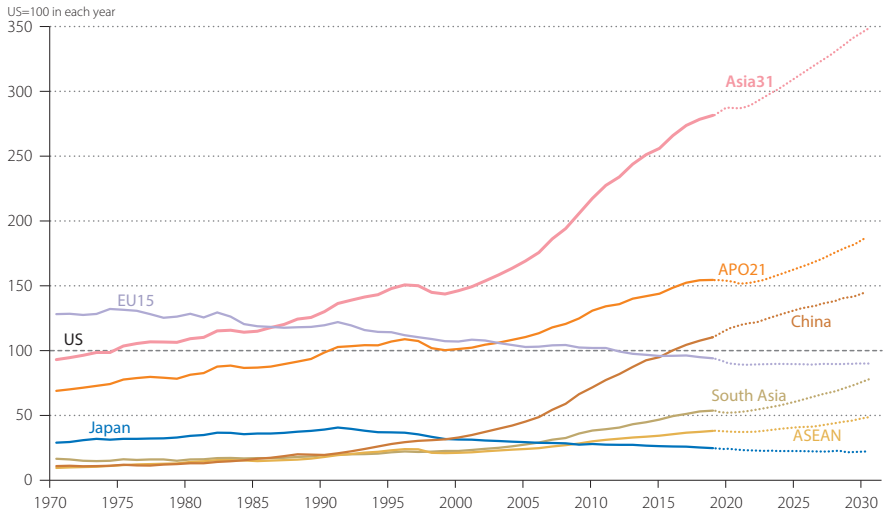

Figure 5 GDP of Asia and the EU, Relative to the US
——Index of GDP at constant market prices in 1970–2019 and our projection period 2019–2030, using 2017 PPP

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8).
Note: Our projections are drawn with a dotted line.

2019, overtaking it in 1975. Figure 5 also shows the rapid expansion of the relative size of the South Asian economy, 81% of which was accounted for by India in 2019.[5] The ASEAN also showed strength in their catch-up effort.

Figure 6 shows regional comparisons of real GDP growth, while Table 10 in Appendix 3 presents cross-country comparisons. The change of guards in Asia is clearly illustrated in Figure 7, which presents the

5: The South Asia consists of Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka.

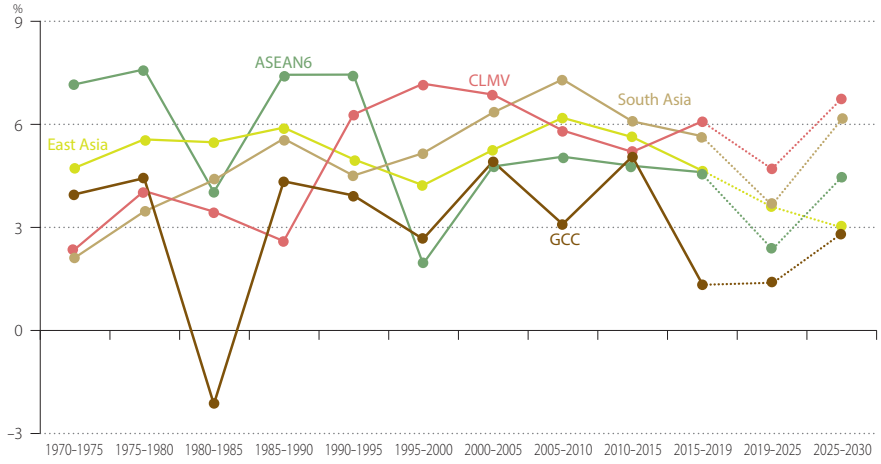

Figure 6 GDP Growth by Region
——Average annual growth rate of GDP at constant market prices in 1970–2019 and our projection period 2019–2030 (drawn with a dotted line), using 2017 PPP

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8).
Note: Our projections are drawn with a dotted line.

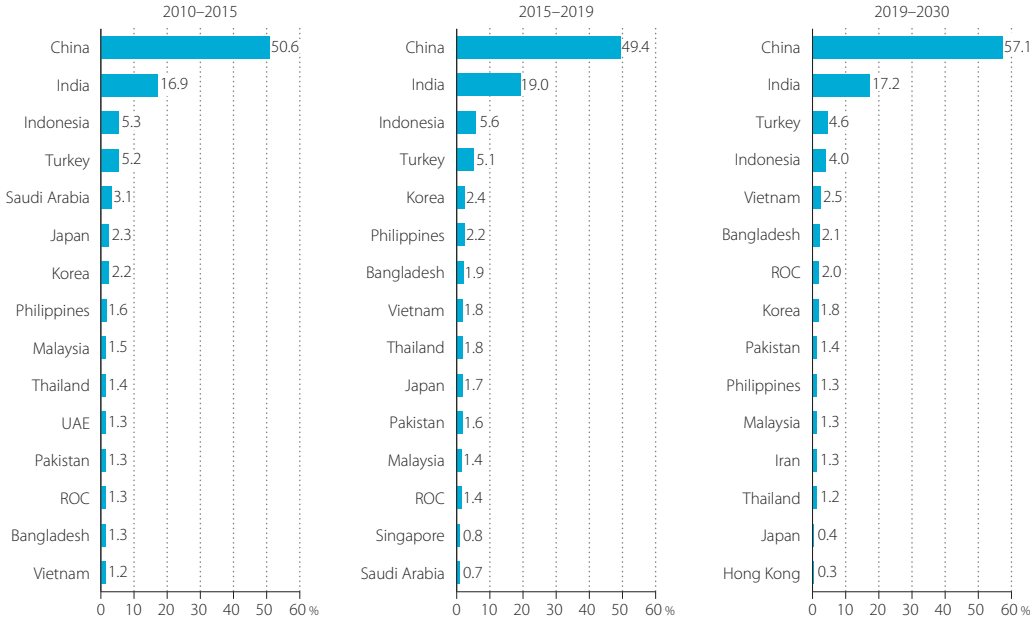

Figure 7 Country Contributions to GDP Growth of Asia
——Contribution share to the growth of gross regional products (the Asia31 growth=100) in 2010–2015, 2015–2019, and 2019–2030 (our projections)

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8). Note: Only the top 15 countries are presented. The average annual growth rate of GDP in Asia31 are 5.4% in 2010–2015, 4.6% in 2015–2019, and 3.6% in our projection period 2019–2030.

country contributions to gross regional products in the Asia31. China and India have emerged as the driving force, propelling Asia forward since 1990 (Table 9). Growth in China and India accounts for 68% of the regional growth in 2015–2019.

3.2 Per Capita GDP

Figure 8 presents the share of the current world population, illustrating that Asia is the most populous region in the world. In 2019, the population of Asia accounted for 59% of the world's population (56% for the Asia31). In addition, there is a significant difference in the population among Asian economies, as shown in Table 11 in Appendix 3. The population of seven countries was in excess of 100 million in 2019, but the populations were less than 10 million in 12 economies of the Asia31. Performance comparisons based on the whole-economy GDP in Section 3.1 do not take into account the population, which can exaggerate the wellbeing of countries with large populations. Based on per capita GDP, which adjusts for the differences in population, China and India, two rising giants in the Asian economy, remain substantially less well-off in light of the US standard. Conversely, the Asian Tigers (Hong Kong, Korea, Singapore, and the ROC) thrive.

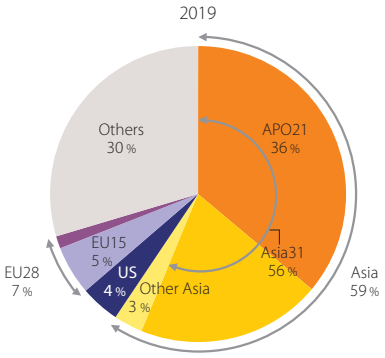

Figure 8 Asia in World Population
——Share of number of populations in 2019

Source: United Nations (2019).

Figure 9 shows comparisons of per capita current-price GDP, using exchange rates as conversion rates, among Japan and the Asian Tigers, relative to the US. A snapshot-level comparison is also presented in Table 12 in Appendix 3. It is worth noting that snapshot comparisons can appear arbitrary due to the volatile nature of exchange rates.

The views found in Table 12 are considerably revised when focusing on production or real income per capita, using PPP as the conversion rate. In terms of per capita GDP at constant prices using PPP in Figure 10 and Table 13 in Appendix 3, Japan was the highest among Asian countries until it was overtaken by Singapore in 1990.[6] The result highlights the outcome of the dramatic development effort made by the Asian Tigers, as shown in Figure 10.

The relative performance of China and India, the two most populous countries in the world (1.40 billion and 1.37 billion in 2019, respectively, as presented in Table 11 in Appendix 3) is diminished in this measure due to their population. Their per capita GDP is 26% and 11% of the US in 2019, respectively, as shown in Figure 11. The income gap between the US and most Asian countries is still sizable (the level achieved by the Asia31 was 22% of the US),[7] indicating a significant opportunity for catch-up.

Table 13 in Appendix 3 also presents individual figures for seven oil-rich economies (the six GCC countries and Brunei). At first glance, figures in 1970, and to a lesser extent those in 1990, suggest these economies had remarkably higher per capita GDP than Japan and the US. However, the measurement of GDP as an indicator of production is misleading for these countries, as it erroneously includes proceeds from the liquidation of a natural resource stock as part of the income flow. In other words, GDP overestimates income from the oil-exporting economies because it does not account for depletion of their natural resource assets. To give a rough indication of the extent of distortion, Figure 12 provides comparisons

6: Based on the new benchmark revision in Japan's System of National Accounts by ESRI, Cabinet Office of Japan, published as of the end of 2020, the year when Singapore overtook Japan in terms of per capita GDP was revised from 1987 to 1990.

7: Per capita GDP may have underestimated the welfare of people in some countries. In the ROC, Hong Kong, and Japan, for example, GNI is consistently higher than GDP although the fluctuations are within +6%. The Philippines is the exception where the divergence between GNI and GDP has been increasing and has become significant for the past two decades, and GNI was more than 10% higher than GDP in the 2010s (Figure 72 in Section 7.1).

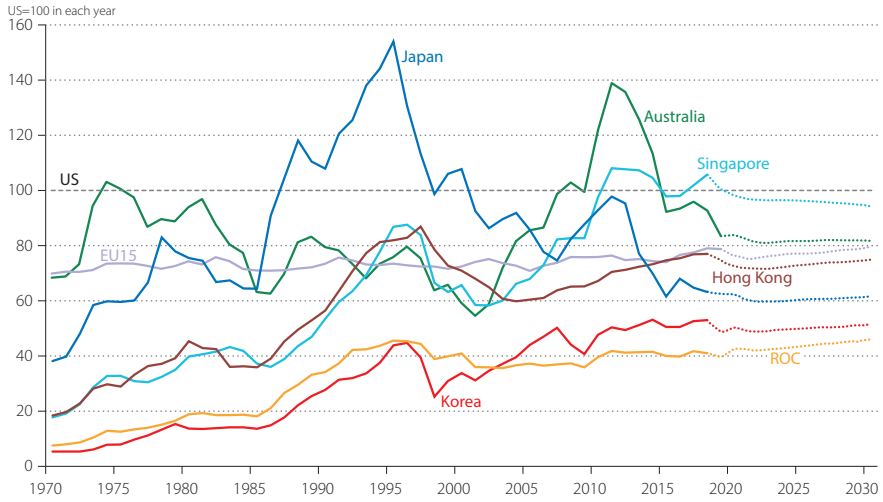

Figure 9 Per Capita GDP using Exchange Rate of Japan and Asian Tigers, Relative to the US

——Index of GDP at current market prices per person in 1970–2019 and our projection period 2019–2030 (drawn with a dotted line), using annual average exchange rate

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8).
Note: Our projections are drawn with a dotted line (exchange rates are assumed to be unchanged after 2019).

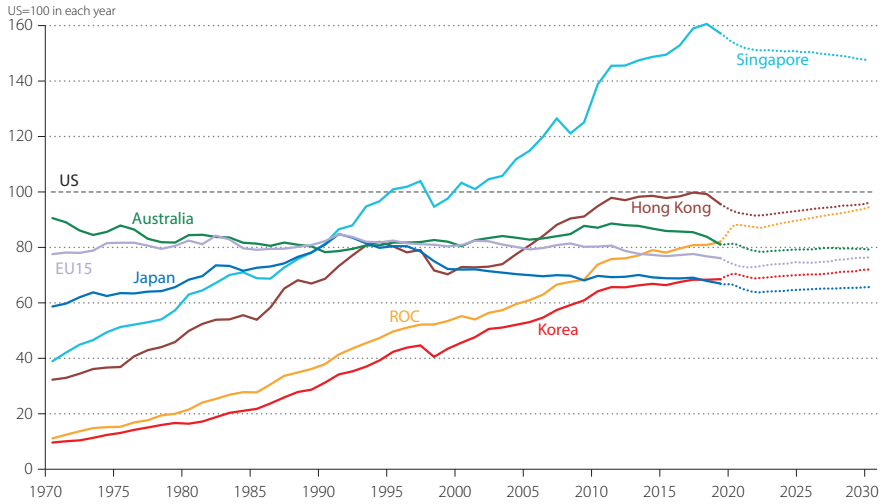

Figure 10 Per Capita GDP of Japan and Asian Tigers, Relative to the US

——Index of GDP at constant market prices per person in 1970–2019 and our projection period 2019–2030 (drawn with a dotted line), using 2017 PPP

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8).
Note: Our projections are drawn with a dotted line.

of per capita GDP excluding production of the mining sector (e.g., crude oil and natural gas). The non-mining GDP per person in GCC economies, such as Bahrain, Saudi Arabia, and Kuwait, is almost identical to Japan's level, although total GDP per capita is much larger. In Iran and Malaysia, the dependence on the mining sector is more moderate than those in GCC in this period.

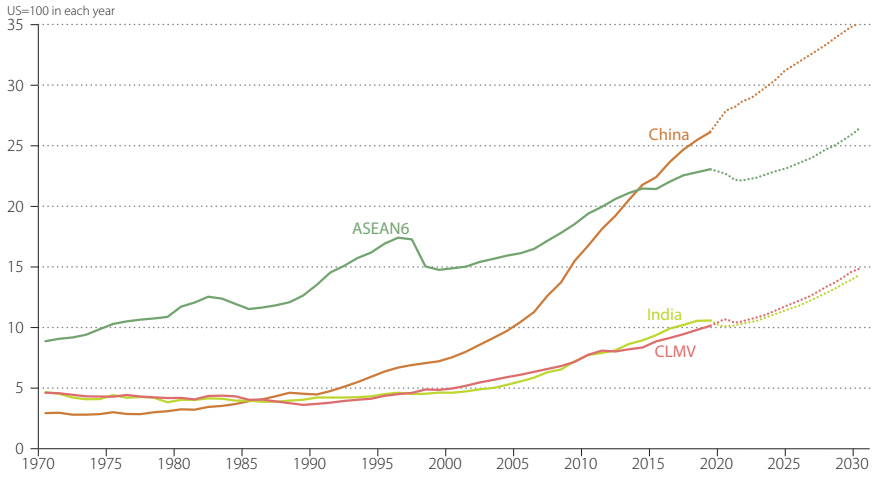

Figure 11 Per Capita GDP of China, India, and the ASEAN, Relative to the US
——Index of GDP at constant market prices per person in 1970–2019 and our projection period 2019–2030 (drawn with a dotted line), using 2017 PPP

Sources: Official national accounts in each country, including author adjustments, and our projections (Box 8).
Note: Our projections are drawn with a dotted line.

Catching up with the per capita GDP level of advanced economies is a long-term process that could take several decades to accomplish. Empirical evidence suggests there may be a negative correlation between per capita GDP level and the speed of catching up, with some exceptions. With the possibility of adopting successful practices and technologies from the more advanced economies, less advanced economies are poised to experience faster growth in per capita GDP, enabling themselves to catch up to average income levels. However, as their income levels approach those of the more advanced countries, their economic growth rates are expected to gradually decline over time. Figure 13 plots countries' initial per capita GDP levels against their respective average growth rates per year between 1970 and 2019.

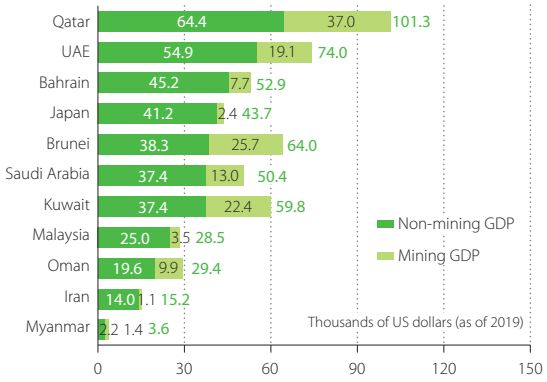

Figure 12 Per Capita Non-Mining GDP of Resource-Rich Countries and Japan
——GDP at constant market prices per person in 2019, using 2017 PPP, reference year 2019

Sources: Official national accounts in each country, including author adjustments.

Table 1 summarizes Figure 13 by grouping countries with four levels of per capita income groups. The speed of catch-up with the US is defined as the difference in the average annual growth rate of per capita real GDP between each country and the US. It shows that many Asian countries have managed to close the gap in per capita real GDP with the US over the last four decades, although some are more successful than others. One can see the initial economic level does not fully explain the catch-up process. If it did, the table would have been populated diagonally from the bottom left corner to top right corner.

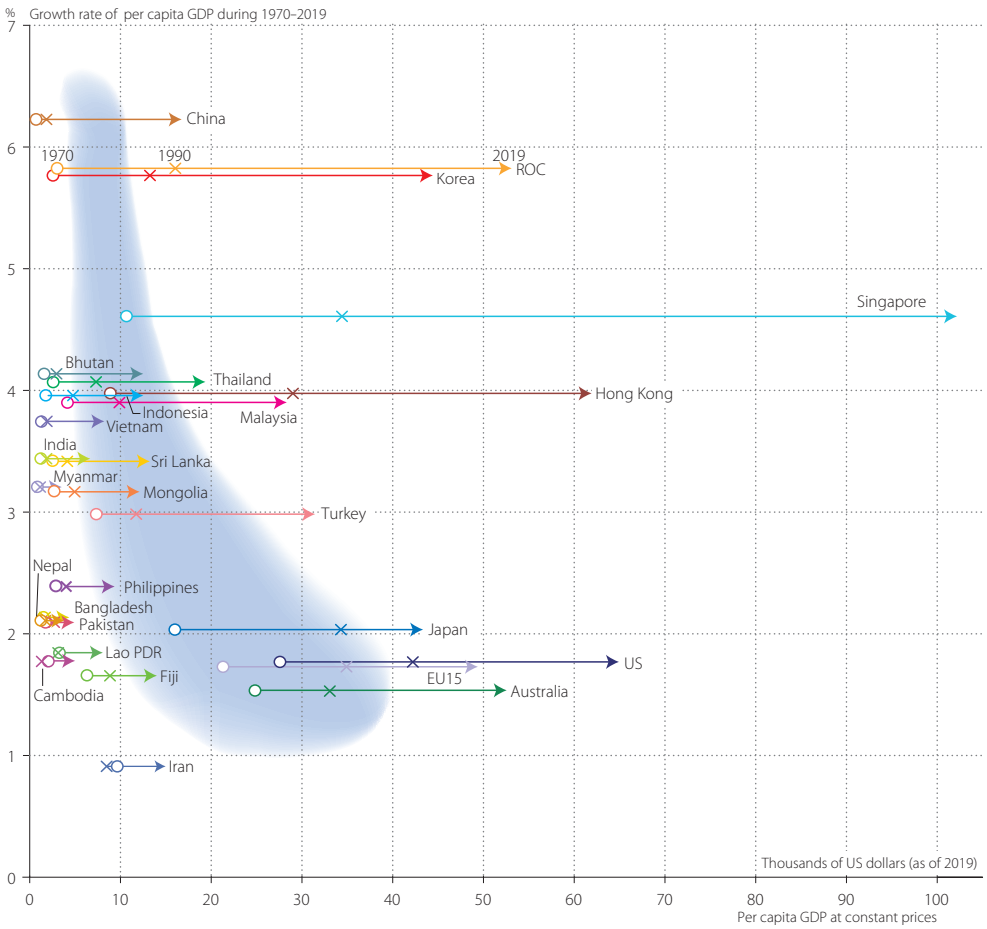

Figure 13 Initial Level and Growth of Per Capita GDP
——Level and average annual growth rate of GDP at constant market prices in 1970–2019, using 2017 PPP, reference year 2019

Sources: Official national accounts in each country, including author adjustments.

Table 1 Country Groups Based on the Initial Economic Level and the Pace of Catching Up
——Level and average annual growth rate of per capita GDP at constant market prices, using 2017 PPP

Per capita GDP level in 1970, relative to the US	Average annual rate of catch-up to the US during 1970–2019					
	(A6) <–1%	(A5) –1% ≤–< 0%	(A4) 0% ≤–< 1%	(A3) 1% ≤–< 2%	(A2) 2% ≤–< 3%	(A1) 3% ≤
(B1) 60% ≤	Bahrain, Brunei, Kuwait, Qatar, Saudi Arabia	Australia, EU15, UAE				
(B2) 20% ≤–< 60%		Fiji, Iran	Japan, Oman	Turkey	Hong Kong, Singapore	
(B3) 10% ≤–< 20%			Lao PDR, Philippines		Malaysia	ROC
(B4) 0% ≤–< 10%			Bangladesh, Cambodia, Nepal, Pakistan	India, Mongolia, Myanmar, Sri Lanka, Vietnam	Bhutan, Indonesia, Thailand	China, Korea

Sources: Official national accounts in each country, including author adjustments. Note: The annual catch-up rates are based on the difference in the growth of per capita GDP at constant prices between each country and the US during 1970–2019.

3.3 Sources of Per Capita GDP Gap

To further understand the diverse performance in the Asian group, per capita GDP can be broken into two components: labor productivity (defined as real GDP per worker in this section); and the employment rate (defined as the ratio of workers relative to the population). Figure 14 shows the percentage point differences in per capita GDP decomposed into the contributions by the labor productivity gap and the employment rate gap, relative to the US in 2019.[8] Most of the Asian countries display a huge per capita GDP gap with the US. This is predominantly explained by their inferior performance of labor productivity. Many countries in East Asia have employment rates higher than the US, with the effect of narrowing the gap. Figure 15 focuses on explaining a country's per capita GDP growth by its components: namely labor productivity growth; and the change in the employment rate for the period 2010–2019, respectively.[9] For most countries, labor productivity explains a larger share of per capita GDP growth than employment.

In the Muslim countries of Iran, Pakistan, and Turkey, the employment rate is significantly less than the US, further reinforcing the poor economic performances of these countries (Figure 14). Their cultural

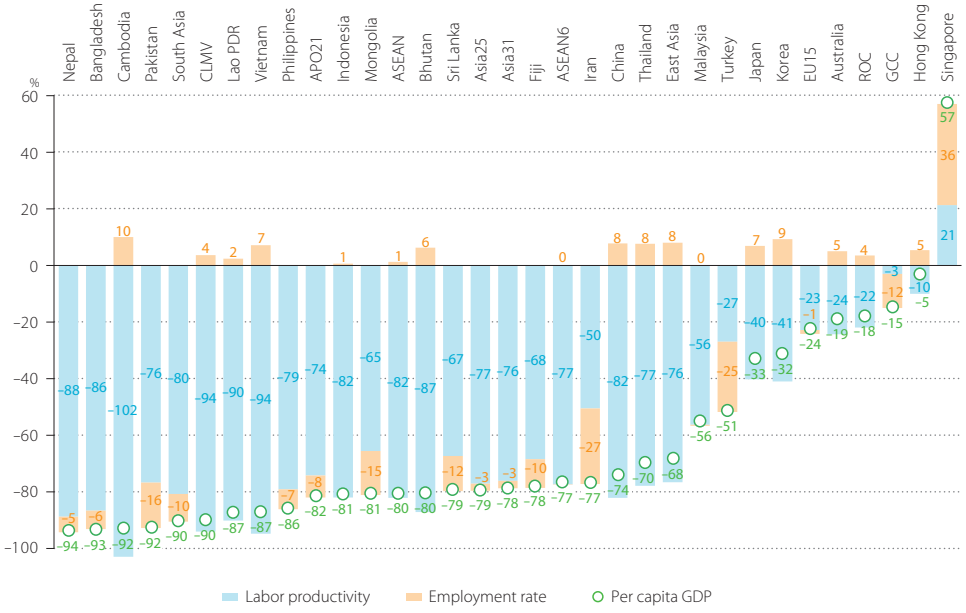

Figure 14 Sources of Per Capita GDP Gap, Relative to the US
——Percentage point differentials in per capita GDP at constant prices in 2019, using 2017 PPP

Sources: Official national accounts in each country, including author adjustments.

8: The gap of country x's per capita GDP relative to the US is decomposed into the sum of the gap of labor productivity and employment rate with respect to the US, as in:

$$\underbrace{\ln\left(GDP_x^t / POP_x^t\right) - \ln\left(GDP_{US}^t / POP_{US}^t\right)}_{\text{Gap of per capita GDP}} = \underbrace{\ln\left(GDP_x^t / EMP_x^t\right) - \ln\left(GDP_{US}^t / EMP_{US}^t\right)}_{\text{Gap of labor productivity}} + \underbrace{\ln\left(EMP_x^t / POP_x^t\right) - \ln\left(EMP_{US}^t / POP_{US}^t\right)}_{\text{Gap of employment rate}}$$

where POP_x^t is population of country x in period t and EMP_x^t is the number of employment of country x in period t.

9: Country x's per capita GDP is decomposed into the product of its labor productivity and employment rate, as in:

$$\underbrace{\ln\left(GDP_x^t / POP_x^t\right)}_{\text{Per capita GDP}} = \underbrace{\ln\left(GDP_x^t / EMP_x^t\right)}_{\text{Labor productivity}} + \underbrace{\ln\left(EMP_x^t / POP_x^t\right)}_{\text{Employment rate}}$$

where POP_x^t is population of country x in period t and EMP_x^t is the number of employment of country x in period t.

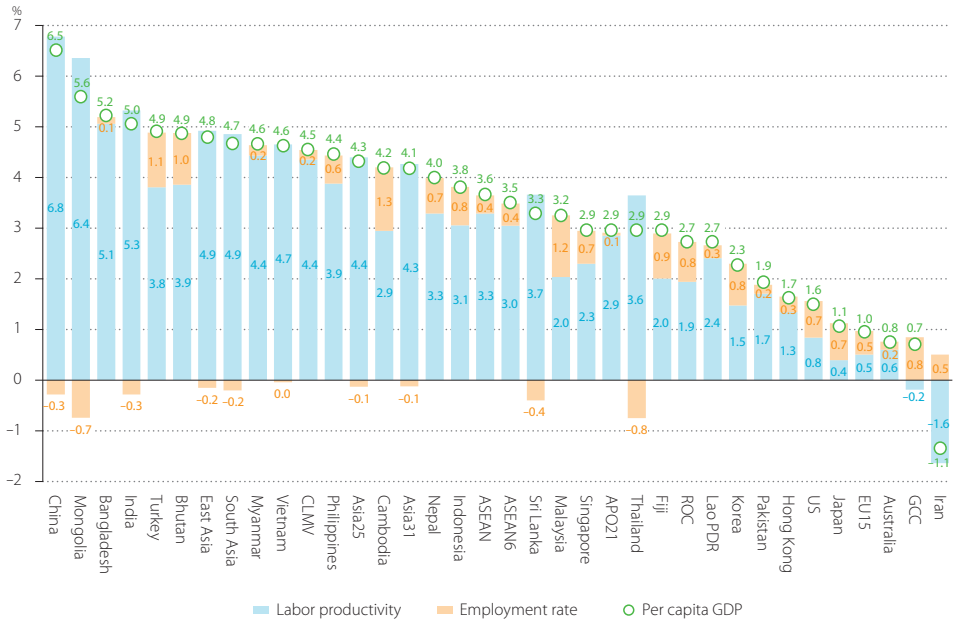

Figure 15 Sources of Per Capita GDP Growth
——Average annual growth rate of per capita GDP at constant prices in 2010–2019, using 2017 PPP

Sources: Official national accounts in each country, including author adjustments.

norms account for why they are among the countries with the lowest shares of female workers in total employment, at 15%, 21% and 29% in 2019, respectively, as shown in Figure 16. In many Asian countries the shares of female employment have increased over the four decades.

Figure 17 shows cross-country comparisons of employment rates in 1970, 2000, and 2019, based on the labor statistics of each country. Employment consists of employees, own-account workers, and contributing family workers. The fastest catch-up countries are countries with the largest surge in employment rates over the past four decades: China, Korea, Cambodia, and the ROC. Some of the countries in Group–A2 (Table 1) also experienced significant improvements in employment rates. While there are exceptions, generally countries that have failed to catch up also tend to make less vigorous improvements over the period, and therefore continue to have lower employment rates.

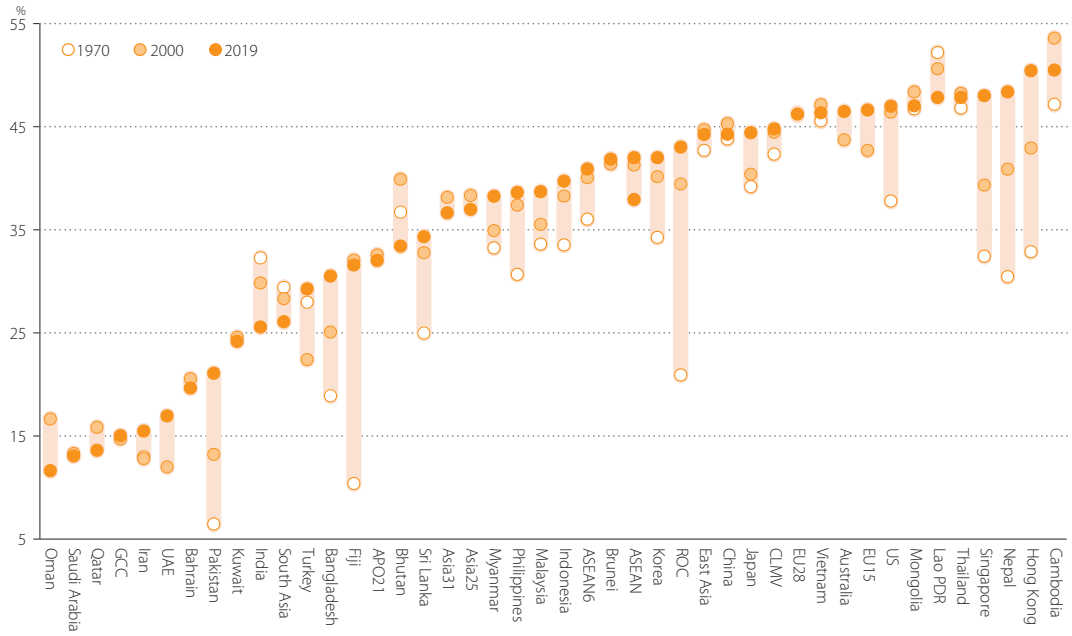

Figure 16 Female Employment Share
——Ratio of female workers to total employment in 1970, 2000, and 2019

Sources: Population census and labor force survey in each country, including author adjustments; ILOSTAT database for GCC countries, and Australia; The EU Labour Force Survey (Eurostat) for the EU15.

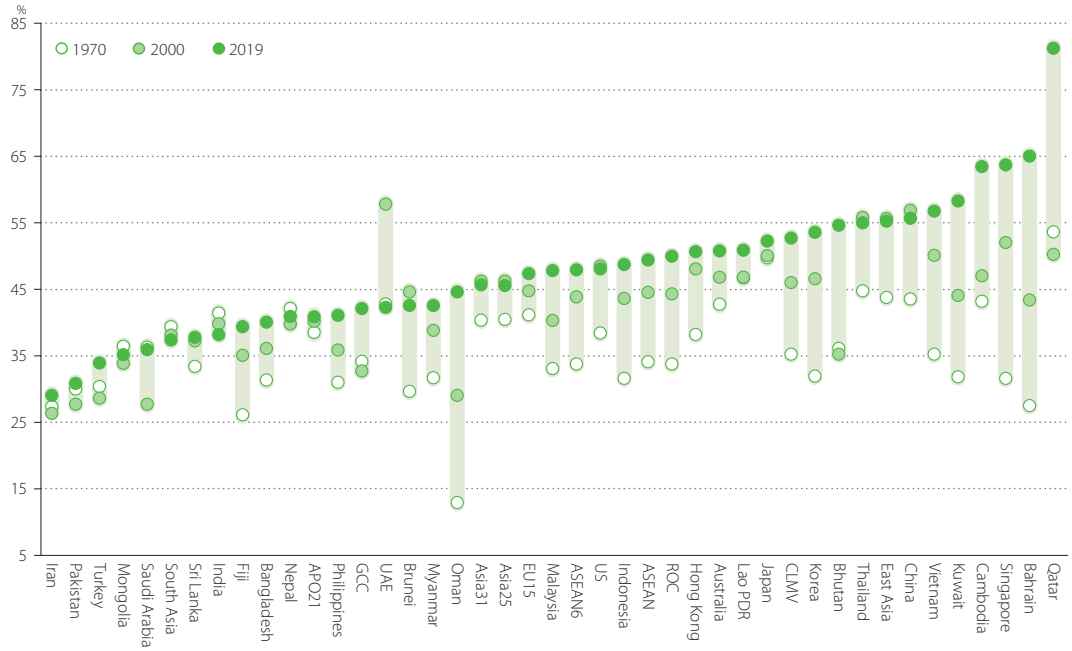

Figure 17 Employment Rate
——Ratio of employment to total population in 1970, 2000, and 2019

Sources: Employment and population data by national statistical offices in each country, including author adjustments.

Box 2 Population and Demographic Dividend

The world's population is estimated to reach 7.7 billion in 2019, of which Asian countries account for 60%, according to United Nations (2019). China and India each account for 18.2% and 17.7% of the world's population, respectively. It has been observed that falling fertility rates and rising living standards go hand in hand, although the direction of causality is less certain. The evolution of the demographic structure implies dynamics in a society that are not captured by the overall population size or growth. As people's economic behavior, aspirations, and needs vary at different stages of life, changes in a country's age structure can have a significant impact on its economic growth via supply-side and demand-side impacts (Cooley and Henriksen 2018).

The growth rate of the world's population has slowed from its peak of around 2.0% in the 1970s to today's 1.1% per year. With falling fertility rates, the UN projects the world's population growth rate will decelerate to 0.50% per year by 2050 and further to 0.03% by 2100. Even so, the world population will still increase by one-third from today's 7.6 billion to 9.7 billion in 2050 and a further 12% to 10.9 billion by 2100. These estimates are based on the medium-fertility variant, but with only a slight variation in fertility, particularly in the more populous countries, the total could be higher (10.6 billion by 2050 and 15.6 billion in 2100) or lower (8.9 billion in 2050 and 7.3 billion in 2100). Figure B2.1 depicts this shift in the distribution of the world population with the share from the more developed regions gradually declining from 17% in 2015 to 13% in 2050 and 11% in 2100, compared with 32% in 1950. Conversely, the share of the least developed countries is depicted as rising from today's 13% to a projected 19% in 2050 and 28% in 2100, up from 8% in 1950.

According to the projection, Asia's share will decline from its 60% today to 54% in 2050 and 43% in 2100, while Africa's share will rise from today's 17% to 26% and 39%, respectively. Figure B2.2 shows the current population size of individual Asian countries compared with the 1970 level and its 2050 projection. As can be seen from this chart, China's population is expected to stabilize around the current level. China has socially engineered the change with its one-child policy, which has made its current population 300–400 million lower than it would have been otherwise. In less than two decades, India is projected to overtake China as the most populous country in the world.

Figure B2.3 shows the demographic make-up of countries in 2019 (the population proportions of the under-15 and over-65 age groups, which together make up the dependent population). Ranking the countries by the share of old-age population filters the rich economies to the top end. These economies also have a relatively low share of the young-age group compared to less developed countries. This suggests that demographic transition tends to run parallel with economic progress, although the direction of causation is not certain. As countries

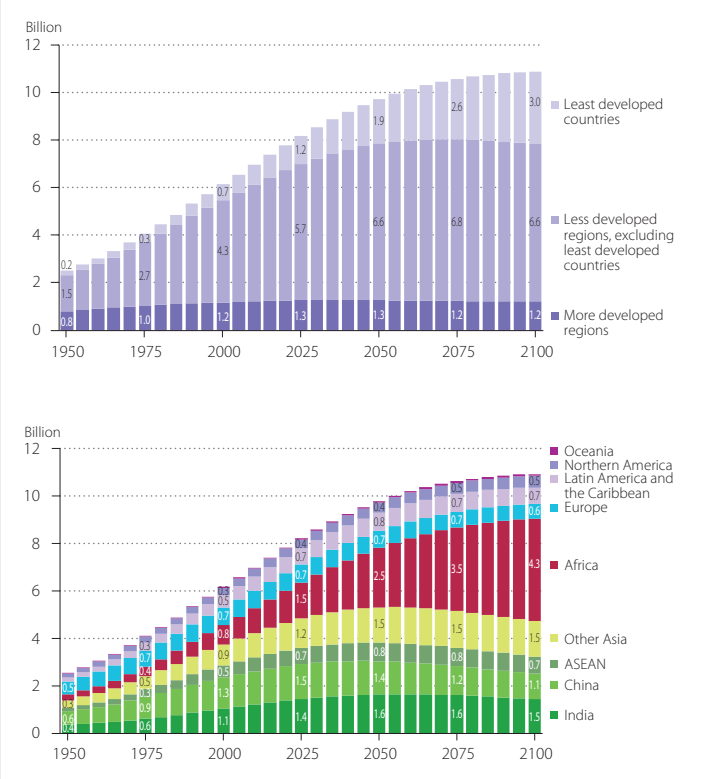

Figure B2.1 Distribution of the World's Population in Different Regions in 1950–2100

Source: United Nations (2019).

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move from high to low mortality and fertility rates, the demographic transition produces a "boom" generation that is larger than those immediately before and after it. As this boom generation gradually works through a nation's age structure, it produces a demographic dividend of economic growth as people reach their prime.

Using demographic data since 1950 and UN projections up to 2100, Figures B2.4 and B2.5 track changes in the ratio of the working population (aged 15-64) to dependent population (aged under 14 and over 65) by country and by country group, respectively. The higher the ratio, the more favorable its demography for economic growth. Japan could have capitalized on the demographic dividend in the 1960s, when its GDP growth was over 10% on average per year for ten years. Similarly, China, Hong Kong, Korea, Singapore, and Thailand are poised for the prospect of such demographic dividend in the 2000s and 2010s, whereas, based on projections, some ASEAN countries, such as Myanmar and Indonesia will have to wait for such opportunity until the 2020s and 2030s, and South Asian countries (except Sri Lanka) until the late 2030s and 2040s.

The reaping of this dividend, however, is far from automatic. A favorable demography can work wonders to produce a virtuous cycle of wealth creation only if it is combined with appropriate health, labor, financial, human capital, and growth-enhancing economic policies. The presence of these complementary factors cannot be taken for granted but needs to be cultivated in order to earn the demographic dividend. As the analysis of the Databook shows, the contribution of labor to economic growth has been smaller than those of capital and TFP for most countries (Figure 40 in Section 5.3). This means that aging in countries is

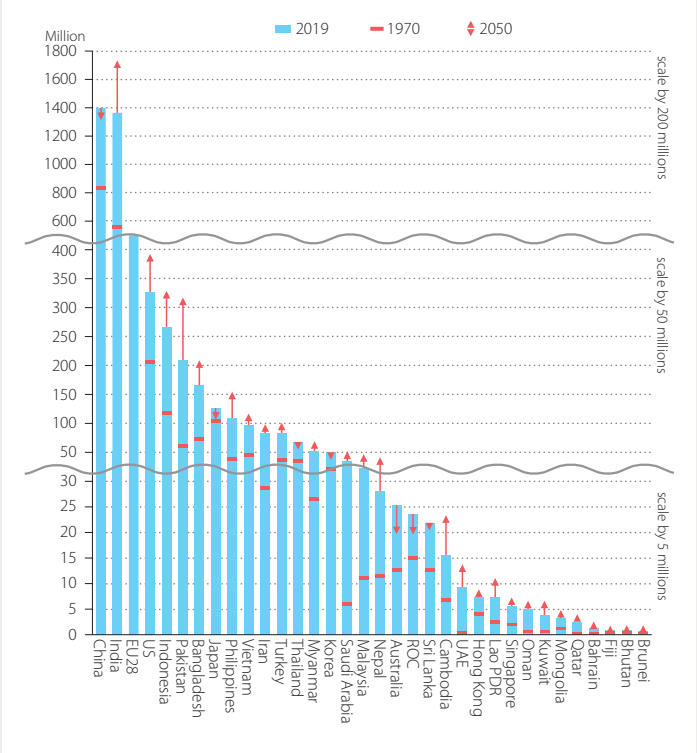

Figure B2.2 Asian Countries' Population Size and Projection in 1970, 2019, and 2050

Source: United Nations (2019).

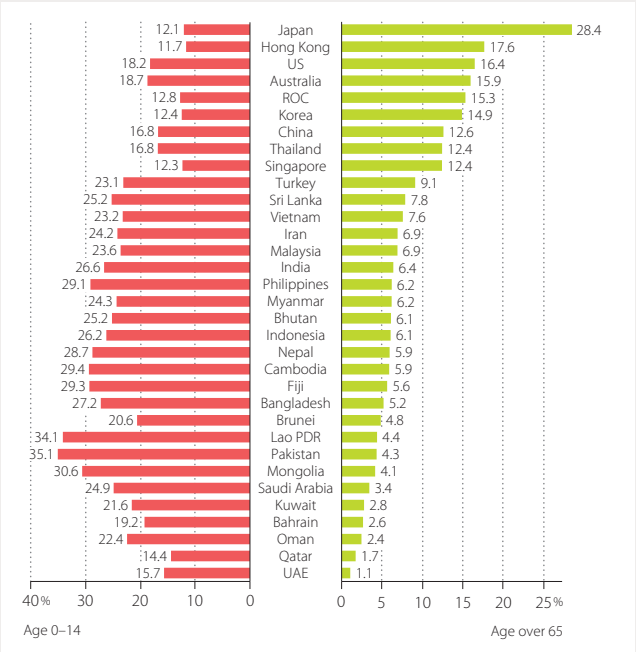

Figure B2.3 Proportion of the Dependent Population in 2019

Sources: Population census and official national accounts in each country.

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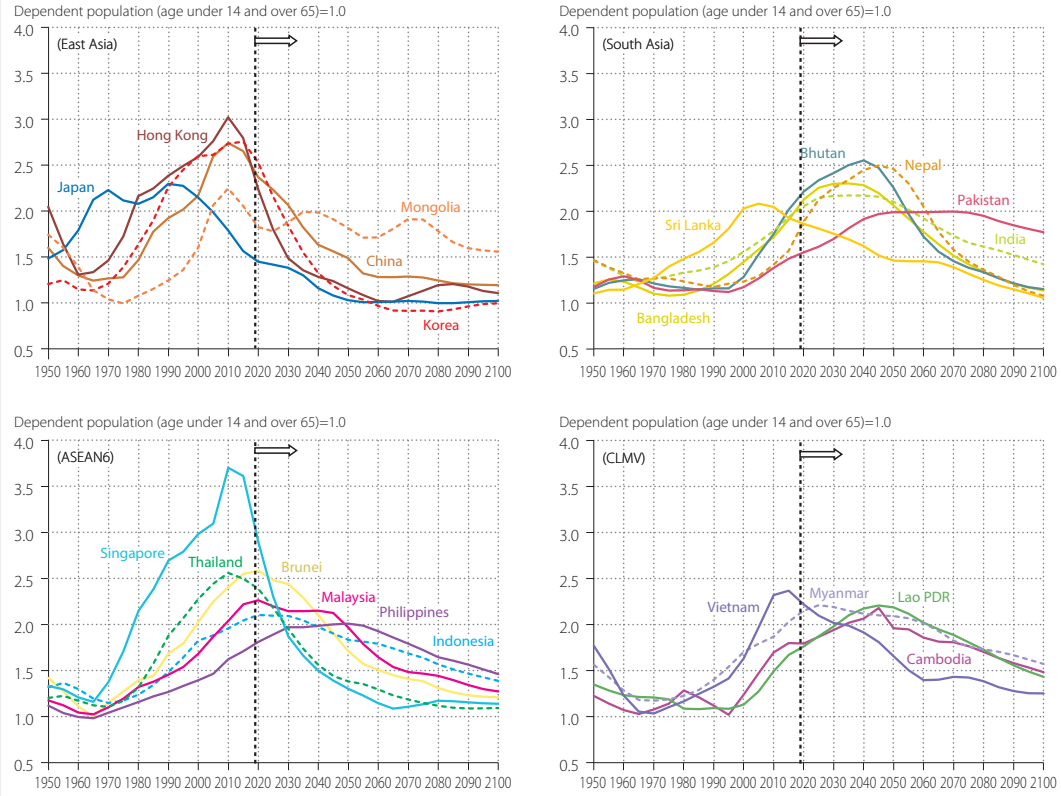

Figure B2.4 Demographic Dividend by Country in 1950–2100

Source: United Nations (2019).

not as impactful if fairly high growth rates of capital and TFP are maintained. Nevertheless, understanding the demographic shift and its implications is highly relevant for economic projections, providing valuable foresight for economic policy-making. In our projection of economic growth by 2030 (Box 8), the changes in demographic structure play an important role to forecast not only hours worked for the entire economy, but also quality changes in labor inputs.

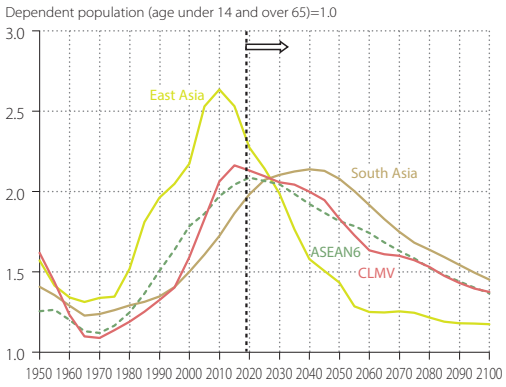

Figure B2.5 Demographic Dividend by Country Group in 1950–2100

Source: United Nations (2019).

4 Expenditure

Highlights

- The Asia31 invested 33% of its GDP in 2019, compared with 21% for the US. East Asia has the highest investment ratio (37%) among the Asian regions (Figure 18), driven by China's higher investment share of 42% (Figure 19). The consumption ratio of the Asia31 has dropped to 50% of GDP in 2019 from 56% in 2000 (Figure 18 and Table 14).
- As a composition of investment, the expansions of IT and R&D capital are becoming more significant in some Asian countries. In region, the shares of IT and R&D investment for the Asia25 are 7.7% and 4.5% in 2019, respectively, compared to 17% and 15% of the US (Figure 25).
- Net export shares in GDP are remarkably high in Singapore and ROC, at 28.3% and 10.2% in 2019, respectively. In contrast, it peaked at 8.3% in 2007 in China and 12.2% in 2005 in Hong Kong. Since then, they have dropped 1.4% and 1.7% in 2019, respectively (Figure 26).
- The growth of household consumption is the main engine of demand-side economic growth, contributing 51% of the regional growth of the Asia31 in 2010–2019. Investment is another engine, contributing 36% of the Asia31 growth (Figure 20).

GDP is defined by three approaches in SNA: production by industry; expenditure on final demand; and income to factor inputs. In this chapter, the economic insights are drawn from analyzing the expenditure side of GDP.

4.1 Final Demands

Figure 18 shows comparisons of final demand shares of nominal GDP among country groups, covering (1) household consumption, including consumption of non-profit institutions serving households (NPISHs), (2) government consumption, (3) investment or, in national accounts terminology, gross fixed capital formation (GFCF) plus changes in inventories, and (4) net exports (exports minus imports).[10] One can see that country groups display distinctive features in their final demand composition, reflecting their development stage and economic makeup.[11]

For almost half of a century, the share of household consumption has been stable for mature economies. In economies undergoing rapid transformation, however, it is more volatile and largely trends downward (Figure 18 and Table 14). Within Asia, all regions except GCC display a decline in household consumption ratios. South Asia maintains the highest share, despite its fall from 76% in 1970 down to 64% in

10: The country comparisons are presented in Table 14 in Appendix 3. In theory, three approaches to measure GDP are accounting identities and should yield the same result, but in practice, they differ by statistical discrepancies. Based on our Metadata Survey 2021 on national accounts for APO member economies, Japan is an exceptional country that determines GDP from its expenditure-side measurement (the expenditure-side estimate is based on the commodity flow data, in which the data on production/shipment in the detail product classification are used as the controlled totals.). In other countries, GDP is estimated from the production side (value-added in industries). Some countries record statistical discrepancy as the difference in the estimates between production-based GDP and the sum of final expenditures. In this Databook, statistical discrepancy is mainly attributed to household consumption when data is recorded. Readers should keep in mind that it can have some impact on the share of final demand.

11: The constant-price estimates in this edition reflect the revisions on final demand prices in the APO Productivity Database 2021, in which the prices on government consumption, export, and import are revised from official estimates in some countries.

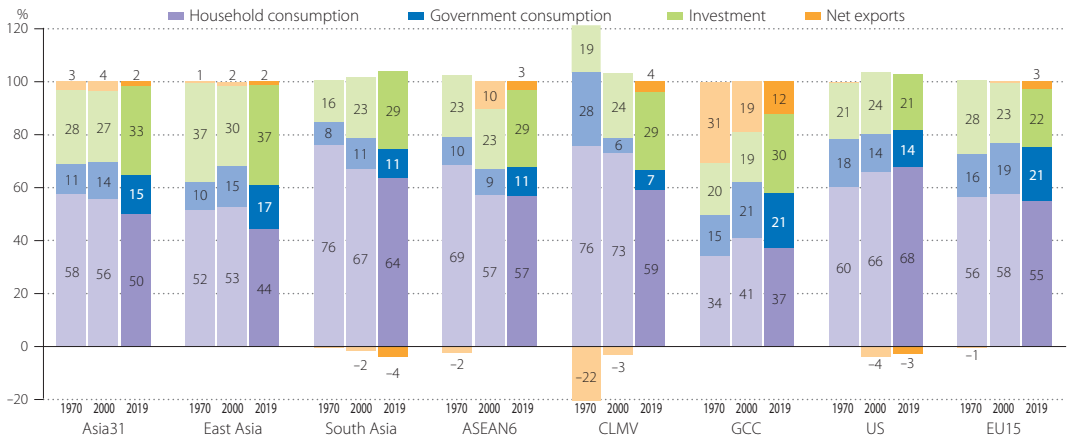

Figure 18 Final Demand Shares by Region
——Share of final demands with respect to GDP at current market prices in 1970, 2000, and 2019

Sources: Official national accounts in each country, including author adjustments. Note: Final demand shares in country groups are computed by using the PPPs for GDP. Household consumption includes consumption of NPISHs. Investment includes GFCF plus changes in inventories.

2019. The rapidly decreasing trends are also found in CLMV. In contrast, the US household consumption share has been climbing.[12]

Overall, Asian countries invest significantly more than the US and the EU15 as a share of GDP. In 2019 investment accounted for 21% and 22% of final demand in the US and the EU15, respectively, compared with 33% for the Asia31. East Asia has the highest investment ratio among the Asian regions in the entire period of our observation. Compared to other components of final demand, the contribution of net exports to the Asian economy has always been more volatile.

The regional averages disguise the great variation displayed by individual countries. Figure 19 shows the cross-country comparisons of final demand share in current market-price GDP in 2019. Countries are arranged in descending order of their household consumption shares. Although most countries fall to the right of the US, there are a handful of Asian countries that have a higher consumption ratio than the US. Bangladesh, Cambodia, Fiji, Hong Kong, Nepal, Pakistan, the Philippines, and Sri Lanka fell to the left of the US in 2019, regardless of a much lower per capita GDP level in these countries, except Hong Kong.

Figure 20 shows the decomposition of average annual economic growth by final demand for the period 2010–2019.[13] While the growth of household consumption is the main engine of economic growth in many countries, investment growth contributes 36% of the growth of the Asia31. The large contribution

12: It is worth noting that the GDP share of government consumption in the EU15 was higher than the average of the Asia31 by 5.5 percentage points in 2019 (Table 14 in Appendix 3). In fact, when it comes to welfare measurement, actual individual consumption, as opposed to household consumption, is preferred because the former takes into account expenditures by NPISHs and government expenditures on individual consumption goods and services (such as education and health) in addition to household consumption.

13: The Törnqvist quantity index is adopted for calculating the growth of real GDP. Using this index, the growth of real GDP into the products of contributions by final demands can be decomposed:
$\underbrace{\ln\left(GDP^{t}/GDP^{t-1}\right)}_{\text{Real GDP growth}} = \underbrace{\sum_i (1/2)\left(s_i^{t}+s_i^{t-1}\right)\ln\left(Q_i^{t}/Q_i^{t-1}\right)}_{\text{Contribution of final demand } i}$ where Q_i^t is quantity of final demand i in period t and s_i^t is expenditure share of final demand i in period t. Thus, the real GDP growth may diverge from the official estimates or those presented in Table 10 in Appendix 3.

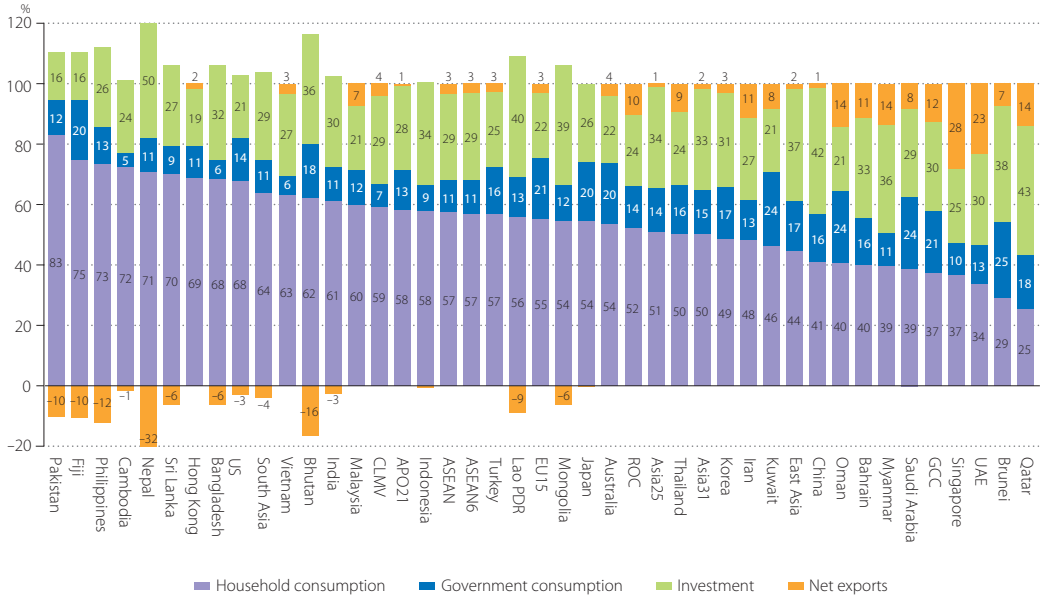

Figure 19 Final Demand Shares in GDP by Country
——Share of final demands with respect to GDP at current market prices in 2019

Sources: Official national accounts in each country, including author adjustments. Note: Household consumption includes consumption of NPISHs. Investment includes GFCF plus changes in inventories.

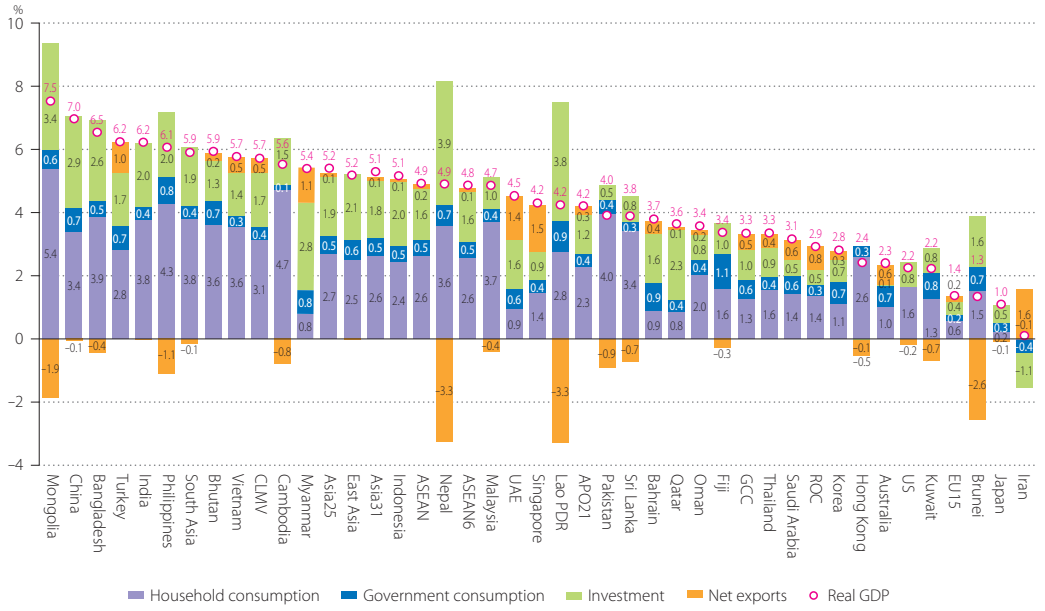

Figure 20 Final Demand Contributions to Economic Growth
——Average annual growth rate of constant-price GDP and contributions of final demands in 2010–2019

Sources: Official national accounts in each country, including author adjustments.

of investment has continued in China at 42% in 2010–2019. Bhutan is another country with a strong driver of investment at 22% of average annual growth (5.9%) in 2010–2019. This is due to massive investment in hydropower plants, mainly financed by India.

4.2 Demand Compositions

The high consumption rate in these countries could be explained partly by the difference in demographic structure. Figure 21 shows that countries with a high proportion of dependent population (aged under 14 and over 65) tend to have a high household consumption share in their GDP. This is reflected by higher propensity to consume by individuals in the dependent population, as well as their savings-consumption choices. These countries, i.e., Cambodia, Fiji, Nepal, Pakistan, and the Philippines, have higher shares of dependent population with over 34% in 2019. The variation of consumption rates is also related to the income level. Countries with a low income will struggle to defer consumption. It is no coincidence that countries clustered on the left of Figure 19 tend to be those in the bottom income groups in terms of per capita GDP in Figure 14 in Section 3.3.

The decomposition of household consumption reveals a tremendous diversity of consumption patterns among individual countries, partly reflecting their income levels and partly the idiosyncratic characteristics of the society. Figure 22 illustrates the cross-country version of Engel's Law, which states that basic necessities will account for a high proportion of household consumption for a lower per capita income group, and vice versa. More specifically, countries where food and non-alcoholic beverages account for a large proportion of consumption tend to have low income (i.e., in Group D5 or Group D6 in Table 2 in Section 6.1). The other end of the spectrum is occupied by the rich Asian countries, namely, the Asian Tigers and Japan. Besides food and non-alcoholic beverages, housing/utilities and transportation are the other large spending categories. In rich economies, these two categories account for larger shares in

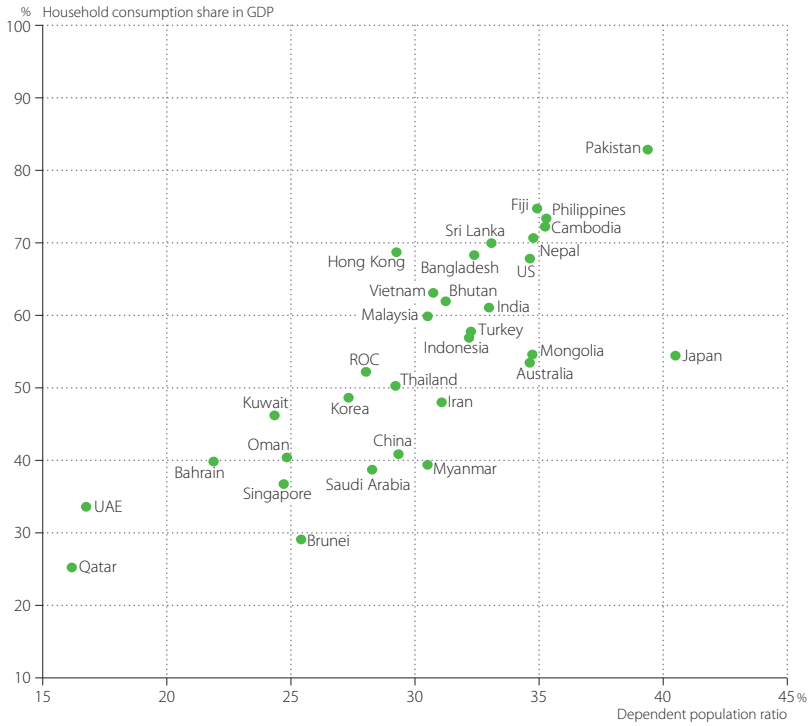

Figure 21 Dependent Population Ratio and Consumption Share
——Share of dependent population to total population and consumption share in GDP at current market prices in 2019

Sources: Population data by national statistical office in each country, World Bank (2021), and official national accounts in each country, including author estimates. Note: Dependent population is defined as persons aged under 14 and over 65.

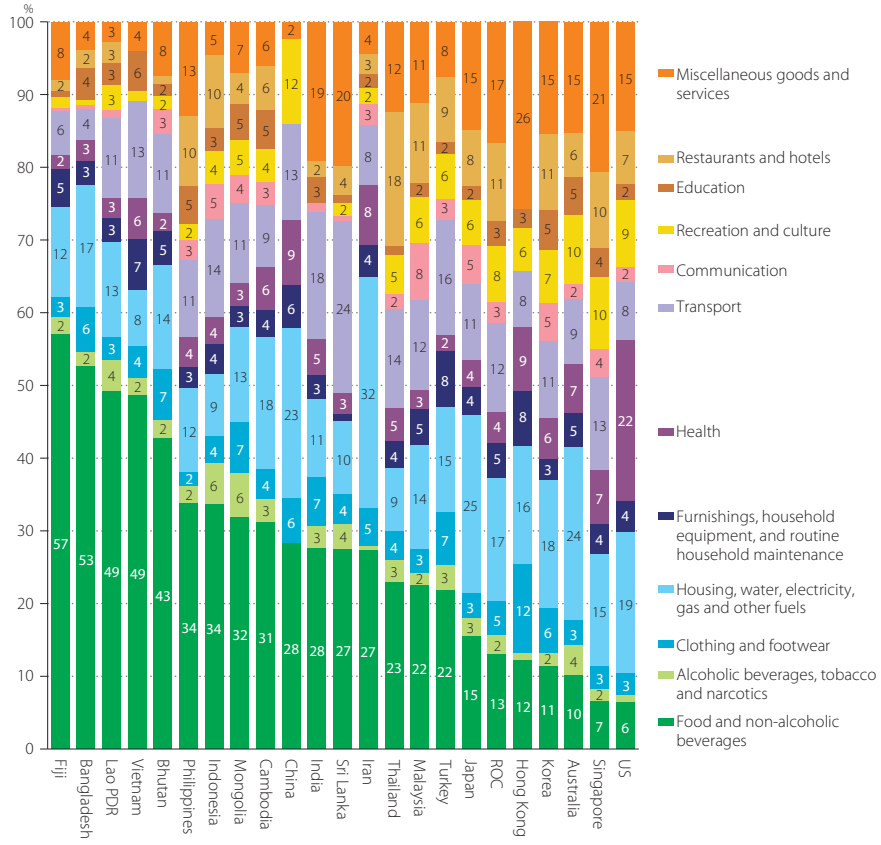

Figure 22 Household Consumption by Purpose
——Shares of household consumption at current prices by purpose in 2019

Sources: Official national accounts in each country. Note: For data of Hong Kong, transportation includes communication; recreation and culture includes hotels; miscellaneous goods and services includes restaurants. For data of China, food and non-alcoholic beverages includes alcoholic beverages, tobacco and narcotics; transportation includes communication; recreation and culture includes education. For data of Vietnam, transportation includes communication. For Fiji, the Lao PDR, and Vietnam, the observation periods are 2009, 2005, and 2016, respectively.

household consumption than food and non-alcoholic beverages. Idiosyncratic spending, such as education in Cambodia, Korea, Mongolia, and Vietnam (accounting for 5–6% of household consumption), and health in the US (accounting for 22% of consumption), are not reflected in other countries.

The role of foreign direct investment (FDI) differs considerably among Asian countries. Figure 23 shows the FDI inflows as a percentage of GFCF in 2019, for the Asian economies with the US and some EU countries for comparison. In nine countries of the Asia31, the FDI inflows are over a 10% share of GFCF. In particular, they are outstanding in the two global cities of the Asian Tigers, Singapore (106.9%) and Hong Kong (97.9% of GFCF). The FDI inflows are extremely low in Japan at 1.1%, indicating that a domestic reform for lowering barriers to entry should be considered for the purpose of encouraging international investment.

It is an important policy target for low-income countries to create a business-enabling environment, just as it is important for middle-income countries to improve various business environments. Based on the EIU's (Economist Intelligence Unit, *The Economist*) ranking (covering 82 countries in the world),[14] Singapore and Hong Kong are in the top 10% of the covered countries. Figure 24 plots the business environment score and the FDI inflows ratio in the countries presented in Figure 23, excluding the countries in

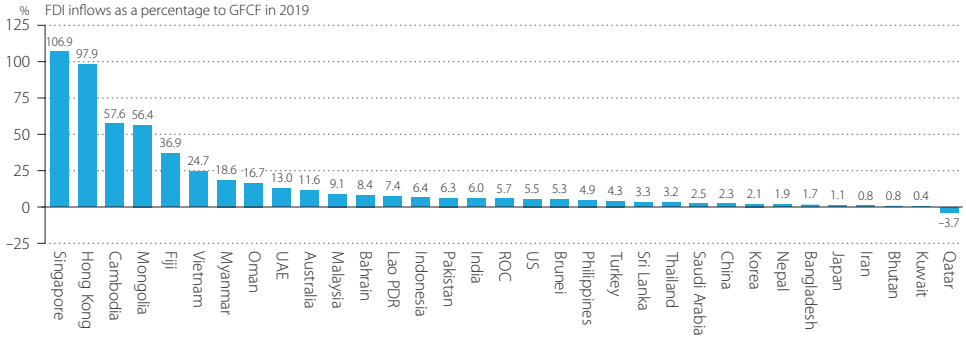

Figure 23 FDI Inflows

——FDI inflows as a percentage of GFCF, an average of the ratios in 2019

Sources: United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2020*, and APO Productivity Database 2021.

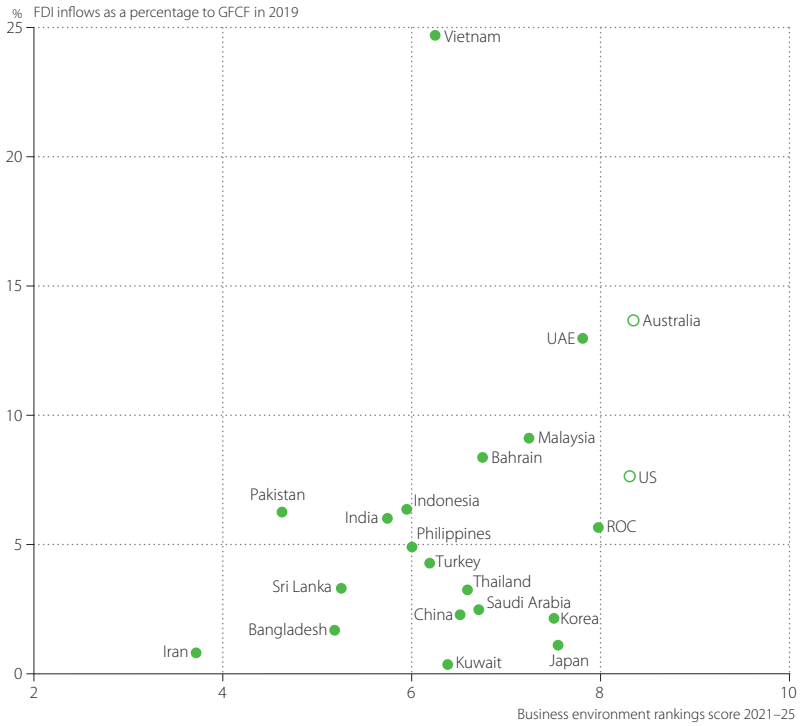

Figure 24 FDI Inflow Ratio and Business Environment

——FFDI inflows as a percentage of GFCF in 2019 and business environment score

Sources: United Nations Conference on Trade and Development (2020), The Economist, The Economist Intelligence Unit 2019, 2020, and 2021, and APO Productivity Database 2021. Note: The evaluation period is 2020–2024 for Australia, Hong Kong, India, Malaysia, Pakistan, Qatar, Singapore, Sri Lanka, Thailand, and Vietnam and 2019–2023 for Iran.

14: The EIU's business rankings model examines 10 separate criteria or categories, covering the political environment, the macroeconomic environment, market opportunities, policy towards free enterprise and competition, policy towards foreign investment, foreign trade and exchange controls, taxes, financing, the labor market and infrastructure. Each category contains a number of indicators that are assessed by the EIU for the last five years and the next five years. The number of indicators in each category varies from 5 (foreign trade and exchange regimes) to 16 (infrastructure); and there are 91 indicators in total. Each of the 91 indicators is scored on a scale from 1 (very bad for business) to 5 (very good for business). Bhutan, Brunei, Cambodia, Fiji, Lao PDR, Mongolia, Myanmar, Oman, and Nepal are not covered in EIU.

which the FDI inflows ratio is over 25%. In Iran, Pakistan, Bangladesh, and Sri Lanka, improving business environment is a necessary condition for attracting FDI. Although Japan is one of the countries with the lowest FDI ratio in Figure 23, this does not seem to be captured in rankings in business environment.

Figure 25 focuses on investment components, showing the nominal GFCF share of five types of assets for Asia25 economies and regions in 2019.[15] For most countries, investment is still very much construction-based (i.e., dwellings, non-residential buildings, and other structures). However, the expansion of IT capital is becoming more significant in some countries like Singapore, Thailand, Malaysia, Hong Kong, and Japan – even at the current price comparisons.[16] The ROC, Japan, Korea, and the US invested in R&D by more than 13% of total investment in 2019. Among the Asian Tigers, however, Hong Kong had a smaller share of R&D in GFCF (5%) in 2019.

Figure 26 plots the long-term trend of net export share in GDP from 1970 to 2019. Net exports, which were previously a significant drag on Singapore and Korea in the 1970s, have improved their position rapidly. The shares of net exports in Singapore and ROC are remarkably high, at 28.3% and 10.2% in 2019, respectively. In contrast, shares of net exports peaked at 8.3% in 2007 in China and 12.2% in 2005 in Hong Kong. Since then, they have declined to 1.4% and 1.7% in 2019, respectively. Japan had enjoyed a trade surplus for most of the period compared, but its trade balance turned negative amounting to –0.6% in 2011 deepening to –2.6% in 2014, due to the shutdown of its nuclear power plants resulting from the Great East Japan Earthquake in 2011.

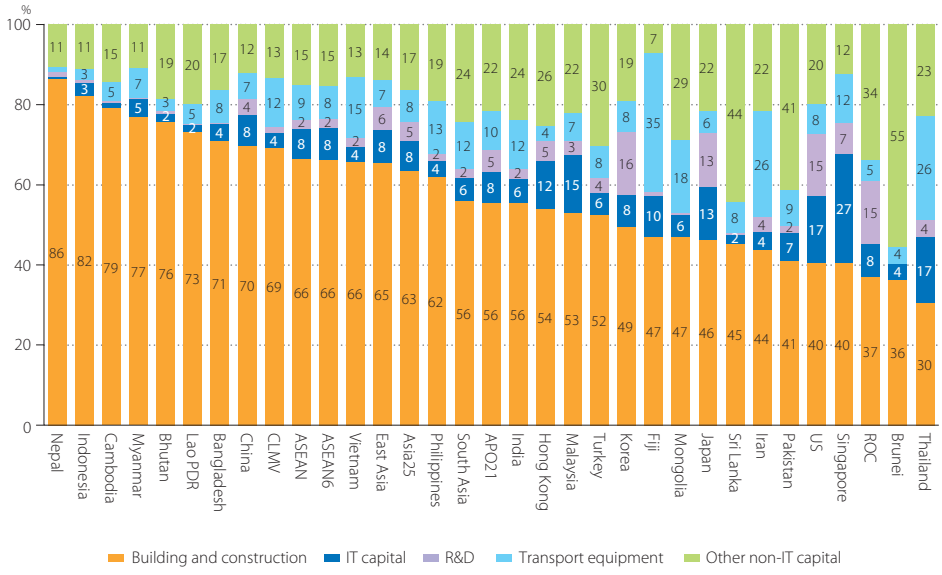

Figure 25 Investment Shares by Type of Asset
——Shares of GFCF at current purchaser's prices by type of produced assets in 2019

Sources: Official national accounts in each country, including author adjustments, and APO Productivity Database 2021. Note: Numbers in parentheses of the assets are corresponding to the code of produced assets, defined in Table 4 in Section 9.2.2.

15: The investment data by type of assets includes our own estimates for the countries where data is not available. Although our GFCF estimates are constructed based on 11 classifications of assets (Table 4 in Section 9.2.2), they have been aggregated into five assets for the purposes of this table. The IT capital is defined as IT hardware, communications equipment, and computer software.

16: Box 4 discusses the IT (hardware and software) and R&D capital stocks and its implications. This edition of the Databook reflects the revised estimates on IT software investment, developed in APO Productivity Database 2021 (Section 9.1.4).

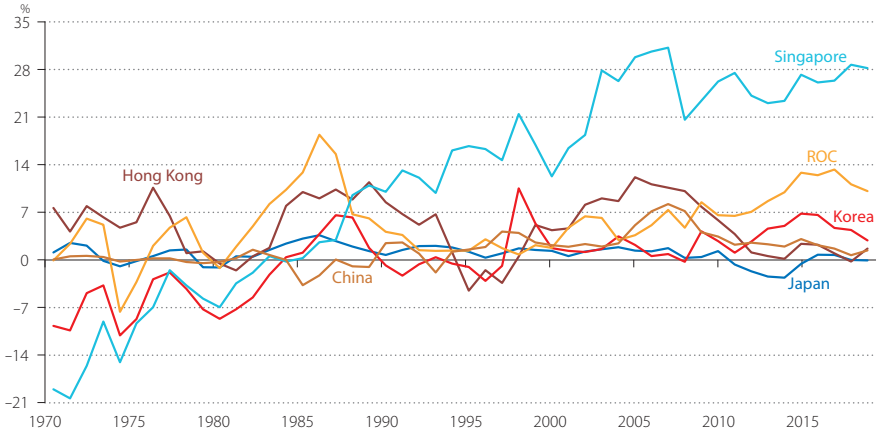

Figure 26 Net Export Shares in GDP of Asian Tigers, China, and Japan
——Shares of net exports with respect to GDP at current market prices in 1970–2019

Sources: Official national accounts in each country, including author adjustments.

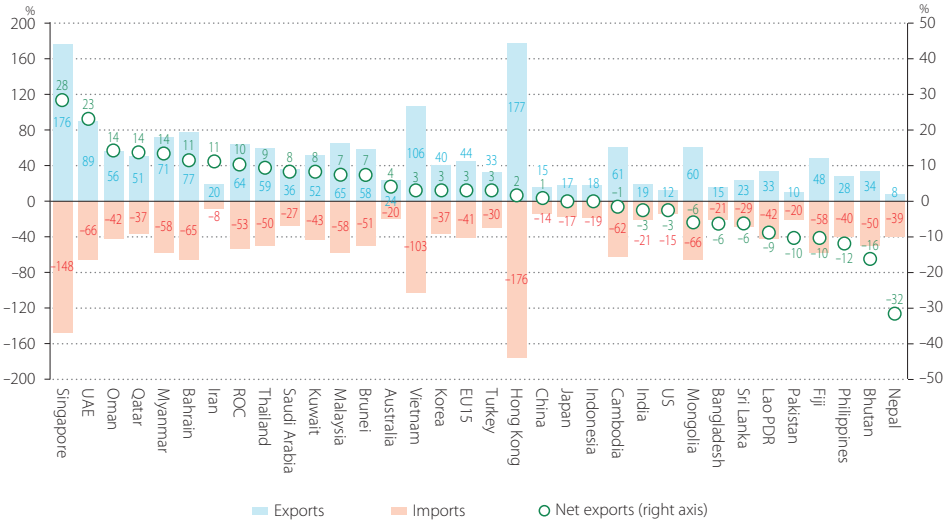

Figure 27 Export and Import Shares in GDP
——Shares of exports and imports with respect to GDP at current market prices in 2019

Sources: Official national accounts in each country, including author adjustments.

As a decomposition of net exports, Figure 27 presents the export and import shares in GDP in 2019. In 2019 the shares in Singapore exports were at 176%, and 177% in Hong Kong, reflecting their port function in Asia. This explains why the total values of exports and imports are exceptionally high, relative to the size of GDP in these economies.[17] About two-thirds of countries realized a trade surplus. However, Nepal and Bhutan, whose currencies are tied to the Indian rupee, are suffering serious trade deficits by 32% and 16% in 2019, respectively.

17: The 2008 SNA requires that the trade values should be recorded to reflect a change in ownership of goods, rather than accounting for goods moved for processing without incurring actual transactions. Singapore and Hong Kong already introduced the 2008 SNA. However, the revisions from the 1993 SNA on the export and import data were very minor.

Box 3 Task-wise International Division of Labor and Factory Asia

In the late 1980s and early 1990s, some Asian countries experienced revolutionary changes in the pattern of international division of labor; the task-wise division of labor, or the second unbundling (Ando and Kimura 2005; Baldwin 2016). In the past, the international division of labor was typically industry-wise. Production activities of one industry were mostly completed within a country's territory, and final products were traded. Each country tended to specialize in a set of specific industries, depending on its technological level and factor endowments. A developing country typically imported manufactured goods and exported primary products. Or, it imported machinery and exported garments. In a broad commodity classification, the trade pattern was mostly one-way; products of an industry were traded from a country to another, but not in both directions.

In the late 1980s, the international division of labor moved to a task-wise model, rather than industry-wise. A representative industry for this type of division of labor is machinery. A machine typically consists of many parts and components, and its production involves a number of tasks. Task-wise international division of labor was initiated in the operation of export processing zones and was gradually extended to more sophisticated production "networks."

Figure B3 presents each Asian country's export/import shares occupied by machinery and transport equipment in the 1990s, 2000s, and 2010s. A striking contrast is observed here, between countries that participate in the

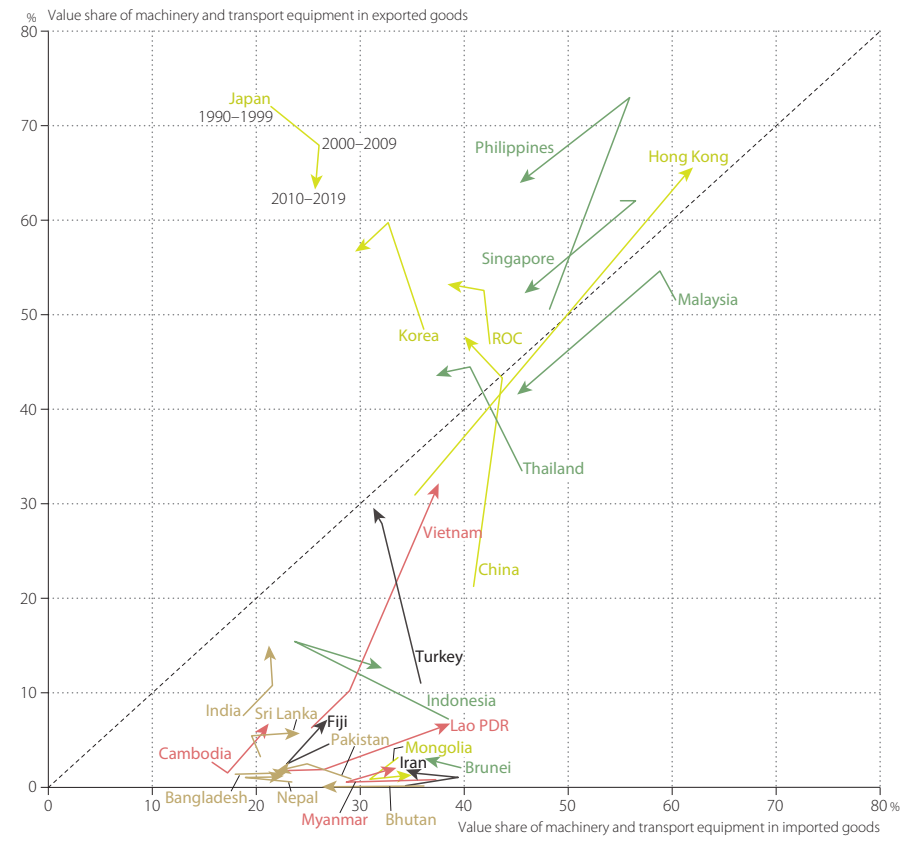

Figure B3 Export and Import Shares of Machinery
——Average value shares in 1990–1999, 2000–2009, and 2010–2019

Source: APO Productivity Database 2021. Note: The arrows are colored by region in light green, brown, green, pink, and black for East Asia, South Asia, ASEAN6, CLMV, and other Asia, respectively.

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task-wise international division of labor and those that do not. Japan and Korea are located way above the 45-degree line, which means their export shares are much larger than import shares. However, note that import shares themselves are high, in the range of 20% to 35%. Malaysia, the Philippines, Thailand, ROC, and China are close to the 45-degree line, around 40% to 70%. These countries are actively exporting and importing these products at the same time. Hong Kong and Singapore are also showing high export/import shares, though some portion of their trade may be entrepot, adding only logistics services.

This is somewhat of intra-industry trade (IIT) but is different from IIT typically observed in trade between developed countries; the latter is based on horizontal product differentiation like trade of yellow cars and blue cars. What we observe in Asia is the task-wise international division of labor with which a large portion of trade is occupied by back-and-forth trade of parts and components at different levels of processing. This type of trade is observed only in limited developing countries: most of the countries in Northeast and Southeast Asia, some Eastern European countries, Mexico, and Costa Rica. Particularly in Asia, a number of countries get involved in it, and production "networks" are developed. This is the indication of "Factory Asia."

For these Asian countries, export/import shares seem to decline a bit in the 2010s. Actually, even in the 2010s, parts and components trade was steadily growing in these countries, but trade in final products expanded faster (Obashi and Kimura 2018). This means these countries get richer and add their charm as a market. That is why the proportion of "network trade" out of total trade declined.

Other developing countries in the world are still in the realm of industry-wise division of labor. South Asian countries, India, Pakistan, Bangladesh, and Nepal are way below the 45-degree line, around 20% in import shares. Although India showed some upward movement in the 2010s, these countries do not yet participate in international production networks in machinery. Indonesia is also struggling with entering such networks.

5 Productivity

Highlights

- In labor productivity, based on GDP at constant basic prices per hour worked, the US has sustained a sizeable gap over even the highest Asian performers (Figure 30 and Table 17). In 2019, the productivity gap between the US and the Asian leader, Singapore, remained at 10% (Figure 29).
- In 2015–2019, the labor productivity of the Asia25 grew by 3.9% per year on average, down from 5.1% in 2010–2015. China experienced a slowdown in labor productivity growth to 5.1% from 8.4% over the same periods. The main drivers of productivity resurgence in the Asia25 were Myanmar, Bangladesh, Vietnam, India, and Turkey (Figure 32 and Table 18).
- TFP growth recovered to 1.3% in 2015–2019 in the Asia25, which improved from 1.0% in 2010–2015. The resurgence of TFP growth in South Asia was outstanding, increasing from 1.3% to 2.0% over the same periods. The main driver was India, in which the speed of TFP growth improved from 1.7% to 2.4% (Figure 37).
- The regional economic growth of the Asia25 has been predominantly explained by the contribution of capital input, representing 67% (62% for non-IT and 5% for IT capital) of economic growth achieved in 2010–2019. The role of TFP growth is also significant, contributing 22% of its regional economic growth in the same period (Figure 40).
- Capital deepening is the key mechanism of labor productivity growth in the Asia25, accounting for 62% (57% for non-IT and 5% for IT capital) in 2010–2019. In the same period, the contributions of labor quality and TFP are 12% and 25%, respectively. In the ASEAN, where the growth of regional TFP in 2010–2019 was moderate, the contribution of labor quality was significant, contributing 60% of the regional improvement in labor productivity (Figure 48).

Labor productivity is measured in several ways, depending on the definitions of output and labor input measures. Section 5.1 presents the labor productivity measure in terms of GDP per worker.[18] As workers in high-performing Asian countries tend to work longer hours on average than those in the US, as shown in Figure 87 in Section 9.3.1, the worker-based labor productivity gaps in this instance cast the Asian countries in a particularly favorable light. Section 5.2 shifts the focus to alternative estimates of labor productivity measure, namely GDP per hour worked.

The sources of economic growth in each economy are further decomposed to factor inputs of labor, capital, and total factor productivity (TFP), based on the growth accounting framework.[19] In Sections 5.3 and 5.6, capital input is included as another key factor of production[20] ; and TFP estimates are presented for the Asia25 economies and the US. Finally, Section 5.7 presents the estimates of energy productivity, which is becoming an important policy target for pursuing sustainable growth of the Asian countries. The details of long-term estimates of growth accounting for the APO21 economies and regions are provided in the country profiles of Chapter 8.

18: GDP is valued at basic prices in this chapter, as opposed to GDP at market prices used in the previous chapters. GDP at basic prices is defined as GDP at market prices, minus net indirect taxes on products. As most Asian countries do not provide official estimates for GDP at basic prices in their national accounts, they are calculated based on available tax data. See Section 9.1.7 for the methods employed for our calculations.

19: The growth accounting approach is based on the microeconomic production theory and the nominal accounting balance of input and output of production. See OECD (2001) for a presentation of definitions, theoretical foundations, and a number of practical issues in measuring productivity.

20: The measurement of capital stock of produced assets, land, and inventory, and capital services are presented in Section 9.2. In this edition of the Databook, inventory was newly considered as one of capital inputs.

5.1 Per-Worker Labor Productivity

Figure 28 presents the cross-country comparisons of per-worker labor productivity levels in 2019, measured as GDP per worker in US dollars as of 2019. On this measure, Singapore is the leading economy, 14% higher than the US level.[21] Hong Kong and the ROC follow at some distance. Turkey, Japan, and Korea took the next tier, with productivity levels at 36–43% below the US. Malaysia and Iran followed. It is worth noting that Iran has the lowest employment rate in Asia, as presented in Figure 17 in Section 3.3, bringing about higher performance in labor productivity. Thereafter, many countries among the Asia group followed with labor productivity levels at less than 25% of the US, pulling down the average performance of the group to 22% for the Asia25, 23% for the ASEAN6, and 9% for CLMV. Bringing up the rear were China and India, with productivity levels that were 21% and 12% of the US level, respectively.

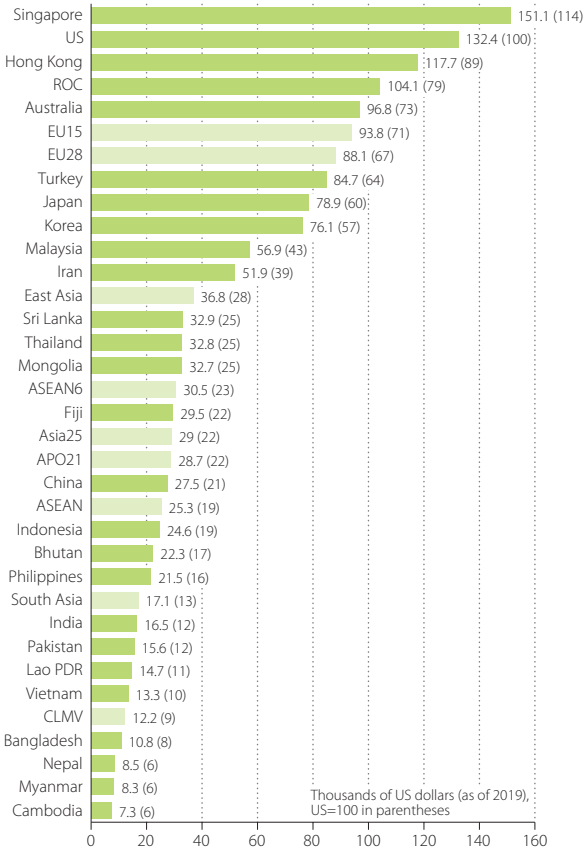

Figure 28 Per-Worker Labor Productivity Level
——GDP at constant basic prices per worker in 2019, using 2017 PPP, reference year 2019

Source: APO Productivity Database 2021.

The growth comparison of per-worker labor productivity is presented in Table 16 in Appendix 3. In this measure, the regional performance has been steady at 4–6% since 2000. China has sustained rapid productivity growth in the past two decades. Its growth accelerated to an average of 9.5% per year in 2005–2010 from 8.0% per year in 2000–2005 and slowed to 7.4% in 2010–2015 and 6.0% in 2015–2019. This contrasts with India's resurgence at 7.0%, 4.7%, 5.3%, and 5.4% over the same periods. Labor productivity growth in Bangladesh and Vietnam have become significant in recent years.

5.2 Per-Hour Labor Productivity

The per-worker based labor productivity gaps presented in Section 5.1 are most likely conservative estimates, since workers in high-performing Asian countries tend to work longer hours than those in the US, on average. To adjust for this discrepancy, total hours worked are constructed in the Asia QALI Database for the 25 Asian countries, although the quality of the estimates may vary considerably across countries.[22] Figure 29 shows how the productivity gap with the US in 2019 varies depending on which measure of

21: Cross-country level productivity comparisons are notoriously difficult to make, hence subject to much data uncertainty. Estimates should therefore be taken as indicative for broad groupings rather than precise ranking.

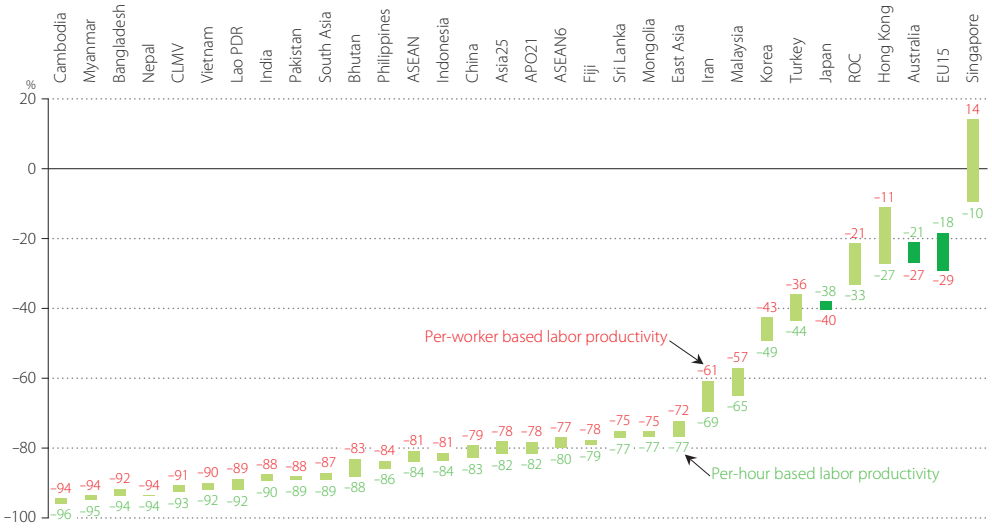

Figure 29 Per-Worker and Per-Hour Labor Productivity Gap, Relative to the US
——Indices of GDP at constant basic prices per worker and hour in 2019, using 2017 PPP

Source: APO Productivity Database 2021. Note: Light green is used for the countries in which per-hour labor productivity is lower than per-worker labor productivity.

labor productivity is used.[23] The productivity gap with the US widens for all Asian countries except Japan when the differences in working hours are taken into account. The choice of labor productivity measure makes a significant difference for the previously high-performing countries relative to the US, such as Singapore (from 14% higher to 10% lower) and Hong Kong (from 11% lower to 27% lower).

Based on GDP at constant basic prices per hour worked, US labor productivity has sustained a sizeable gap over even the Asian high performers, as presented in Figure 30 (and Table 17 in Appendix 3). The gap between the US and the Asian leader, Singapore, has been narrowing slowly and the productivity gap of 10% still remains in 2019. Hong Kong and the ROC have improved by eight and 13 times in this period and have overcome Japan in 2007 and 2010, respectively. They were ahead of Korea, despite Korea's effort in catching up with Japan by 2.6% per year on average over the entire observation period (1970–2019). If Korea can maintain this effort at the same pace, it would take 8 years to draw level with Japan.

The average growth rates of hourly labor productivity performances for the Asia25 economies and regions are compared in Figure 31. In the Asia25 as a region, labor productivity growth has accelerated to 4.6% per year in the recent period 2010–2019, compared to the past two-decade averages of 3.8% in 1990–2010 and 2.4% in 1970–1990. Figure 32 focuses on more recent productivity performances.[24] As a region, labor productivity growth in the most recent period 2015–2019 was very strong at 3.9% per year, though it is

22: Cross-country comparisons of hours worked are notoriously difficult, not least because harmonized data is rarely readily available. In the countries studied, three published their total hours worked as part of their official statistics, but not for the whole period studied in this report; and the publications may have been constructed based on different methodologies. It is therefore important to bear in mind the data limitations. See Section 9.3.1 for an explanation of the estimation procedure of total hours worked.
23: The labor productivity gap for country *x* is country *x*'s labor productivity divided by the US's labor productivity in Figure 29.
24: Table 18 in Appendix 3 illustrates the growth rate of per-hour labor productivity since 1990. The growth patterns of individual countries generally follow their counterparts closely in per-worker productivity growth, as shown in Table 16 in Appendix 3. In some countries the two measures diverge greatly and are not at all consistent through the periods compared. This contrast was particularly stark in the first half of the 1990s, when Japan's hourly productivity growth was 1.8% compared with 0.6% in per-worker productivity growth.

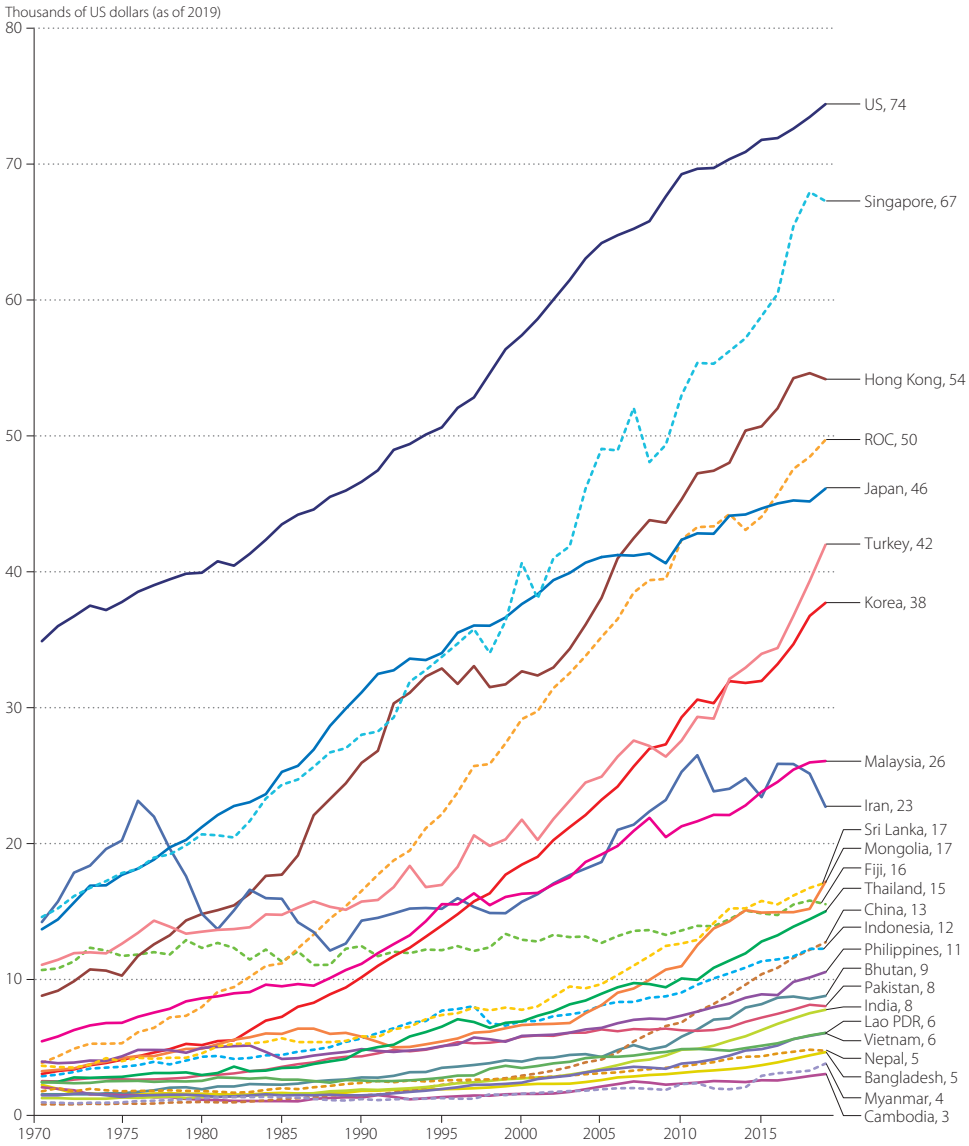

Figure 30 Per-Hour Labor Productivity Level in the Long Run
——GDP at constant basic prices per hour in 1970–2019, using 2017 PPP, reference year 2019

Unit: Thousands of US dollars (as of 2019). Source: APO Productivity Database 2021.

below the highest record of the regional productivity growth (5.3% in 2005–2010), which was accelerated by an extremely high performance of China (10.2%). The main drivers of the recent productivity performances are Myanmar, Bangladesh, Vietnam, India, and Turkey.

Figure 33 presents the growth of hours worked for the Asia25 economies in 2015–2019, compared with those in 2010–2015 and 2005–2010. Over these sub-periods, hours worked growth in the Asia25 are stable as 1.0% in 2015–2019, up from 0.3% in 2010–2015. The change in growth rates varies widely by country. Singapore and Brunei experienced a continuous slowdown in hours-worked growth over these

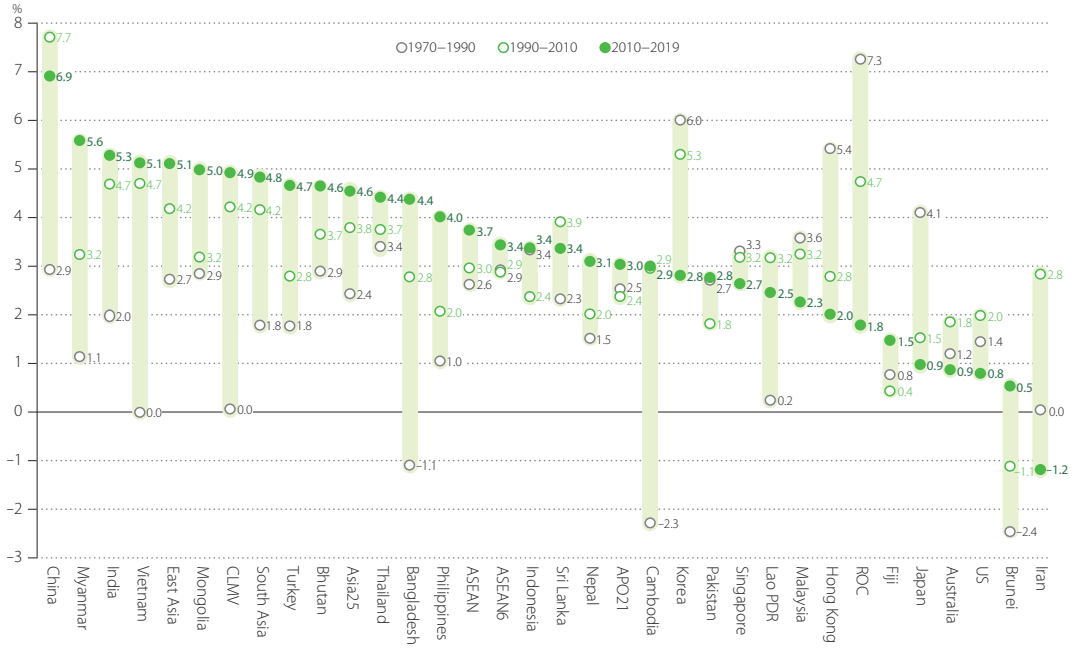

Figure 31 Labor Productivity Growth in the Long Run
——Average annual growth rate of GDP at constant basic prices per hour in 2010–2019, 1990–2010, and 1970–1990

Source: APO Productivity Database 2021. Note: The starting period for Australia is 1978.

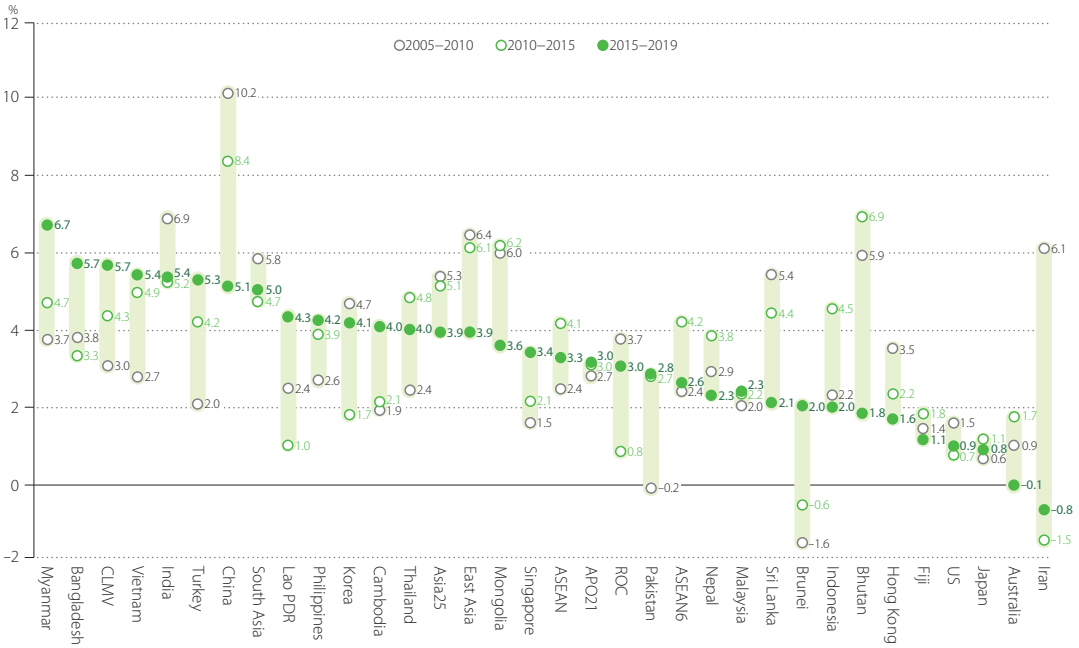

Figure 32 Labor Productivity Growth in the Recent Periods
——Average annual growth rate of GDP at constant basic prices per hour in 2015–2019, 2010–2015, and 2005–2010

Source: APO Productivity Database 2021.

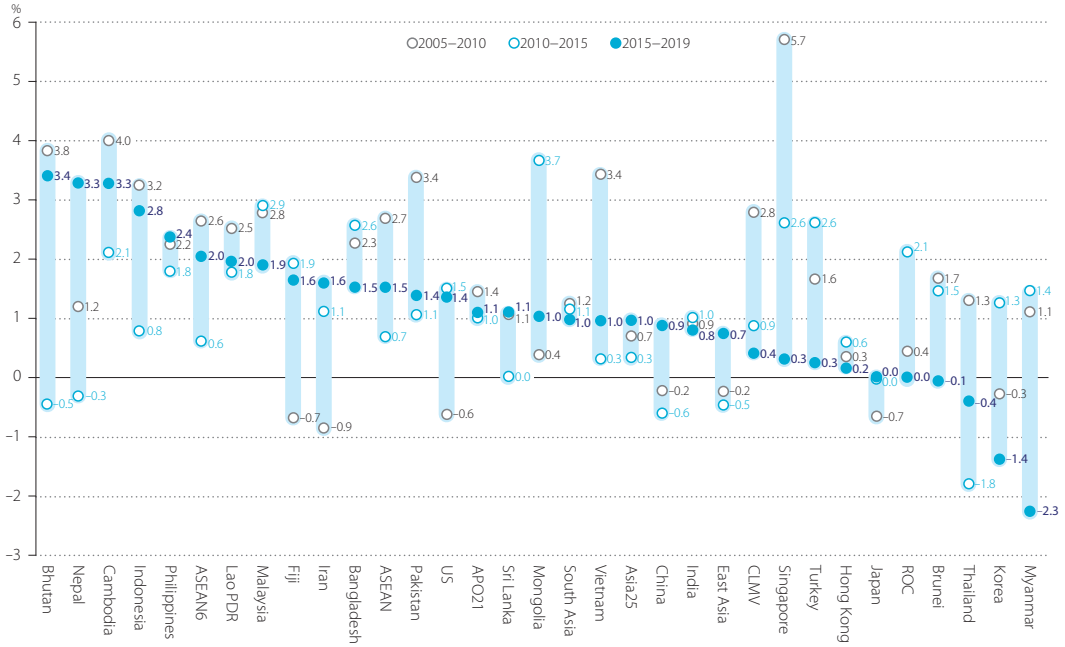

Figure 33 Hours Worked Growth in the Recent Periods
——Average annual growth rate of hours worked in 2015–2019, 2010–2015, and 2005–2010

Source: Asia QALI Database 2021. Note: See Section 9.3 for measurement of labor input.

sub-periods, and Myanmar and Korea recorded a considerable decline in 2015–2019. In contrast, the growth of hours worked recovered in 2015–2019 in Bhutan, Nepal, Sri Lanka, China, and Thailand, from negative or zero growth in the 2010–2015.

One can identify where countries are today in terms of their hourly productivity performance against a backdrop of Japan's historical experience. Figure 34 traces the long-term path of Japan's per-hour labor productivity for the period 1885–2019 along the green line, expressed as relative to Japan's 2019 level (set equal to 1.0).[25] A structural break is observed during World War II when output collapsed. Countries' relative hourly productivity levels against Japan in 2019 are then mapped against Japan's growth (as circles). Here, corresponding year can be located when Japan's hourly productivity level was the closest to the country in question. Most Asian countries are clustered around Japan's level between the 1960s and the early 1970s. Cambodia, with the lowest hourly productivity in 2019, sees levels corresponding to Japan in the middle 1920s. Even if they manage Japan's long-term productivity growth of 2.8% on average per year, this means it will take them about a century to catch up with the Asian leaders' current position (Singapore, Hong Kong, the ROC, and Japan).

The productivity leaders are the Asian Tigers, of which Singapore, Hong Kong, and the ROC have already surpassed Japan. Figure 35 compares the time span taken by each country to raise its labor productivity from 30–70% of Japan's level today (unit of measurement on the y-axis of Figure 34). What Japan had achieved in the 21 years from 1970 to 1991, Hong Kong, the ROC, and Korea managed to achieve

25: While mindful that level comparisons of productivity among countries and over periods are subject to a great degree of data uncertainty, they should provide a rough sketch of the productivity divergence in Asia.

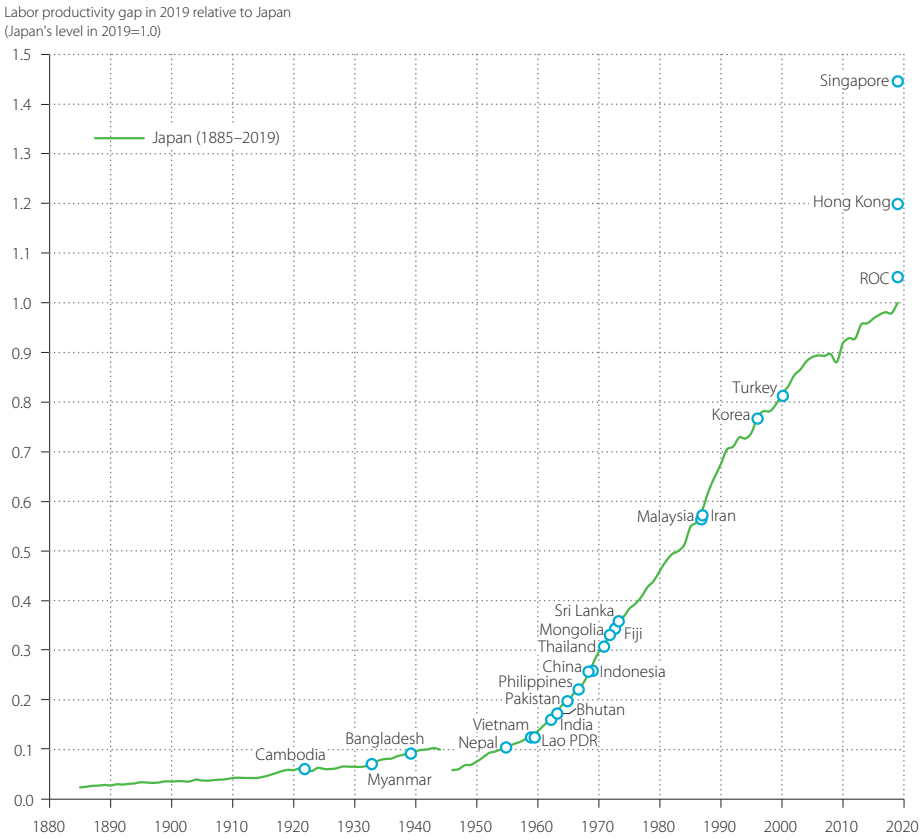

Figure 34 Historical Labor Productivity Trend of Japan and Current Level of Asia
——Index of GDP at constant basic prices per hour worked for Japan in 1885–2019 and for Asian countries in 2019, using 2017 PPP

Sources: For historical data of Japan, the sources of GDP are Ohkawa, Takamatsu, and Yamamoto (1974) during 1885–1954 and the JSNA by ESRI, Cabinet Office of Japan, during 1955–2019 (including author adjustments). Hours worked data is based on KEO Database, Keio University, during 1955–2019. During 1885–1954, the average hours worked per person are assumed to be constant. For the labor productivity level of Asian countries in 2019, it is based on the APO Productivity Database 2021.

in 15, 15, and 18 years, respectively (Figure 35). Although the speed of catch-up for latecomers is increasing somewhat, most Asian countries will take a long time to catch up to the leaders, currently clustered near Japan's 1960–1970 levels (Figure 34).

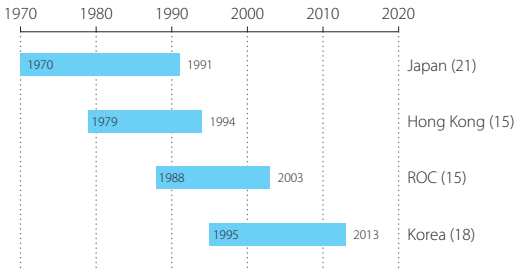

Figure 35 Time Durations Taken to Improve Labor Productivity by Japan and Asian Tigers

Source: See Figure 34.

5.3 Total Factor Productivity

Labor productivity in the previous sections is only a one-factor or partial-factor productivity measure and does not provide a full perspective of production efficiency. An observation of low labor productivity could suggest production inefficiency, but it could also reflect different capital intensities in the chosen production method, under the relative labor-capital price faced by the economy concerned. By observing movements in labor productivity alone, it is difficult to distinguish which is the case. In populous Asian economies, which are relatively plentiful in low-skilled labor, production lines may be deliberately organized in a way to utilize this abundant, and hence relatively cheap, resource. It follows that the chosen production method is most likely (low-skilled) labor-intensive and with little capital, manifested in low labor productivity and high capital productivity. Therefore, economists analyze TFP, which is GDP per unit of combined inputs, to arrive at an overall efficiency of a country's production.

Measuring capital input is a key factor for determining TFP. It is defined by capital services – the flow of services from productive capital stock, as recommended in the 2008 SNA.[26] The required basis for estimating capital services is the appropriate measure of capital stock. The SNA recommends constructing the national balance sheet accounts for official national accounts. However, this is not a common practice in the national accounts of many Asian countries.[27] Even where estimates of net capital stocks are available for the entire economy, assumptions and methodologies can differ considerably among countries. In response to this challenge, harmonized estimates for capital stocks and capital services have been constructed and compiled within the APO Productivity Database, built on the same methodology and assumptions. In this methodology, changes in the quality of capital are incorporated into the measurement of capital services in two ways: changes in the composition are captured by explicitly differentiating assets into 16 types; and an appropriate and harmonized deflator is used for IT capital to reflect the rapid quality change embodied in IT-related assets (see Section 9.2.2).[28]

With these improvements, the APO Productivity Database 2021 estimates capital services, hours worked, labor qualities, and TFP for the Asia25 economies.[29] In addition, the regional growth accounts are developed for six country groups – Asia25, APO21, East Asia, South Asia, CLMV, and ASEAN6.[30] Cross-country comparisons of TFP growth for the Asia25 economies and regions and the US are shown in Figure 36 for the period 2010–2019, compared with the past two-decade averages in 1970–1990 and 1990–2010. Taking the US as the reference economy, with TFP growth of 0.5% on average per year in 2010–2019, 15 Asian economies achieved higher TFP growth than the US. The Asia25 sustained a steady

26: See the chapter on capital services and the national accounts of the 2008 SNA (United Nations 2009). The second edition of the *OECD Capital Manual* (OECD 2009) provides a comprehensive framework for constructing prices and quantities of capital services. In the APO Productivity Database 2021, the Törnqvist index is used for aggregating 16 types of capital inputs (11 types of fixed assets provided in Table 4 in Section 9.2.2, 4 types of land in Table 5 in Section 9.2.5, and inventory stock in Section 9.2.3).

27: Based on our metadata survey, half of APO member economies do not develop the balance sheet accounts within the official national accounts; these countries are Bangladesh, the ROC, Indonesia, the Lao PDR, Mongolia, Nepal, Sri Lanka, and Vietnam (but the National Wealth Survey is available in the ROC for some selected years).

28: IT capital is defined as a composite asset of IT hardware (computers, electric computing equipment copying machines, and other office machineries), communications equipment, and computer software.

29: In measuring TFP, income generated from domestic production should be separated into labor and capital compensations. The national accounts readily provide the estimates of compensation of employees as a component of value added in many countries; compensation for the self-employed is not separately estimated but is combined with returns to capital in mixed income, except China, where labor remuneration in the national accounts includes labor income for the self-employed (Holz 2006). The assumption on wages for self-employed and contributing family workers is presented in Section 9.3.3. See Box 5 for sensitivity of our assumptions to the TFP results.

30: In Databook, the country aggregations of capital and labor inputs are based on the estimates of PPP for capital and labor inputs, respectively, which are the updates of the estimates developed in Nomura (2018). In most Asian countries, the PPP for output underestimates the PPP for capital input, indicating the capital prices are higher than the output prices and overestimates the PPP for labor inputs, indicating the labor prices are lower than the output prices.

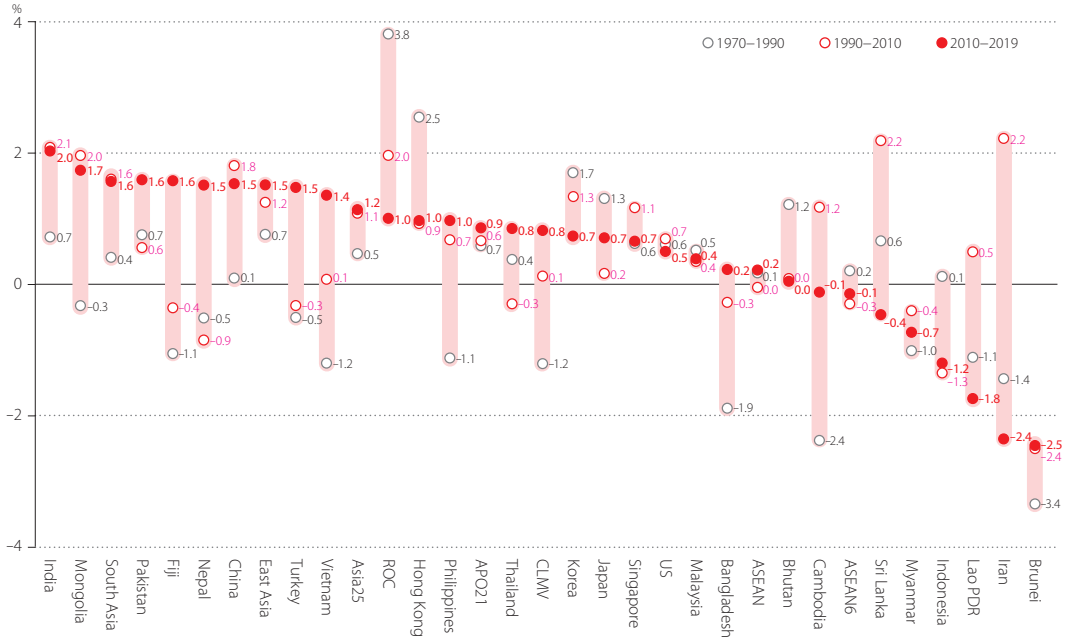

Figure 36 TFP Growth in the Long Run

——Average annual growth rate of total factor productivity in 2010–2019, 1990–2010, and 1970–1990

Source: APO Productivity Database 2021.

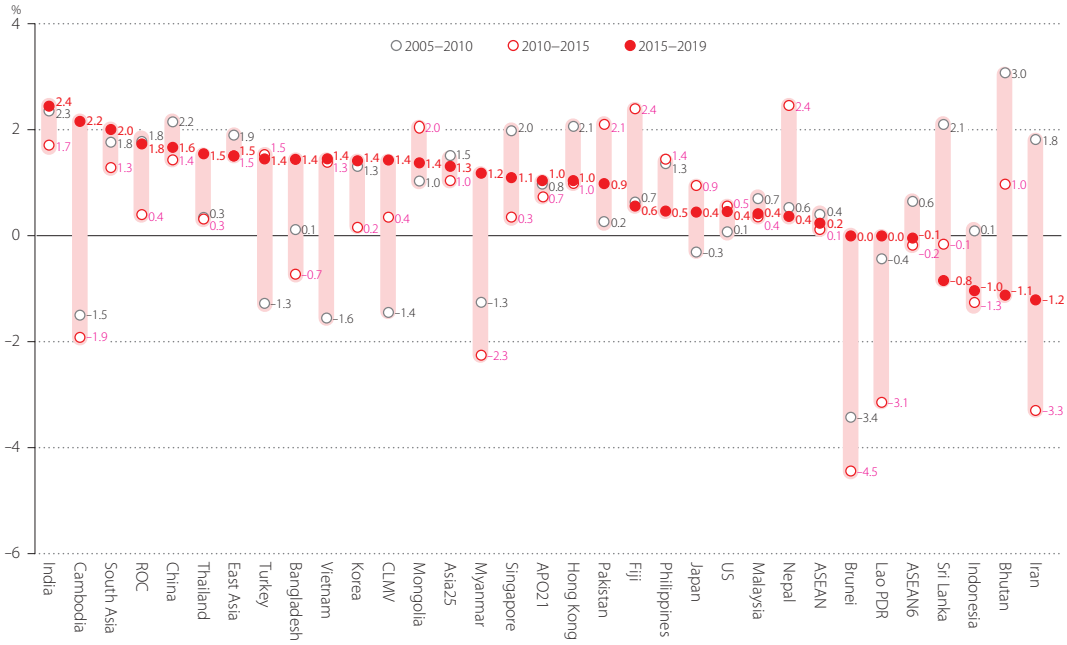

Figure 37 TFP Growth in the Recent Periods

——Average annual growth rate of total factor productivity in 2015–2019, 2010–2015, and 2005–2010

Source: APO Productivity Database 2021.

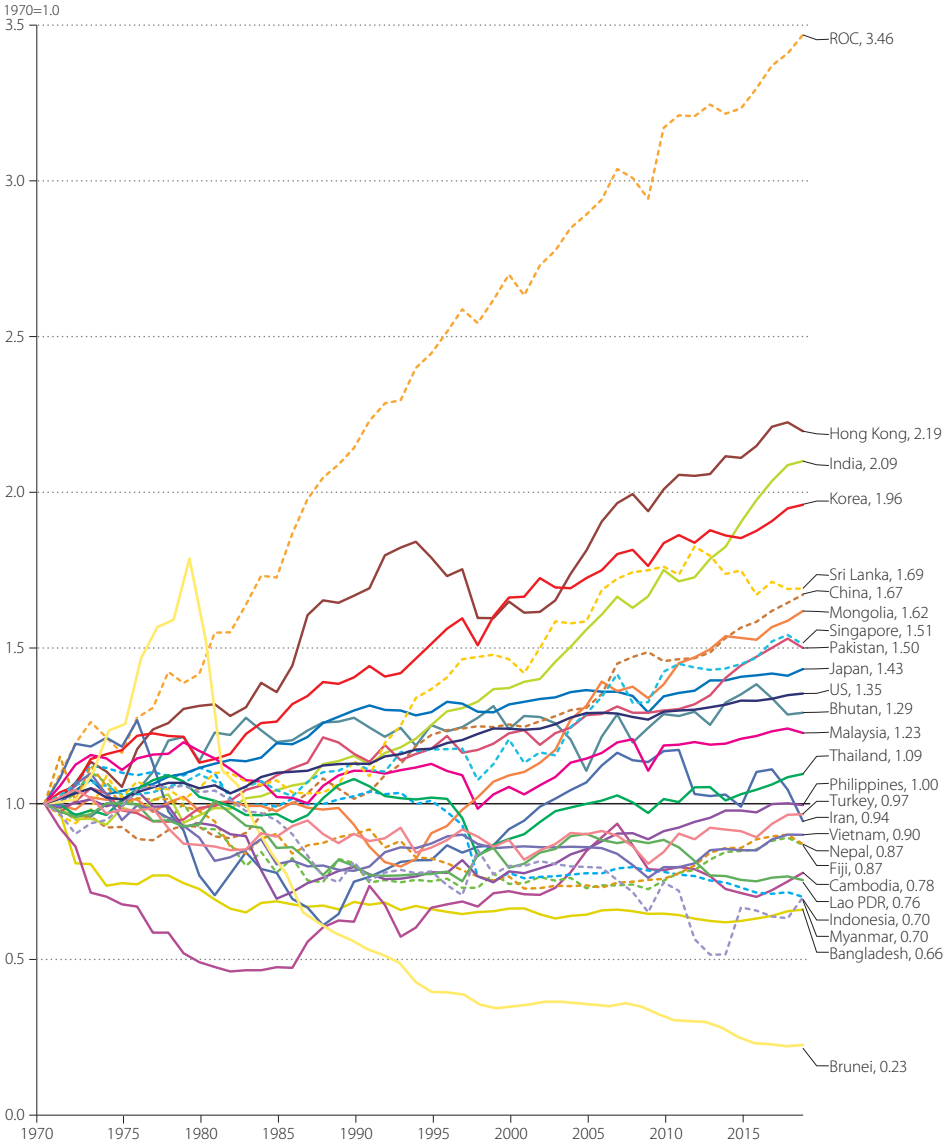

Figure 38 TFP Index in the Long Run
——Index of total factor productivity in 1970–2019

Source: APO Productivity Database 2021.

speed of TFP growth at 1.2% and 1.1% per year in 2010–2019 and 1990–2010, respectively, up from 0.5% per year in 1970–1990. By country, there was a considerable decline in TFP growth in Iran (–2.4% in 2010–2019 from 2.2% in 1990–2010), Sri Lanka (–0.4% from 2.2% over the same periods), Lao PDR (–1.8% from 0.5%), Cambodia (–0.1% from 1.2%), and ROC (1.0% from 2.0%).[31] In contrast, the TFP growth accelerated in CLMV from 0.1% to 0.8% over the same periods. This was driven by Vietnam, in which the speed of TFP growth accelerated from 0.1% to 1.4%.

31: The productivity account in China in this edition of the Databook reflect our sweeping revision conducted in the APO Productivity Database 2021 (Appendix 2). Compared to the past estimates in the 2020 edition, China's TFP growths were downwardly revised from 1.4% to 0.1% in 1970–1990, from 4.0% to 1.8% in 1990–2010, and from 2.6% to 1.5% in 2010–2018.

TFP growth rates in more recent periods are provided in Figure 37 (and Table 19 in Appendix 3) for the Asia25 economies. In the most recent period 2015–2019, many Asian countries recovered TFP growth, compared to those in the early 2010s. In the Asia25, TFP growth improved from 1.0% on average in 2010–2015 to 1.3% in 2015–2019. The recovery in South Asia from 1.3% to 2.0% over the same periods was outstanding. The main driver of the recent recovery of TFP growth in South Asia was India, in which the speed of TFP growth improved from 1.7% to 2.4%.

The long-term trends of TFP index in our entire observation period are compared for the Asia25 economies in Figure 38. There is a wide range in TFP growth in the long run. While the TFP of ROC more than tripled (3.5 times) and those in Hong Kong and India more than doubled (2.2 times and 2.1 times, respectively) in the past half a century, ten countries failed to improve their TFP.

5.4 Sources of Economic Growth

Policy is of significance in identifying the drivers behind the rapid economic growth in the Asian countries. If growth has been driven by capital accumulation more than assimilation of existing technologies from the advanced economies, the Asian model may prove to be too expensive for many less well-off countries to emulate. According to our findings for the period 2010–2019 (Figure 39 for the contributions to economic growth and Figure 40 for the contribution shares), it is true that capital accumulation plays a much more significant role in the economic growth of most Asian countries than in the US, explaining 67% (62% for non-IT and 5% for IT capital) of economic growth achieved in the Asia25. Capital accumulation appears to be a necessary step to economic growth, especially in the early and middle stages of development. In Japan and Hong Kong, however, TFP growth became the dominant driver in this period.

Figure 41 places our estimates among those of OECD (2021) for 16 other OECD countries, to give readers a wider perspective for the two periods 2000–2010 and 2010–2019. For harmonized comparison with OECD's TFP estimates, our estimates are measured excluding the impacts of land capital and labor quality changes, only in Figures 41 and 42.[32] Though growing at a more subdued pace, the contribution made by TFP in the slower-growing, mature economies should not be underestimated. Figure 42 plots per capita GDP levels in 2019 and the TFP contribution shares in the period 2010–2019, for the 25 Asian countries (as dots) with comparison of OECD countries (as white circles). There are no significant differences in the roles of TFP contribution to economic growth between the mature OECD economies and the middle-income Asian countries.

32: The multi-factor productivity in the OECD Productivity Database (OECD 2021), referred to as TFP in this report, defines total input as the weighted average of the growth rates of total hours worked and capital services. Although our estimates are adjusted to be comparable with them, two differences in assumptions remain. First, capital services of residential buildings are included in our estimates of capital input in order to be consistent with output that includes the imputed cost of owner-occupied housing. Second, the compensation of capital is defined in our estimates as the residual of the value added and the compensation of labor (compensations for employees, self-employed persons, and contributing family workers), whereas the OECD defines it as the imputed value of capital services based on the assumptions of an ex-ante rate of returns on capital. Thus, although both apply the same Törnqvist index, the weights to aggregate labor and capital can differ. Other than these, our methodology and assumptions in measuring capital services are designed to be largely consistent with the OECD methodology; and the impact of the differences in assumptions on the volume estimates of capital services is judged to be limited.

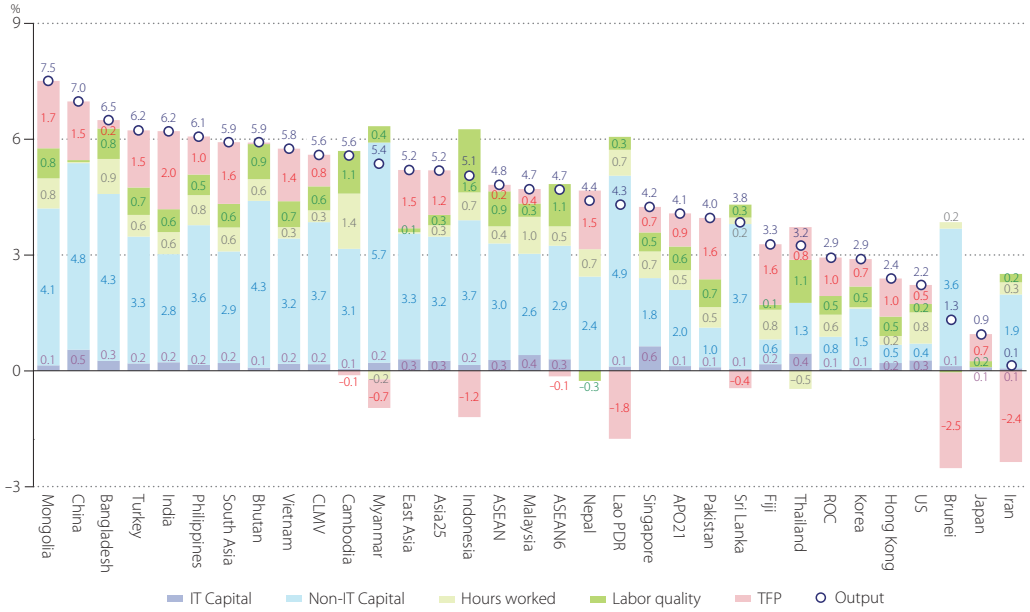

Figure 39 Sources of Economic Growth
——Average annual growth rate of constant-price GDP and contributions of labor, capital, and TFP in 2010–2019

Source: APO Productivity Database 2021.

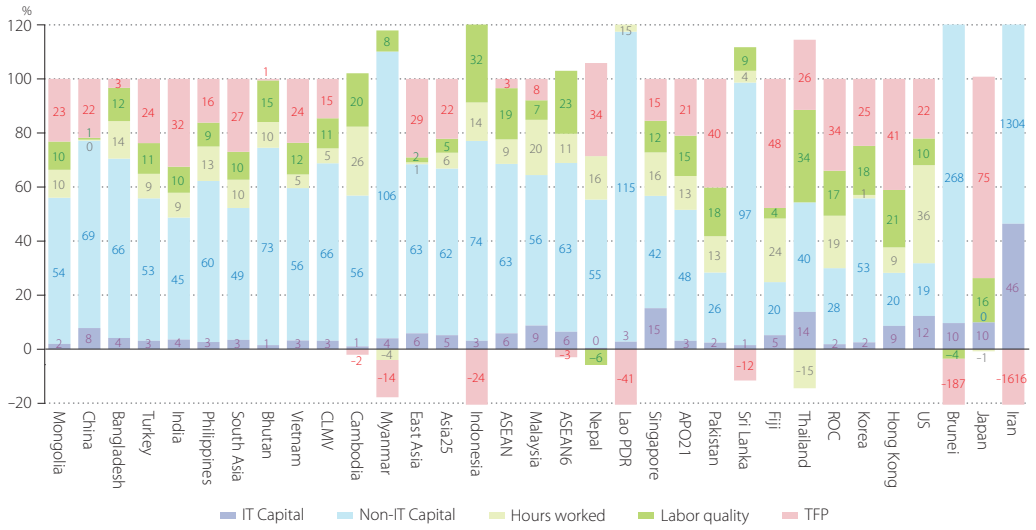

Figure 40 Contribution Shares of Economic Growth
——Average contribution shares of labor, capital, and TFP in 2010–2019

Source: APO Productivity Database 2021.

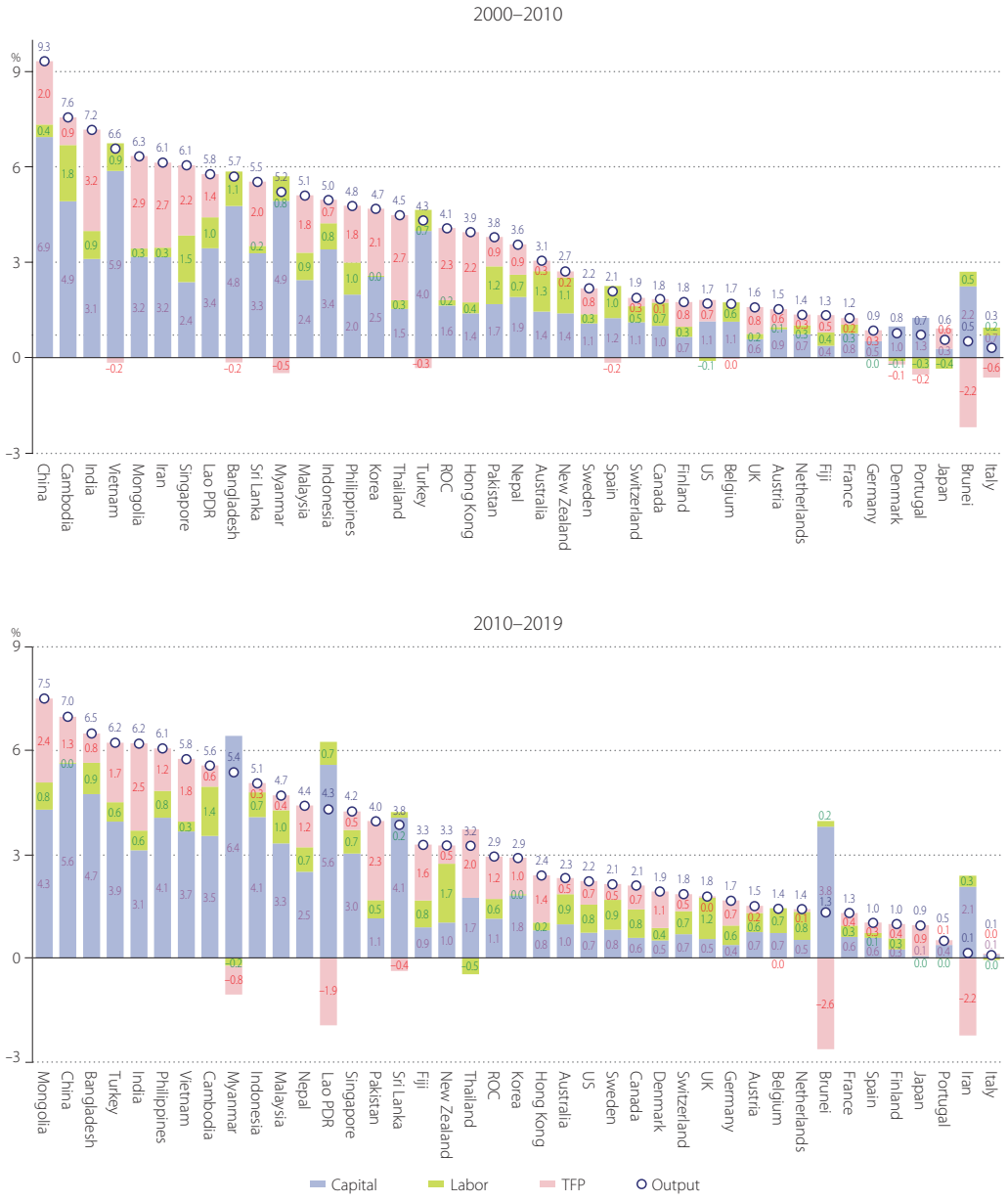

Figure 41 Comparison of Sources of Economic Growth with OECD Countries
——Average annual growth rate of constant-price GDP and contributions of labor, capital, and TFP in 2000–2010 and 2010–2019

Sources: APO Productivity Database 2021 for the Asia25 economies and the US. OECD Stat (Dataset: Multi-Factor Productivity) and OECD (2021) for OECD countries (except Japan, Korea, Turkey, and the US). Note: The impacts of labor quality changes are included in TFP; land stock is not included in capital inputs. The ending years for Spain and Portugal are 2018.

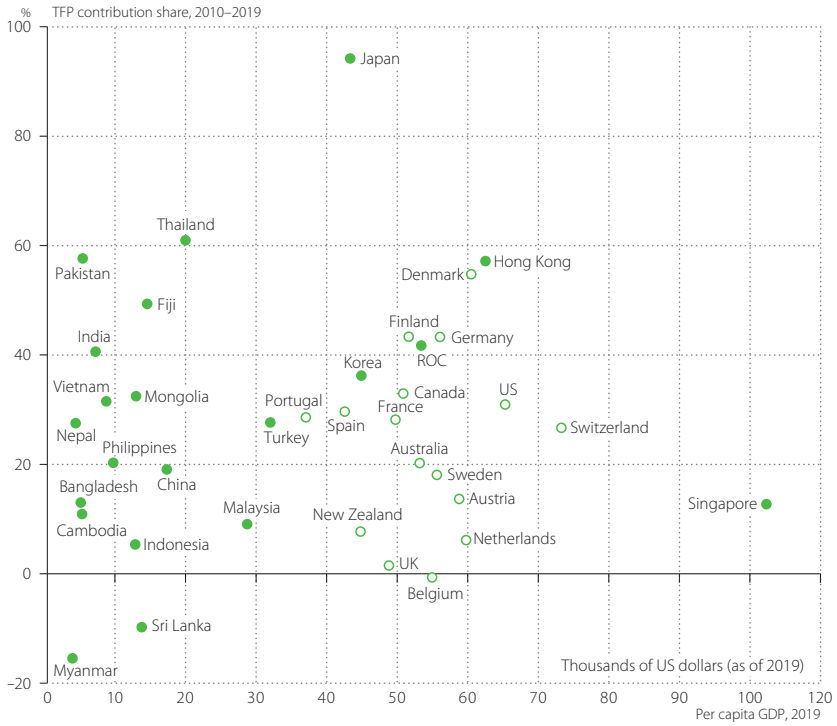

Figure 42 Comparison of TFP Contribution Shares with OECD Countries
——Average contribution shares of TFP in economic growth in 2010–2019

Sources: APO Productivity Database 2021 for the Asia25 economies and the US. OECD Stat (Dataset: Multi-Factor Productivity) and OECD (2021) for OECD countries (except Japan, Korea, Turkey, and the US).
Note: The impacts of labor quality changes are included in TFP; land stock is not included in capital inputs. The ending years for Spain and Portugal are 2018.

Tracking the size and growth of IT capital has become a standard practice in productivity research, following attempts to establish the driving force behind productivity resurgence in developed economies. This started with the US in the 1990s. Unlike technological advancements in the past, which were largely confined to manufacturing, IT can permeate the economy and bring about significant production gains in, for example, wholesale and retail, banking and finance, and transportation and telecommunications (service sectors that have traditionally struggled with slow productivity growth). Given the share of the service sector in the economy (Table 22 in Appendix 3), the potential and implications for economic development and productivity gains therefore could be immense. A frequent question asked by policymakers and researchers is how best to capitalize on the productivity potential invited by DX (digital transformation). As with non-IT capital, it involves a process of accumulation and assimilation. IT capability becomes a factor which determines an economy's long-term growth prospects.[33]

Japan has been leading Asian countries in terms of IT capital contribution to economic growth. Japan's shift in capital allocation took off in earnest in the mid-1990s with the contribution of IT capital to capital input growth rising from a low of 11% in 1994, to a high of over 40% in the late 1990s, as shown in Figure 43. This was a period when Japan's overall investment growth slowed significantly after the economic collapse of the early 1990s. After years of excesses, Japan shifted away from non-IT to IT

33: The 2008 SNA formally acknowledges the IT sector's importance to the modern economy and has made it more identifiable and separable in industry classification and asset type.

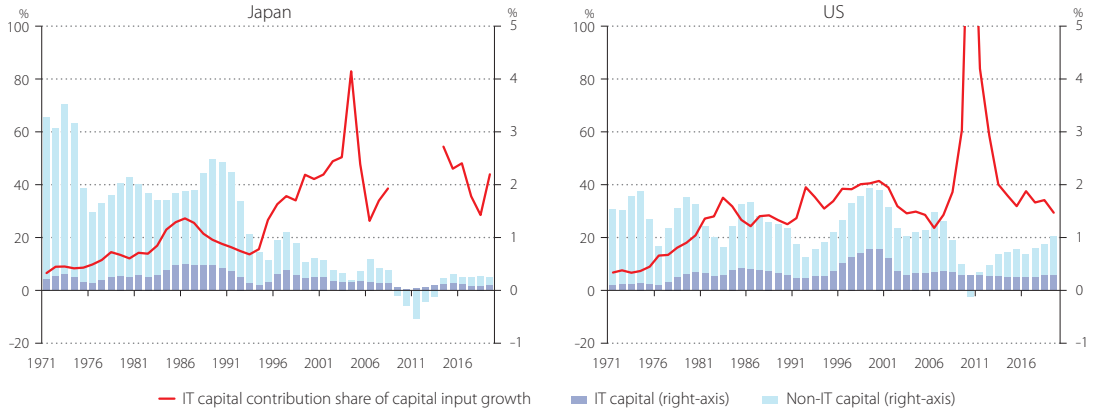

Figure 43 IT Capital Contribution Shares in Japan and the US
——IT capital contribution shares in annual growth rate of capital input in 1970–2019

Source: APO Productivity Database 2021.

capital as a profitable investment. In contrast, the US started its shift toward IT capital much earlier than any Asian economy and over a longer period. Since 1981, IT capital has accounted for over 25% of US capital input growth, reaching a height of over 40% in the late-1990s and the late-2000s.[34]

A similar allocation shift to IT capital is also found in the Asian Tigers (Figure 44).[35] In the Asian Tigers, the contribution share of IT capital to total capital input peaked at about 30% at the turn of the millennium, from a share of 10% or below before 1994. China was a latecomer in terms of investing in IT capital with a surge in its contributions only taking off around 2000 and peaking at 14% in the early 2000s. There has not been as big of a drive in IT pickups in India as in other Asian countries.

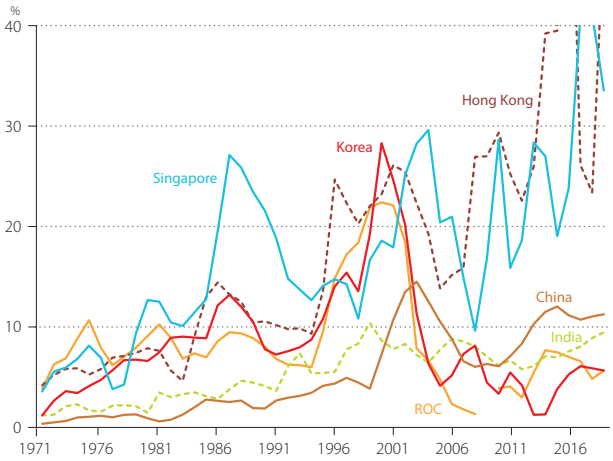

Figure 44 IT Capital Contribution Shares in Asian Tigers, China, and India
——IT capital contribution shares in annual growth rate of capital input in 1970–2019

Source: APO Productivity Database 2021.

34: In recent years, the slowdown in total capital growth has concentrated more on non-IT capital, resulting in spikes in the contribution of IT capital in Japan and the US.
35: The quality of the data on investment for IT capital (IT hardware, communications equipment, and computer software) varies considerably among countries. See Sections 9.1.4 and 9.2.1.

5.5 Capital Productivity

Although TFP more accurately measures how efficiently an economy utilizes its factor inputs, labor productivity and its drivers are of interest because of the close link to GDP per capita. Within the same growth accounting framework, average per-hour labor productivity growth at the aggregate level can be broken down into effects of capital deepening (as measured by capital input per hour worked), which reflects the capital-labor substitution, labor quality changes (as measured by quality-adjusted labor input per hour worked), and TFP. In other words, these factors are key in fostering labor productivity.

Capital deepening existed in 2015–2019 – albeit to various degrees – in all of the countries compared, as presented in Figure 45. In the Asia25, the speeds of capital deepening were stable at 6% to 7% per year in the 2010s. Experience of countries suggests that capital deepening is an accompanying process of rapid economic development. The relatively early starters (Japan and the Asian Tigers) underwent more rapid capital deepening than the other countries compared; and in the earlier, rather than the latter, period. The reverse is true for the emerging Asian economies, where concerted efforts were made to increase capital intensity in the latter period. Myanmar, China, Lao PDR, India, Bangladesh, and Vietnam moved up to occupy the top spots in 2015–2019.

While labor productivity steadily improved for all countries as shown in Figure 32 in Section 5.2, the growth rate of capital productivity (as the other measure of partial productivity) remained negative for many countries regardless of the observation periods, shown in Figure 46. Although rates of capital deepening in Myanmar and China were outstanding, at 11.0% and 7.9% per year, on average in 2015–2019, their capital productivity experienced the sharpest decline of 4.3% and 2.8% per year, respectively.

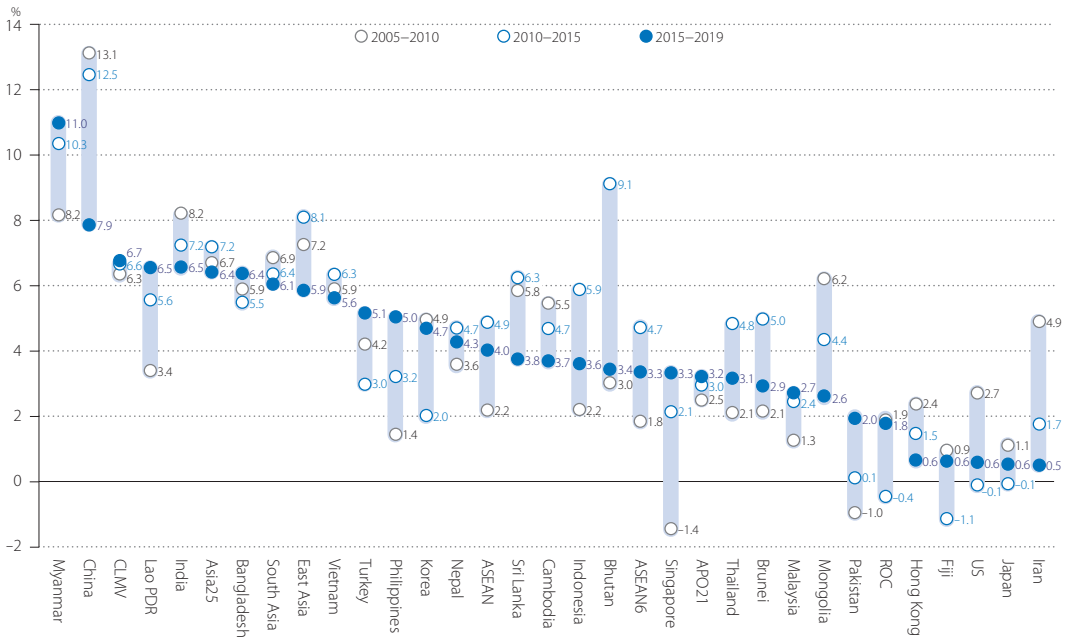

Figure 45 Capital Deepening
——Average annual growth rate of capital input per hour worked in 2015–2019, 2010–2015, and 2005–2010

Source: APO Productivity Database 2021.

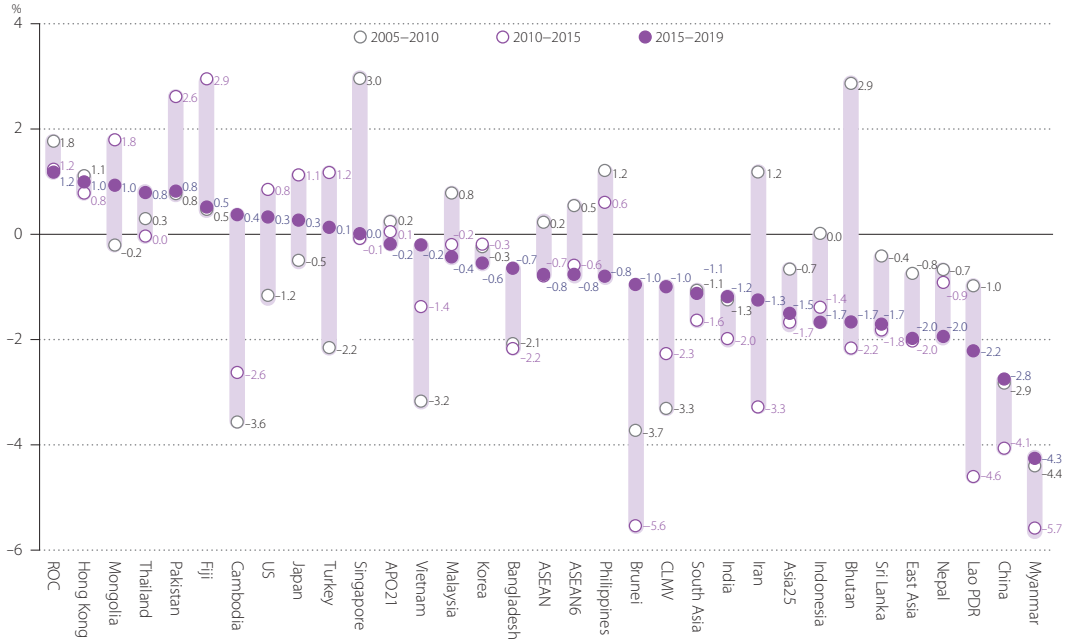

Figure 46 Capital Productivity Growth
——Average annual growth rate of constant-price GDP per capital input in 2015–2019, 2010–2015, and 2005–2010

Source: APO Productivity Database 2021.

5.6 Sources of Labor Productivity Growth

Labor productivity growth can be decomposed into contributions from capital deepening, labor quality, and TFP growth. Capital deepening should raise labor productivity, all other things being equal. According to our findings for the period 2010–2019 (Figure 47 for the contributions to per-hour labor productivity growth and Figure 48 for the contribution shares), it remains the prime engine of labor productivity growth, explaining 62% (57% for non-IT and 5% for IT capital) in the Asia25. The contribution of improvement in labor quality is more moderate at 12% in the Asia25, than 25% of the TFP contribution. However, the role of labor quality changes is more significant in emerging Asian countries. In the ASEAN with almost zero growth of regional TFP in 2010–2019, the contribution of labor quality was the prime engine contributing 60% of the regional improvement in labor productivity. In South Asia, the TFP growth explains 33% of labor productivity improvement, which is larger than the contribution of labor quality improvement (22%).

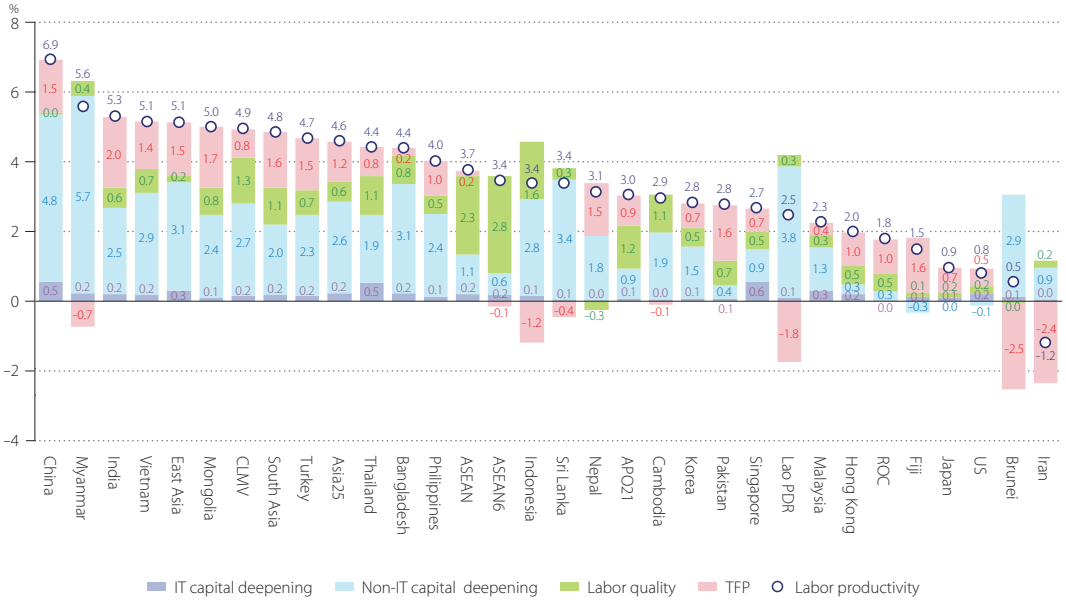

Figure 47 Sources of Labor Productivity Growth
——Decompositions of average annual growth rate of constant-price GDP per hour in 2010–2019

Source: APO Productivity Database 2021.

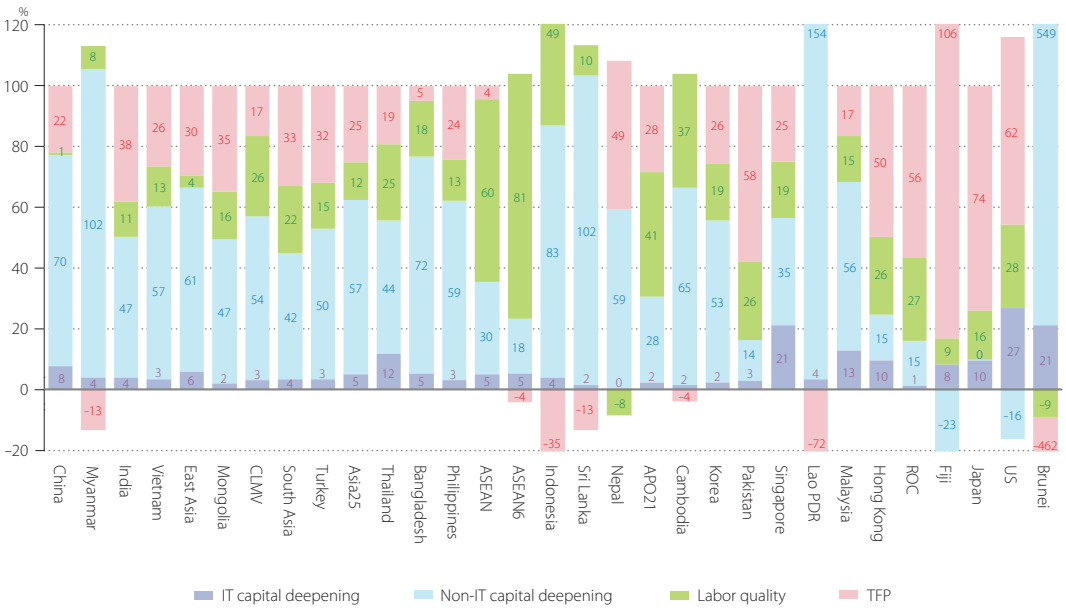

Figure 48 Contribution Shares of Labor Productivity Growth
——Contribution shares of capital deepening, labor quality, and TFP in 2010–2019

Source: APO Productivity Database 2021. Note: The countries with a negative growth of labor productivity are excluded.

5.7 Energy Productivity

In the Asia31, to produce 45% of the world output in 2018, 44% of world energy was consumed and 52% of world CO2 was emitted (Figure 49), compared to 17%, 11%, and 9% in the EU28. This implies that Asia has lower energy productivity (defined as a ratio of output per energy consumption) and higher carbon intensity of energy at the aggregate level, compared to the EU28. It is imperative to improve energy productivity and carbon intensity in the growing economies of Asia in order to reduce CO2 emissions in the world in the long run.

There is considerable diversity in energy productivity among countries. Figure 50 compares energy productivity trends of Japan, China, the Asia31, and the EU15 in 1970–2018, relative to the US. Japan's

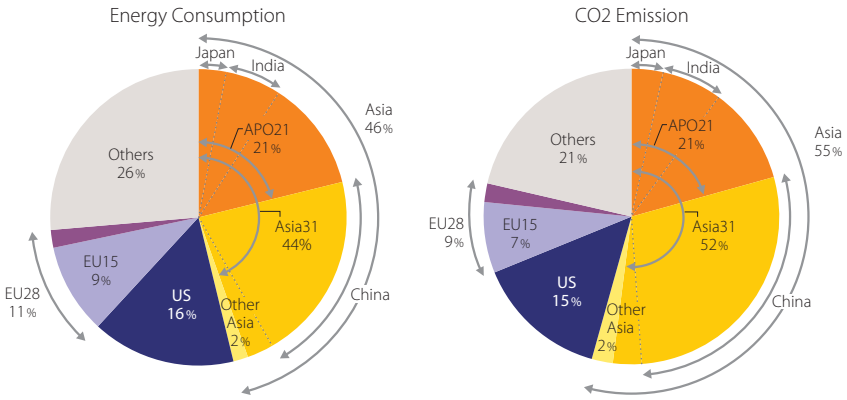

Figure 49 Asia in World Energy Consumption and CO2 Emission
——Share of final energy consumption and CO2 emission in 2018

Sources: IEA (2020a and 2020b).

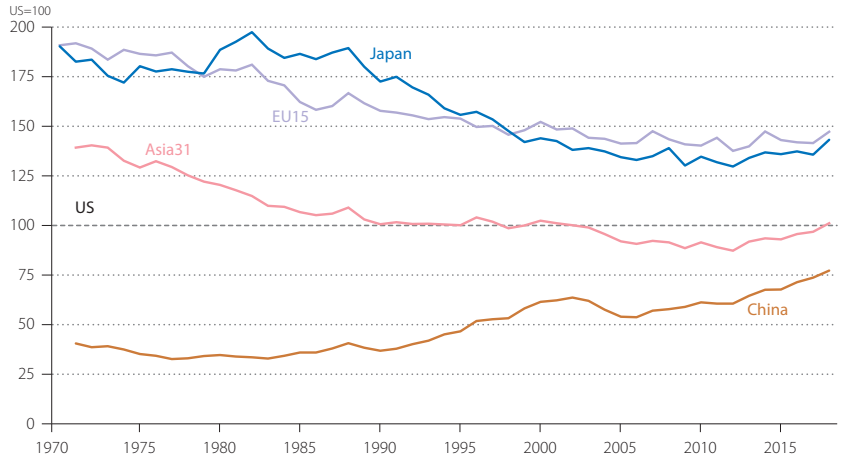

Figure 50 Energy Productivity of Japan, China, and the EU, Relative to the US
——Index of GDP at constant market prices, using 2017 PPP, per energy consumption in 1970–2018

Sources: Official national accounts in each country, including author adjustments, and IEA (2020b).

energy productivity level is almost equivalent to the EU15 from the mid-1990s. The level of Chinese energy productivity was less than 40% of that of the US in the 1970s and the 1980s. However, China succeeded to improve energy productivity along with the economic growth since the 1990s, closing the gap with the US to 23% in 2018.

The energy productivity measure reflects not only the difference in energy efficiencies of industries and households, but also the difference in industry and production structure of the economy. Thus, the energy productivity at the aggregate level is highly dependent on the development stage of the economy and industrial structure. Figure 51 places countries on the two partial productivity indicators of labor and energy, measured in 2018. Less-developed countries with lower labor productivity (such as the Philippines, Sri Lanka, and Bangladesh) tend to have higher energy productivity. One of the effective strategies to improve labor productivity in such countries is to expand the manufacturing sector. This frequently follows the deterioration in energy productivity. As a next stage of economic growth, well-developed countries will be able to pay more attention to improving energy productivity by abolishing implicit or explicit subsidies on energy prices, especially in electricity prices, and levying heavier taxes on energy consumptions. The C-shape dynamics found between labor and energy productivities corresponds to the so-called Environmental Kuznets curve, as an inversed U-shape relationship between environmental quality (at the y-axis) and economic development (at the x-axis).

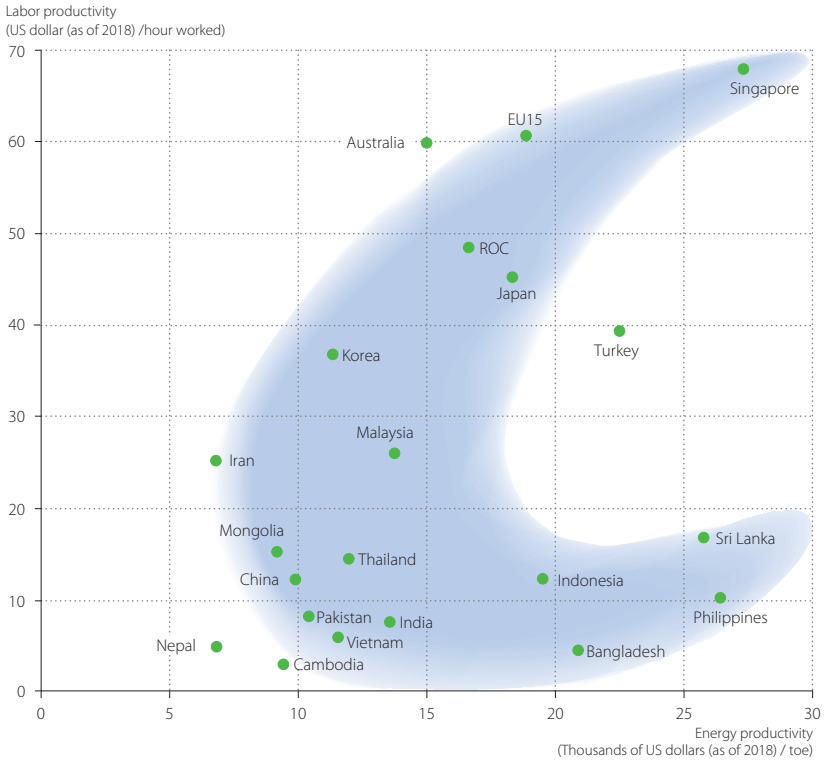

Figure 51 Labor Productivity and Energy Productivity
——Per-hour labor productivity level and energy productivity level in 2018

Sources: Official national accounts in each country, including author adjustments, IEA (2020b), and APO Productivity Database 2021.

Figure 52 decomposes the sources of CO2 emission growth (from fuel combustion) in the Asian countries during 2000–2018, based on the so-called Kaya identity. The growth in CO2 emissions is decomposed into three components: changes in real GDP; carbon intensity of energy; and energy intensity of GDP (the inverse of energy productivity). In many countries, the production expansion (real GDP growth) is the most significant factor to explain the growth of CO2 emissions. With the exception of Iran, energy productivity has improved in many Asian countries in this period. However, these improvements are not enough to offset an expansion of energy consumption in all Asian countries except Japan.

On the other hand, in many Asian economies, the carbon intensity of energy has increased, mainly due to an expansion of coal consumption. Japan achieved some improvement in energy efficiency in this period, but the carbon intensity of energy increased due to an extremely low operation rate of nuclear power plants after the Fukushima Daiichi nuclear disaster in March 2011. Singapore realized a significant improvement in carbon intensity of energy by the shift from oil to LNG in electricity power generation.[36] This helped offset the increases in CO2 emission accompanied by strong economic growth, regardless of very modest improvement in energy productivity. In this period, a decoupling in the growth of GDP and CO2 emission is apparent in a few developed countries, especially in the EU and the US. However, this may be due mainly to the shift in energy-consuming production to the Asian countries, in which more energy was required, and more CO2 was emitted to produce the same output.

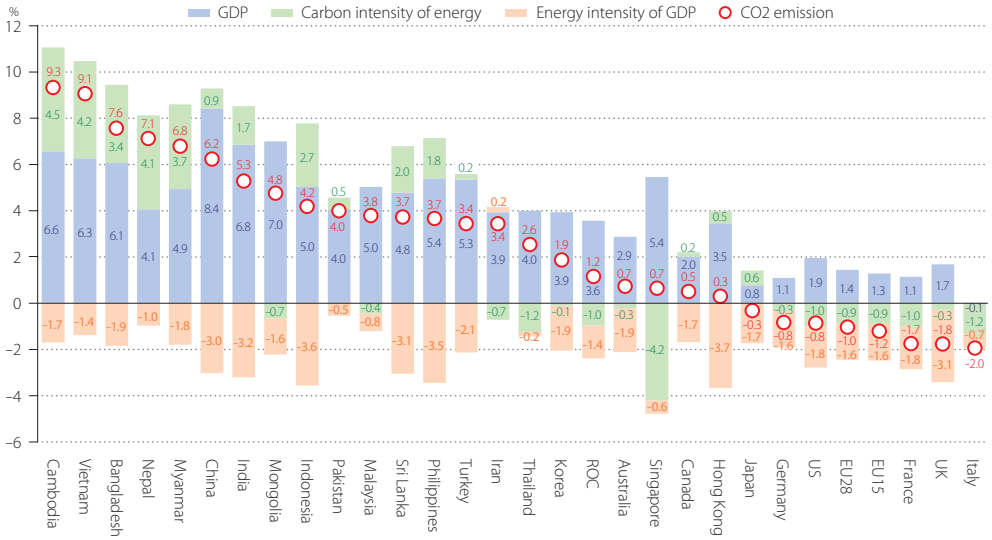

Figure 52 Sources of CO2 Emission Growth
——Average annual growth rate of CO2 emission in 2000–2018

Sources: Official national accounts in each country, including author adjustments, and IEA (2020a and 2020b).

36: In Singapore, the share of natural gas in electricity power generation reached 95% in 2018 from 19% in 2000, compared to the decrease in the share of oil in power generation from 80% in 2000 to 0.6% in 2018 (IEA 2020b).


Bangladesh
Bhutan
Brunei
Cambodia
China
ROC
Fiji
Hong Kong
India
Indonesia
Iran
Japan
Korea
Lao PDR
Malaysia
Mongolia
Myanmar
Nepal
Pakistan
Philippines
%
1970–1975
1975–1980
1980–1985
1985–1990
1990–1995
1995–2000
2000–2005
2005–2010
2010–2015
2015–2019
IT capital
Non IT capital
Hours worked
Labor quality
TFP
Output

Figure 53 Growth Accounting Decomposition by Country and Region
——Average annual growth rate of constant-price GDP and contributions of labor, capital, and TFP in 1970–2019

Source: APO Productivity Database 2021.

Box 4 An Alternative Path to a Fully Developed Economy?

The Databook presents the decomposition of capital stock, which includes the stock of IT (hardware and software) and R&D capital. Figure B4 shows these stocks relative to GDP in 2019. R&D capital has been regarded as the basis of scientific knowledge and crucial inputs for innovation. As shown in Figure B4, the ratio of R&D capital to GDP is particularly high in Korea, Japan, Singapore, and the US, followed by the ROC. Surprising are extremely low ratios of R&D capital to GDP in other Asian economies. There exists a big gap between economies that have reached the high-income level and those that have not. Our conventional understanding is that innovation capability backed by R&D capital in a well-organized massive national innovation system is essential for stepping up from upper middle-income to fully developed economies.

However, our IT capital data may be suggesting a different view. The IT capital here consists of IT hardware, consisting of computers and communications equipment such as TVs, radios, and cellular phones, and IT software. The stock of this IT capital relative to GDP is much larger than that of R&D capital in most of the developing countries. The gap between developed and developing countries is much smaller. In Singapore and Thailand, the ratios are even higher than any other countries in the figure. Although we are not sure why Thailand has much larger IT hardware than IT software, fully developed and newly developed economies tend to have large IT software stocks.

The current developing countries are not conducting cutting-edge innovation at the technological frontier but are proactively engaged in the deployment of new technologies even though such activities are not counted as R&D investment. In the past two decades, business innovation was shifting its weight from gradual innovation with large-scale R&D investment to disruptive innovation (Bower and Christensen 1995). The latter is characterized by multiple trials and errors, a large amount of failure cases with a few extremely successful cases as unicorns. Although it may not yet be properly counted in GDP, the proliferation of new services is astounding, which includes social media, e-commerce, matching, service outsourcing, e-payment, fintech, and e-government. New technologies are also rejuvenating old industries such as agriculture, manufacturing, transportation, and tourism. These suggest that heavy and slow R&D, and perhaps manufacturing-centric development, may not be the only way to step up to fully developed economies from now on.

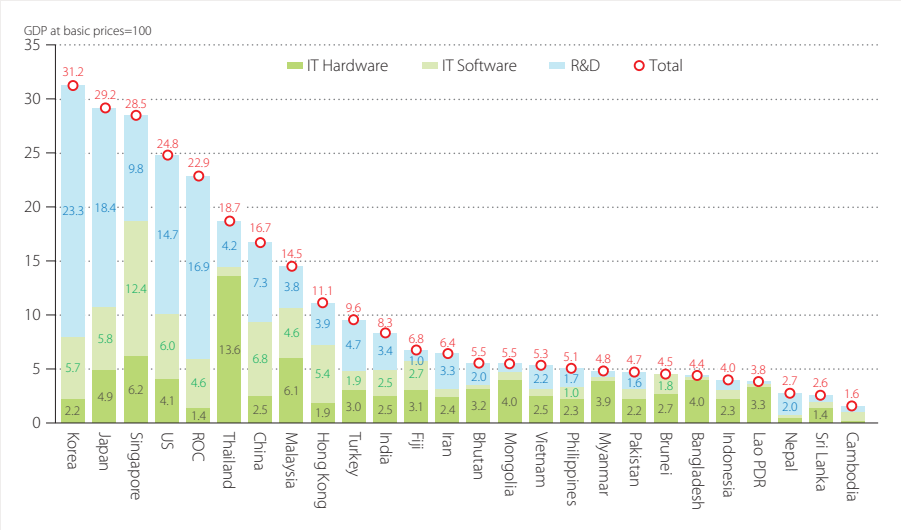

Figure B4 Stock of IT and R&D Capital, Relative to GDP in 2019
——Ratios of end-of-year capital stocks of IT and R&D to the basic-price GDP in 2019

Source: APO Productivity Database 2021.

Box 5 Sensitivity to TFP Estimates by Labor Share

TFP computations, based on the growth accounting framework, depend on data that is often difficult to observe. One difficulty is calculating the compensation for the self-employed and unpaid family workers. Section 9.3.3 presents the assumption on measuring the labor compensation for total employment in the Asia QALI Database 2021. The future review on this assumption affects TFP estimates directly through the revision of factor income shares, and indirectly through the estimates of the ex-post rate of return, and thus the aggregate measure of capital services.

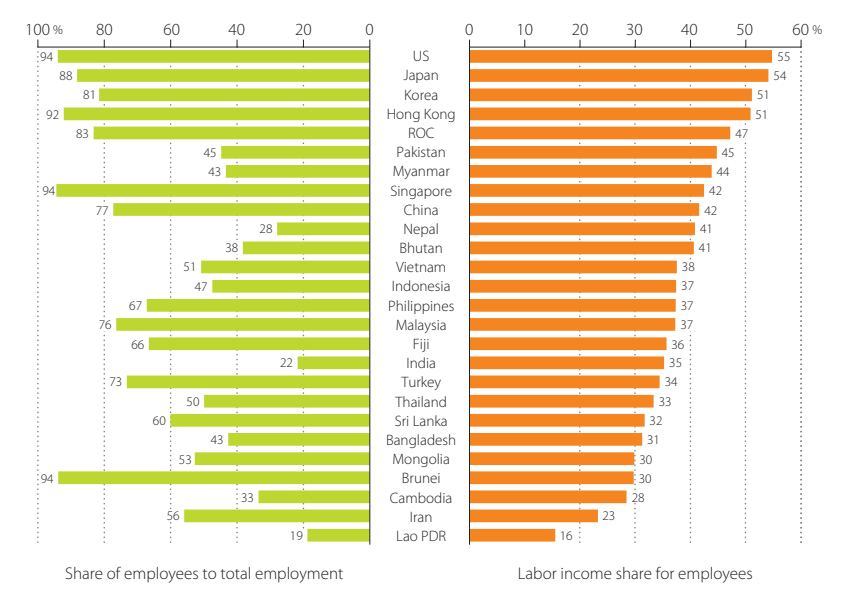

Figure B5.1 Labor Income Share for Employees in 2019

Sources: Official national accounts in each country, including author adjustments; Asia QALI Database 2021.

The right panel of Figure B5.1 presents the labor income share (the ratio of compensation of employees to the basic-price GDP) based on the official national accounts (including author adjustments in basic-price GDP for some countries) in the Asia25 economies and the US in 2019. The left panel of the figure illustrates the

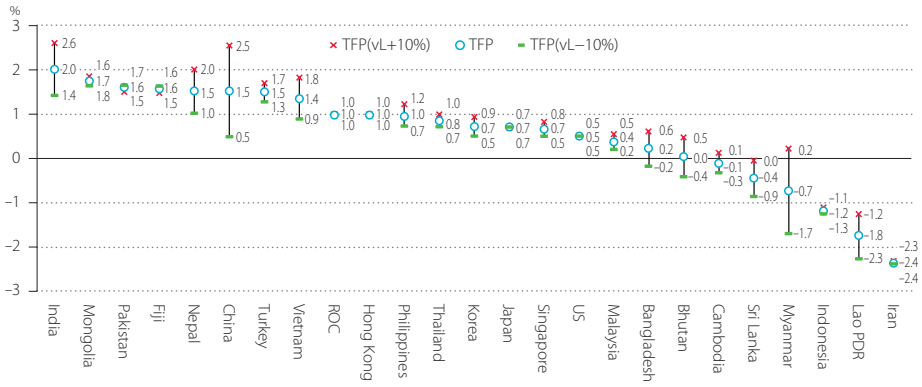

Figure B5.2 Sensitivity of TFP Estimates by the Change of Labor Share
——Average annual growth rate of total factor productivity in 2010–2019

Source: APO Productivity Database 2021.

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employee share to total employment. There is a significant divergence in labor income share for employees among the Asian countries. This does not necessarily reflect differences in the number of employees in total employment. Although Malaysia and Turkey have a high employee share of 76% and 73%, the labor income share is only 37% and 34% in 2019, respectively.

Figure B5.2 illustrates the sensitivity of TFP estimates by changing the factor income share during the period from 2010 to 2019. In general, the growth rate of capital input is higher than that of labor input, therefore the higher income share of labor results in higher estimates of TFP growth. In other words, labor productivity (Figure 32 in Section 5.2) is improved much faster over a given period than capital productivity (Figure 46 in Section 5.6), the growth of which frequently tends to be negative. The TFP estimate reflects the improvement of labor productivity more when the labor share increases. In Vietnam, with TFP growth of 1.4% on average during the period 2010–2019, the true estimate could be 1.8% if the current labor share were underestimated by 10%.

6 Industry Perspective

Highlights

- **While Asian countries are diversifying and moving away from agriculture, the sector continues to dominate employment, accounting for 29% of total employment in 2019 in the Asia25 (Figure 58), down from 63% in 1980. Its share in total value added decreased more moderately, from 17% to 9% over the same period (Figures 54 and 61).**
- **Manufacturing is a significant sector, accounting for over 20% of total value added in nine Asian countries in 2019 (Figure 54 and Table 22). It is particularly prominent at 32% in ROC, 28% in Korea, and 26% in China. Manufacturing is dominated by machinery and equipment in most Asian economies, while Bangladesh and Cambodia concentrate on light manufacturing, such as textiles and the food industry (Figures 56 and 68).**
- **In labor productivity growth by region, contribution of the manufacturing sector is significant at 33% in East Asia in 2010–2019, but remains moderate in CLMV at 17% and South Asia at 12% (Figure 70). In South Asia, 63% of the labor productivity growth is explained by improvement in the service sector, compared to 27% in East Asia and 36% in CLMV (Figure 71).**

Industry decomposition gives insight into the source of a country's economic dynamics which, in turn, determines its overall performance and characteristics, its strengths, and its vulnerabilities. On one hand, a broad industry base reflects diversification and sophistication in the economy, and in turn is more resourceful in weathering economic shocks. On the other hand, reliance on a narrow industry base leaves an economy more vulnerable to shocks and more susceptible to volatility. The different composition of economic activities among countries is one of the main sources of the huge gap in average labor productivity at the aggregate level. By analyzing the industry structure of the Asian economies, one can clearly trace the path of economic development and identify countries' respective stages based on their characteristics. [37]

6.1 Industrial Structure

Table 1 in Section 3.2 introduced a country grouping according to stages of development from the point of the view of long-run economic growth from 1970 (as measured by per capita GDP relative to the US). Table 2 regroups countries based on the same set of criteria as in Table 1, but applies it to 2019 income levels and focuses on more recent catch up to the US from 2010.

Countries at the lower rungs of the development ladder tend to have a greater agriculture sector as a share of value added.[38] Figure 54 shows the industry composition of the Asian economies and regions in 2019,[39] indicating a broad, negative correlation between the share of the agriculture sector and the relative

37: Constructing the industry origins of labor productivity growth requires confronting a large volume of data from different sources. Issues of data inconsistency arising from fragmentation of national statistical frameworks can present enormous hurdles to researchers in this field. The industry data in this chapter is mainly based on official national accounts. Where back data is not available, series are spliced together using different benchmarks and growth rates. Data inconsistencies in terms of concepts, coverage, and data sources have not been fully treated although levels of breakdown are deliberately chosen to minimize the potential impact of these data inconsistencies. Readers should bear these caveats in mind in interpreting the results.

38: In Chapter 5, GDP is adjusted to be valued at basic prices (if the official estimates at basic prices are not available, they are our estimates). However, the definition of GDP by industry differs among countries in this chapter due to data availability. The industry-level GDP is valued at factor cost for Fiji and Pakistan; at basic prices for Bangladesh, Cambodia, Hong Kong, India, Korea, the Lao PDR, Mongolia, Nepal, Singapore and Vietnam; at producers' prices for Iran, the ROC and the Philippines; and at market prices for Indonesia, Japan, Malaysia, Sri Lanka, Thailand, and Turkey.

Table 2 Country Groups Based on the Current Economic Level and the Pace of Catching Up
——Level and average annual growth rate of per capita GDP at constant market prices, using 2017 PPP

Per capita GDP level in 2019, relative to the US	Average annual rate of catch-up to the US during 2010–2019					
	(C6) <–1%	(C5) –1% ≤–< 0%	(C4) 0% ≤–< 1%	(C3) 1% ≤–< 2%	(C2) 2% ≤–< 3%	(C1) 3% ≤
(D1) 100% ≤	Qatar			Singapore, UAE		
(D2) 70% ≤ - <100%	Brunei, Kuwait	Australia, EU15, EU28, Saudi Arabia	Bahrain, Hong Kong	ROC		
(D3) 40% ≤ - < 70%	Oman	Japan	Korea	Malaysia		Turkey
(D4) 20% ≤ - < 40%	Iran			Fiji, Sri Lanka, Thailand		China
(D5) 10% ≤ - < 20%				Lao PDR	Indonesia, Philippines	Bhutan, India, Mongolia, Vietnam
(D6) < 10%			Pakistan		Cambodia, Nepal	Bangladesh, Myanmar

Sources: Official national accounts in each country, including author adjustments. Note: The annual catch-up rates in column are based on the estimates in 2010–2019.

per capita GDP against the US.[40] The changes in industry shares of value added are presented in Table 22 in Appendix 3.

To foster productivity in less-developed countries, it is important to adopt existing technologies from the advanced economies. In this view of assimilation, manufacturing is a key sector in driving countries to make a leap in economic development. It accounts for 20% more of total value added in nine of the Asian countries compared in Figure 54. Figure 55 compares our estimates of TFP growth during 2010–2019 and the shares of manufacturing in 2019. A positive correlation between them, which was observed in the past decades, is less clear in the 2010s. Regardless of larger share of manufacturing, TFP growth is stagnated in Korea and Thailand.

Figure 56 shows the breakdown of the manufacturing sector, comprising nine sub-industries, for 17 selected Asian countries and the US in 2019.[41] Countries are sorted based on the size of the share of machinery and equipment in manufacturing GDP. The dominance of machinery and equipment in Asian manufacturing is apparent. At the other end are countries dominated by light manufacturing; e.g., the food products, beverages, and tobacco products sector.

39: The nine industries are 1–agriculture; 2–mining; 3–manufacturing; 4–electricity, gas, and water supply; 5–construction; 6–wholesale and retail trade, hotels, and restaurants; 7–transport, storage, and communications; 8–finance, real estate, and business activities; and 9–community, social, and personal services. Cambodia, Iran, and Nepal use the International Standard Industry Classification of All Economic Activities (ISIC) Rev.3. Other Asian economies already have switched to the ISIC Rev.4. See Appendix 10 in the 2018 edition of the Databook for the concordances between the industry classification used in the Databook and the ISIC Rev.3 and Rev.4.

40: The regional averages as industry share of value added are based on a country's industry GDP, using the PPPs for GDP for the whole economy without consideration of the differences in relative prices of industry GDP among countries.

41: Manufacturing consists of nine sub-industries: 3.1–food products, beverages, and tobacco products; 3.2–textiles, wearing apparel, and leather products; 3.3–wood and wood products; 3.4–paper, paper products, printing, and publishing; 3.5–coke, refined petroleum products, chemicals, rubber, and plastic products; 3.6–other non-metallic mineral products; 3.7–basic metals; 3.8–machinery and equipment; and 3.9–other manufacturing.

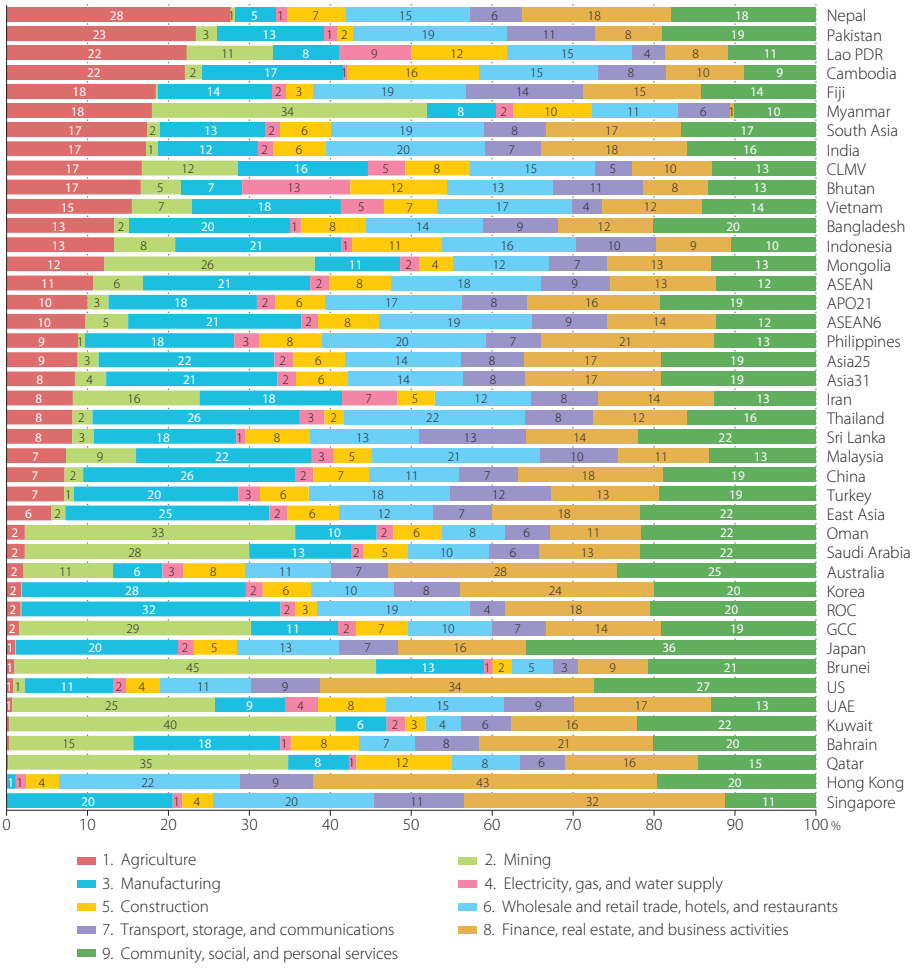

Figure 54 Industry Shares of Value Added
——Shares of industry GDP in aggregate GDP at current prices in 2019

Sources: Official national accounts in each country, including author adjustments.

Figure 57 shows how the share of the agriculture industry in total value added dropped over time in the Asian economies with per capita GDP lower than 40% of the US level in 2019. This could reflect the actual decline in agricultural output and/or the relatively rapid expansion in other sectors. Despite the broad spread, the downward trend is unmistakable. The share of the agriculture sector displays a long-term declining trend in all countries, except Fiji, albeit at different paces and at different starting times.

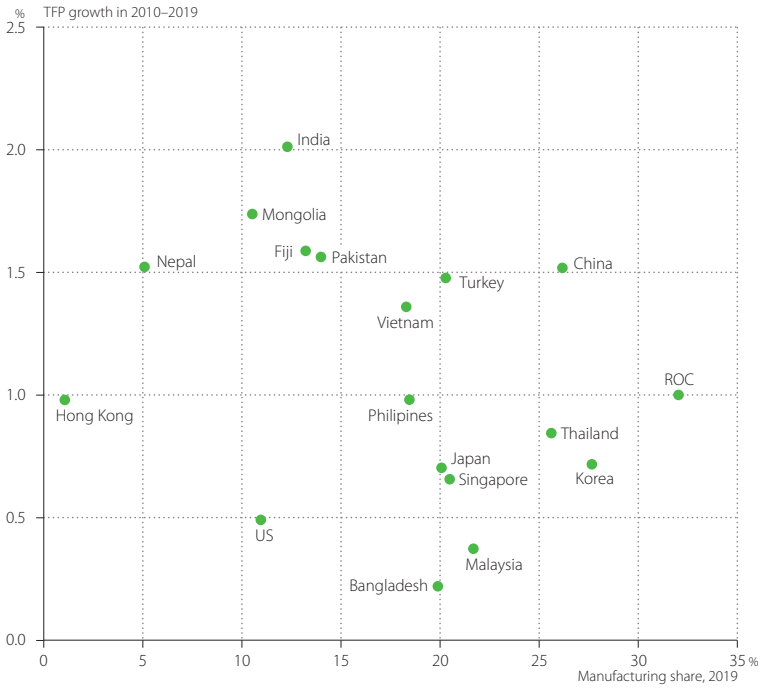

Figure 55 Manufacturing GDP Share and TFP Growth
——GDP share of manufacturing in 2019 and average annual TFP growth rate in 2010–2019

Sources: Official national accounts in each country, including author adjustments; APO Productivity Database 2021. Note: Countries with negative TFP growth are excluded.

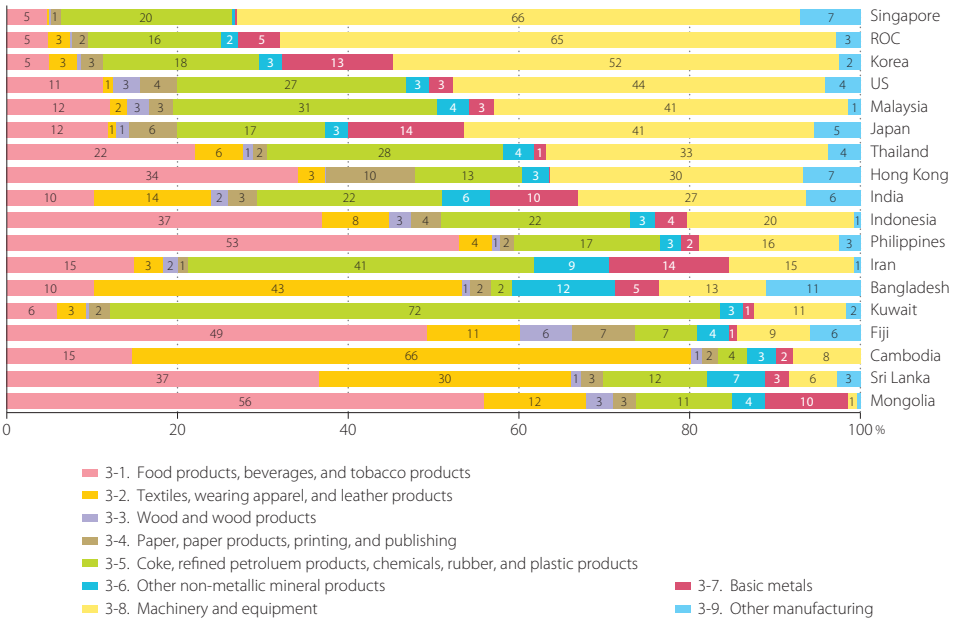

Figure 56 Industry Shares of Value Added in Manufacturing
——Shares of sub-industry GDP in aggregate GDP at current prices in 2019

Sources: Official national accounts in each country, including author adjustments.

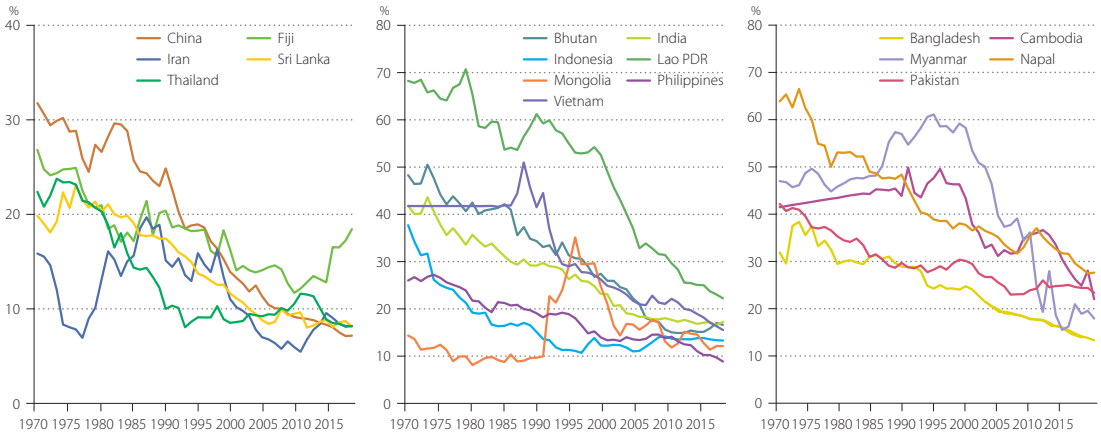

Figure 57.1: Group-D4 (20%≤...<40%) Figure 57.2: Group-D5 (10%≤...<20%) Figure 57.3: Group-D6 (<10%)

Figure 57 Trend of Value-added Share in Agriculture
——Share of agriculture sector GDP in aggregate GDP at current prices in 1970–2019

Sources: Population census and labor force survey in each country, including author adjustments. Note: Countries are grouped according to the levels of per capita income in 2019, relative to the US, defined in Table 2 .

6.2 Employment Allocation

Despite the relative decline of agriculture's share in total value added, employment in the sector for Asia accounts for 29% of total employment in 2019. Figure 58 shows industry shares in total employment by country and region, ranking them by size of employment in the agriculture sector.

Figure 59 traces the historical trajectory of Japan's employment share of agriculture for the period 1885–2019 and the countries' levels in 2019, mapped against Japan's experience (as circles). Large shares of agriculture employment – over 30% in 10 countries – correspond to Japan's level at the end of the 1950s and the onset of high economic growth. This may indicate room for improving labor productivity and per capita income if more productive industries are developed and jobs are created.

The trend of employment share over time (Figure 60) suggests that the relative decline in the share of agriculture in total value added has been accompanied by a downward trend in its share in total employment.[42] This trend is unmistakable in most of the countries plotted in Figure 60.[43] Between 1970 and 2019, the employment share in agriculture dropped from 82% to 23% in China and from 77% to 32% in Thailand.

Comparisons of the value-added and employment shares reveal some interesting facts. Agriculture is the only industry sector that consistently has a disproportionately higher employment share than justified by

42: Nepal's employment-by-industry figures are constructed by interpolating benchmark data taken from its labor force survey, as well as its population census. Figure 60 indicates that its share of agriculture has increased since 2001. This reflects the employment share of agriculture at 61% in the population census of 2001 and its share of 70% in the labor force survey of 2008.

43: However, the decline in a share does not always reflect an actual fall in employment for the agriculture sector; rather, it could reflect total employment rising faster than employment in agriculture. Countries that have been experiencing a consistent fall in actual employment in the agriculture sector are, for example, the ROC, Hong Kong, Japan, and Korea, whereas in Cambodia, India, Iran, Nepal, and Pakistan, actual employment has been rising. Other countries such as Thailand, Indonesia, Singapore, Malaysia, and Vietnam have no established trend in employment growth. China, however, has seen actual employment in agriculture falling since the turn of the millennium.

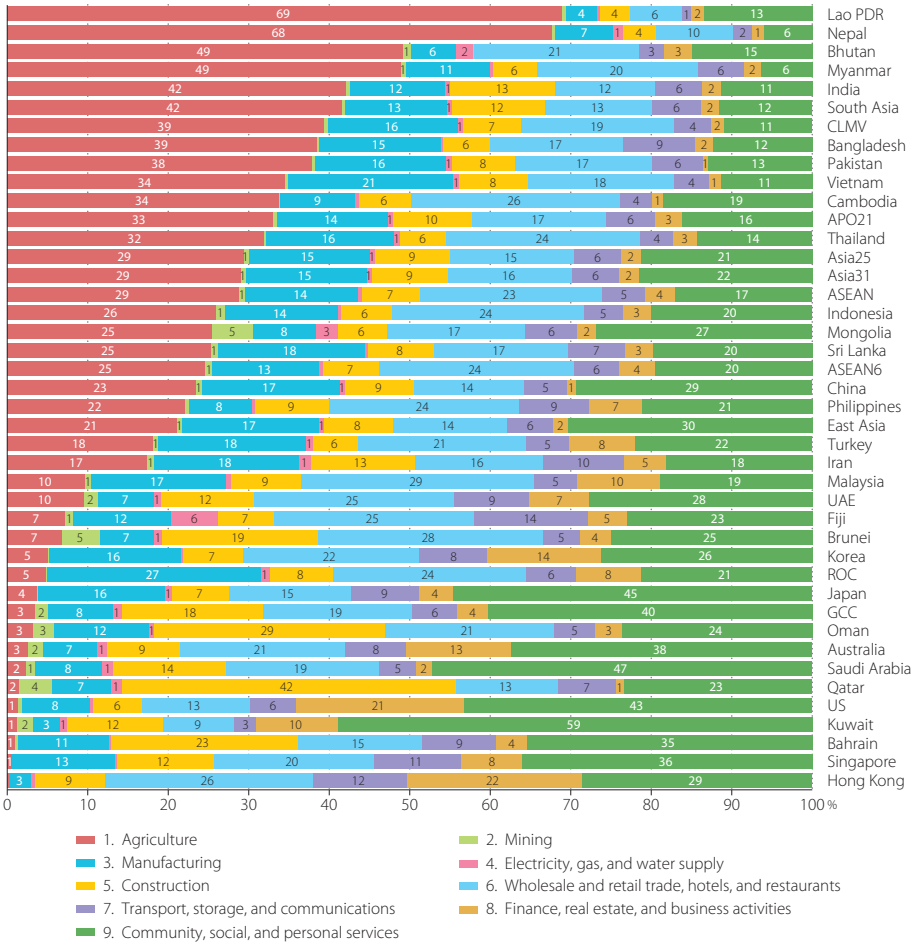

Figure 58 Industry Shares of Employment
——Shares of number of employment by industry in 2019

Sources: Population census and labor force survey in each country, including author adjustments.

its share in value added across all economies in Asia, except Fiji. This suggests that agriculture is still highly labor-intensive and/or there may be a high level of underemployment in the sector, both of which imply that the labor productivity level is low compared to other sectors.[44] Thus, countries with a sizeable agriculture sector often have low per capita GDP. In these cases, shifting out of agriculture will help boost economy-wide labor productivity.

The US is an exception, where its agricultural value-added share and employment share are similar at 1%, as shown in Figure 61; suggesting that labor productivity in this sector is higher than that experienced in Asian countries.[45] The reverse is true for the sector of finance, real estate, and business activities, which

44: Gollin, Parente, and Rogerson (2004) and Caselli (2005) demonstrate the negative correlation between employment share of agriculture and GDP per worker. They show that the agriculture sector was relatively large in less well-off countries and agricultural labor productivity was lower than that in other sectors.

45: Jorgenson, Nomura, and Samuels (2016) indicates agriculture sector is one of the industries, which realized a high TFP growth constantly in the US (1.0% on average per year in 1970–2012), compared to its stagnation in Japan's agriculture (–0.1%), reflecting differences in the scale of individual production units, as well as massive public investments (including research and development) in new agricultural technology in the US.

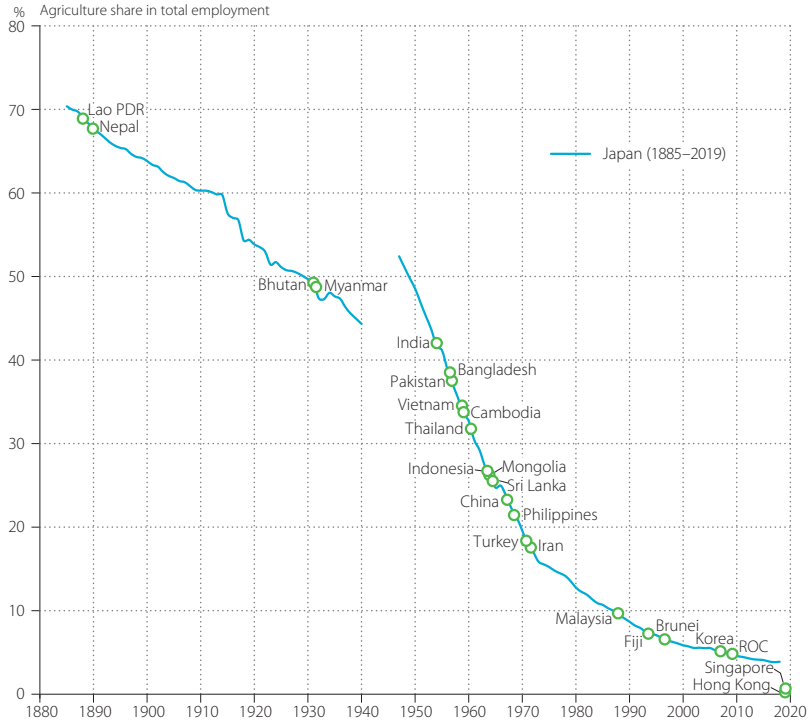

Figure 59 Historical Employment Share of Agriculture in Japan and Current Level of Asia

——Shares of number of employment in agriculture for Japan in 1885–2019 and for Asian countries in 2019

Sources: Population census and labor force survey in each country, including author adjustments. The sources of historical data of Japan are Ohkawa, Takamatsu, and Yamamoto (1974) during 1885–1954 and population censuses since 1920.

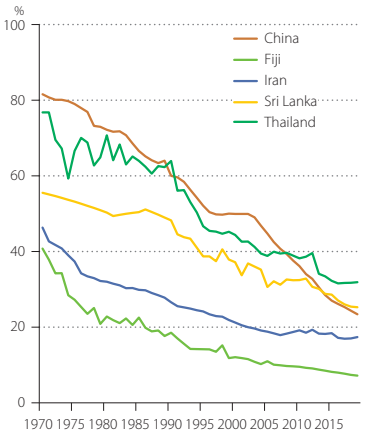

Figure 60.1: Group-D4 (20%≤...<40%)

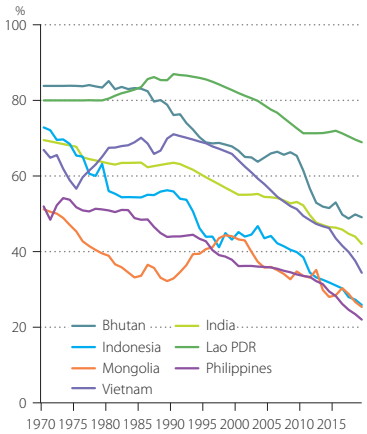

Figure 60.2: Group-D5 (10%≤...<20%)

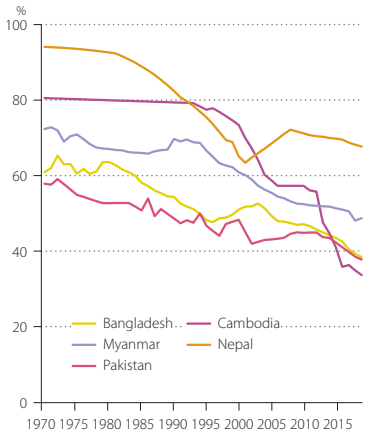

Figure 60.3: Group-D6 (<10%)

Figure 60 Trends of Employment Share in Agriculture

——Share of number of employment in agriculture in 1970–2019

Sources: Population census and labor force survey in each country, including author adjustments. Note: Countries are grouped according to the levels of per capita income in 2019, relative to the US, defined in Table 2.

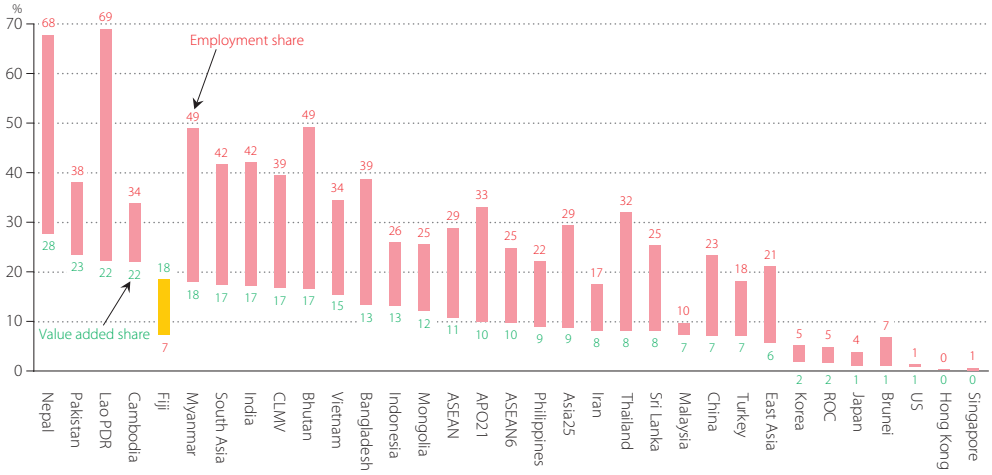

Figure 61 Value Added and Employment Shares of Agriculture
——Shares of industry GDP in aggregate GDP at current prices and number of employment in 2019

Sources: Official national accounts, population census and labor force survey in each country, including author adjustments.

often generate a much greater value-added share than suggested by its employment share. In 2019, the sector accounted for 34% of total value added generated by 21% of employment in the US, and 17% and 2% in the Asia25, respectively (Figures 54 and 58).

When the number of underemployed workers (known as labor surplus) in each country is estimated, based on the simple assumption that the employment share is equivalent to the value-added share of agriculture in the status of zero labor surplus,[46] the number of labor surplus reaches 341 million persons for the Asia25 in 2019. Figure 62 presents the country contributions and regional totals (right chart) of the estimated labor surplus.

It is the manufacturing sector that largely absorbs workers who have been displaced from the agriculture sector, especially in the initial stages of economic development. Figure 63 traces the trajectory of growth rates of GDP and employment in combination with manufacturing for Asian countries and the US over the past five decades. Each dot represents the average annual growth rate in the 1970s, 1980s, 1990s, and 2000s. The growth rate in the recent decade of the 2010s (2010–2019) is illustrated by an arrow. If manufacturing GDP and employment grow at the same rate, a dot will be on a 45-degree line through the origin running from the lower left to upper right quadrants. In Japan, despite positive gains in manufacturing GDP, the overall growth in manufacturing employment was negative or slightly positive.

In Korea and the ROC, expansion of manufacturing output could allow for increases of employment in the 1970s and 1980s (Figure 63.1). However, since the 1990s manufacturing has not been an absorption sector of employment, regardless of the sound expansion of production in this sector. The experiences of Singapore, Indonesia, and Thailand are closer to the 45-degree line through the origin, which implies well-balanced growth of output and employment in the manufacturing sector. The job creation role of manufacturing has remained in these countries, but it is diminishing rapidly (Figure 63.3).

46: In this calculation the mining sector is excluded in the totals in both of employment and value added.

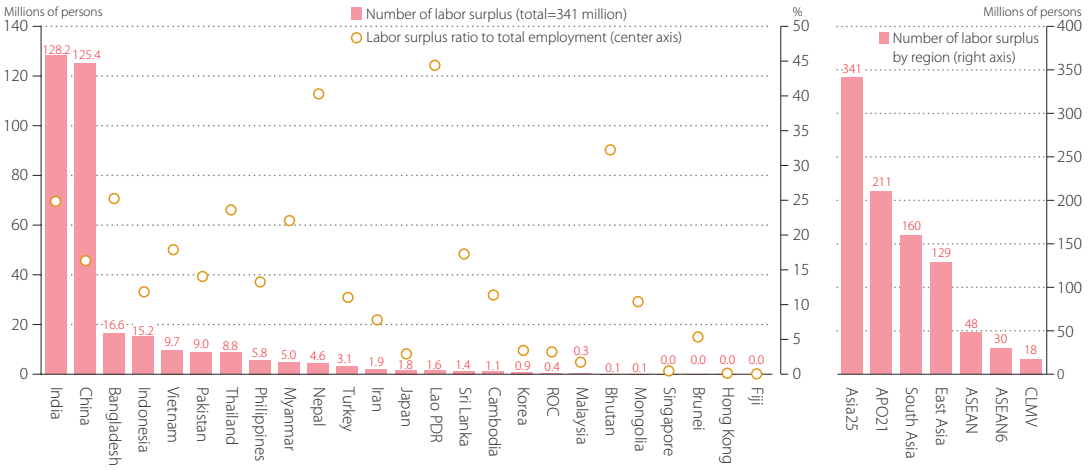

Figure 62 Labor Surplus
——Number and ratio of labor surplus in 2019

Sources: Our estimates based on the APO Productivity Database 2021.

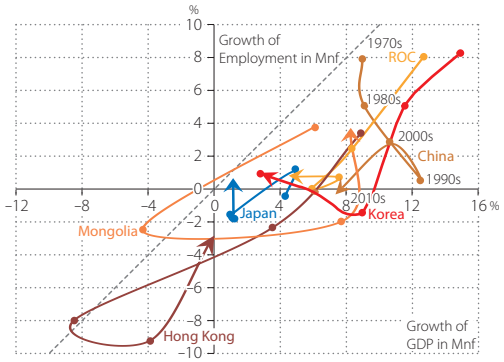

Figure 63.1: East Asia

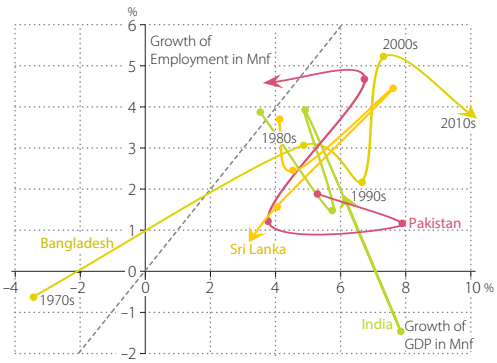

Figure 63.2: South Asia

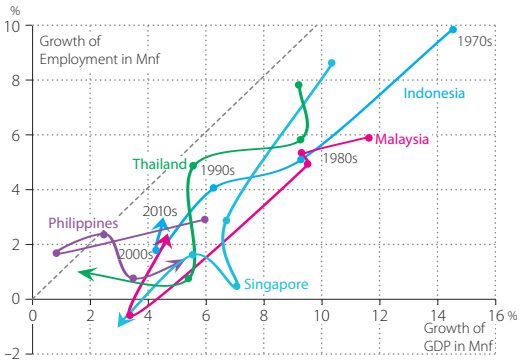

Figure 63.3: ASEAN6

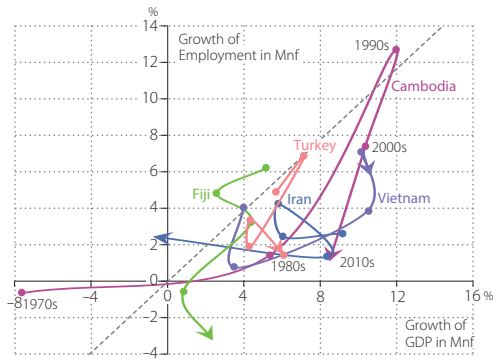

Figure 63.4: CLMV and Other Asian

Figure 63 Job Creation in Manufacturing
——Average annual growth rate of constant-price GDP and number of employment in 1970–2019

Sources: Population census and labor force survey and official national accounts in each country, including author adjustments. Note: Each dot represents the average annual growth rate in manufacturing (mnf) in the 1970s, 1980s, 1990s, and 2000s. The arrows indicate the rate in the 2010s (2010–2019).

6.3 Industry Origins of Economic Growth

Industry origins of economic growth by country and region for the period 2010–2019 are shown in Figure 64. China and India have been the two main drivers among the Asian economies, accounting for 49% and 19% during 2015–2019, respectively, as shown in Figure 7 in Section 3.1. However, looking at the industry composition, the origins of economic growth in China and India are quite different. China's economic growth has been fueled by industry sector expansion; whereas India's economic growth has been

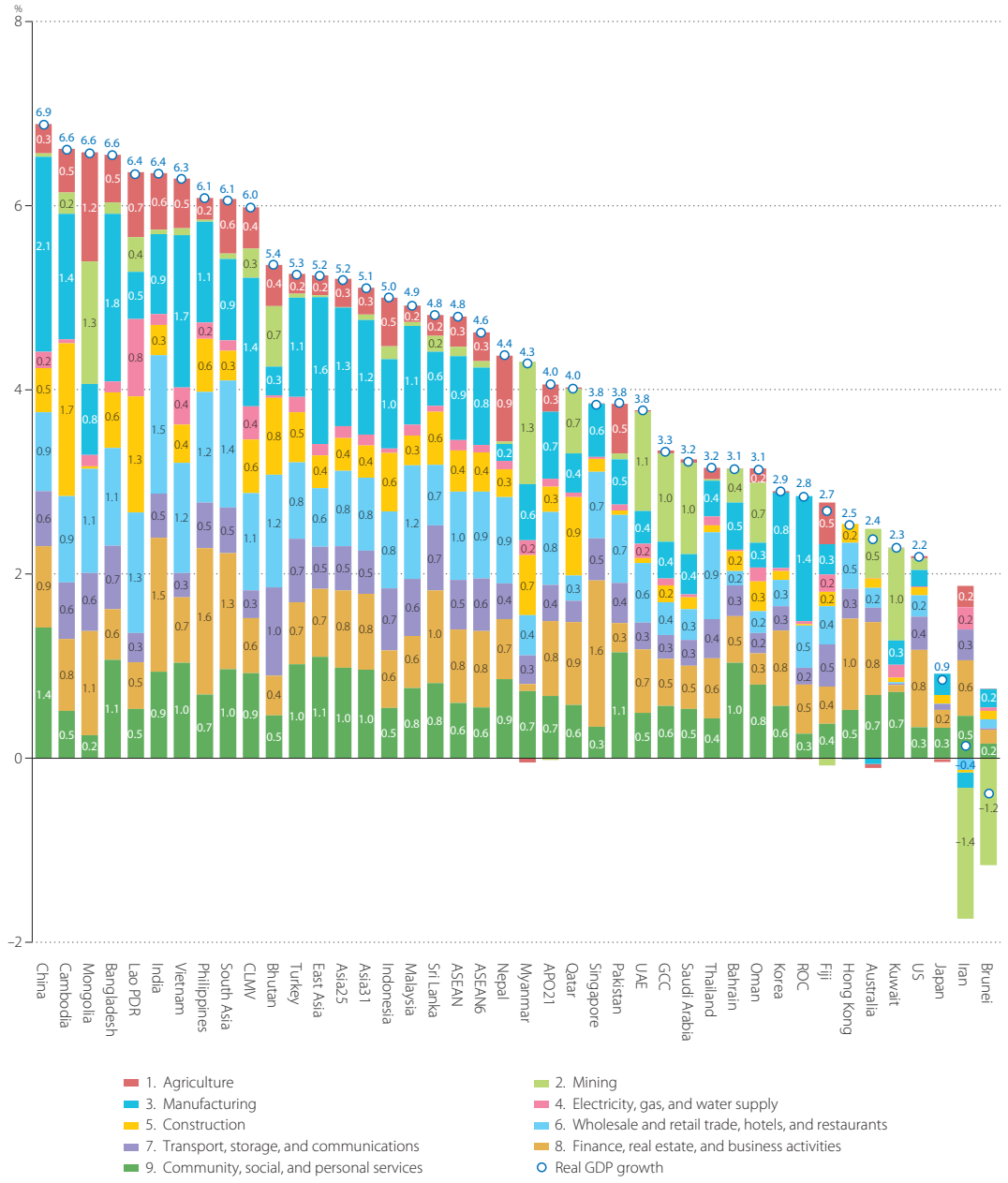

Figure 64 Industry Origins of Economic Growth
——Industry decomposition of average annual growth rate of constant-price GDP in 2010–2019

Sources: Official national accounts in each country, including author adjustments.

led by service sector expansion. This also indicates that the nature of growth in China may have started shifting more toward services in recent years.

Figure 65 contrasts industry contributions to economic growth among regions.[47] Even within such a short period, one can see that the industry structure of growth is changing. The first striking feature is the dominance of manufacturing in Asian countries. Between 2010 and 2019, its contribution to economic growth in the Asia25 was 25% compared to 8% in the US. This, however, masks a divergence within Asia. In the earlier period, manufacturing accounted for 30% of growth in East Asia but 15% in South Asia, although the differential is narrowing somewhat.

In 2010–2019, manufacturing sustained its significance in ROC, China, and Korea, contributing 48%, 31%, and 28% to economic growth, respectively, as shown in Figure 66.[48] Its contribution is modest in Singapore at 15%. In Hong Kong, it has been a drag on economic growth in the past decade or so.

The service sector plays an equal, if not more important, role in Asian economic growth. Services were a substantial contribution to economic growth in all Asian countries (Figure 67). The story behind India's recent growth has been one of services. Modern information and communication technology have allowed India to take an unusual path in its economic development, bypassing a stage when manufacturing steers growth. Within the service sector, contribution is quite evenly spread among the sub-sectors, more recently the iron/steel and motor vehicle sectors have been intensively developed. For further improvement in per capita GDP and to capitalize on the demographic dividend (see Box 2), expansion of labor-intensive manufacturing may be required in India for greater job creation.

Economic growth in the Asian Tigers also was dominated by the service sector, albeit more so in Hong Kong and Singapore than in the ROC and Korea, where manufacturing remained a significant force. The service sector accounted for 51% of growth in the ROC for the period 2010–

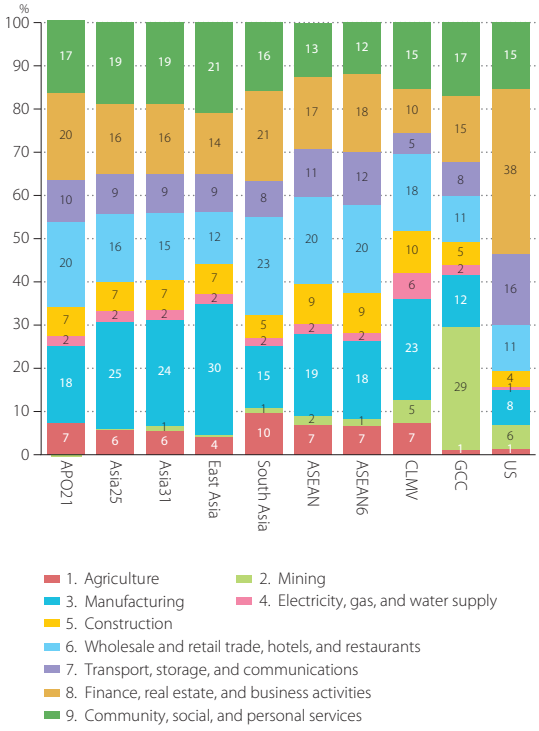

Figure 65 Industry Origins of Regional Economic Growth

——Contribution shares of industry GDP growth in aggregate GDP by region in 2010–2019

Sources: Official national accounts in each country, including author adjustments.

47: Asian averages are calculated using the Törnqvist index to aggregate the growth rates of industry GDP of each country based on the two-period average of each country's shares of industry GDP to the gross regional products as weights.

48: The Törnqvist quantity index is adopted for calculating the growth of real GDP. Using this index, the growth of real GDP into the products of contributions by industries can be decomposed:

$$\underbrace{\ln\left(GDP^{t}/GDP^{t-1}\right)}_{\text{Real GDP growth}} = \Sigma_j \underbrace{(1/2)\left(s_j^{t}+s_j^{t-1}\right)\ln\left(Q_j^{t}/Q_j^{t-1}\right)}_{\text{Contribution of an industry } j}$$

where Q_j^t is real GDP of an industry j in period t and s_j^t is the nominal GDP share of an industry j in period t.

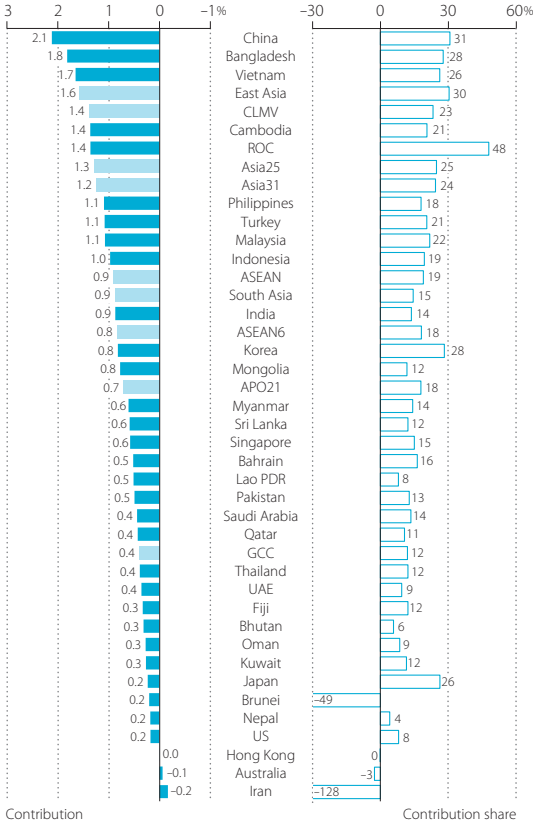

Figure 66 Contribution of Manufacturing to Economic Growth
——Average annual contributions and contribution shares in 2010–2019

Sources: Official national accounts in each country, including author adjustments.

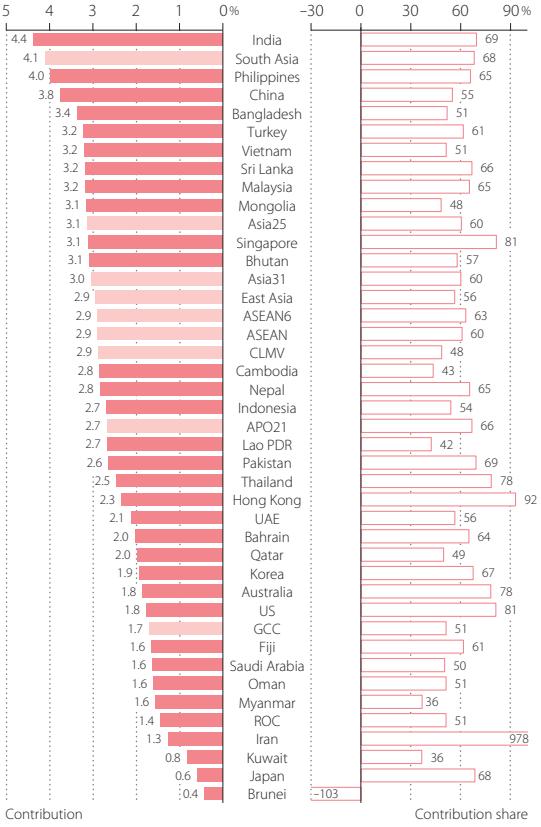

Figure 67 Contribution of Service Sector to Economic Growth
——Average annual contributions and contribution shares in 2010–2019

Sources: Official national accounts in each country, including author adjustments.

2019, 67% in Korea, 81% in Singapore, and 92% in Hong Kong, counterbalancing zero contribution by manufacturing (Figures 66 and 67).

For some Asian countries, agriculture is still the principal sector. The five countries in which the agriculture sector has the largest share in total value added are Nepal, Cambodia, Pakistan, the Lao PDR, and Bhutan, as shown in Figure 54. For the period 2010–2019, agriculture in Nepal had the highest contribution to economic growth among all Asian countries, accounting for 21% of growth (Figure 64). Figure 68 illustrates the sub-industry origins of average annual growth of manufacturing GDP for selected Asian countries in 2010–2019.[49] Manufacturing in Asia has been dominated by 3-8 (machinery and equipment), but the expansion of 3-2 (textiles, wearing apparel, and leather products) has a significant impact in Bangladesh and Cambodia.

49: The Törnqvist quantity index is adopted for calculating the growth of real GDP of manufacturing. Using this index, the growth of real GDP of manufacturing into the products of contributions by sub-industries of manufacturing can be decomposed:

$$\underbrace{\ln\left(GDP^{t}/GDP^{t-1}\right)}_{\text{Real GDP growth of manufacturing}} = \sum_{j} \underbrace{(1/2)\left(s_j^{t}+s_j^{t-1}\right)}_{\text{Contribution of a sub–industry } j} \ln\left(Q_j^{t}/Q_j^{t-1}\right)$$

where Q_j^t is real GDP of a sub-industry j in period t and s_j^t is the nominal GDP share of a sub-industry j in period t.

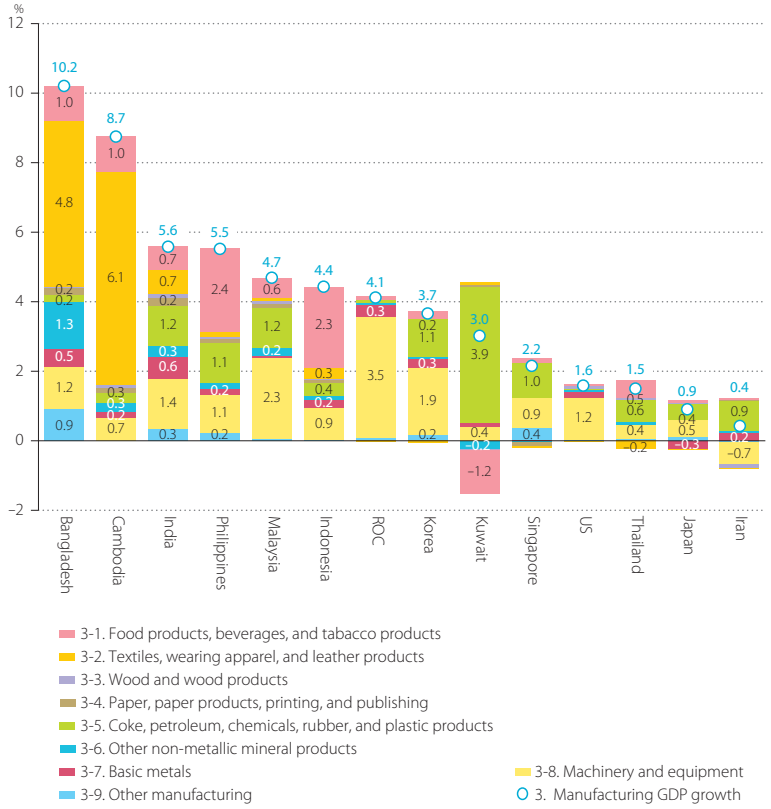

Figure 68 Industry Origins of Output Growth in Manufacturing
——Sub-industry contributions in average annual growth rate of constant-price manufacturing GDP in 2010–2019

Sources: Official national accounts in each country, including author adjustments.

6.4 Industry Origins of Labor Productivity Growth

This section analyzes the industry sources of labor productivity growth in Asia.[50] Figure 69 shows the industry origins of average labor productivity growth per year in 2010–2019.[51] Positive labor productivity growth was achieved across all sectors for the Asia25. If one focuses on the regional economy, the findings highlight the fact that service industries no longer hamper an economy's productivity performance

50: The data presented in this chapter is subject to greater uncertainty than those in previous chapters and the quality across countries is also more varied. Employment data of the less developed countries often lacks frequency as well as industry details. Neither does the industry classification of employment data necessarily correspond to those of industry output data. Consequently, the quality of labor productivity estimates at the industry level is compromised. Furthermore, estimates of the manufacturing sector should be of better quality than those of the service sector as many countries have occasional manufacturing censuses, but do not have a similar census covering the service sector.

51: Not all Asian countries are included, as employment by industry sector is not available for some countries. Labor productivity growth in Table 24 in Appendix 3 is defined simply as per-worker GDP at constant prices by industry (v_j). The industry decomposition of labor productivity growth for the whole economy (v) in Figure 69 (industry contribution in Table 24) is based on the equation $v = \sum_j \overline{w}_j v_j^*$ where the weight is the two-period average of value-added shares. In this decomposition, the number of workers as a denominator of labor productivity (v_j^*) is adjusted, weighting the reciprocal of the ratio of real per-worker GDP by industry to its industry average. Thus, the industry contribution ($\overline{w}_j v_j^*$) is emphasized more in industries in which the per-worker GDP is higher than the industry average, in comparison with the impact ($\overline{w}_j v_j$) of using the non-adjusted measure of labor productivity.

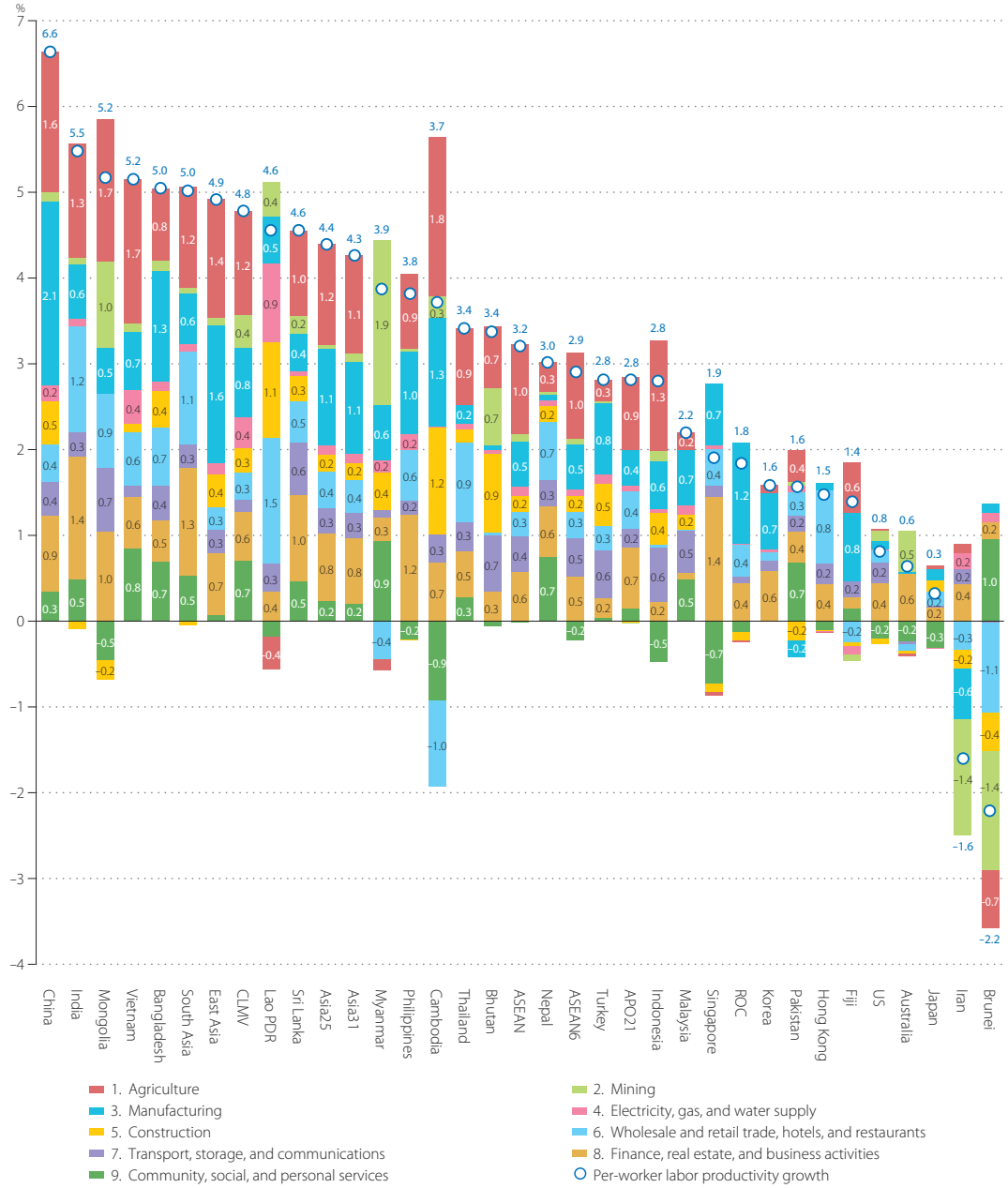

Figure 69 Industry Origins of Labor Productivity Growth
——Average annual growth rate of constant-price GDP per worker and industry contributions in 2010–2019

Source: APO Productivity Database 2021.

but are as capable as manufacturing in achieving productivity growth. In fact, there are no significant differences between manufacturing and non-manufacturing sectors in the Asia25; i.e., manufacturing (at 4.6% on average per year), agriculture (5.9%), construction (3.9%), electricity (3.0%), and transport, storage, and communications (2.9%), as provided in Table 24 in Appendix 3.

The manufacturing sector has been a driving force behind productivity growth in most Asian countries, as shown in Figure 70. Contributions from manufacturing were 64% in the ROC and 41% in Japan and Korea

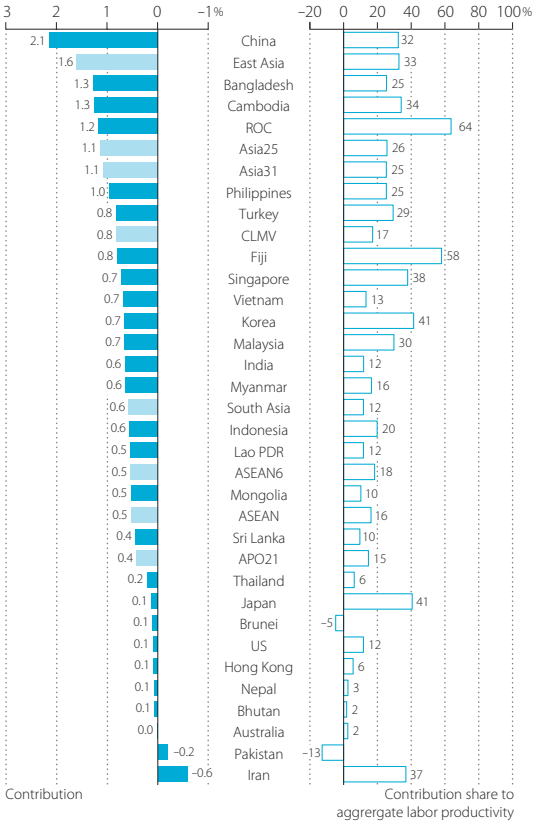

Figure 70 Contribution of Manufacturing to Labor Productivity Growth

——Average annual contributions of manufacturing in growth of constant-price GDP per worker in 2010–2019

Source: APO Productivity Database 2021.

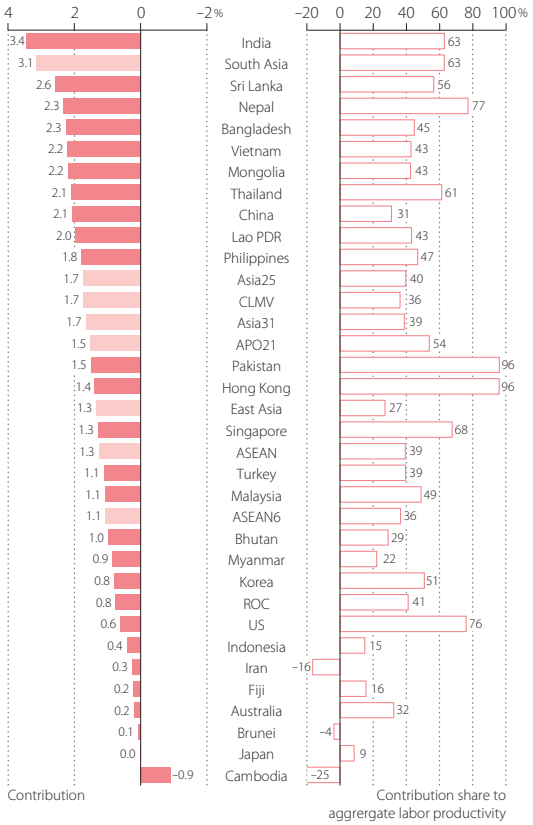

Figure 71 Contribution of Service Sector to Labor Productivity Growth

——Average annual contributions of service sector in growth of constant-price GDP per worker in 2010–2019

Source: APO Productivity Database 2021.

in 2010–2019. In CLMV and South Asia, manufacturing contributed moderately to their improvement in regional labor productivity is still moderate at 17% and 12%, respectively, in the same period.

Traditionally, it has been difficult for the service sector to realize productivity growth, but modern advancements in information and communication technology have changed this. Many IT-intensive users are in this sector, which is capable of capturing the productivity benefits arising from IT utilization (see Box 4). The growing importance of these services is observed when explaining the productivity growth in Western economies of recent decades. In Asia, the contribution from services matches that of manufacturing. Among the four industries in the service sector, three are potentially IT-employing industries: wholesale and retail trade, hotels, and restaurants; transport, storage, and communications; and finance, real estate, and business activities.

Figure 71 presents the contribution of services in labor productivity growth by country in 2010–2019. Services were contributing at least one-third or more to labor productivity growth in most Asian countries. By region, contribution of services in labor productivity improvement is significant at 63% in South Asia, compared to 27% in East Asia and 36% in CLMV. The contribution was predominant in Hong Kong, Pakistan, and Nepal.

Box 6 Disaster Damages on Capital Stock

Natural disasters can have a significant impact on economic growth especially in developing economies. In the APO Productivity Database 2021, the damages on capital stock by natural disasters are newly considered in measurement of net capital stock, based on the total estimated damages developed in the Emergency Events Database (EM-DAT) by the Centre for Research on the Epidemiology of Disasters (CRED), Université catholique de Louvain, Belgium. This edition of the Databook reflects these revised productivity accounts.

The data on the total damages estimated in the EM-DAT is incorporated through two adjustment processes. First, the total value of damage is divided into damage on gross capital stock and damage on GDP, based on our assumptions in the most detailed levels of types of disaster. Second, the gross capital stock is converted to net capital stock to be compared with our capital stock estimates. Table B6 presents the estimated value of damages on net capital stock of produced assets at constant price as of 2019 (in parentheses) and the damage ratios to total stock at current prices in the year, in which the disaster occurred. The top 60 disasters in Asia are sorted by the magnitude of damage ratio to capital stock.

Although the Great East Japan Earthquake in 2011 has the largest damage value of capital stock (about 100 billion US dollar), the damage ratio on the total stock is limited to 0.56% due to the large size of the aggregate capital stock and ranked in the 56th position in Table B6. Ten disasters have the damage ratio of over 3% of capital stock, which are found primarily in developing countries. In particular, the Cyclone Nargis during early May 2008 is the worst natural disaster in the recorded history of Myanmar, causing a highly devastating damage of 14% of its capital stock.

Figure B6 shows the revision on TFP growth from the previous year to the disaster year, reflecting the damages to the capital stock in Table B6. This revision is expected to correct the overvaluation bias of capital stock growth and the undervaluation bias of the TFP estimates in the disaster year. In the case of the Myanmar's Cyclone Nargis in 2008, the TFP estimate is revised from negative 9.2% to negative 5.1%. In other cases, negative TFPs are modified to be close to zero or slightly positive. Although there is room for improvement in measurement accuracy, our judgement is that the impact of disasters should be reflected in capital input, not TFP.

Table B6 Capital Stock Damages by Natural Disasters

——Damage ratios on net capital stock at current prices and damages of capital stock at constant prices in 2019

	Year	Type	Damage to net capital			Year	Type	Damage to net capital			Year	Type	Damage to net capital	
1 Myanmar	2008	S	14.00	(3.17)	21 Fiji	1985	S	1.65	(0.09)	41 China	1998	F	0.88	(36.48)
2 Nepal	2015	E	4.68	(3.27)	22 Sri Lanka	1978	S	1.60	(0.37)	42 China	1976	E	0.87	(5.50)
3 Nepal	1980	E	4.42	(0.37)	23 Bangladesh	1987	F	1.58	(1.01)	43 Bangladesh	1995	S	0.84	(0.82)
4 Lao PDR	1993	S	4.05	(0.21)	24 Iran	1990	E	1.57	(15.25)	44 Vietnam	1994	F	0.79	(0.35)
5 Pakistan	1973	F	3.61	(1.38)	25 Myanmar	1989	O	1.56	(0.05)	45 China	1996	F	0.75	(24.76)
6 Fiji	2016	S	3.59	(0.33)	26 Pakistan	2005	E	1.51	(3.70)	46 Myanmar	1992	F	0.74	(0.03)
7 Myanmar	2004	E	3.37	(0.57)	27 Nepal	1993	F	1.34	(0.28)	47 Vietnam	1997	S	0.71	(0.48)
8 Bangladesh	1988	F	3.15	(2.02)	28 Cambodia	2000	F	1.34	(0.15)	48 Fiji	1986	S	0.69	(0.04)
9 Bangladesh	1998	F	3.13	(3.79)	29 Philippines	2013	S	1.32	(6.14)	49 India	1993	F	0.68	(7.38)
10 Turkey	1999	E	3.09	(11.54)	30 Bangladesh	2004	F	1.31	(2.59)	50 Pakistan	1992	F	0.68	(0.94)
11 Cambodia	1991	F	2.76	(0.16)	31 Vietnam	1996	S	1.31	(0.77)	51 Philippines	1976	E	0.66	(0.52)
12 Thailand	2011	F	2.41	(23.06)	32 Philippines	1972	F	1.29	(0.77)	52 Vietnam	1991	F	0.65	(0.16)
13 Bangladesh	1974	F	2.38	(0.69)	33 Cambodia	2013	F	1.20	(0.35)	53 Sri Lanka	1992	F	0.60	(0.28)
14 Fiji	1972	S	2.34	(0.06)	34 Pakistan	1976	F	1.18	(0.52)	54 Fiji	2012	F	0.59	(0.05)
15 Bangladesh	1991	S	2.24	(1.68)	35 Myanmar	1991	F	1.06	(0.04)	55 China	1991	F	0.59	(12.01)
16 Fiji	1993	S	2.04	(0.13)	36 Fiji	1983	S	1.01	(0.06)	56 Japan	2011	E	0.56	(99.49)
17 Cambodia	2011	F	2.02	(0.45)	37 Myanmar	1984	O	0.96	(0.04)	57 China	2008	E	0.55	(62.60)
18 Pakistan	2010	F	1.90	(5.55)	38 Bangladesh	2007	S	0.95	(2.39)	58 Nepal	1988	E	0.53	(0.08)
19 Sri Lanka	2004	E	1.87	(1.20)	39 Myanmar	1988	O	0.93	(0.04)	59 ROC	1977	S	0.52	(0.45)
20 ROC	1999	E	1.67	(10.84)	40 Nepal	1987	F	0.92	(0.13)	60 Lao PDR	1992	F	0.52	(0.03)

Unit: Percentage (ratio at the beginning-of-period next capital stock) and billions of US dollars (as of 2019) in parentheses. Sources: EM-DAT, CRED, Université catholique de Louvain, Belgium and APO Productivity Database 2021. Note: S, E, F, and O presents the types of main disaster as storm, earthquake, flood, and others, respectively.

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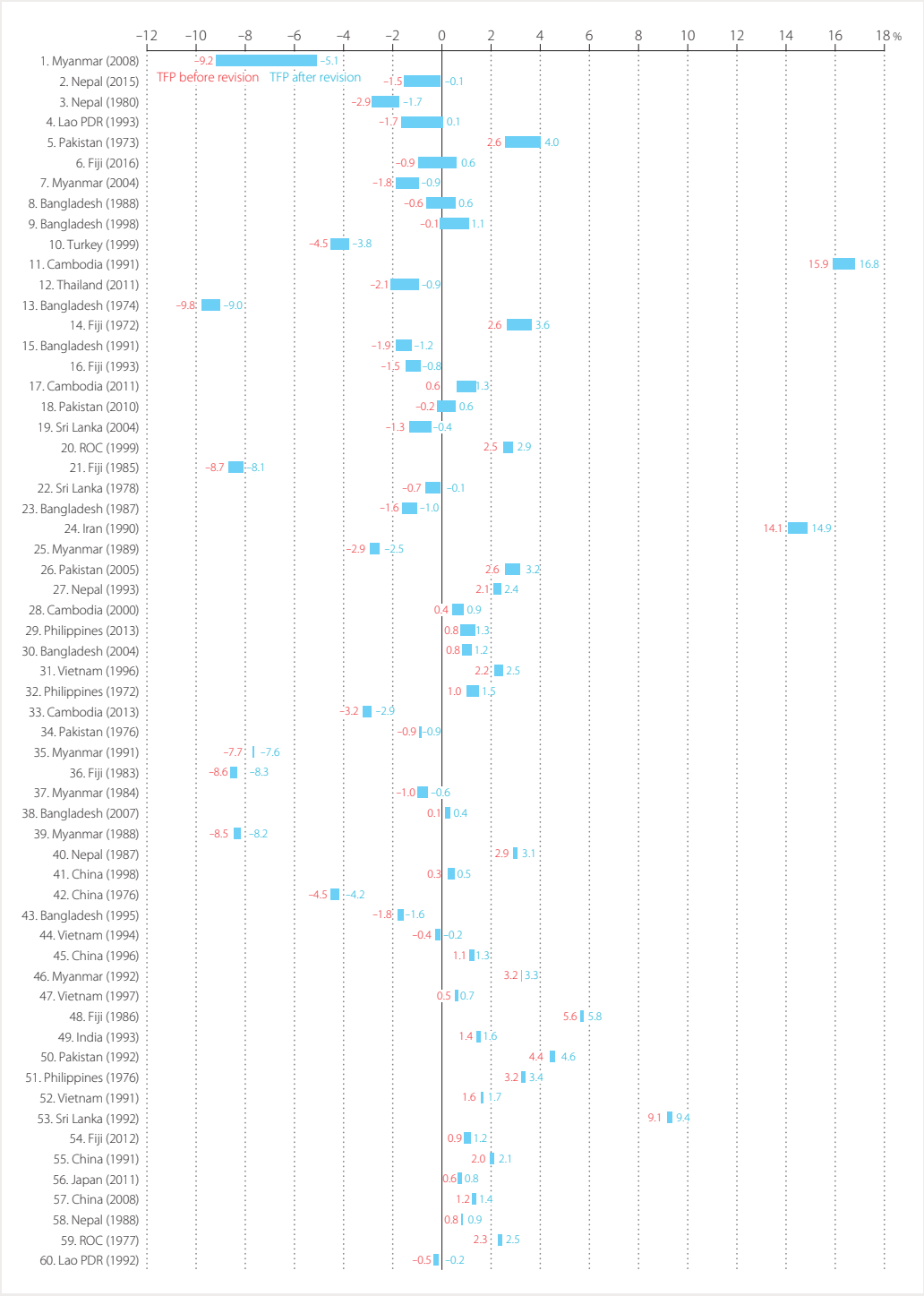

Figure B6 Impacts by Disaster Damages to Capital Stock on TFP
——Annual growth rate of total factor productivity from the previous year to the disaster year

Source: APO Productivity Database 2021. Note: See Table B6.1 for the damages to capital stock in each disaster.

Box 7 Premature Deindustrialization

Deindustrialization, or the shrinkage of the manufacturing sector, has been a major concern in advanced economies for reasons Rodrik (2016) calls "premature deindustrialization." He claims that many developing economies in recent periods are starting to lose their share of the manufacturing sector without experiencing full industrialization. Premature deindustrialization may harm developing economies during their economic development because manufacturing is a dynamic sector, typically at the center of sustained economic growth and technological progress (Figure 55 in Section 6.1). The sector also has created massive jobs for relatively poor people (Figure 63 in Section 6.2). Additionally, it generates flows of labor from rural to urban, and from informal to formal sectors, as well as nurturing human capital. Early servicification of the economy without a mature manufacturing sector may jeopardize a smooth transition from developing to developed economies.

Rodrik points out that premature deindustrialization is serious particularly in Latin America and Sub-Saharan Africa. How about in Asia? Figure B7.1 plots GDP shares of the manufacturing sector in Asian economies,

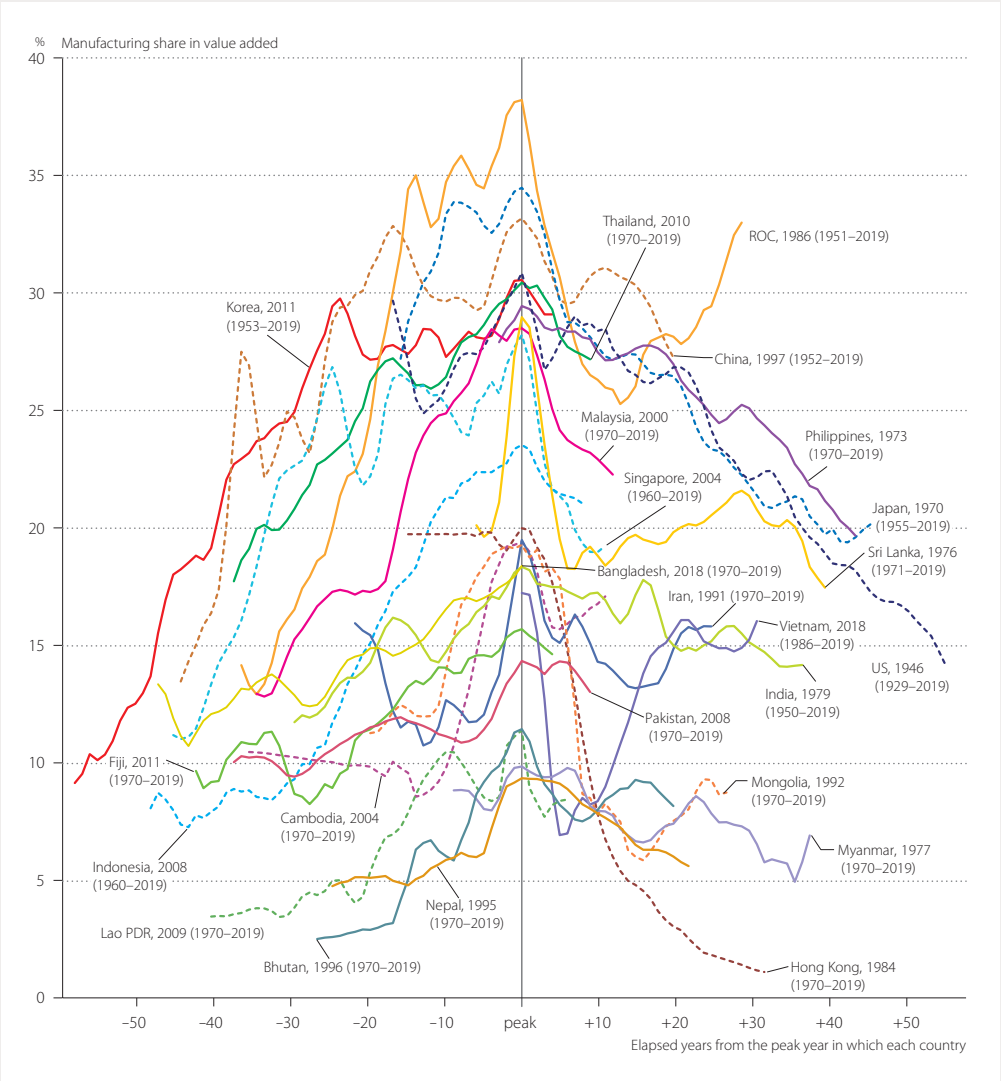

Figure B7.1 Country Peaks in Manufacturing GDP Share
——GDP share of manufacturing in 1970–2019

Sources: Official national accounts in each country, including author adjustments; APO Productivity Database 2021. Note: The lines present the trends based on the three-year moving averages.

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placing the peak of each country's inverse U shape at the center. A typical image of the up and down is drawn by the US and Japan with peaks above 30% in 1946 and 1970 respectively. The peaks in manufacturing GDP are faster than those in manufacturing employment shares, which are 1970 in the US and 1976 in Japan. China, the ROC, and Korea also reached their peaks above 30% in 1978, 1986, and 2011, respectively, and remain high. Malaysia, Singapore, and Thailand show a similar pattern with the peaks in 2000, 2004, and 2010, respectively.

The Philippines somehow reached its peak in 1973 and recently holds around 20%. Indonesia is also just above 20%. Although these are respectable figures, more room for industrialization may be possible. Cambodia, Bangladesh, India, Pakistan, and Vietnam are struggling below 20%. Obviously, these countries are not fully industrialized yet, needing further effort to promote the sector.

On the other hand, the IMF (2018, Chapter 3) suggests that service sectors can potentially drive economy-wide productivity growth; and the decline in manufacturing jobs has contributed little to the rise in labor income inequality in advanced economies. Figure B7.2 indicates that less and middle-income Asian countries, with low and stagnated shares of manufacturing GDP, seemingly improved their per capita income level. However, it is quite uncertain if these countries will continue to grow by skipping the intermediate stage of mature industrialization.

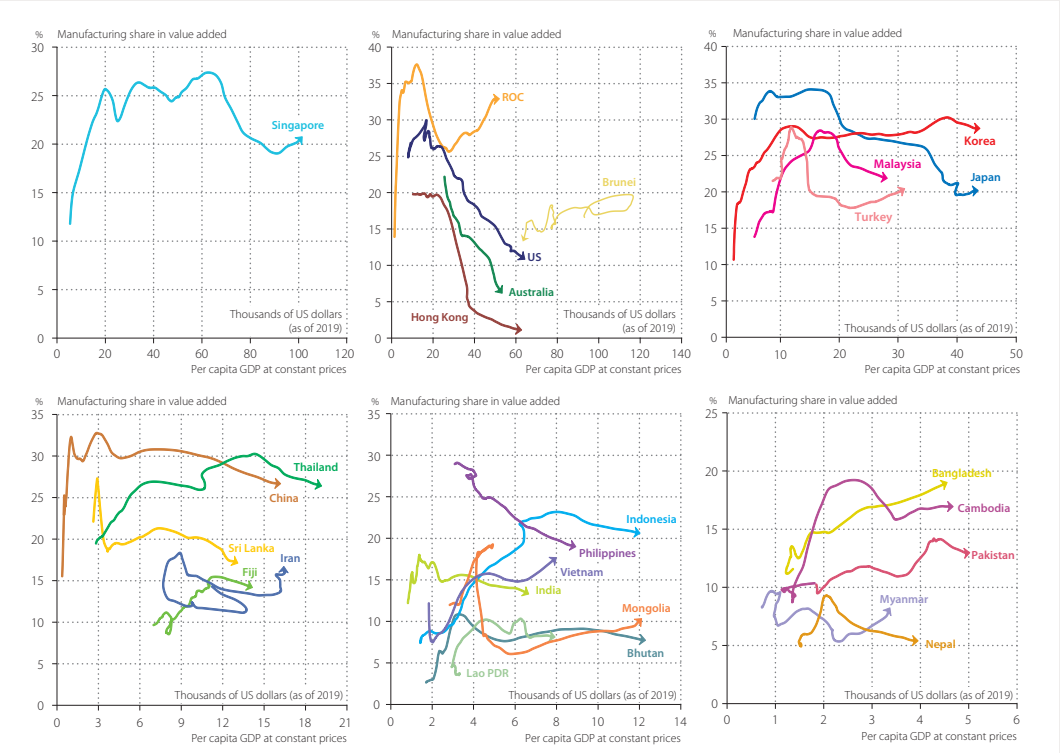

Figure B7.2 Manufacturing GDP Share and Per Capita GDP
——Five-year moving averages of shares of manufacturing GDP and per capita GDP in 1970–2019

Sources: Official national accounts in each country, including author adjustments; APO Productivity Database 2021.

7 Real Income

Highlights

- **Real GDP could systematically underestimate (or overestimate) growth in real income if terms of trade improve (or deteriorate) in some resource-rich countries, where trading gain has made it possible to sustain a rise in purchasing power with little real GDP growth in countries (Figure 74 and Table 25). The positive trading gain effects which oil-rich countries experienced in the 2000s were negative in 2010–2019: –2.0 percentage points in Kuwait and –0.9 percentage points in Saudi Arabia. (Figure 73).**
- **Net primary income from abroad as a percentage of GDP has risen strongly in the Philippines, from 0.8% in 1990 to its peak of 11.8% in 2013. In Bangladesh, it increased from 1.9% to its peak of 8.5% in 2012 (Figure 72).**
- **Six resource-rich countries have been enjoying a trading gain over 1.2% per annum in 2000–2019. Among them, Lao PDR managed to achieve growth in labor productivity. In contrast, export-oriented, high-productivity Asian countries have been facing a deteriorating trading gain position as a price of their own success (Figure 75).**

The constant-price GDP captures real production, not real income. An improvement in the terms of trade, which is defined as the relative price of a country's exports to imports, explicitly raises real income and, in turn, welfare (Diewert and Morrison 1986; Kohli 2004). In many ways, a favorable change in the terms of trade is synonymous with technological progress, making it possible to get more for less. That is, for a given trade balance position, a country can either import more for what it exports, or export less for what it imports.

7.1 Real Income and Terms of Trade

By focusing on production, the real GDP concept does not capture the beneficial effect of the improvement in the terms of trade. In contrast, real income focuses on an economy's consumption possibilities, and in turn captures the impact of a change in the relative price of exports to imports. Real income growth attributed to changes in the terms of trade can be significant when there are large fluctuations in import and export prices and the economy is highly exposed to international trade, as is the case with many Asian economies shown in Figure 27 in Section 4.1.

The distinction between real income and real GDP lies in the differences between the corresponding deflators. Real GDP is calculated from a GDP deflator aggregating prices of household consumption, government consumption, investment, exports, and imports,[52] while real income is calculated from the prices of domestic expenditure, consisting of household consumption, government consumption, and investment. Therefore, real income can be understood as the amount of domestic expenditure that can be purchased with the current income flow.[53] As such, real income captures the purchasing power of the income flow. Furthermore, the Databook adopts the concept of gross national income (GNI) instead of GDP in its estimation of real income, to consider net income transfer from abroad. Applying the method proposed by Diewert and Morrison (1986), the annual growth rate of real income can be fully attributed

52: The weight for import price changes is negative. Thus, if import prices decrease, this tends to raise the GDP deflator.
53: This definition of real income is the same as in Kohli (2004 and 2006). An alternative definition is nominal GDP deflated by the price of household consumption.

to three components: annual growth rate of real GDP; real income growth attributed to changes in prices of exports and imports (referred to as the trading gain);[54] and the effect of net income transfer.[55]

Figure 72 plots the time series of net primary income from abroad as a percentage of GDP for some selected countries. The role of net primary income from abroad has been shifting from negative to positive in Hong Kong, with the transition taking place in the mid-1990s leading up to the handover of Hong Kong from British rule to China in 1997. Since then, net primary income from abroad has been positive. Net primary income from abroad has risen strongly in the Philippines, rising from 0.8% in

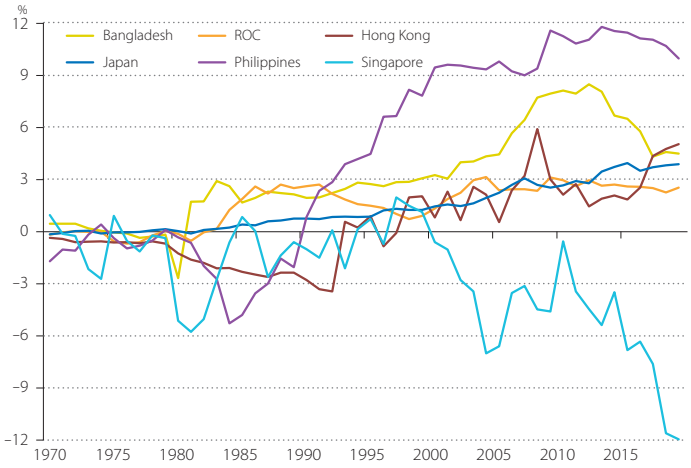

Figure 72 Effect of Net Income Transfer on GDP
——Share of net income transfer in GDP at current market prices in 1970–2019

Sources: Official national accounts in each country, including author adjustments.

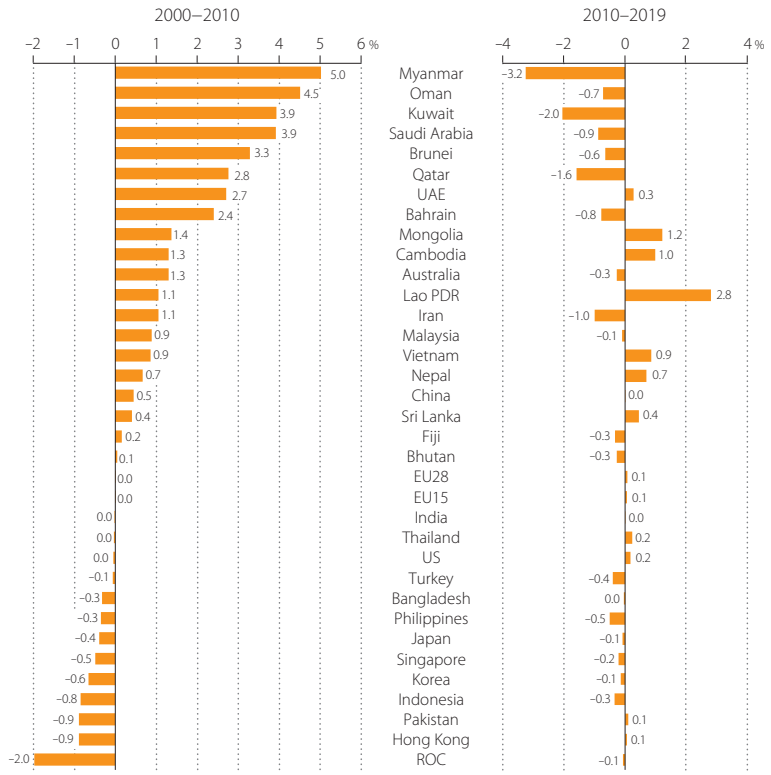

Figure 73 Trading Gain Effect
——Average annual contributions to real income growth in 2000–2010 and 2010–2019

Sources: Official national accounts in each country, including author adjustments.

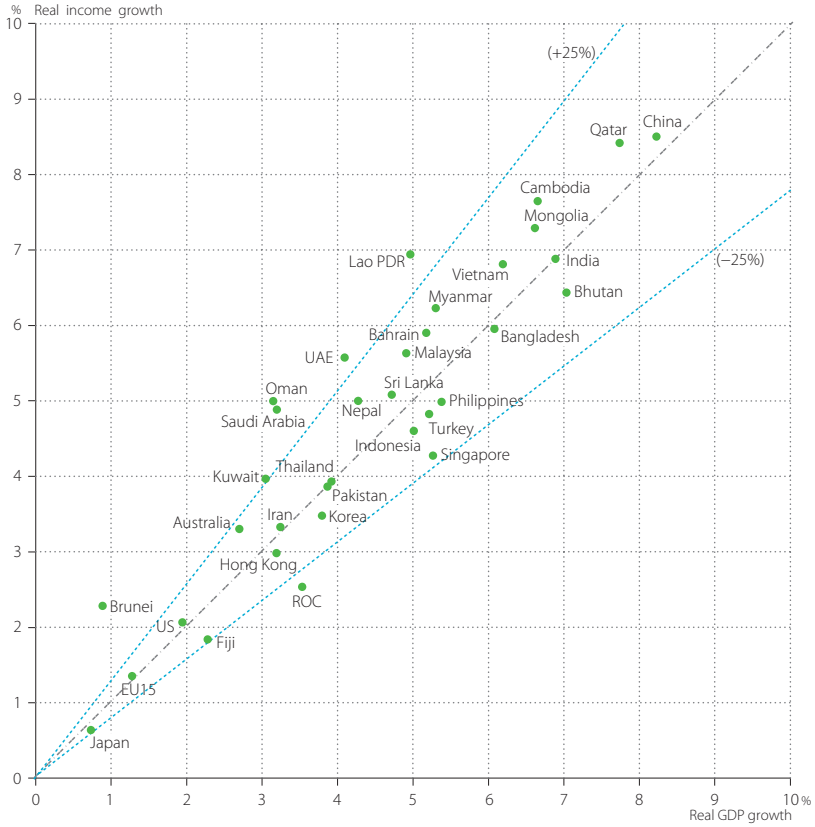

Figure 74 Real Income and GDP Growth
——Average annual growth rate of constant-price GDP and real income in 2000–2019

Sources: Official national accounts in each country, including author adjustments.

1990 to its peak of 11.8% in 2013, providing a long-term significant contribution to the purchasing power of Filipinos, with remittances from many overseas workers.[56] A similar, but moderate, trend can be found in Bangladesh. Singapore's net primary income from abroad displayed larger fluctuations in the 1980s and the 2000s, and its negative share has expanded in the 2010s.

The price changes of crude oil in the recent decade have a great impact on trading gains in Asian countries. Figure 73 compares the trading gain effects in the periods 2000–2010 and 2010–2019. The positive

54: The term "trading gain" is used by some authors (Kohli 2006). This term is adopted in this report.

55: Real income growth can be decomposed into two components as follows:

$$\underbrace{\ln\left(\frac{GNI^t}{GNI^{t-1}}\right) - \ln\left(\frac{P_D^t}{P_D^{t-1}}\right)}_{\text{Real income growth}} = \underbrace{\ln\left(\frac{GNI^t/GDP^t}{GNI^{t-1}/GDP^{t-1}}\right)}_{\text{Income transfer effect}} + \underbrace{\ln\left(GDP^t/GDP^{t-1}\right) - (1/2)\sum_i\left(s_i^t + s_i^{t-1}\right)\ln\left(P_i^t/P_i^{t-1}\right)}_{\text{Real GDP growth}} +$$

$$\underbrace{(1/2)\left(s_X^t + s_X^{t-1}\right)\left(\ln\left(P_X^t/P_X^{t-1}\right) - \ln\left(P_D^t/P_D^{t-1}\right)\right) - (1/2)\left(s_M^t + s_M^{t-1}\right)\left(\ln\left(P_M^t/P_M^{t-1}\right) - \ln\left(P_D^t/P_D^{t-1}\right)\right)}_{\text{Real income growth attributed to changes in the terms of trade (=trading gain)}}$$

where P_i^t is price of final demand i in period t and s_i^t is expenditure share of final demand i in period t. D is domestic expenditure, X is export, and M is import. Note that the real GDP growth based on this formulation may differ from that used in other chapters, since the implicit Törnqvist quantity index is adopted for calculating it.

56: In the 2018 benchmark revision of the Philippines system of national accounts (PSNA) published as of April 2020, the net primary income from abroad was considerably revised downwardly. The ratio before this revision, which was published in the 2020 edition of the Databook, was three times larger than the revised estimate in this edition.

trading gain effects that oil-rich countries experienced in the 2000s were negative in the period 2010–2019: –2.0 percentage points in Kuwait and –0.9 percentage points in Saudi Arabia. In contrast, the trading gain effects in Pakistan and Hong Kong turned positive at 0.1 percentage points per year.

Over a long period of time the trading gain effect is, on average, small, but over a shorter period could be very significant. Combining both the trading gain effect and net primary income from abroad, real income growth for most of the countries compared fell within the margin of ±25% of real GDP growth in the long run, as shown in Figure 74 and Table 25 in Appendix 3. In larger economies, as the US, the EU15, China, India, and Japan, real income growth was almost equivalent to the real GDP growth on average in 2000–2019. Brunei, Kuwait, Lao PDR, Oman, ROC, Saudi Arabia, and UAE appear to be the outliers in this period.

7.2 Trading Gain and Productivity Growth

When the trading gain is highly favorable, it can breed a sense of complacency with productivity performances suffering as a result. Resource-rich economies are susceptible to this pitfall because they are poised to reap some extremely positive trading gains when commodity prices turn in their favor over a sustained

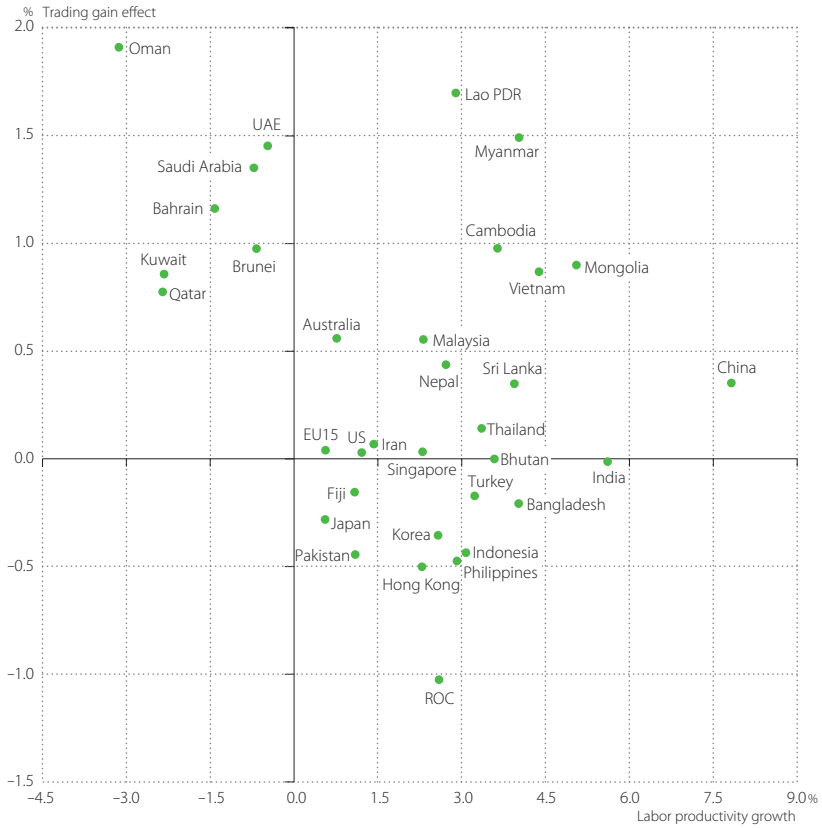

Figure 75 Trading Gain Effect and Labor Productivity Growth
——Average annual rate of trading gain and the growth of constant-price GDP per hour worked in 2000–2019

Sources: Official national accounts in each country, including author adjustments; APO Productivity Database 2021.

period. Just as commodity prices can rise, so too can they fall. This is when countries' real income growth could suffer if fundamentals for real GDP growth are weak.

Figure 75 plots the labor productivity growth and the trading gain effect in 2000–2019. In general, a resource-rich country can suffer from "Dutch disease," which is a phenomenon where a country's currency is pushed up by the commodity boom, making other parts of its economy less competitive and potentially increasing the country's dependence on natural resources.[57] This is how resource abundance can easily lead to resource dependence.

Figure 76 illustrates trading gain effects and changes in value-added shares of the mining sector from 2000 to 2019 in some selected countries. It indicates that large trade gainers typically have dominant mining sectors, such as petroleum and natural gas. Provided resource prices continually rise, these countries continue to gain from the positive terms-of-trade effects. However, if resource prices fall, or natural reserves are depleted, then the story of the Dutch disease may appear. Richness in natural resources may become a curse if they do not have competitive industries other than mining. A way to counteract Dutch disease is broad-based, robust productivity growth and industry diversification. Figure 76 shows some of the trading gainers (i.e., the GCC countries) actively reduced their share of the mining sector over time,

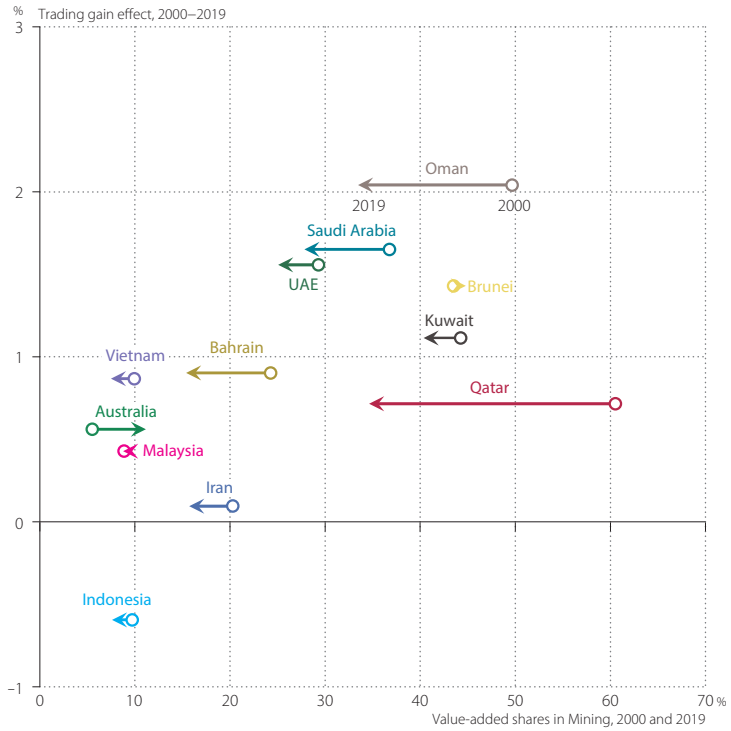

Figure 76 Trading Gain Effect and Value-added Share in Mining Sector
—Average annual rate of trading gain in 2000–2019 and the changes of mining GDP share from 2000 to 2019

Sources: Official national accounts in each country, including author adjustments; APO Productivity Database 2021.

57: The term was originated by The Economist in 1977 (*The Economist*, 26 November 1977, "The Dutch Disease.") to describe the overall decline of the manufacturing and the subsequent economic crisis in the 1960s in the Netherlands after the discovery of the large natural gas field in the North Sea in 1959.

which could reflect the intention of developing industries other than mining. However, Figure 75 shows that labor productivity growth rates in these countries remained low, or even negative. Even if they wanted to start industrialization, their high income and strong local currency would not allow them to easily develop a manufacturing sector or an internationally competitive service industry. Another concern is their heavy dependence on foreign workers, both skilled and unskilled.

On the other side of coin are the resource/energy-importing economies. Most of these suffered from negative trading gain effects, losing a part of their economic growth due to resource price hikes, particularly in the 2000s (Table 25 in Appendix 3). However, this has strengthened their competitiveness in manufacturing and other productive activities for the future. Figure 75 also shows that many Asian countries have succeeded in achieving high growth of labor productivity while having to accept a deteriorating trading gain over the long run. These countries are typically resource importers whose voracious demand for commodities pushes up their import prices. Meanwhile, export prices tend to fall because of their achievement in productivity improvement, resulting in unfavorable movements in terms of trade. This is particularly the case in countries where economic growth is highly dependent on export promotion. In such instances, a negative trading gain is partially a side-effect of productivity success. Although the trading gain effect partly negates their real GDP growth, they are better positioned than before their development took off, and without productivity improvements.

Box 8 Projection of Economic Growth

The growth accounting in the Databook evaluates the quality of economic growth in each country and region in Asia. The similar framework can be applied to forecast the economic growth, based on future scenarios on population and technology. This Box presents the estimates of our mid-term projections on economic growth and labor productivity for 25 Asian economies through 2030. Our projections reflect the economic growth of the first quarter of 2021, where available.

Our scenario on population is based on the projection in United Nations (2019), in which the annual projections are provided by gender and age, as presented in Box 2. This is divided into estimates in different categories of education attainment, based on the projections developed in Wittgenstein Centre Data (Lutz, Butz, and KC 2014), in each class of gender and age. The employment rate in each class of population by gender, age, and education is developed in the Asia QALI Database 2021 (Section 9.3.2). The employment rates in the recent period 2015–2019 are assumed to be constant for the future in each class of population. Using these population and the employment rates, the employment by gender, age, and education is estimated for the period 2020–2030.

The rate of employment in each class is divided into estimates in different categories of employment status, i.e., own-account workers, contributing family workers, and employees, based on the current composition in 2019, which is provided in the Asia QALI Database. In the future scenario of employee share, it is assumed to gradually increase by 1–3% per year until 2030, based on the past trend in each country. Based on these scenarios, the projections of employment rates cross-classified by gender, age, education, and employment status are developed through 2030 in each country. The estimated average growth rates of total employment per year are presented in Figure B8.1 for the two periods 2019–2025 and 2025–2030.

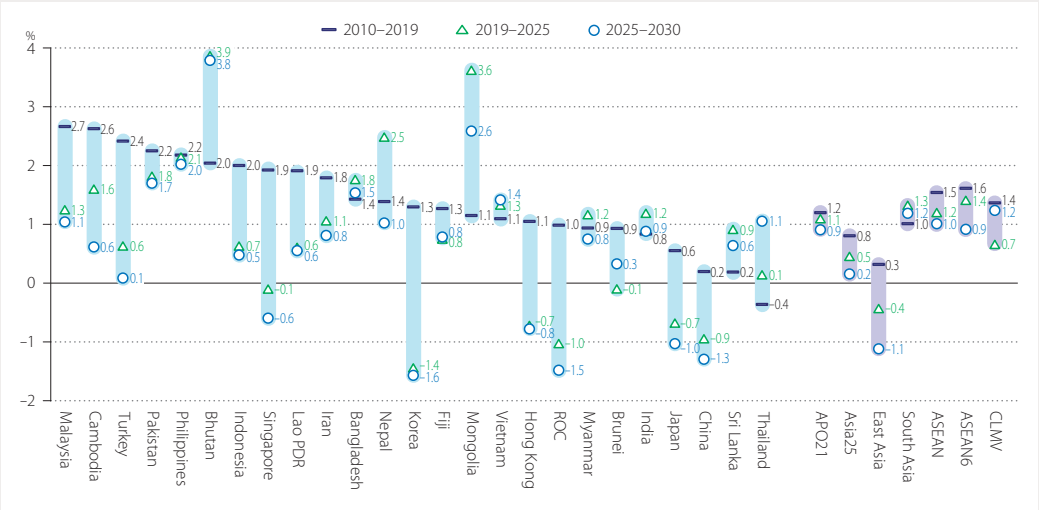

Figure B8.1 Projection of Change in Total Employment until 2030

Unit: Percentage (average annual growth rate). Sources: Our estimates based on United Nations (2019), Lutz, Butz, and KC (2014), and Asia QALI Database 2021.

Based on this future scenario of employment, hours worked and labor quality are projected through 2030. In each country, the average hours worked per worker are benchmarked at the elementary level of employment by the recent estimates in 2019 (in the Asia QALI Database 2021). These are assumed to be slightly decreased based on past trends. The relative wage structure cross-classified by gender, age, education, and status is also provided in 2019 by the Asia QALI Database 2021. Based on these data, labor quality changes are estimated through 2030. The estimates of average annual growth rates of labor quality in each country are presented in Figure B8.2. In some countries such as Indonesia, Thailand, and Mongolia, the quality changes are expected to decrease considerably in the 2020s from the past achievement in 2010–2019, when labor quality growth was

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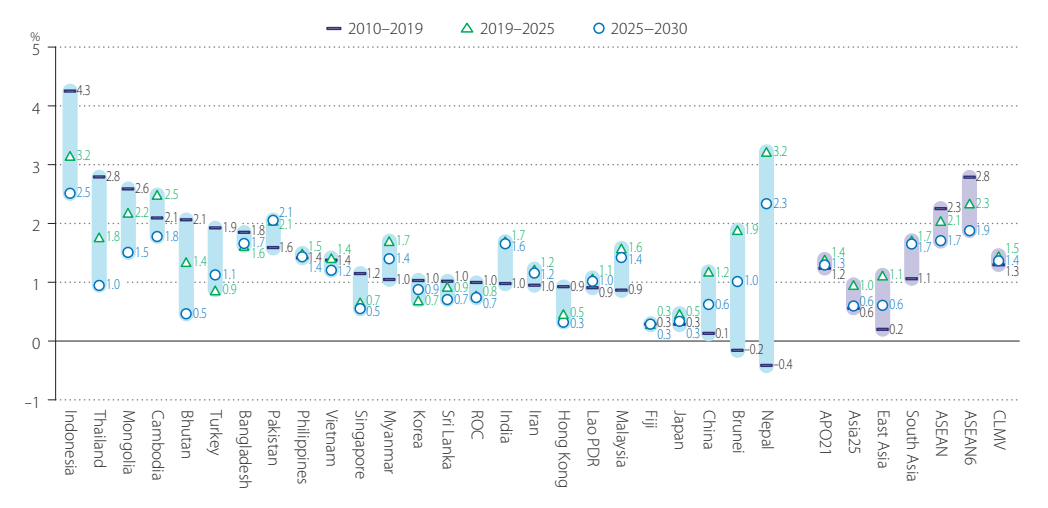

Figure B8.2 Projection of Labor Quality Change until 2030

Unit: Percentage (average annual growth rate). Source: Our estimates based on Asia QALI Database 2021.

exceptionally high, reflecting the rapid changes in employment status and education attainment. In the Asia25, the labor quality changes are estimated as stable in the 2020s, with the deteriorations in the Asian Tigers and the ASEAN expected to be offset by the improvements in China and South Asia.

There is a significant uncertainty in future capital accumulation. As a baseline scenario in our projection, GFCF shares in Asian countries are assumed to follow the long-term trend of Japan. The dotted line in Figure B8.3 presents the past GFCF share since 1885; and the line presents the ten-year moving average. The current levels of GFCF shares in Asian countries are plotted in the years in which the per-hour labor productivities are equivalent between them and Japan (see Figure 34 in Section 5.2). Based on these historical trends, the future GFCF rates are assumed in each country. The investment this year is estimated by GDP and determines the beginning-of-the-period capital stock level for next year, which provides capital services to be used in next year's production.

Another uncertain source of economic growth is TFP. As a base line scenario, the TFP growth in 2010–2019 estimated in APO Productivity Database 2021 is used to provide benchmark estimates at present. In some countries, however, the past achievements reflect events that will not be repeated in the future. In these cases, benchmark estimates of TFP growth are set arbitrarily. In each Asian country, the future change in TFP is assumed to follow the long-term trend of a leading country in each region. From the first quarter of 2020 to the first quarter of 2021, including the impacts of the COVID-19 pandemic (see Box 1), the actual GDP growth is observed in the quarterly national accounts (QNA) in Asian countries. The TFP growth in 2020–2021 is adjusted so the projection of economic growth is equivalent to the actual GDP estimates in QNA. The benchmark estimate of labor share is provided in the APO Productivity Database 2021 (see Section 9.3.3 and Box 5) and is assumed to be time-invariant in each country.

The baseline estimates of economic growth are presented in Figure B8.4. In the Asia25, the recent economic growth in 2010–2019 (5.2% per year on average) is projected to decrease considerably to 3.4% in 2019–2025 due to the COVID-19 pandemic in 2020; and projected to recover to 4.0% in 2025–2030. The main country-source of this slowdown of Asian growth is the deceleration of Chinese economic growth, which is projected to decrease from 7.0% to 4.6% and 3.6%, respectively. South Asia is expected to improve economic performance through 2030, from 3.6% in 2019–2025 to 6.2% in 2025–2030. The projected regional growth of South Asia in the second half of the 2020s is much higher than that in East Asia (3.0%). In the ASEAN, although CLMV is projected to have the highest growth pace among regions in the second half of the 2020s (6.7%), the ASEAN's regional growth is projected to slow to 4.8% in the second half of the 2020s.

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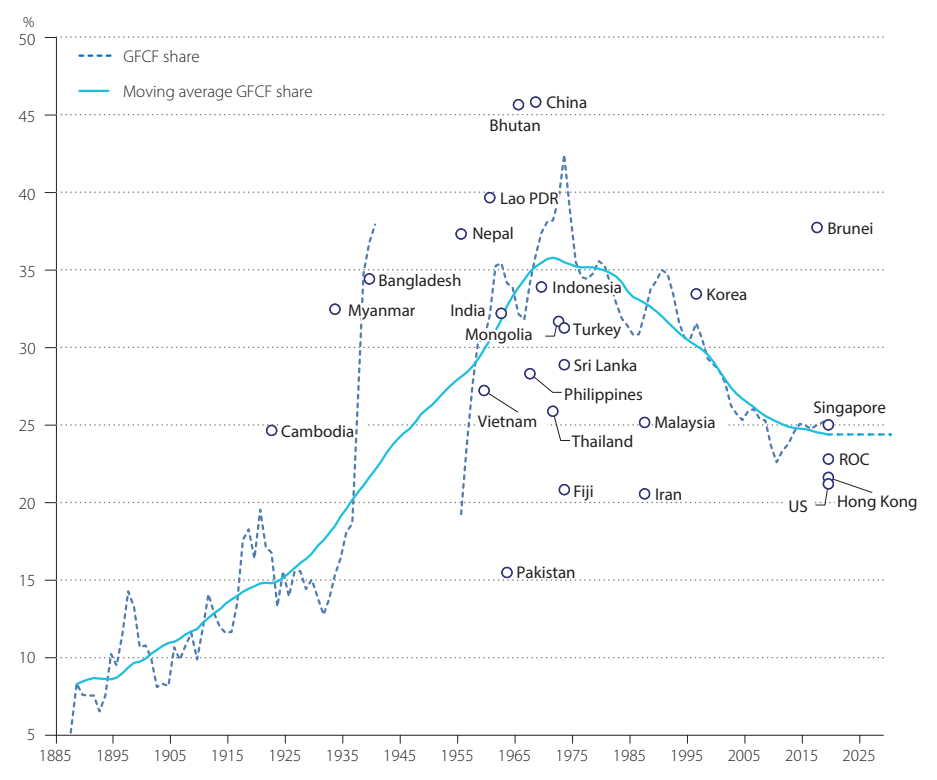

Figure B8.3 Historical GFCF Shares of Japan and Current Level of Asia
——Shares of GFCF in GDP at market prices for Japan in 1885–2019 and for Asian countries in 2019

Source: Our estimates based on APO Productivity Database 2021.

In terms of per-hour labor productivity growth, the current rate of improvement (4.6% per year in 2010–2019) is projected to slow to 3.3% in 2019–2025, with recovery to 4.1% in 2025–2030 in the Asia25, as shown in Figure B8.5. In low-income countries like Nepal, Lao PDR, and Cambodia, and high-income countries like Japan and ROC, the rate of improved labor productivity is expected to accelerate in the 2020s, compared with their achievements in 2010–2019.

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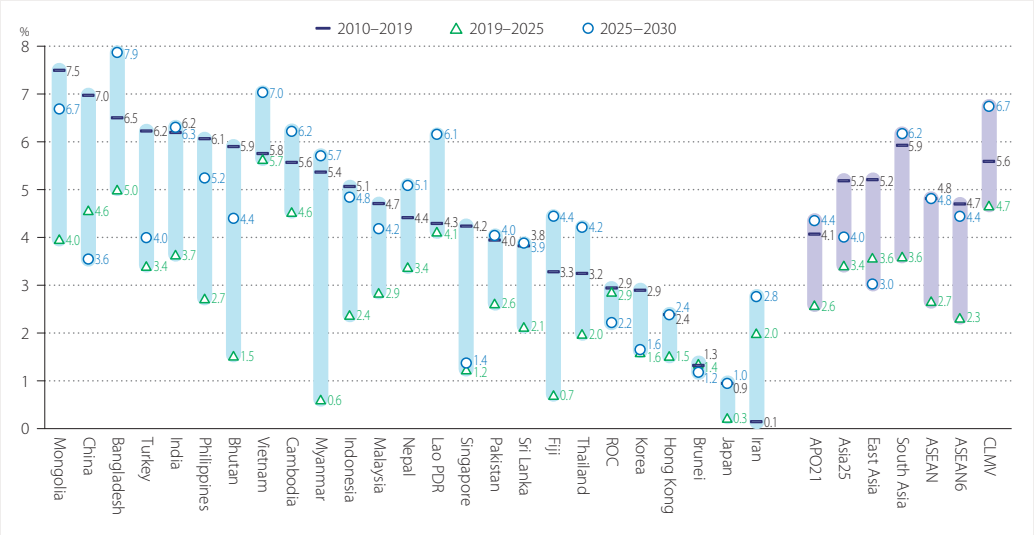

Figure B8.4 Projection of Economic Growths until 2030

Unit: Percentage (average annual growth rate). Sources: Our estimates based on APO Productivity Database 2021 and Asia QALI Database 2021.

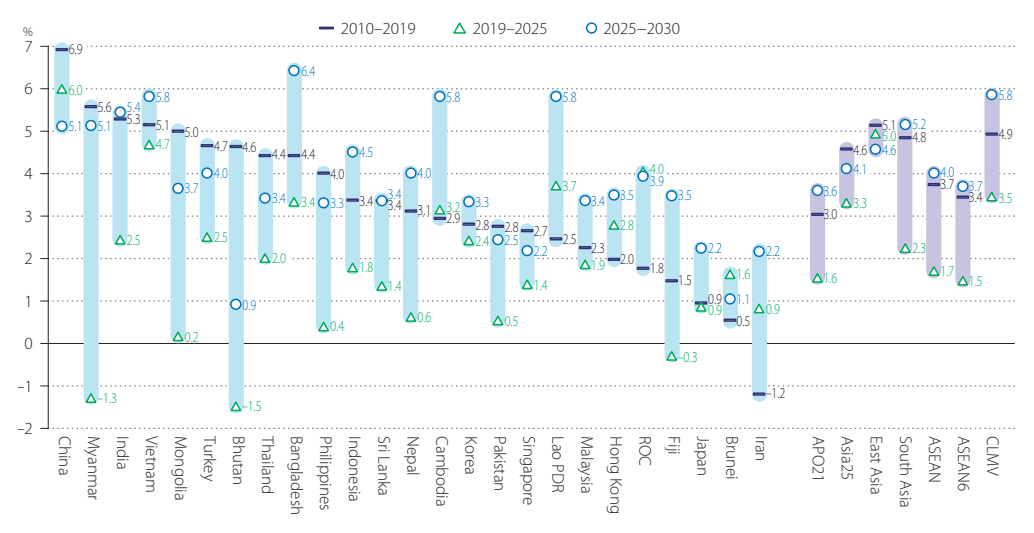

Figure B8.5 Projection of Per-Hour Labor Productivity Growths until 2030

Unit: Percentage (average annual growth rate). Sources: Our estimates based on APO Productivity Database 2021 and Asia QALI Database 2021.

8 Country Profiles

Bangladesh

Key Indicators

GDP in 2019	799	Billions of US dollars (as of 2019)
(exchange rate based)	301	Billions of US dollars (as of 2019)
Per capita GDP in 2019	4.8	Thousands of US dollars (as of 2019)
(exchange rate based)	1.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	10.8	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	4.7	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	10.6	US dollars (as of 2019)
Energy productivity levels in 2018	20.9	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	121.6	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	66,372	Thousands persons
Employment rate in 2019	40.1	%
Female employment share in 2019	31.3	%
Average schooling years of workers in 2019	6.3	Years
Investment share in 2019	31.6	%
ICT investment share in GFCF in 2019	4.3	%
Agriculture share in GDP in 2019	13.3	%
Manufacturing share in GDP in 2019	19.9	%
Agriculture share in employment in 2019	38.6	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	–0.6	3.8	4.1	5.7	6.5	7.3	7.8	7.8	6.5	5.1	–0.2	4.2	5.0
Labor input growth	4.1	3.8	2.4	3.3	4.0	3.0	4.7	1.9	1.9	2.9	3.5	3.5	3.4
Labor quality growth	1.2	1.2	0.6	0.8	1.8	1.4	2.8	0.5	0.5	1.2	1.8	1.7	1.7
Hours worked growth	2.8	2.6	1.8	2.5	2.1	1.5	1.9	1.4	1.3	1.8	1.8	1.7	1.7
College labor input growth	10.1	9.2	5.7	2.4	7.1	4.1	4.1	2.7	2.7	5.4	5.0	4.9	4.8
Non-college labor input growth	3.7	3.2	1.9	3.4	3.3	2.7	4.9	1.7	1.7	2.3	3.1	3.1	3.0
IT capital input growth	8.6	12.5	13.6	12.3	18.9	16.8	18.2	14.4	11.7	10.9	10.8	9.1	10.4
Non-IT capital input growth	1.7	4.9	6.2	8.0	7.7	7.7	7.6	7.9	8.1	8.3	8.0	7.3	7.4
Per-worker labor productivity growth	–3.3	1.8	1.9	3.1	5.1	5.9	5.9	6.5	5.2	3.2	–2.0	2.4	3.3
Per-hour labor productivity growth	–3.4	1.2	2.3	3.2	4.4	5.7	6.0	6.4	5.2	3.3	–2.0	2.5	3.4
Capital productivity growth	–1.8	–5.0	–6.3	–8.0	–7.9	–7.9	–7.8	–8.0	–8.1	–3.3	–8.3	–3.1	–2.5
TFP growth	–3.2	–0.6	–0.3	–0.2	0.2	1.4	1.3	2.3	0.9	–1.0	–6.4	–1.5	–0.8

Production

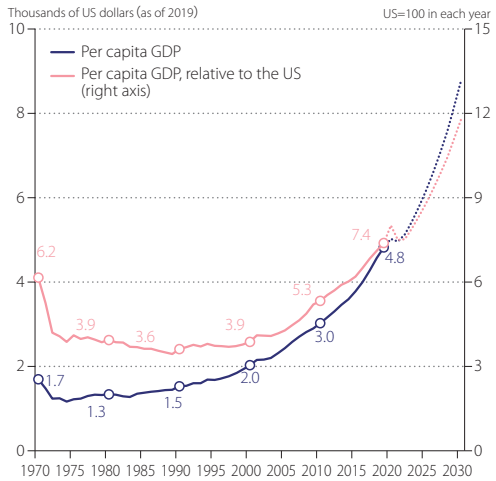

Figure 1 Per Capita GDP

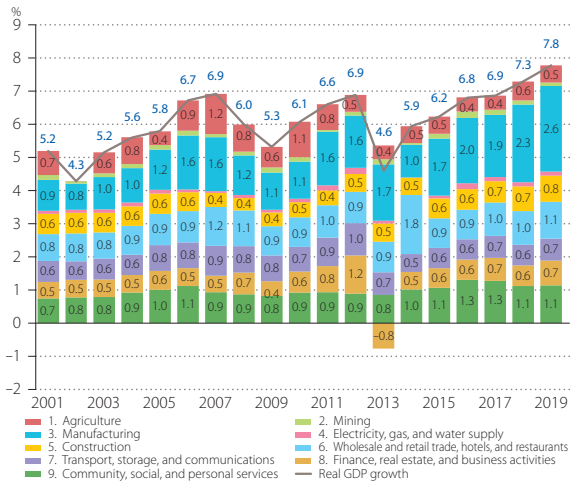

Figure 2 Industry Origins of Economic Growth

Labor

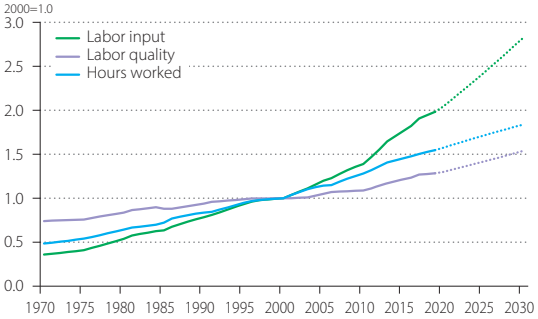

Figure 3 Labor Inputs

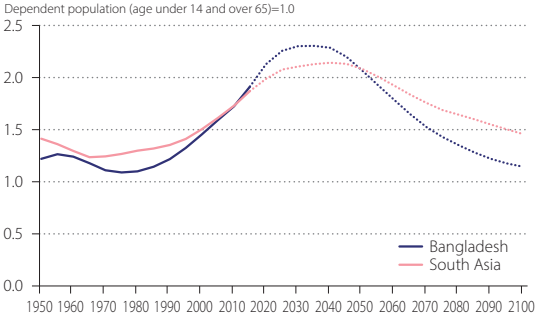

Figure 4 Demographic Dividend

Productivity

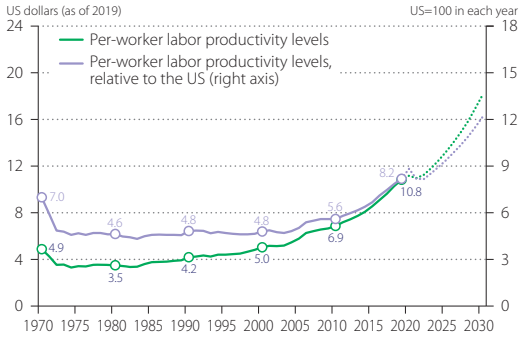

Figure 5 Per-Worker Labor Productivity Level

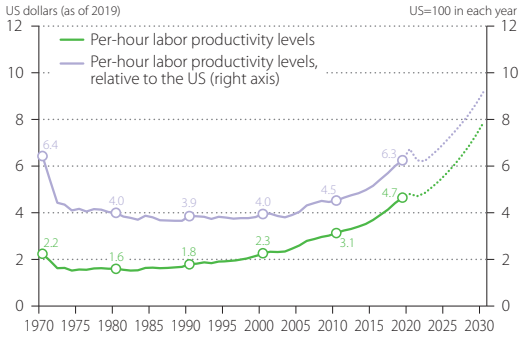

Figure 6 Per-Hour Labor Productivity Level

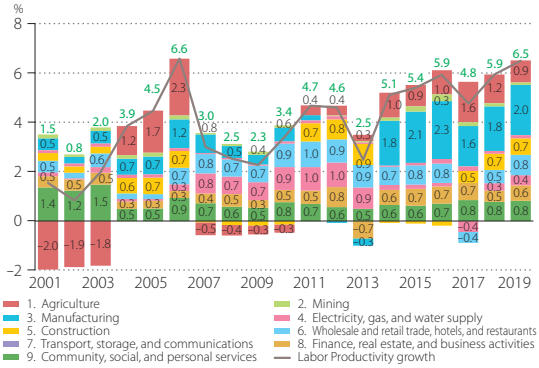

Figure 7 Industry Origins of Labor Productivity Growth

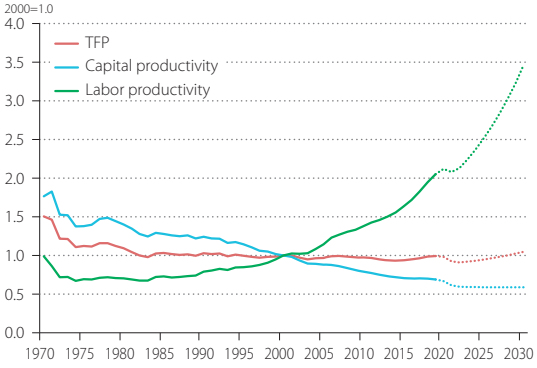

Figure 8 Productivity Indicators

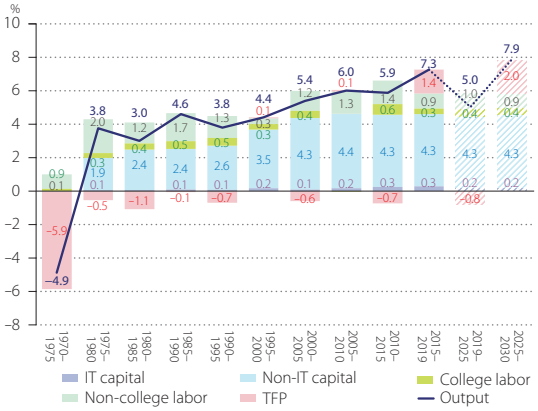

Figure 9 Decomposition of Economic Growth

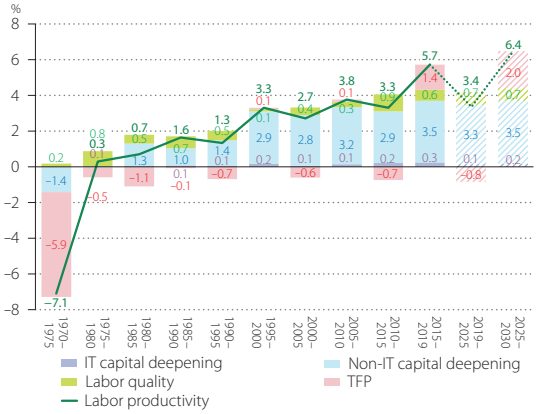

Figure 10 Decomposition of Labor Productivity Growth

Cambodia

Key Indicators

GDP in 2019	78	Billions of US dollars (as of 2019)
(exchange rate based)	27	Billions of US dollars (as of 2019)
Per capita GDP in 2019	5.0	Thousands of US dollars (as of 2019)
(exchange rate based)	1.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	7.3	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	3.0	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	5.9	US dollars (as of 2019)
Energy productivity levels in 2018	9.4	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	158.2	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	9,873	Thousands persons
Employment rate in 2019	63.5	%
Female employment share in 2019	50.5	%
Average schooling years of workers in 2019	5.4	Years
Investment share in 2019	24.4	%
ICT investment share in GFCF in 2019	1.4	%
Agriculture share in GDP in 2019	22.0	%
Manufacturing share in GDP in 2019	17.3	%
Agriculture share in employment in 2019	33.8	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	–5.3	3.7	6.1	7.6	5.6	7.3	7.4	8.7	7.6	–0.6	4.1	5.9	5.6
Labor input growth	1.3	2.9	5.4	4.6	4.7	3.9	2.8	3.5	1.6	3.5	3.8	4.3	3.9
Labor quality growth	0.9	0.5	1.1	1.0	2.1	0.6	1.2	0.9	–0.8	2.9	2.6	2.5	2.4
Hours worked growth	0.5	2.5	4.2	3.7	2.6	3.3	1.5	2.7	2.5	0.6	1.2	1.8	1.5
College labor input growth	6.9	4.6	6.1	14.1	8.9	10.4	11.2	5.6	4.2	4.9	4.1	4.1	3.8
Non-college labor input growth	1.3	2.9	5.3	4.2	4.4	3.4	2.1	3.4	1.4	3.4	3.8	4.3	3.9
IT capital input growth	11.7	4.8	26.0	14.4	17.3	11.8	8.5	5.4	4.9	3.8	3.6	6.4	8.7
Non-IT capital input growth	1.9	0.3	4.2	8.5	6.8	6.9	6.7	6.9	7.3	7.0	5.9	5.7	5.8
Per-worker labor productivity growth	–5.7	1.2	2.4	4.3	2.9	4.6	4.8	6.4	5.2	–1.6	2.5	3.9	3.9
Per-hour labor productivity growth	–5.8	1.2	1.9	3.9	2.9	4.0	5.9	6.0	5.2	–1.3	2.9	4.1	4.1
Capital productivity growth	–0.1	0.0	–3.8	–8.4	–6.8	–6.9	–6.7	–6.8	–7.2	–7.6	–1.8	0.1	–0.3
TFP growth	–7.1	2.3	1.4	0.9	–0.1	2.2	3.0	3.8	3.6	–5.6	–0.6	0.9	0.8

Production

Figure 1 Per Capita GDP

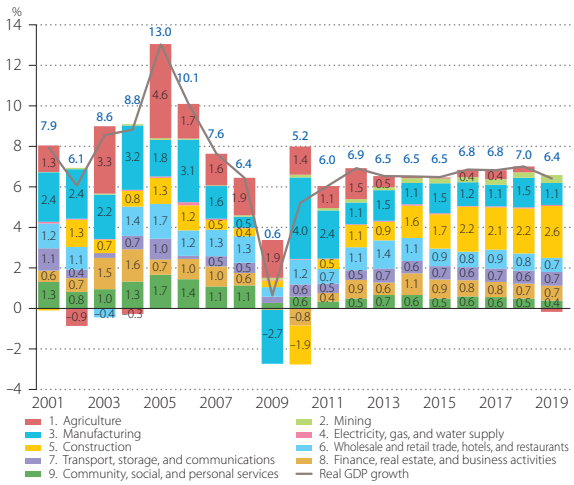

Figure 2 Industry Origins of Economic Growth

Labor

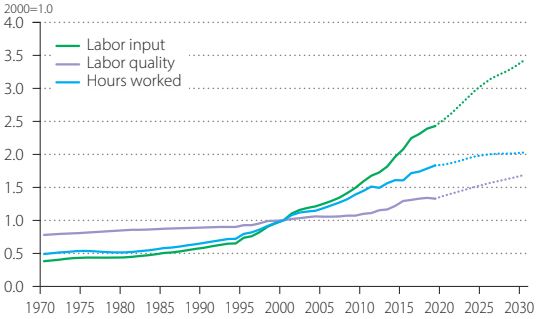

Figure 3 Labor Inputs

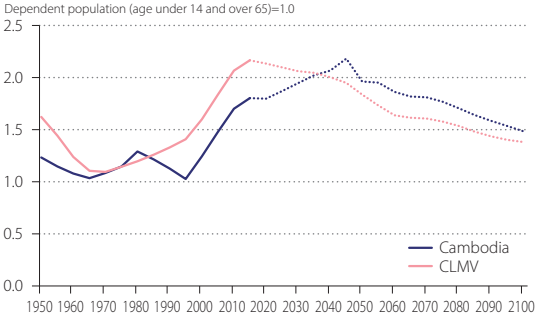

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

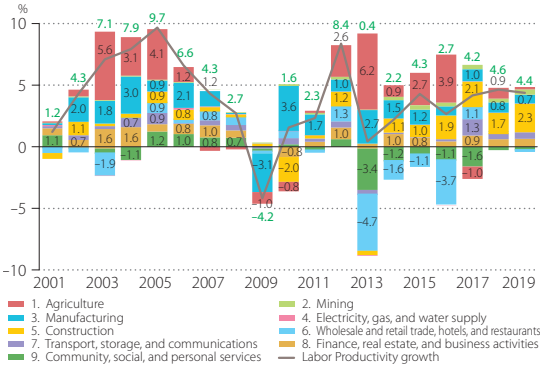

Figure 7 Industry Origins of Labor Productivity Growth

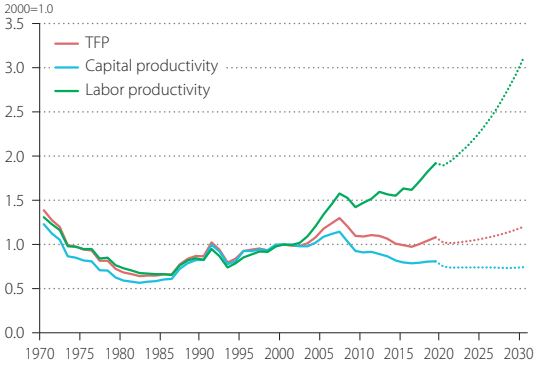

Figure 8 Productivity Indicators

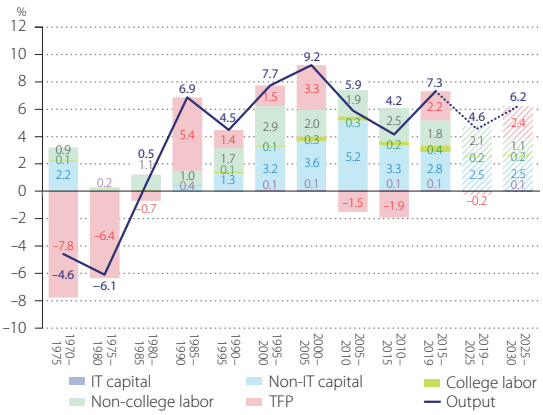

Figure 9 Decomposition of Economic Growth

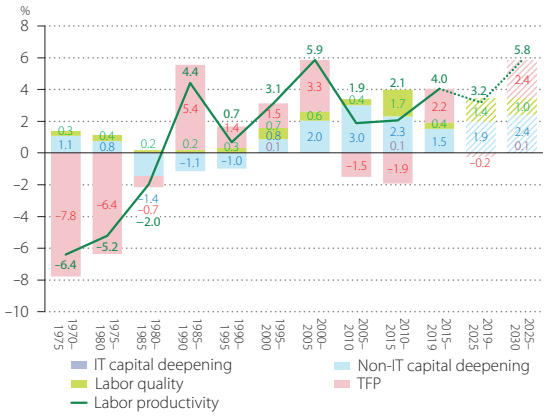

Figure 10 Decomposition of Labor Productivity Growth

ROC

Key Indicators

GDP in 2019	1,261	Billions of US dollars (as of 2019)
(exchange rate based)	612	Billions of US dollars (as of 2019)
Per capita GDP in 2019	53.4	Thousands of US dollars (as of 2019)
(exchange rate based)	25.9	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	104.1	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	49.7	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	95.0	US dollars (as of 2019)
Energy productivity levels in 2018	16.6	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	216.1	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	11,790	Thousands persons
Employment rate in 2019	50.0	%
Female employment share in 2019	43.0	%
Average schooling years of workers in 2019	13.2	Years
Investment share in 2019	23.6	%
ICT investment share in GFCF in 2019	8.3	%
Agriculture share in GDP in 2019	1.7	%
Manufacturing share in GDP in 2019	32.0	%
Agriculture share in employment in 2019	4.9	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	10.5	9.2	6.8	4.1	2.9	3.0	3.2	2.6	3.1	3.1	5.4	0.8	1.6
Labor input growth	4.4	2.9	2.2	2.1	2.2	0.6	0.2	1.4	0.9	0.4	–0.3	–0.4	–0.5
Labor quality growth	1.1	0.9	1.1	1.7	1.0	0.7	0.9	0.6	0.3	0.7	0.7	0.8	0.8
Hours worked growth	3.3	2.0	1.1	0.3	1.2	0.0	–0.7	0.8	0.6	–0.4	–1.1	–1.2	–1.3
College labor input growth	7.5	6.8	6.2	5.0	3.6	2.0	2.2	2.5	1.9	1.8	1.1	1.0	0.9
Non-college labor input growth	3.8	1.6	0.1	–0.7	0.1	–1.6	–2.9	–0.4	–0.7	–2.0	–2.8	–3.0	–3.2
IT capital input growth	21.5	17.4	18.7	3.3	2.4	2.7	3.0	1.9	2.7	4.3	1.8	3.2	2.3
Non-IT capital input growth	9.8	7.7	6.9	2.9	1.7	1.7	1.8	1.5	1.8	1.5	1.2	1.4	1.2
Per-worker labor productivity growth	7.3	6.9	5.5	3.2	1.9	2.3	2.5	1.9	2.6	3.9	6.2	1.8	2.7
Per-hour labor productivity growth	7.3	7.3	5.7	3.7	1.8	3.0	4.0	1.8	2.5	3.5	6.4	2.0	2.9
Capital productivity growth	–10.1	–8.0	–7.5	–2.9	–1.7	–1.8	–1.8	–1.5	–1.8	1.4	4.2	–0.6	0.4
TFP growth	3.5	4.1	2.3	1.6	1.0	1.8	2.2	1.1	1.7	2.1	4.9	0.3	1.2

Production

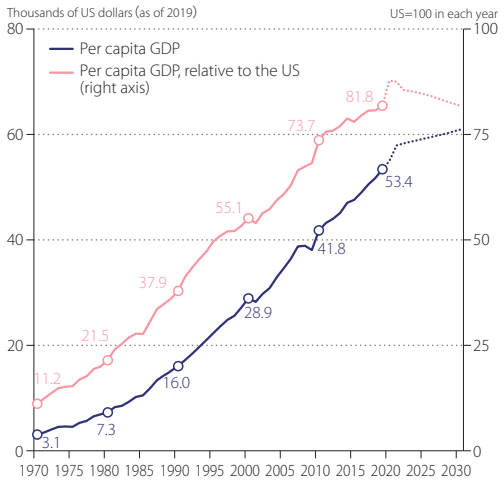

Figure 1 Per Capita GDP

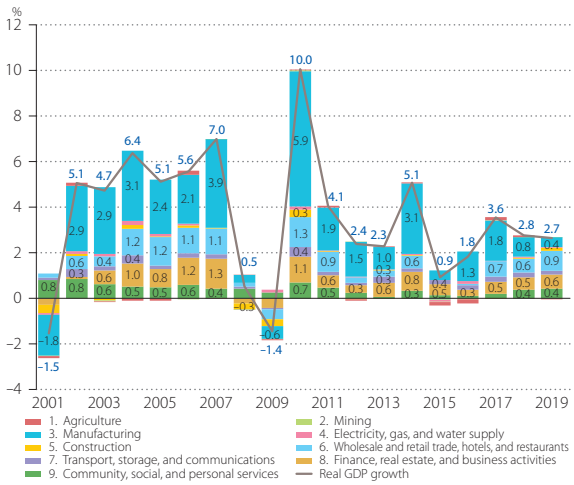

Figure 2 Industry Origins of Economic Growth

Labor

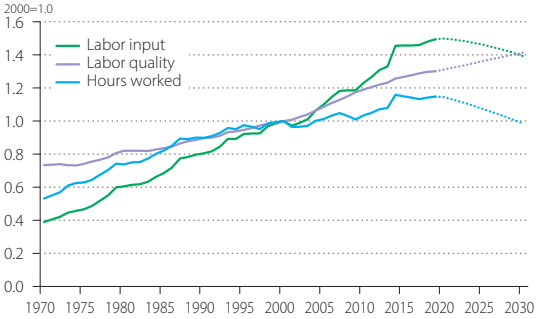

Figure 3 Labor Inputs

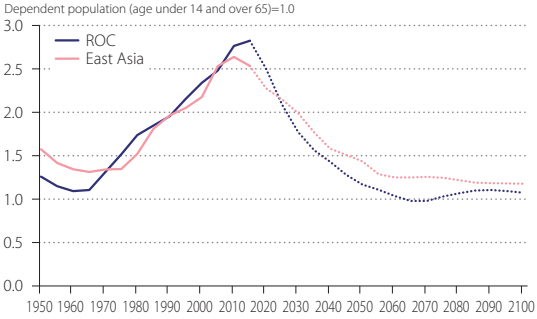

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

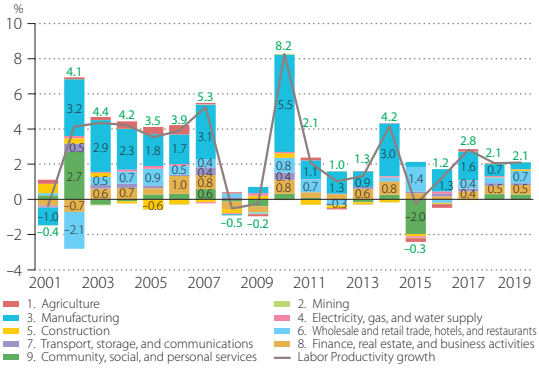

Figure 7 Industry Origins of Labor Productivity Growth

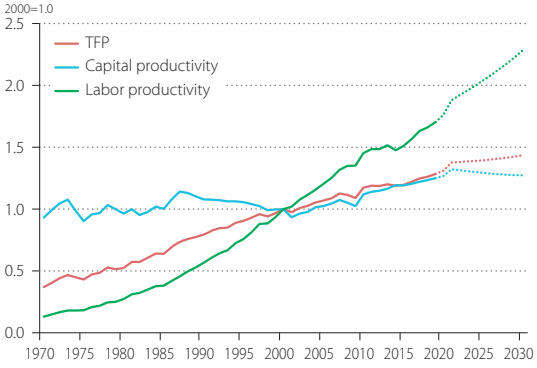

Figure 8 Productivity Indicators

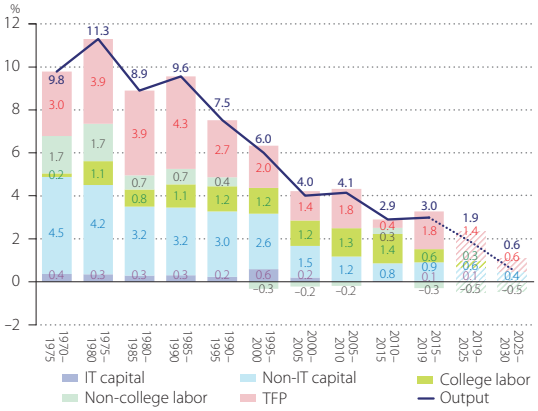

Figure 9 Decomposition of Economic Growth

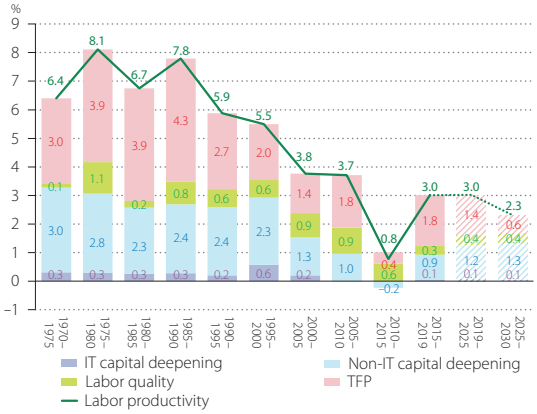

Figure 10 Decomposition of Labor Productivity Growth

Fiji

Key Indicators

GDP in 2019	13	Billions of US dollars (as of 2019)
(exchange rate based)	5	Billions of US dollars (as of 2019)
Per capita GDP in 2019	14.2	Thousands of US dollars (as of 2019)
(exchange rate based)	6.2	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	29.5	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	15.5	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	39.9	US dollars (as of 2019)
Energy productivity levels in 2018	n.a.	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	227.3	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	351	Thousands persons
Employment rate in 2019	39.5	%
Female employment share in 2019	31.5	%
Average schooling years of workers in 2019	10.6	Years
Investment share in 2019	15.8	%
ICT investment share in GFCF in 2019	10.3	%
Agriculture share in GDP in 2019	18.4	%
Manufacturing share in GDP in 2019	14.0	%
Agriculture share in employment in 2019	7.3	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.7	2.2	2.3	1.3	3.3	2.7	5.2	3.7	–0.4	–15.4	2.7	4.8	3.9
Labor input growth	5.3	4.5	3.8	1.8	2.1	2.1	0.5	1.9	1.3	1.3	1.3	1.3	1.3
Labor quality growth	2.0	2.3	1.8	1.0	0.3	0.5	0.4	0.0	0.0	0.2	0.3	0.3	0.3
Hours worked growth	3.2	2.1	2.0	0.8	1.8	1.6	0.2	1.9	1.3	1.1	1.0	1.0	1.0
College labor input growth	6.1	7.4	5.2	3.8	1.3	1.4	0.9	1.9	1.1	1.8	1.5	1.8	1.7
Non-college labor input growth	5.1	3.5	3.2	0.7	2.5	2.5	0.4	1.9	1.4	1.0	1.1	1.1	1.1
IT capital input growth	8.1	15.4	2.1	3.5	6.8	7.9	8.0	9.0	7.5	6.1	2.4	3.1	4.1
Non-IT capital input growth	5.6	2.0	2.8	0.5	1.2	2.0	3.1	2.8	2.7	2.0	1.3	1.4	1.5
Per-worker labor productivity growth	1.5	–0.3	0.6	0.3	2.0	1.4	4.2	1.9	–1.7	–16.4	2.0	4.1	3.2
Per-hour labor productivity growth	1.4	0.1	0.4	0.5	1.5	1.1	5.1	1.8	–1.7	–16.5	1.7	3.8	3.0
Capital productivity growth	–5.6	–2.2	–2.7	–0.6	–1.4	–2.2	–3.2	–3.1	–2.9	–17.6	1.4	3.4	2.3
TFP growth	–0.8	–1.3	–0.9	0.1	1.6	0.6	3.1	1.2	–2.6	–17.2	1.4	3.4	2.5

Production

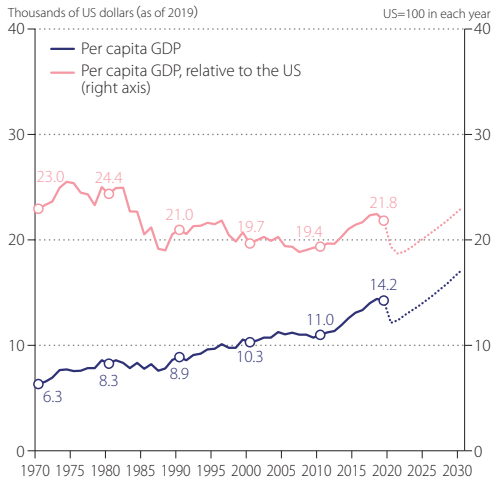

Figure 1 Per Capita GDP

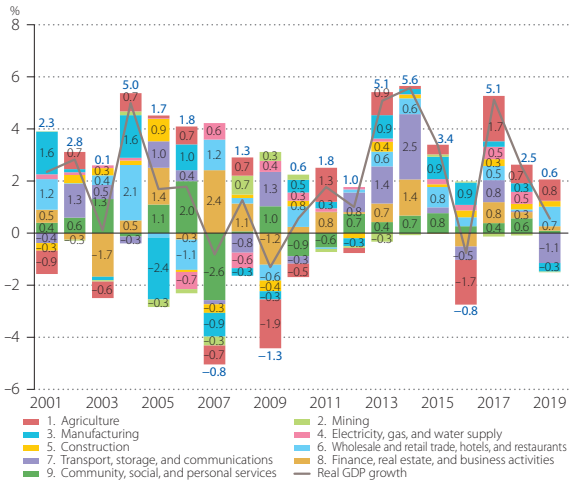

Figure 2 Industry Origins of Economic Growth

Labor

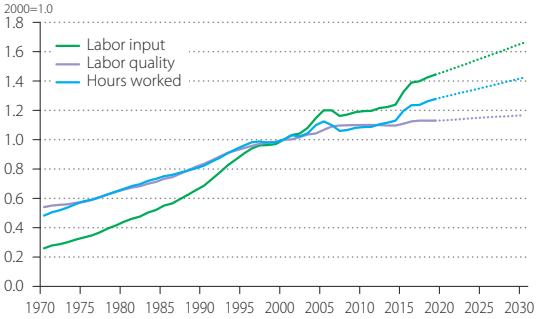

Figure 3 Labor Inputs

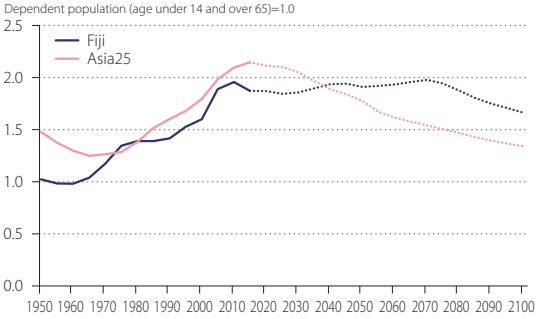

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

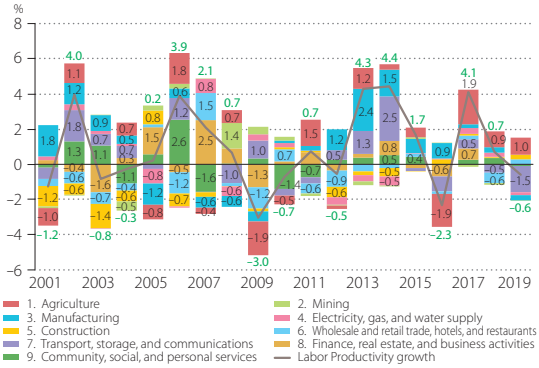

Figure 7 Industry Origins of Labor Productivity Growth

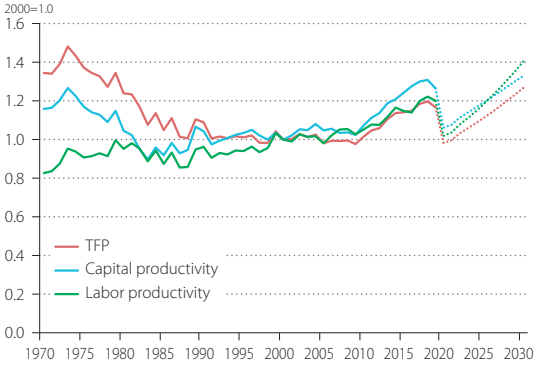

Figure 8 Productivity Indicators

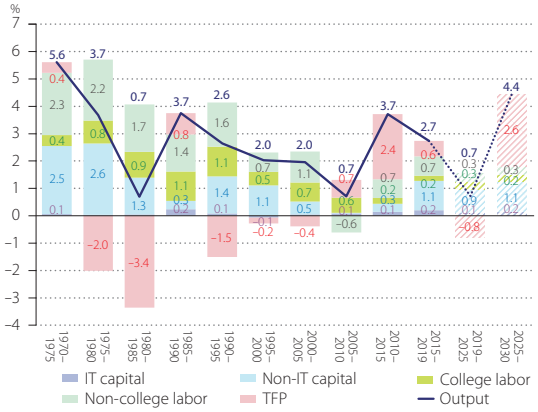

Figure 9 Decomposition of Economic Growth

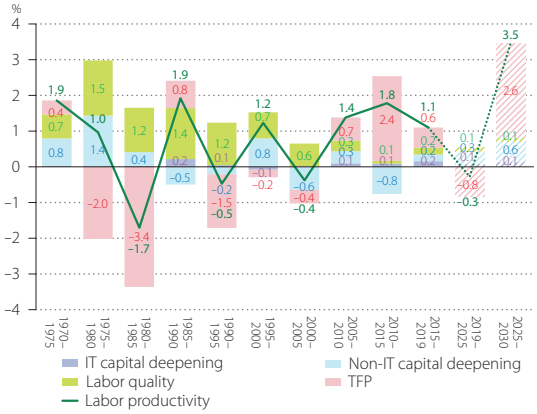

Figure 10 Decomposition of Labor Productivity Growth

Hong Kong

Key Indicators

GDP in 2019	468	Billions of US dollars (as of 2019)
(exchange rate based)	366	Billions of US dollars (as of 2019)
Per capita GDP in 2019	62.3	Thousands of US dollars (as of 2019)
(exchange rate based)	48.7	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	117.7	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	54.2	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	142.6	US dollars (as of 2019)
Energy productivity levels in 2018	50.6	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	93.9	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	3,808	Thousands persons
Employment rate in 2019	50.7	%
Female employment share in 2019	50.4	%
Average schooling years of workers in 2019	12.4	Years
Investment share in 2019	18.9	%
ICT investment share in GFCF in 2019	12.0	%
Agriculture share in GDP in 2019	0.1	%
Manufacturing share in GDP in 2019	1.1	%
Agriculture share in employment in 2019	0.2	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	8.9	6.6	4.3	3.9	2.4	1.8	3.7	2.7	−1.3	−6.3	3.9	1.8	1.5
Labor input growth	4.5	2.6	3.3	1.2	1.3	0.9	0.8	2.7	−0.2	−1.2	−0.7	−0.7	−0.7
Labor quality growth	0.8	1.6	1.3	0.5	0.9	0.7	1.2	0.6	0.2	0.6	0.4	0.4	0.5
Hours worked growth	3.7	1.0	2.0	0.7	0.4	0.2	−0.5	2.1	−0.4	−1.8	−1.2	−1.2	−1.2
College labor input growth	7.6	8.0	7.9	4.8	4.2	3.0	3.5	4.3	2.1	0.3	0.3	0.3	0.3
Non-college labor input growth	4.2	1.5	1.6	−1.2	−1.6	−1.6	−2.4	0.7	−3.1	−3.2	−2.1	−2.1	−2.1
IT capital input growth	18.7	17.2	16.4	7.6	6.5	4.4	4.4	5.1	3.3	2.5	4.6	6.4	6.4
Non-IT capital input growth	7.7	5.6	4.9	2.4	1.1	0.6	0.9	1.1	0.2	0.3	0.4	0.6	0.5
Per-worker labor productivity growth	5.0	4.8	2.5	3.1	1.3	1.5	2.8	1.7	−0.7	−5.8	4.6	2.5	2.2
Per-hour labor productivity growth	5.2	5.6	2.3	3.3	2.0	1.6	4.2	0.7	−0.8	−4.5	5.0	2.9	2.7
Capital productivity growth	−7.9	−5.9	−5.4	−2.8	−1.5	−0.8	−1.1	−1.3	−0.4	−6.8	3.2	0.8	0.6
TFP growth	2.7	2.4	−0.1	2.0	1.0	1.0	2.8	0.7	−1.3	−5.8	3.9	1.7	1.5

Production

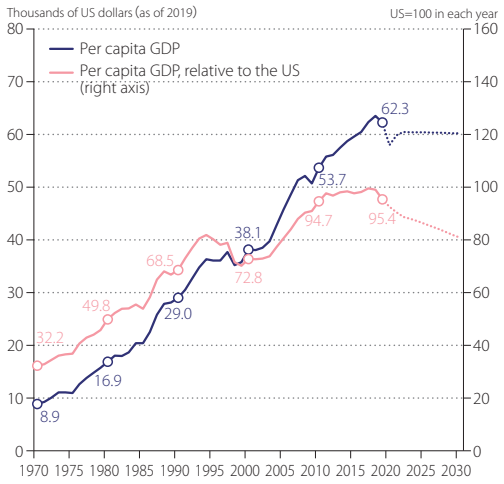

Figure 1 Per Capita GDP

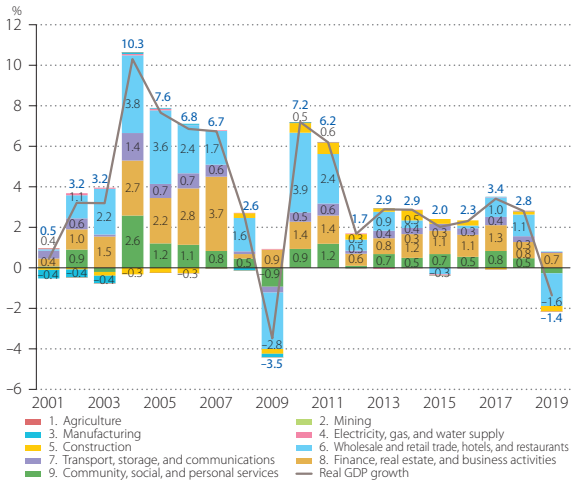

Figure 2 Industry Origins of Economic Growth

Labor

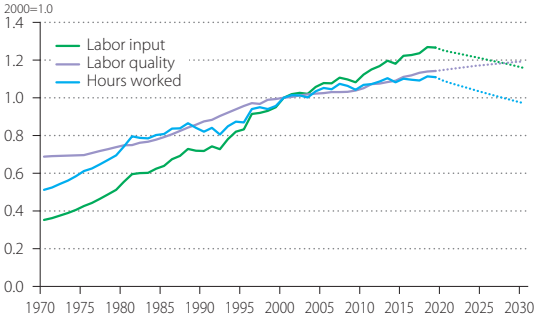

Figure 3 Labor Inputs

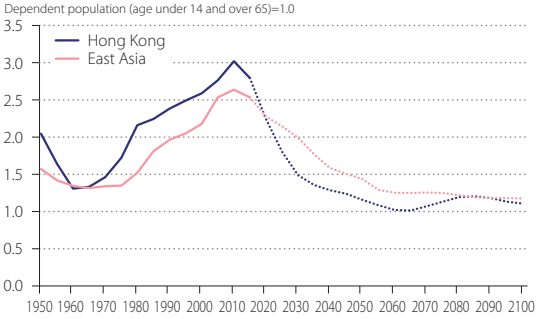

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

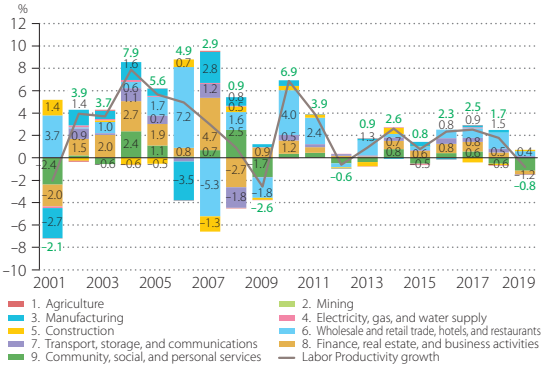

Figure 7 Industry Origins of Labor Productivity Growth

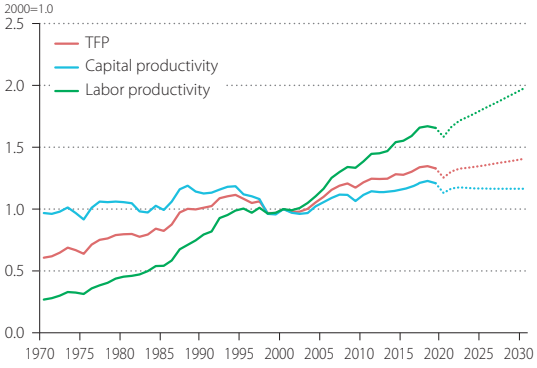

Figure 8 Productivity Indicators

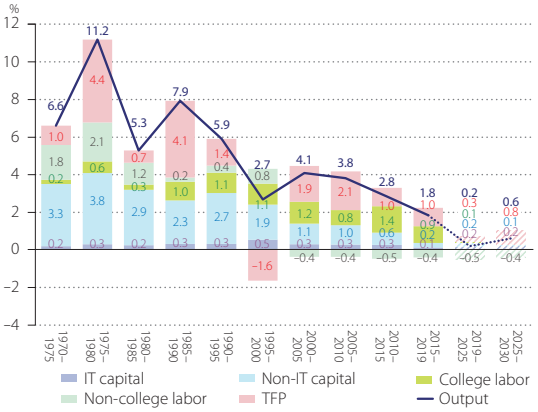

Figure 9 Decomposition of Economic Growth

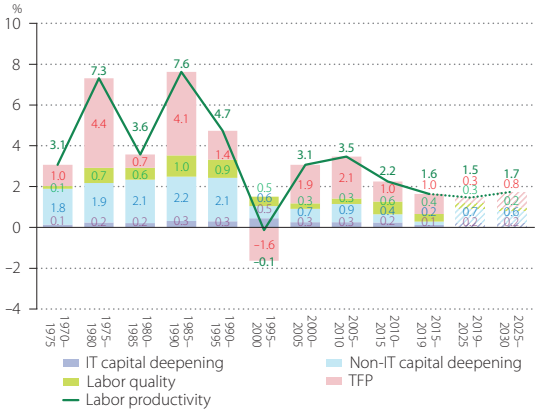

Figure 10 Decomposition of Labor Productivity Growth

India

Key Indicators

GDP in 2019	9,423	Billions of US dollars (as of 2019)
(exchange rate based)	2,872	Billions of US dollars (as of 2019)
Per capita GDP in 2019	6.9	Thousands of US dollars (as of 2019)
(exchange rate based)	2.1	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	16.5	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	7.8	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	18.2	US dollars (as of 2019)
Energy productivity levels in 2018	13.6	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	280.3	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	519,584	Thousands persons
Employment rate in 2019	38.0	%
Female employment share in 2019	25.6	%
Average schooling years of workers in 2019	6.3	Years
Investment share in 2019	30.2	%
ICT investment share in GFCF in 2019	5.9	%
Agriculture share in GDP in 2019	17.2	%
Manufacturing share in GDP in 2019	12.3	%
Agriculture share in employment in 2019	42.1	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	3.0	4.9	4.9	7.5	6.2	5.8	5.5	6.8	3.0	–8.3	7.9	4.9	5.0
Labor input growth	3.0	3.1	2.7	2.9	1.9	1.4	1.2	1.5	1.5	2.8	3.0	3.0	2.9
Labor quality growth	0.6	1.1	1.0	1.5	1.0	0.6	0.5	0.5	0.5	1.5	1.8	1.8	1.7
Hours worked growth	2.4	2.0	1.7	1.4	0.9	0.8	0.8	1.0	1.0	1.3	1.2	1.2	1.2
College labor input growth	10.1	7.2	5.3	5.7	2.5	2.1	1.8	2.3	2.2	3.4	3.9	3.8	3.7
Non-college labor input growth	2.3	2.3	2.0	1.7	1.6	1.1	0.9	1.1	1.1	2.5	2.5	2.5	2.4
IT capital input growth	11.7	16.5	16.3	15.9	13.5	14.3	14.4	14.6	14.5	11.4	5.9	7.7	7.3
Non-IT capital input growth	4.4	4.9	5.3	7.1	7.6	7.0	7.2	7.0	6.9	6.1	4.8	5.2	5.2
Per-worker labor productivity growth	0.5	3.5	3.7	5.9	5.4	5.4	6.0	5.2	3.3	–9.6	6.8	3.7	3.9
Per-hour labor productivity growth	0.5	3.4	3.6	5.7	5.3	5.4	6.0	5.2	3.3	–9.6	6.8	3.7	3.9
Capital productivity growth	–4.4	–5.0	–5.5	–7.4	–7.8	–7.3	–7.5	–7.3	–7.3	–14.6	3.1	–0.4	–0.2
TFP growth	–0.4	1.8	1.7	2.4	2.0	2.4	3.1	2.5	0.6	–12.5	4.2	1.0	1.2

Production

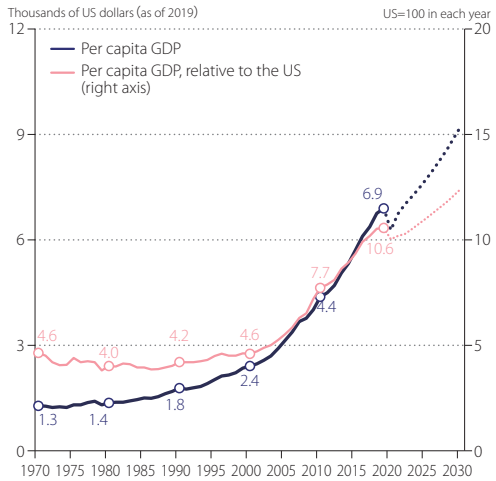

Figure 1 Per Capita GDP

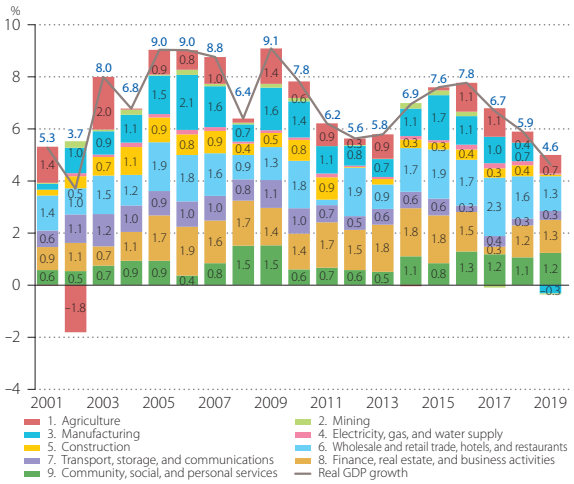

Figure 2 Industry Origins of Economic Growth

Labor

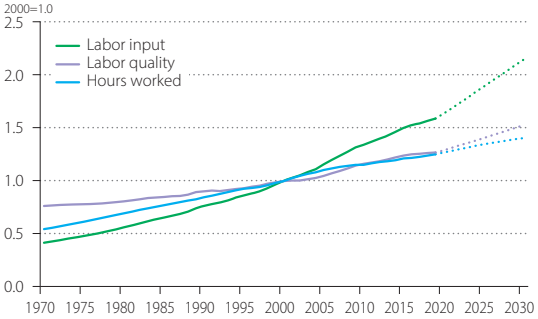

Figure 3 Labor Inputs

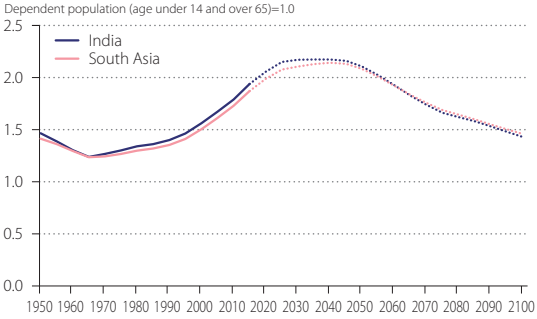

Figure 4 Demographic Dividend

Productivity

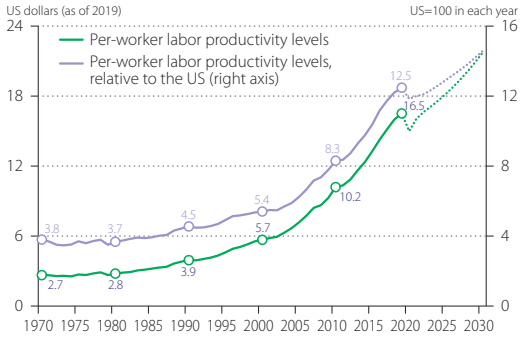

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

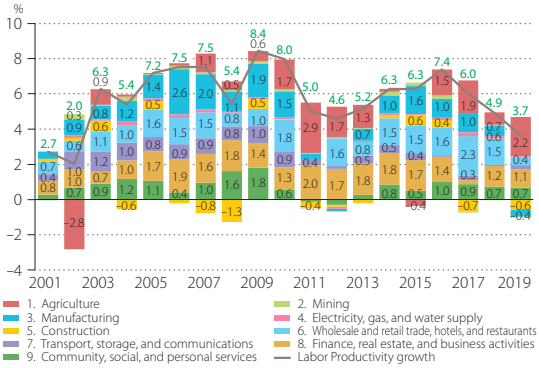

Figure 7 Industry Origins of Labor Productivity Growth

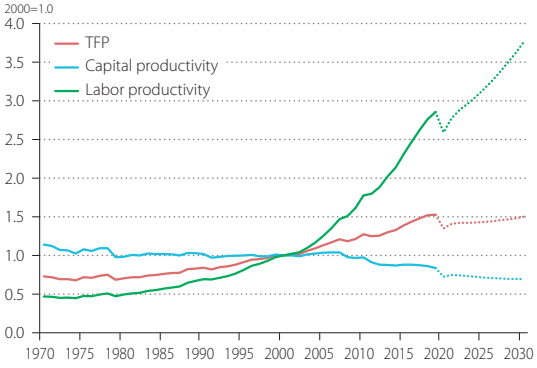

Figure 8 Productivity Indicators

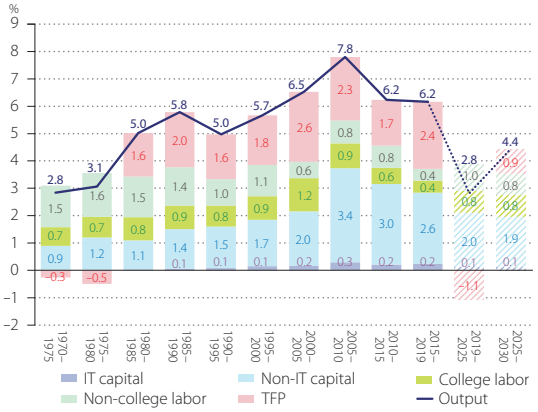

Figure 9 Decomposition of Economic Growth

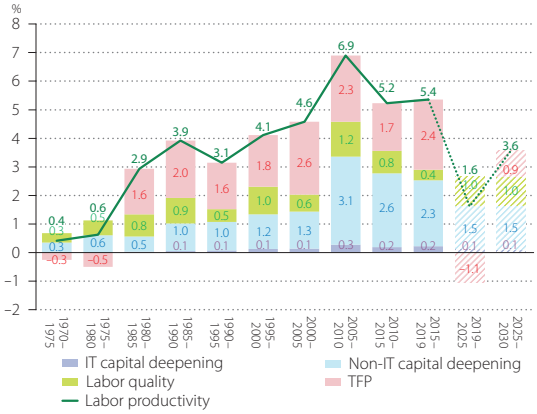

Figure 10 Decomposition of Labor Productivity Growth

Indonesia

Key Indicators

GDP in 2019	3,329	Billions of US dollars (as of 2019)
(exchange rate based)	1,124	Billions of US dollars (as of 2019)
Per capita GDP in 2019	12.5	Thousands of US dollars (as of 2019)
(exchange rate based)	4.2	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	24.6	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	12.3	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	42.0	US dollars (as of 2019)
Energy productivity levels in 2018	19.5	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	178.3	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	129,590	Thousands persons
Employment rate in 2019	48.7	%
Female employment share in 2019	39.8	%
Average schooling years of workers in 2019	8.9	Years
Investment share in 2019	34.1	%
ICT investment share in GFCF in 2019	3.1	%
Agriculture share in GDP in 2019	13.3	%
Manufacturing share in GDP in 2019	20.5	%
Agriculture share in employment in 2019	26.0	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	8.0	6.1	4.1	5.0	5.1	4.8	4.8	4.8	4.7	–2.0	4.2	2.1	2.6
Labor input growth	5.9	5.8	6.4	5.1	5.9	5.1	3.8	1.5	7.5	4.7	4.0	3.7	3.6
Labor quality growth	1.9	2.4	4.3	2.8	4.3	2.3	0.8	1.3	3.0	3.8	3.3	3.1	3.0
Hours worked growth	4.0	3.4	2.1	2.3	1.7	2.8	3.0	0.2	4.5	0.9	0.7	0.6	0.5
College labor input growth	7.8	5.5	11.4	7.4	9.6	7.1	9.1	–0.1	9.9	4.4	4.4	4.1	4.0
Non-college labor input growth	5.8	5.9	5.6	4.3	4.1	4.0	0.9	2.4	6.3	4.8	3.7	3.5	3.3
IT capital input growth	24.0	19.0	11.6	12.9	13.6	12.7	12.6	12.2	11.0	8.3	5.5	5.5	4.7
Non-IT capital input growth	7.4	7.4	6.9	4.7	6.4	6.3	6.4	6.1	6.0	5.7	5.1	5.0	4.7
Per-worker labor productivity growth	4.6	2.2	2.4	3.1	3.1	1.7	2.1	2.6	1.5	–2.8	3.4	1.4	2.0
Per-hour labor productivity growth	4.0	2.7	2.0	2.7	3.4	2.0	1.8	4.6	0.2	–2.9	3.5	1.5	2.1
Capital productivity growth	–7.4	–7.5	–7.0	–4.8	–6.5	–6.4	–6.5	–6.2	–6.0	–7.8	–0.9	–2.9	–2.1
TFP growth	1.1	–0.9	–2.7	0.0	–1.2	–1.0	–0.5	0.7	–2.0	–7.3	–0.4	–2.3	–1.6

Production

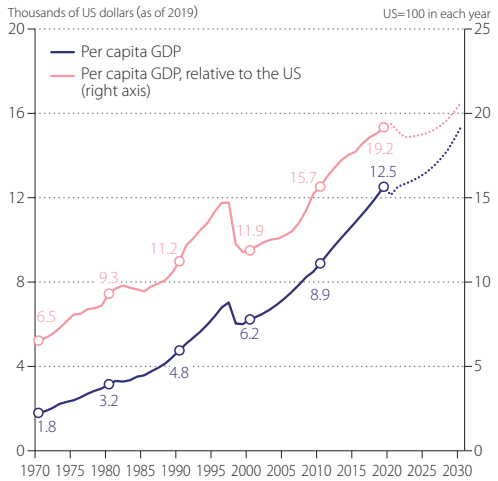

Figure 1 Per Capita GDP

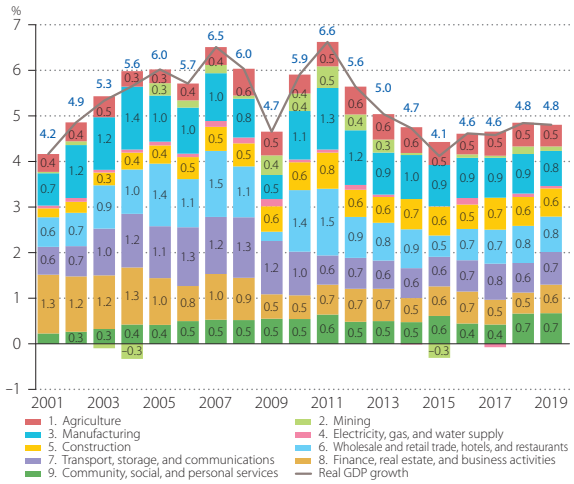

Figure 2 Industry Origins of Economic Growth

Labor

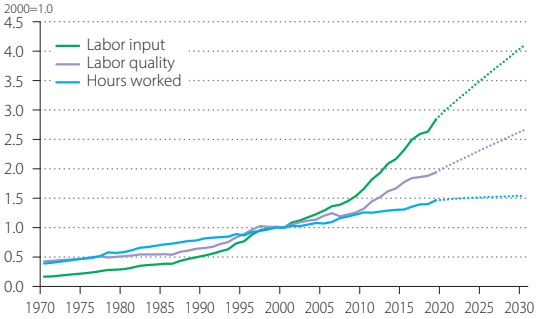

Figure 3 Labor Inputs

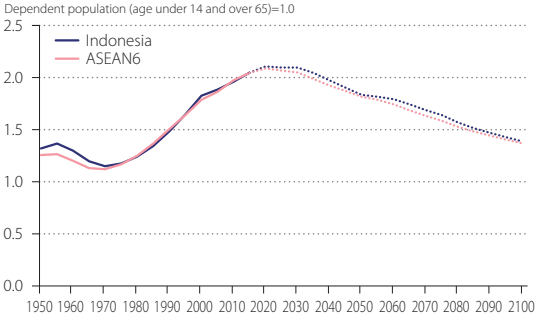

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

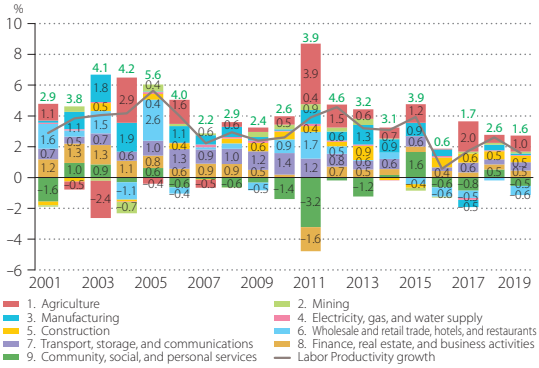

Figure 7 Industry Origins of Labor Productivity Growth

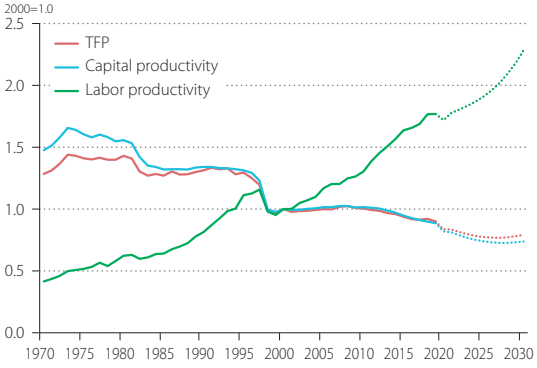

Figure 8 Productivity Indicators

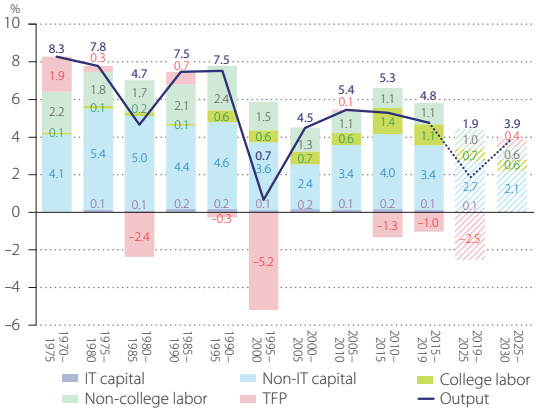

Figure 9 Decomposition of Economic Growth

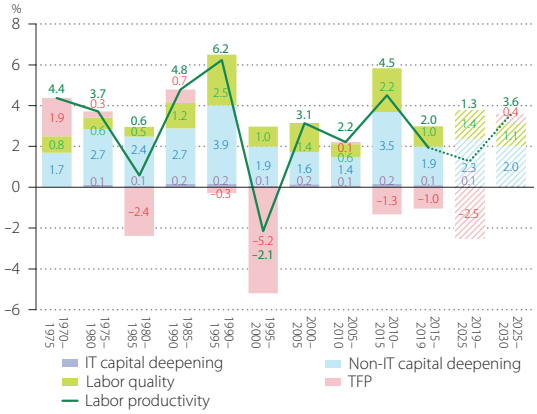

Figure 10 Decomposition of Labor Productivity Growth

Iran

Key Indicators

GDP in 2019	1,265	Billions of US dollars (as of 2019)
(exchange rate based)	821	Billions of US dollars (as of 2019)
Per capita GDP in 2019	15.2	Thousands of US dollars (as of 2019)
(exchange rate based)	9.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	51.9	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	22.7	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	51.4	US dollars (as of 2019)
Energy productivity levels in 2018	6.8	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	425.6	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	24,217	Thousands persons
Employment rate in 2019	29.0	%
Female employment share in 2019	15.4	%
Average schooling years of workers in 2019	9.8	Years
Investment share in 2019	27.5	%
ICT investment share in GFCF in 2019	4.5	%
Agriculture share in GDP in 2019	8.2	%
Manufacturing share in GDP in 2019	17.6	%
Agriculture share in employment in 2019	17.4	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	3.0	2.3	3.7	6.1	0.2	0.9	3.6	−4.8	−8.0	−0.3	3.0	1.2	1.9
Labor input growth	3.8	3.7	4.5	3.3	2.3	1.8	3.7	−2.9	2.9	4.0	2.1	2.1	2.1
Labor quality growth	1.2	1.1	1.7	1.9	1.0	0.2	0.0	−0.8	0.8	1.1	1.3	1.3	1.2
Hours worked growth	2.6	2.6	2.8	1.4	1.3	1.6	3.7	−2.0	2.1	2.9	0.8	0.9	0.8
College labor input growth	5.0	7.2	9.9	6.5	3.6	2.0	4.1	−2.4	2.0	4.7	2.8	2.8	2.6
Non-college labor input growth	3.6	2.9	2.5	1.1	0.8	1.4	3.3	−3.5	3.9	3.1	1.3	1.3	1.3
IT capital input growth	7.7	11.0	8.1	16.9	5.0	1.3	2.3	2.2	0.2	18.4	9.9	8.6	7.6
Non-IT capital input growth	6.3	1.8	0.7	3.6	2.5	2.1	2.5	2.4	1.9	4.6	3.5	3.4	3.1
Per-worker labor productivity growth	0.4	−0.2	0.8	4.2	−1.6	−1.6	0.3	−6.6	−10.0	−1.5	2.0	0.1	0.9
Per-hour labor productivity growth	0.4	−0.3	0.9	4.8	−1.2	−0.8	−0.1	−2.8	−10.2	−3.1	2.2	0.3	1.1
Capital productivity growth	−6.2	−1.8	−0.7	−3.7	−2.5	−2.1	−2.5	−2.4	−1.9	−5.1	−0.6	−2.3	−1.2
TFP growth	−2.6	−0.3	2.0	2.4	−2.4	−1.2	0.8	−6.0	−10.2	−4.9	−0.2	−1.9	−1.0

Production

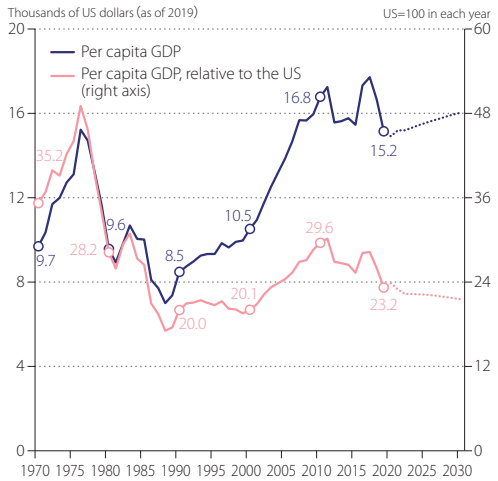

Figure 1 Per Capita GDP

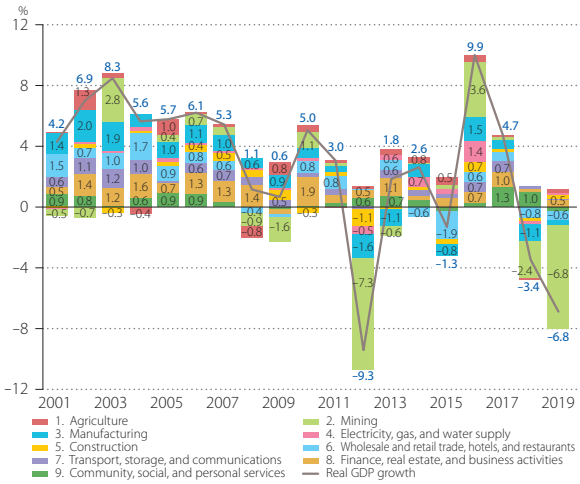

Figure 2 Industry Origins of Economic Growth

Labor

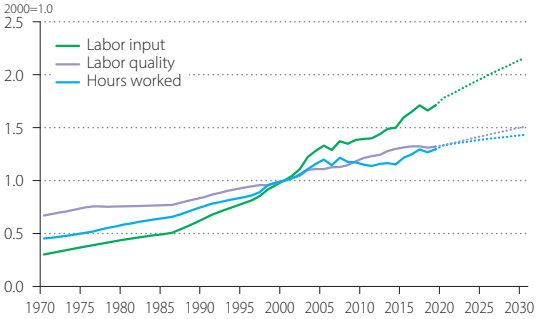

Figure 3 Labor Inputs

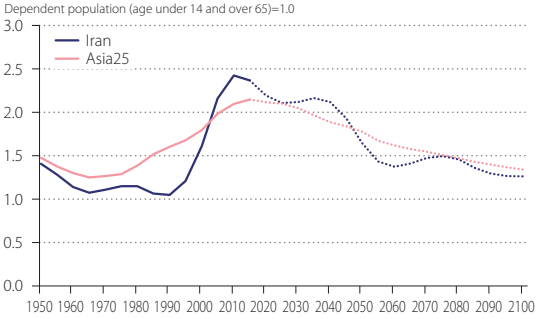

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

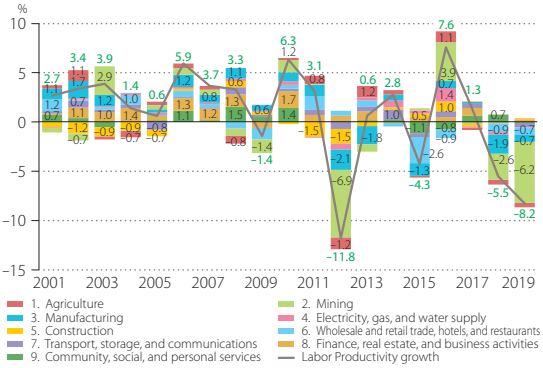

Figure 7 Industry Origins of Labor Productivity Growth

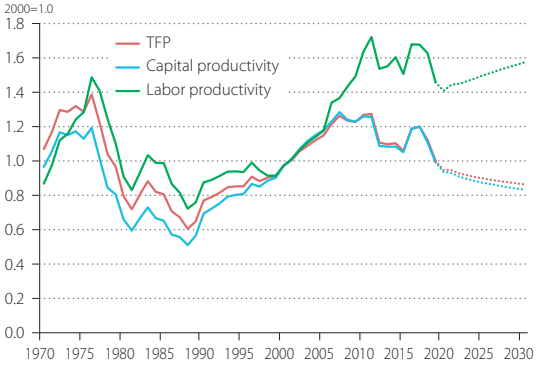

Figure 8 Productivity Indicators

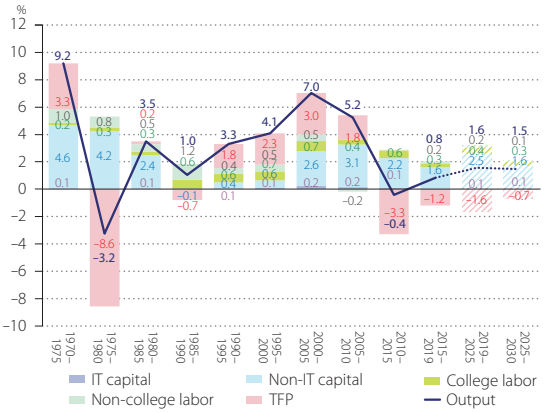

Figure 9 Decomposition of Economic Growth

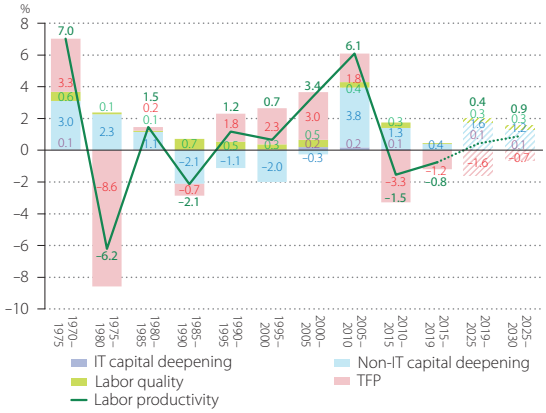

Figure 10 Decomposition of Labor Productivity Growth

Japan

Key Indicators

GDP in 2019	5,509	Billions of US dollars (as of 2019)
(exchange rate based)	5,149	Billions of US dollars (as of 2019)
Per capita GDP in 2019	43.7	Thousands of US dollars (as of 2019)
(exchange rate based)	40.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	78.9	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	46.1	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	155.5	US dollars (as of 2019)
Energy productivity levels in 2018	18.3	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	208.2	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	65,927	Thousands persons
Employment rate in 2019	52.3	%
Female employment share in 2019	44.4	%
Average schooling years of workers in 2019	13.3	Years
Investment share in 2019	25.8	%
ICT investment share in GFCF in 2019	13.2	%
Agriculture share in GDP in 2019	1.1	%
Manufacturing share in GDP in 2019	20.1	%
Agriculture share in employment in 2019	3.8	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.7	4.5	1.2	0.6	1.0	0.8	1.8	0.6	0.2	−4.9	2.7	1.6	1.1
Labor input growth	1.8	1.8	0.0	0.2	0.3	0.3	1.7	1.5	−2.5	1.4	−0.3	−0.4	−0.5
Labor quality growth	1.6	1.0	0.7	0.8	0.3	0.3	0.6	0.1	0.0	0.4	0.5	0.5	0.5
Hours worked growth	0.2	0.7	−0.7	-0.6	0.0	0.0	1.2	0.7	−1.8	1.0	−0.8	−0.9	−0.9
College labor input growth	5.4	4.6	2.6	2.3	1.3	1.2	3.0	2.2	−2.3	2.7	1.0	0.9	0.8
Non-college labor input growth	0.7	0.6	−1.6	−1.8	−1.1	−1.0	0.0	0.5	−2.8	−0.5	−2.3	−2.4	−2.5
IT capital input growth	13.5	16.1	7.3	3.5	2.5	2.6	2.3	2.0	2.8	3.0	0.8	1.9	1.9
Non-IT capital input growth	5.6	4.1	2.0	0.4	0.0	0.4	0.4	0.5	0.3	0.2	−0.1	0.0	0.0
Per-worker labor productivity growth	3.9	3.6	0.9	0.7	0.4	0.0	0.7	−1.6	0.3	−4.3	3.2	2.2	1.8
Per-hour labor productivity growth	4.4	3.8	1.9	1.2	0.9	0.8	0.5	−0.2	2.1	−5.8	3.5	2.5	2.0
Capital productivity growth	−5.9	−4.8	−2.4	−0.6	−0.2	−0.5	−0.5	−0.6	−0.5	−5.3	2.7	1.4	0.9
TFP growth	1.1	1.5	0.1	0.2	0.7	0.4	0.5	−0.5	1.5	−5.8	2.8	1.7	1.3

Production

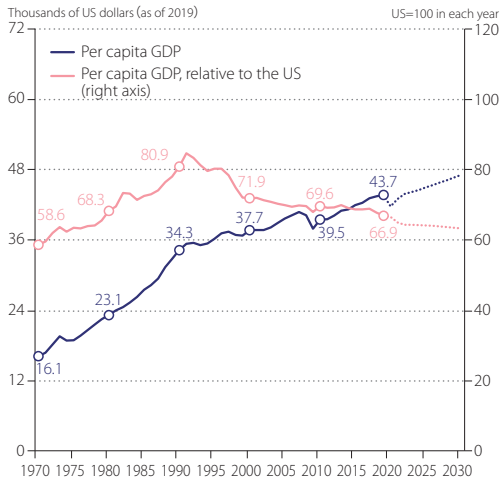

Figure 1 Per Capita GDP

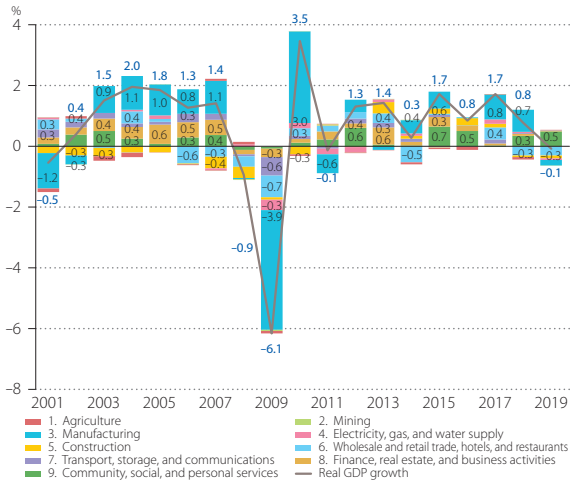

Figure 2 Industry Origins of Economic Growth

Labor

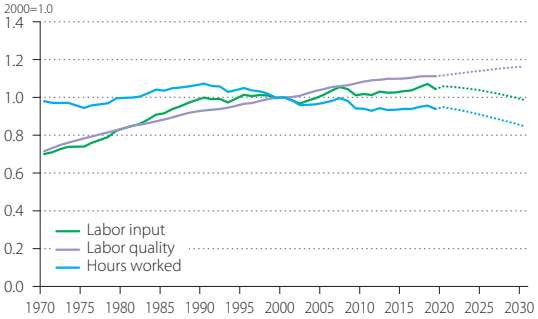

Figure 3 Labor Inputs

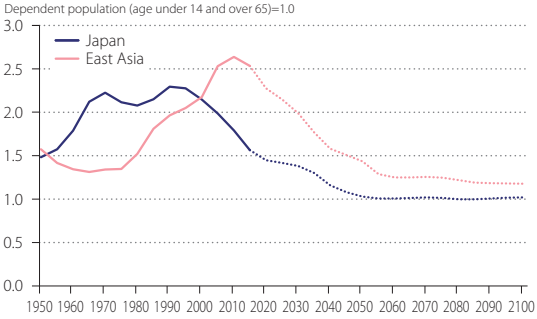

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

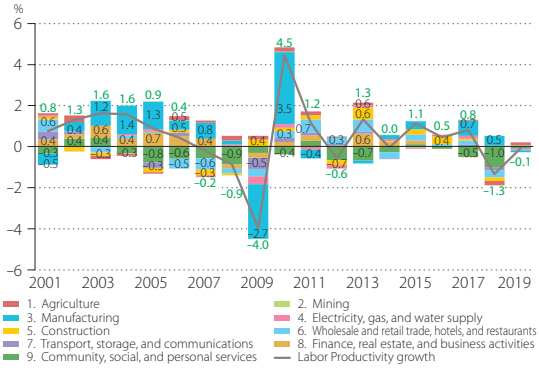

Figure 7 Industry Origins of Labor Productivity Growth

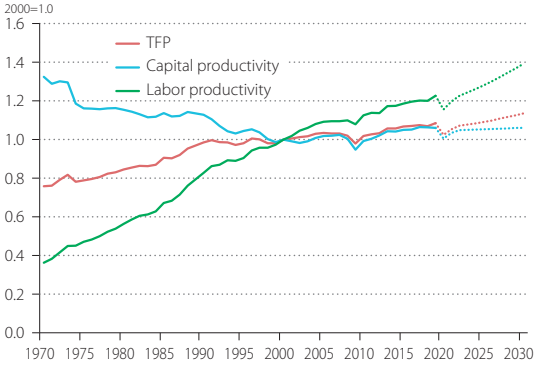

Figure 8 Productivity Indicators

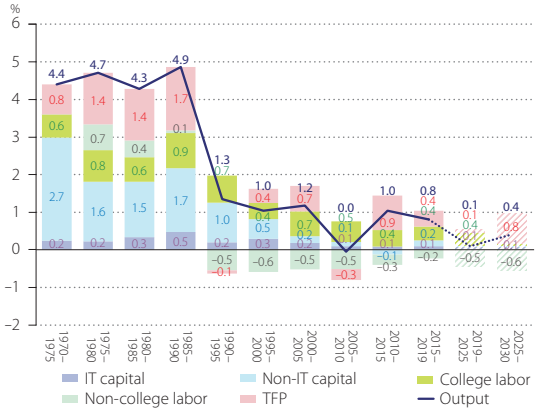

Figure 9 Decomposition of Economic Growth

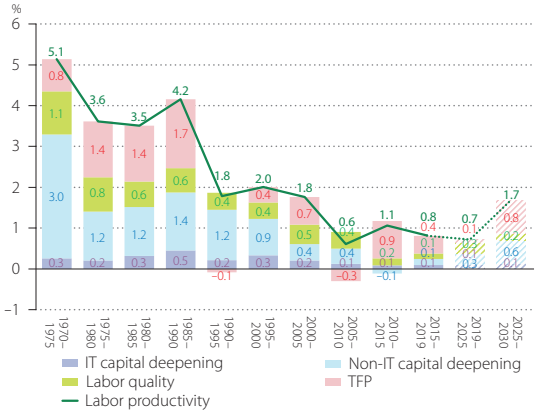

Figure 10 Decomposition of Labor Productivity Growth

Korea

Key Indicators

GDP in 2019	2,311	Billions of US dollars (as of 2019)
(exchange rate based)	1,647	Billions of US dollars (as of 2019)
Per capita GDP in 2019	44.7	Thousands of US dollars (as of 2019)
(exchange rate based)	31.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	76.1	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	37.7	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	148.5	US dollars (as of 2019)
Energy productivity levels in 2018	11.3	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	293.1	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	27,747	Thousands persons
Employment rate in 2019	53.7	%
Female employment share in 2019	42.1	%
Average schooling years of workers in 2019	13.3	Years
Investment share in 2019	31.3	%
ICT investment share in GFCF in 2019	8.1	%
Agriculture share in GDP in 2019	1.8	%
Manufacturing share in GDP in 2019	27.7	%
Agriculture share in employment in 2019	5.1	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	9.1	9.8	6.8	4.7	2.8	2.8	3.1	3.0	2.3	−1.0	3.5	2.7	1.7
Labor input growth	4.1	5.7	3.1	2.2	1.1	−0.5	−0.3	−1.8	0.0	2.8	−0.5	−0.6	−0.7
Labor quality growth	0.9	3.1	2.1	2.2	1.0	0.9	0.9	1.0	0.5	−0.1	0.8	0.8	0.9
Hours worked growth	3.3	2.7	0.9	0.1	0.1	−1.4	−1.2	−2.8	−0.5	2.9	−1.3	−1.5	−1.5
College labor input growth	3.6	10.9	7.2	5.6	3.0	1.5	1.4	0.0	2.0	3.8	0.8	0.7	0.7
Non-college labor input growth	4.3	4.1	1.0	−0.9	−1.7	−3.7	−3.1	−4.8	−3.5	1.0	−3.0	−3.3	−3.4
IT capital input growth	25.0	20.8	16.9	5.9	2.4	3.2	3.6	3.7	3.0	2.8	2.0	2.2	1.4
Non-IT capital input growth	9.8	8.4	7.2	5.1	3.4	3.3	3.4	3.7	3.2	2.4	2.2	2.2	2.0
Per-worker labor productivity growth	5.3	6.7	5.4	3.5	1.6	1.9	2.0	2.7	1.0	0.4	4.7	4.0	3.2
Per-hour labor productivity growth	5.3	6.7	6.0	4.6	2.8	4.1	4.4	5.8	2.6	−3.9	4.8	4.1	3.2
Capital productivity growth	−10.0	−8.8	−7.7	−5.1	−3.3	−3.3	−3.4	−3.7	−3.1	−3.4	1.4	0.5	−0.2
TFP growth	1.2	2.2	1.7	1.0	0.7	1.4	1.6	2.1	0.6	−3.6	2.7	1.9	1.1

Production

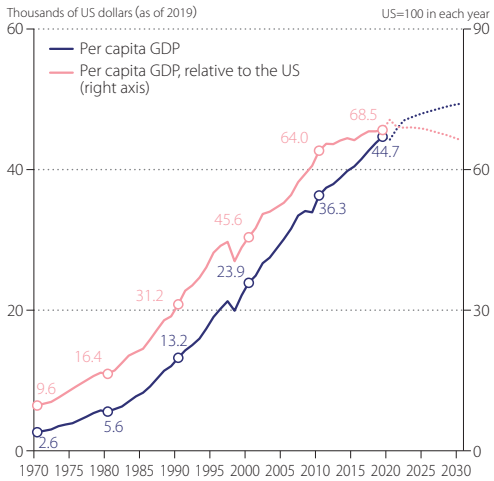

Figure 1 Per Capita GDP

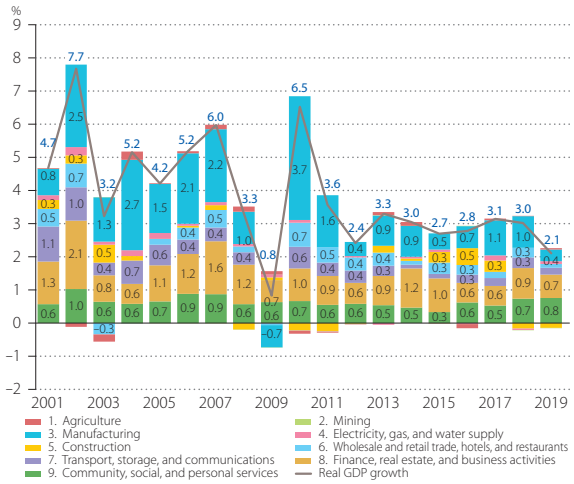

Figure 2 Industry Origins of Economic Growth

Labor

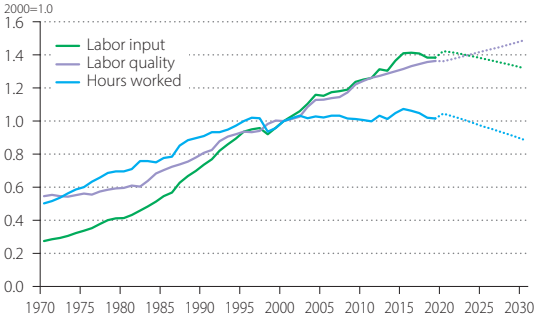

Figure 3 Labor Inputs

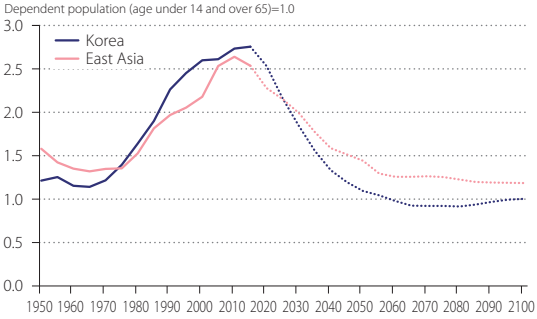

Figure 4 Demographic Dividend

Productivity

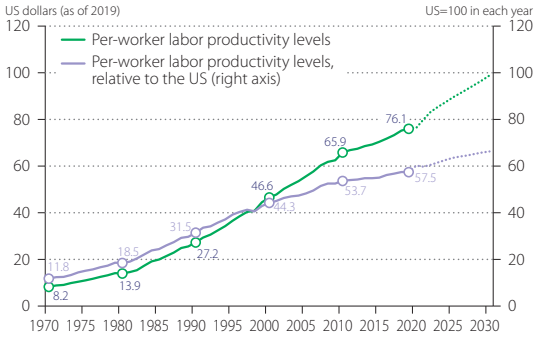

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

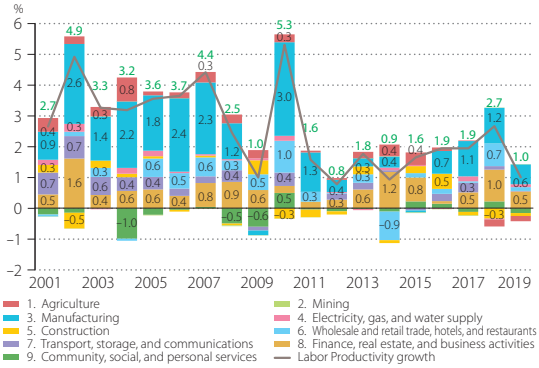

Figure 7 Industry Origins of Labor Productivity Growth

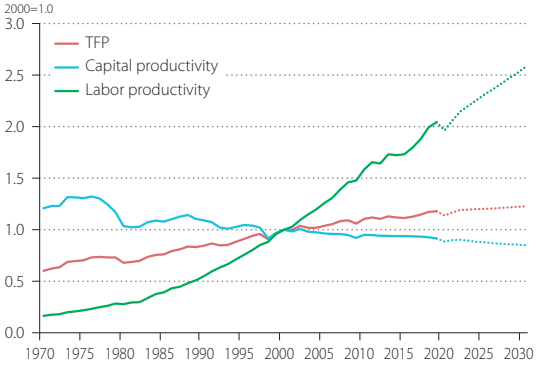

Figure 8 Productivity Indicators

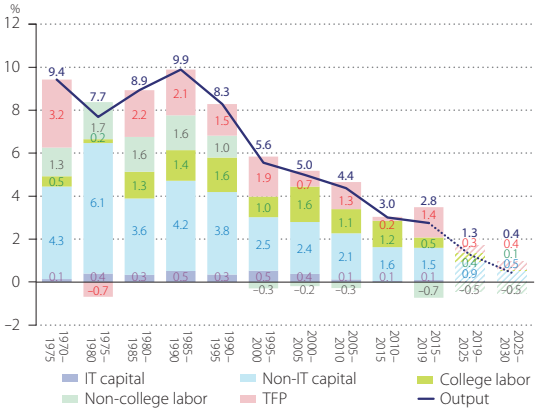

Figure 9 Decomposition of Economic Growth

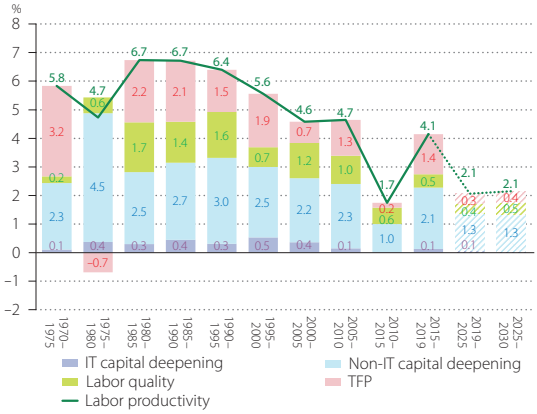

Figure 10 Decomposition of Labor Productivity Growth

Lao PDR

Key Indicators

GDP in 2019	60	Billions of US dollars (as of 2019)
(exchange rate based)	19	Billions of US dollars (as of 2019)
Per capita GDP in 2019	8.3	Thousands of US dollars (as of 2019)
(exchange rate based)	2.6	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	14.7	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	6.1	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	12.3	US dollars (as of 2019)
Energy productivity levels in 2018	n.a.	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	n.a.	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	3,686	Thousands persons
Employment rate in 2019	50.9	%
Female employment share in 2019	47.9	%
Average schooling years of workers in 2019	5.9	Years
Investment share in 2019	39.7	%
ICT investment share in GFCF in 2019	1.8	%
Agriculture share in GDP in 2019	22.2	%
Manufacturing share in GDP in 2019	8.2	%
Agriculture share in employment in 2019	68.9	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	1.3	2.8	6.0	5.8	4.3	6.3	7.2	6.8	5.6	0.4	5.3	5.2	5.2
Labor input growth	1.2	3.0	3.6	3.9	2.8	2.0	1.5	2.4	2.3	1.6	1.5	1.5	1.4
Labor quality growth	0.3	0.4	0.7	1.5	0.9	0.0	−0.1	0.2	0.2	1.0	1.1	1.1	1.1
Hours worked growth	0.9	2.7	2.9	2.4	1.9	2.0	1.6	2.2	2.2	0.6	0.4	0.4	0.4
College labor input growth	8.4	7.7	8.5	8.7	1.2	0.3	−1.8	2.2	2.2	3.9	4.4	4.3	4.2
Non-college labor input growth	1.0	2.8	3.1	3.0	3.2	2.4	2.4	2.4	2.4	1.1	0.8	0.8	0.7
IT capital input growth	3.0	16.0	13.5	10.5	7.2	6.1	−5.0	16.7	12.2	−3.4	−4.8	−2.2	−0.6
Non-IT capital input growth	2.8	5.2	7.8	5.1	7.9	8.6	7.9	8.1	9.4	10.8	8.2	7.9	7.7
Per-worker labor productivity growth	0.4	0.1	3.1	3.3	2.4	4.3	5.5	4.5	3.4	−0.4	4.7	4.6	4.6
Per-hour labor productivity growth	0.4	0.1	3.0	3.3	2.5	4.3	5.6	4.6	3.4	−0.2	4.9	4.8	4.8
Capital productivity growth	−2.8	−5.2	−7.9	−5.2	−7.8	−8.4	−7.6	−8.2	−9.4	−10.1	−2.5	−2.5	−2.3
TFP growth	−0.7	−1.5	−0.1	1.1	−1.8	0.0	1.6	0.5	−1.6	−7.1	−0.4	−0.4	−0.3

Production

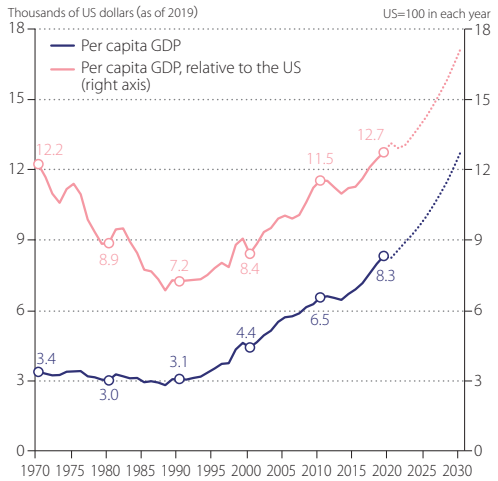

Figure 1 Per Capita GDP

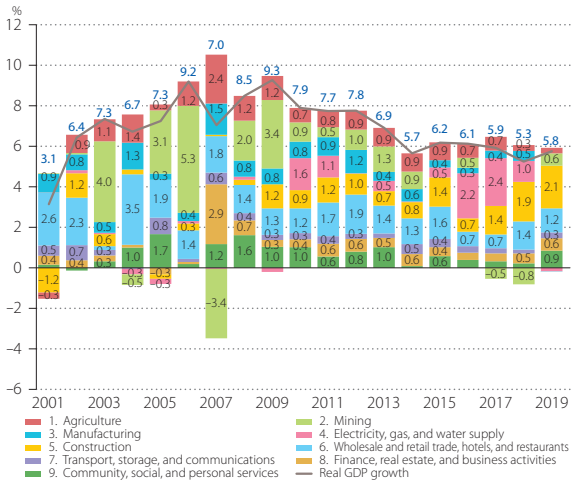

Figure 2 Industry Origins of Economic Growth

Labor

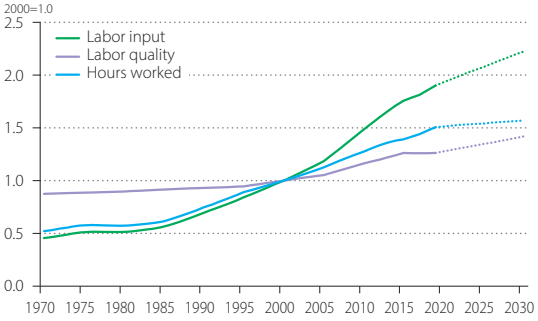

Figure 3 Labor Inputs

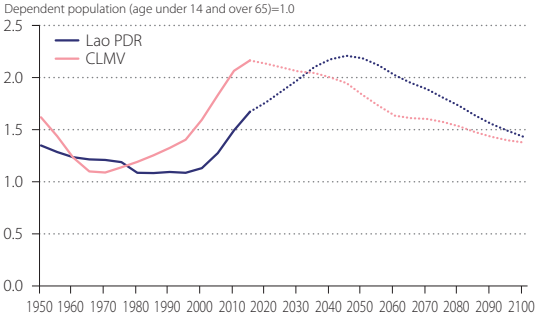

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

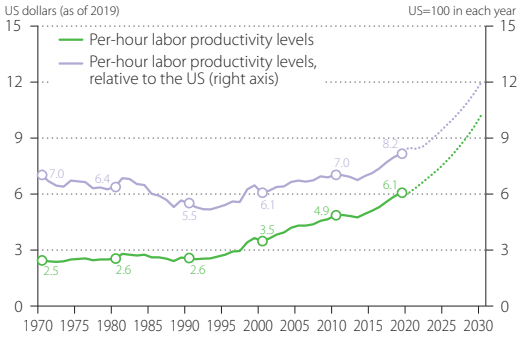

Figure 6 Per-Hour Labor Productivity Level

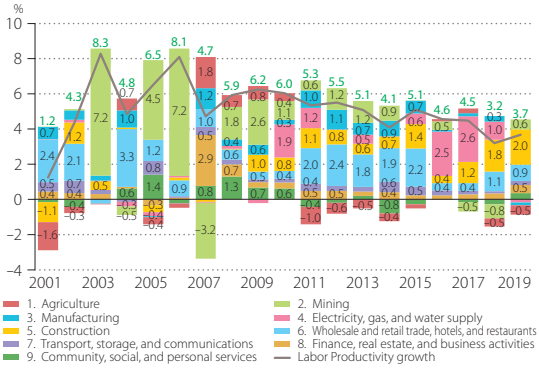

Figure 7 Industry Origins of Labor Productivity Growth

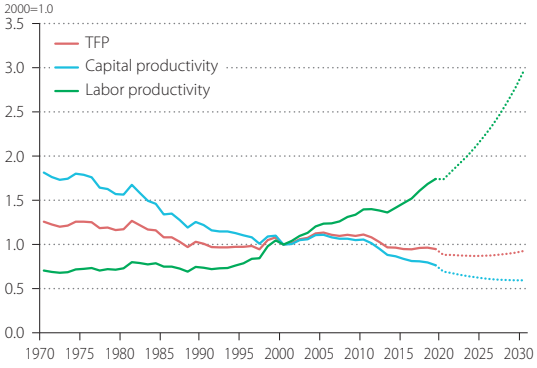

Figure 8 Productivity Indicators

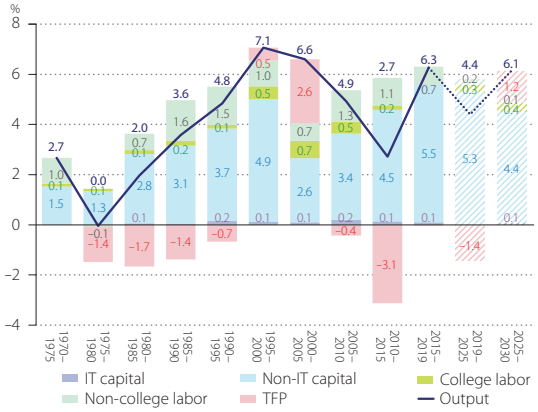

Figure 9 Decomposition of Economic Growth

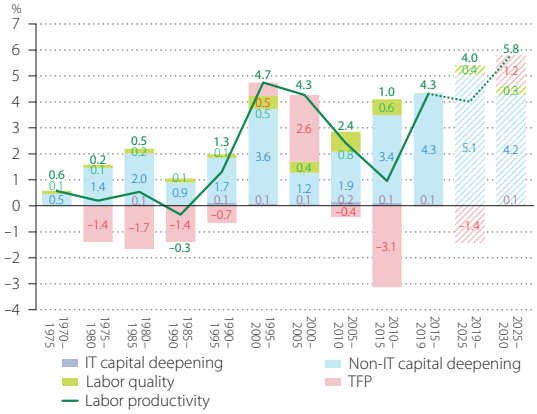

Figure 10 Decomposition of Labor Productivity Growth

Malaysia

Key Indicators

GDP in 2019	928	Billions of US dollars (as of 2019)
(exchange rate based)	365	Billions of US dollars (as of 2019)
Per capita GDP in 2019	28.5	Thousands of US dollars (as of 2019)
(exchange rate based)	11.2	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	56.9	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	26.1	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	55.4	US dollars (as of 2019)
Energy productivity levels in 2018	13.7	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	265.3	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	15,550	Thousands persons
Employment rate in 2019	47.7	%
Female employment share in 2019	38.8	%
Average schooling years of workers in 2019	10.1	Years
Investment share in 2019	21.0	%
ICT investment share in GFCF in 2019	14.7	%
Agriculture share in GDP in 2019	7.3	%
Manufacturing share in GDP in 2019	21.7	%
Agriculture share in employment in 2019	9.7	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	7.8	5.9	7.1	5.1	4.7	4.2	4.9	4.2	3.0	–5.8	6.3	5.6	4.0
Labor input growth	4.7	5.3	5.7	4.4	3.3	2.5	2.2	1.6	4.6	2.4	2.7	2.7	2.6
Labor quality growth	1.5	2.0	2.4	1.9	0.9	0.6	0.8	–0.5	2.1	1.4	1.6	1.6	1.6
Hours worked growth	3.2	3.3	3.3	2.4	2.4	1.9	1.4	2.1	2.5	1.0	1.1	1.1	1.0
College labor input growth	8.5	11.5	8.7	7.8	4.9	3.5	3.6	3.5	5.8	4.0	4.2	4.1	3.9
Non-college labor input growth	4.3	4.0	4.5	2.2	1.9	1.6	0.9	–0.1	3.5	0.9	1.2	1.1	1.1
IT capital input growth	18.0	19.2	20.7	14.7	8.5	7.6	7.7	7.4	6.5	4.3	3.6	5.4	5.5
Non-IT capital input growth	7.1	7.0	8.2	2.8	4.7	4.3	4.6	4.4	3.5	3.1	2.6	2.7	2.6
Per-worker labor productivity growth	4.6	2.6	3.8	2.6	2.0	2.4	2.8	1.9	1.1	–7.4	4.9	4.3	2.8
Per-hour labor productivity growth	4.6	2.6	3.8	2.7	2.3	2.3	3.6	2.1	0.4	–6.8	5.1	4.5	3.0
Capital productivity growth	–7.1	–7.2	–8.6	–3.6	–4.9	–4.5	–4.8	–4.5	–3.7	–9.0	3.6	2.7	1.2
TFP growth	1.6	–0.6	–0.5	1.2	0.4	0.4	1.2	0.8	–1.1	–8.7	3.5	2.8	1.3

Production

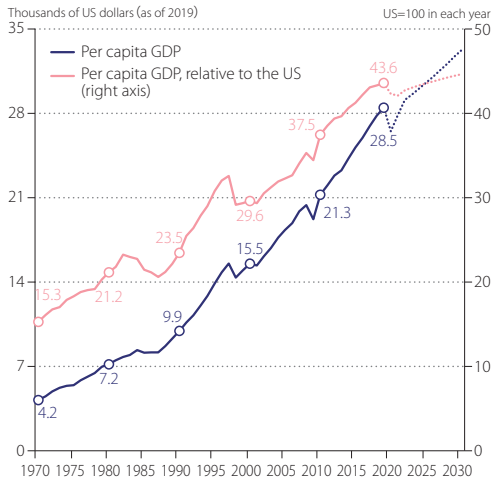

Figure 1 Per Capita GDP

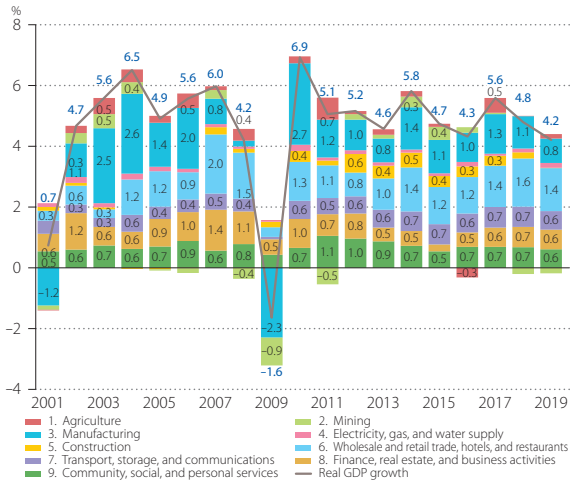

Figure 2 Industry Origins of Economic Growth

Labor

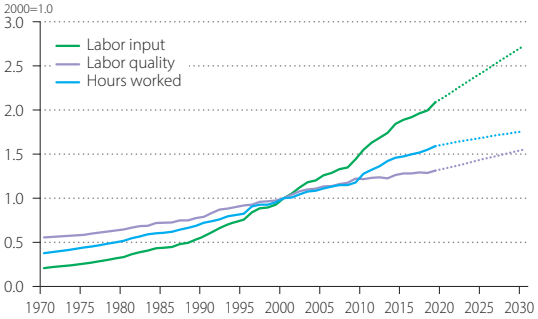

Figure 3 Labor Inputs

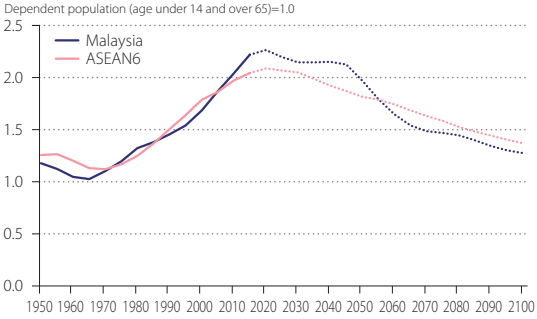

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

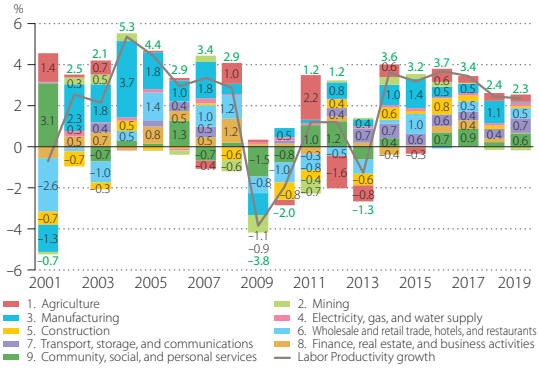

Figure 7 Industry Origins of Labor Productivity Growth

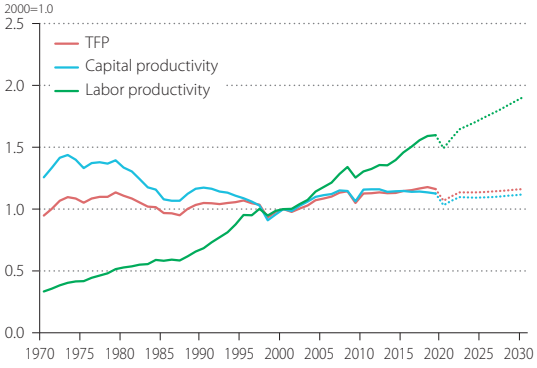

Figure 8 Productivity Indicators

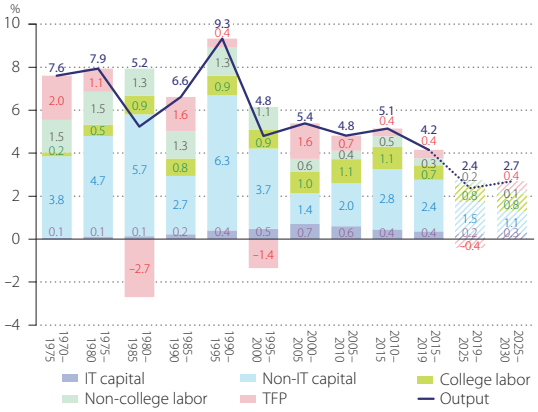

Figure 9 Decomposition of Economic Growth

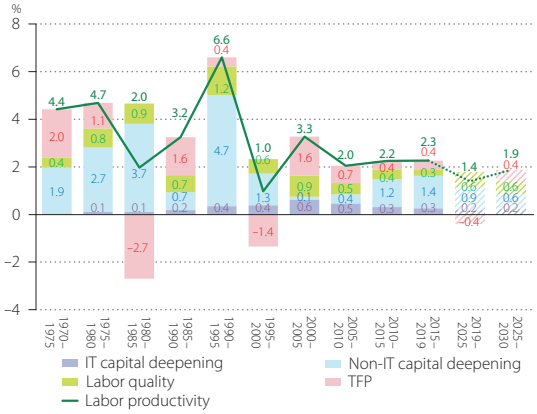

Figure 10 Decomposition of Labor Productivity Growth

Mongolia

Key Indicators

GDP in 2019	41	Billions of US dollars (as of 2019)
(exchange rate based)	14	Billions of US dollars (as of 2019)
Per capita GDP in 2019	12.6	Thousands of US dollars (as of 2019)
(exchange rate based)	4.3	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	32.7	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	17.2	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	35.9	US dollars (as of 2019)
Energy productivity levels in 2018	9.2	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	592.2	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	1,146	Thousands persons
Employment rate in 2019	35.1	%
Female employment share in 2019	47.1	%
Average schooling years of workers in 2019	12.1	Years
Investment share in 2019	39.4	%
ICT investment share in GFCF in 2019	5.5	%
Agriculture share in GDP in 2019	12.1	%
Manufacturing share in GDP in 2019	10.5	%
Agriculture share in employment in 2019	25.4	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	5.9	5.2	0.9	6.3	7.5	4.6	5.3	6.8	4.9	–8.6	7.4	8.0	6.8
Labor input growth	6.1	4.7	–2.3	4.5	5.1	2.4	4.2	6.6	–6.3	12.0	5.2	4.9	4.8
Labor quality growth	4.3	1.1	–1.8	3.2	2.6	1.3	–1.1	1.5	1.1	3.8	2.1	1.9	1.9
Hours worked growth	1.8	3.6	–0.5	1.3	2.5	1.0	5.3	5.1	–7.5	8.1	3.2	2.9	2.9
College labor input growth	10.3	6.5	0.7	5.7	8.0	2.3	4.1	5.9	–6.1	12.3	5.2	4.9	4.8
Non-college labor input growth	4.3	3.4	–5.8	2.3	–5.0	2.5	5.0	11.0	–7.6	10.0	5.6	5.1	4.8
IT capital input growth	26.4	13.9	7.8	17.8	8.4	17.0	19.5	24.6	24.7	18.4	6.9	8.3	8.8
Non-IT capital input growth	6.1	6.1	–0.1	3.7	6.0	3.3	1.5	4.6	6.8	7.1	4.1	4.4	4.6
Per-worker labor productivity growth	4.1	1.6	0.6	3.9	6.4	4.7	–2.3	5.6	13.8	–18.8	4.9	5.7	4.5
Per-hour labor productivity growth	4.1	1.6	1.4	5.0	5.0	3.6	0.0	1.7	12.4	–16.7	4.2	5.0	3.9
Capital productivity growth	–6.2	–6.1	0.0	–3.9	–6.0	–3.6	–1.9	–5.0	–7.2	–16.0	3.2	3.5	2.1
TFP growth	–0.2	–0.5	1.6	2.4	1.7	1.4	2.6	1.3	2.0	–17.4	2.9	3.4	2.1

Production

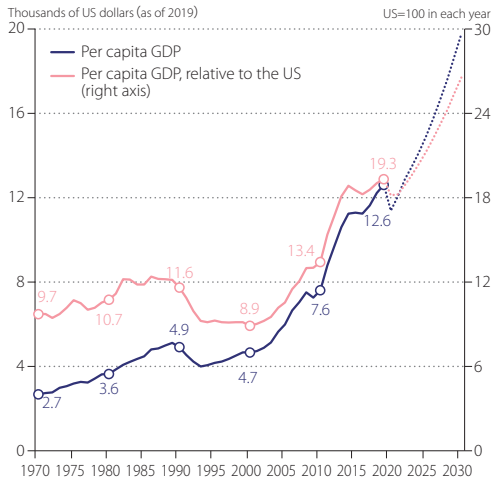

Figure 1 Per Capita GDP

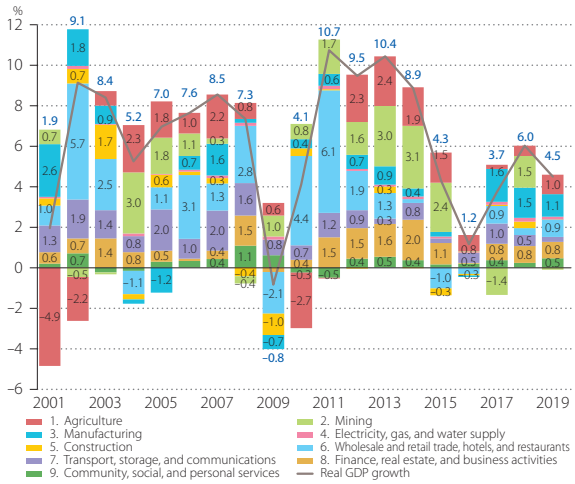

Figure 2 Industry Origins of Economic Growth

Labor

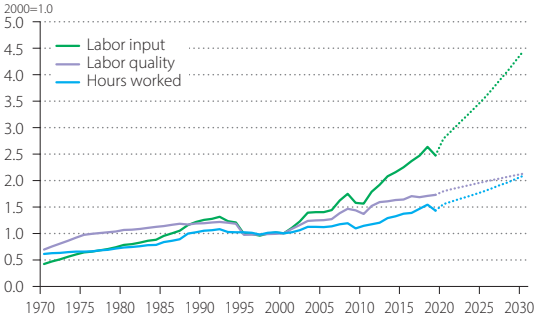

Figure 3 Labor Inputs

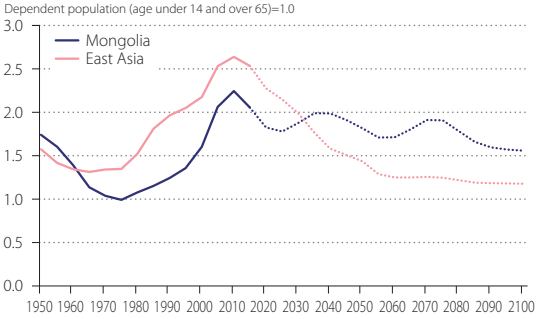

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

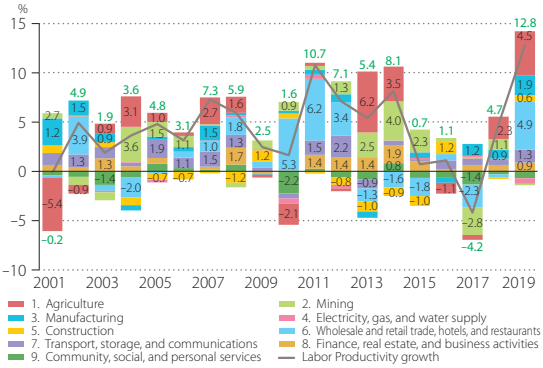

Figure 7 Industry Origins of Labor Productivity Growth

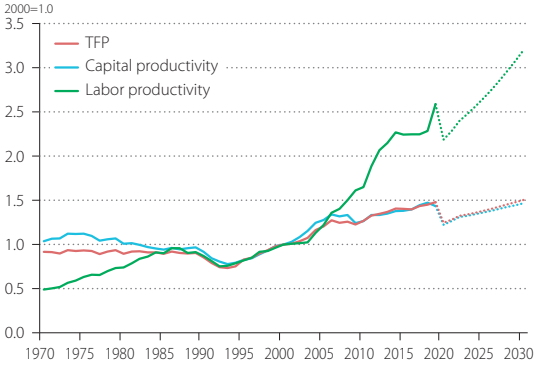

Figure 8 Productivity Indicators

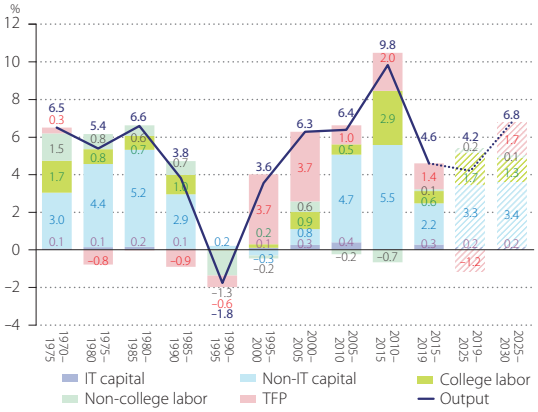

Figure 9 Decomposition of Economic Growth

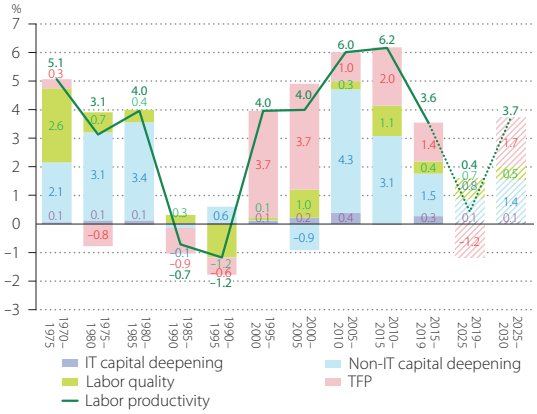

Figure 10 Decomposition of Labor Productivity Growth

Nepal

Key Indicators

GDP in 2019	113	Billions of US dollars (as of 2019)
(exchange rate based)	34	Billions of US dollars (as of 2019)
Per capita GDP in 2019	4.0	Thousands of US dollars (as of 2019)
(exchange rate based)	1.2	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	8.5	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	4.8	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	13.4	US dollars (as of 2019)
Energy productivity levels in 2018	6.8	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	117.2	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	11,437	Thousands persons
Employment rate in 2019	40.8	%
Female employment share in 2019	48.4	%
Average schooling years of workers in 2019	4.8	Years
Investment share in 2019	49.7	%
ICT investment share in GFCF in 2019	0.7	%
Agriculture share in GDP in 2019	27.6	%
Manufacturing share in GDP in 2019	5.1	%
Agriculture share in employment in 2019	67.8	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	3.2	4.3	4.0	3.7	4.7	5.8	6.5	6.7	2.2	–2.1	2.8	4.9	4.5
Labor input growth	3.6	4.8	5.6	2.9	0.9	3.4	3.2	3.8	4.1	5.9	6.5	6.4	6.0
Labor quality growth	0.5	3.5	3.3	1.8	–0.4	0.1	0.0	0.2	0.3	3.2	3.4	3.4	3.2
Hours worked growth	3.1	1.4	2.3	1.2	1.3	3.3	3.2	3.6	3.8	2.7	3.1	3.0	2.8
College labor input growth	8.8	8.8	16.7	8.6	1.0	3.8	3.6	4.3	4.7	8.3	9.1	8.8	8.1
Non-college labor input growth	3.4	4.6	4.0	0.9	0.8	3.2	3.0	3.6	3.8	4.5	5.0	4.9	4.6
IT capital input growth	19.3	8.6	10.6	3.7	8.0	11.0	13.6	11.8	7.0	4.1	7.3	6.9	7.6
Non-IT capital input growth	3.1	5.5	5.5	4.7	5.8	7.5	7.4	8.3	7.5	5.9	6.3	6.1	6.1
Per-worker labor productivity growth	0.0	3.4	1.7	2.5	3.0	2.4	3.1	3.0	–1.4	–4.6	0.0	2.2	2.0
Per-hour labor productivity growth	0.1	3.0	1.6	2.4	3.1	2.3	3.0	2.9	–1.6	–4.8	–0.3	1.8	1.7
Capital productivity growth	–3.2	–5.5	–5.5	–4.7	–5.8	–7.5	–7.4	–8.3	–7.4	–8.0	–3.6	–1.2	–1.7
TFP growth	–0.2	–0.8	–1.6	–0.1	1.5	0.4	1.1	0.6	–3.4	–8.0	–3.7	–1.4	–1.6

Production

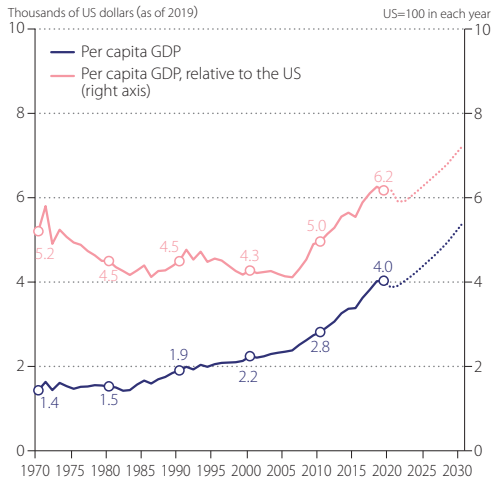

Figure 1 Per Capita GDP

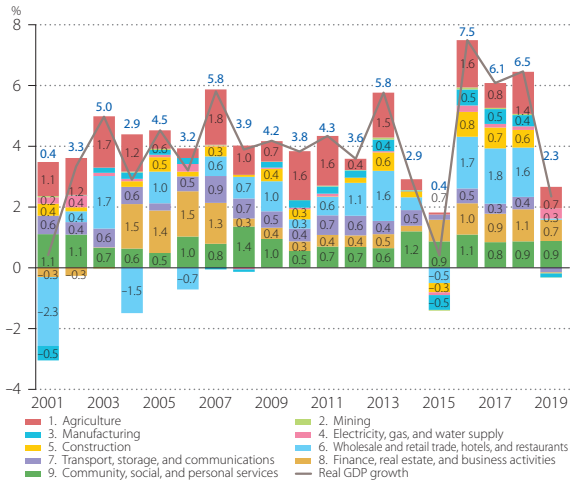

Figure 2 Industry Origins of Economic Growth

Labor

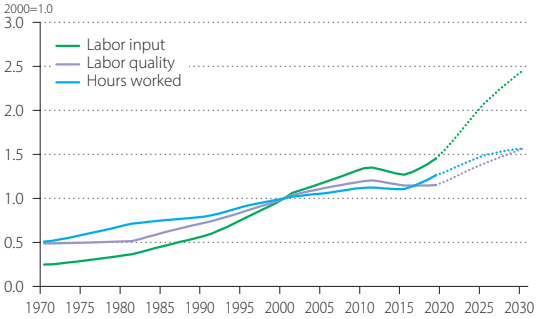

Figure 3 Labor Inputs

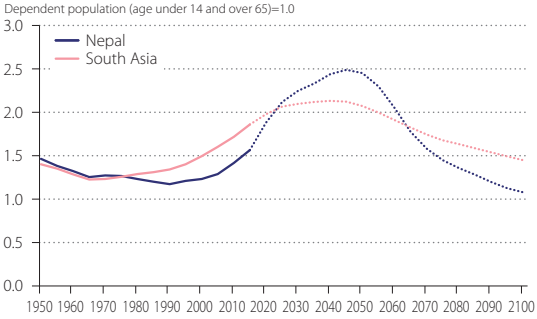

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

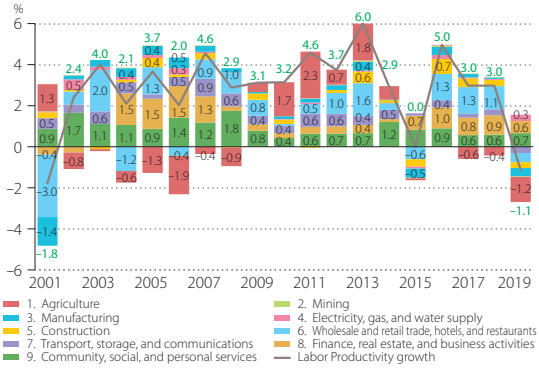

Figure 7 Industry Origins of Labor Productivity Growth

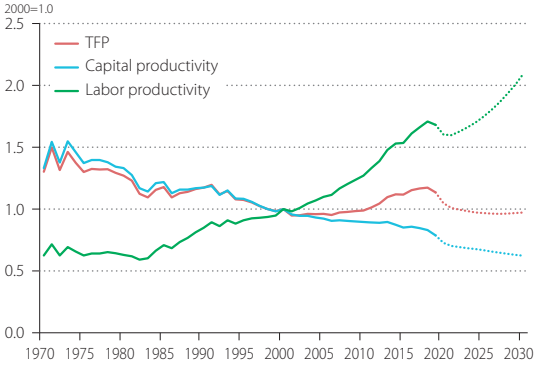

Figure 8 Productivity Indicators

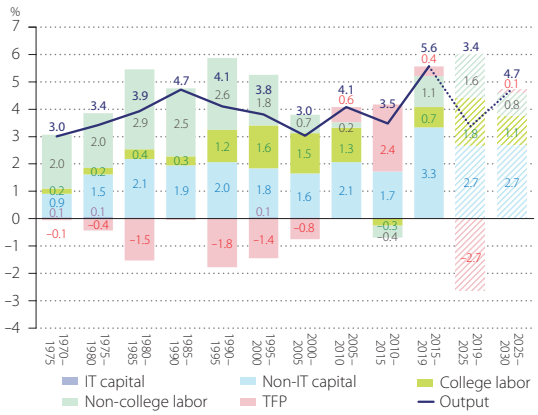

Figure 9 Decomposition of Economic Growth

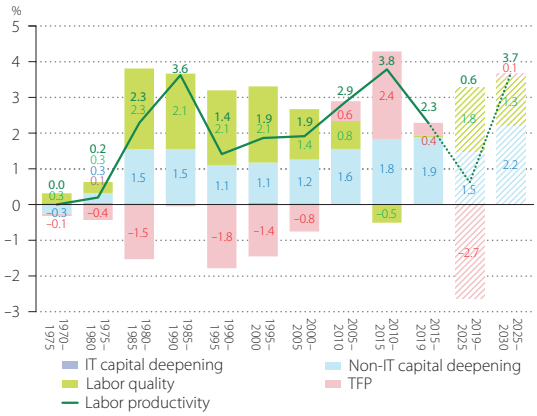

Figure 10 Decomposition of Labor Productivity Growth

Pakistan

Key Indicators

GDP in 2019	1,057	Billions of US dollars (as of 2019)
(exchange rate based)	253	Billions of US dollars (as of 2019)
Per capita GDP in 2019	5.1	Thousands of US dollars (as of 2019)
(exchange rate based)	1.2	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	15.6	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	8.0	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	10.5	US dollars (as of 2019)
Energy productivity levels in 2018	10.4	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	195.0	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	64,634	Thousands persons
Employment rate in 2019	30.9	%
Female employment share in 2019	21.1	%
Average schooling years of workers in 2019	5.1	Years
Investment share in 2019	15.6	%
ICT investment share in GFCF in 2019	7.0	%
Agriculture share in GDP in 2019	23.4	%
Manufacturing share in GDP in 2019	13.2	%
Agriculture share in employment in 2019	37.9	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.3	6.3	4.7	3.8	4.0	4.2	5.2	5.4	1.1	0.5	2.7	3.5	3.2
Labor input growth	4.2	3.6	3.0	4.0	2.8	3.1	3.2	3.1	2.7	5.1	4.0	4.0	4.0
Labor quality growth	1.5	1.1	1.1	1.0	1.6	1.7	2.2	2.1	0.2	1.2	2.3	2.3	2.2
Hours worked growth	2.7	2.5	1.9	3.0	1.2	1.4	1.1	1.0	2.4	3.8	1.7	1.7	1.7
College labor input growth	5.9	6.8	8.1	5.3	4.4	5.0	5.8	5.4	2.8	6.7	5.3	5.3	5.1
Non-college labor input growth	4.1	3.2	2.1	3.6	2.2	2.4	2.3	2.2	2.6	4.4	3.5	3.5	3.5
IT capital input growth	7.8	14.1	5.8	11.2	7.4	11.5	12.8	13.7	10.0	9.1	9.6	8.6	8.3
Non-IT capital input growth	4.6	6.3	5.5	2.6	2.0	3.2	3.0	3.6	3.4	3.1	3.5	3.5	3.5
Per-worker labor productivity growth	1.4	3.8	2.8	0.5	1.7	1.6	2.6	2.9	–1.3	–1.4	1.0	1.7	1.4
Per-hour labor productivity growth	1.5	3.9	2.8	0.8	2.8	2.8	4.1	4.5	–1.3	–3.3	1.0	1.8	1.4
Capital productivity growth	–4.6	–6.3	–5.4	–2.7	–2.1	–3.3	–3.2	–3.8	–3.6	–2.7	–0.9	–0.1	–0.5
TFP growth	–0.1	1.6	0.5	0.6	1.6	0.9	1.9	2.0	–2.0	–3.6	–1.1	–0.3	–0.6

Production

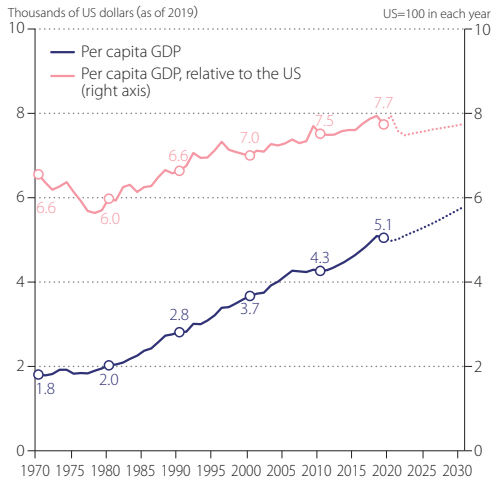

Figure 1 Per Capita GDP

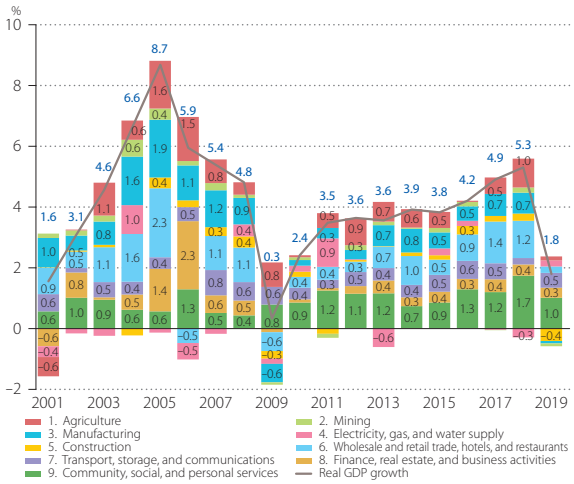

Figure 2 Industry Origins of Economic Growth

Labor

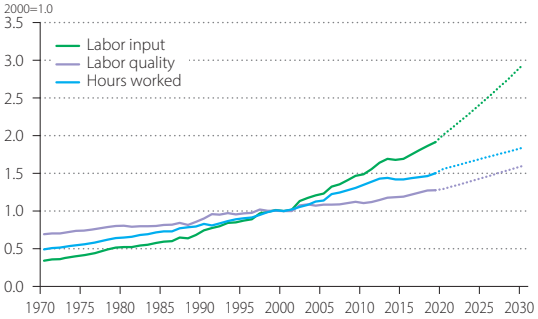

Figure 3 Labor Inputs

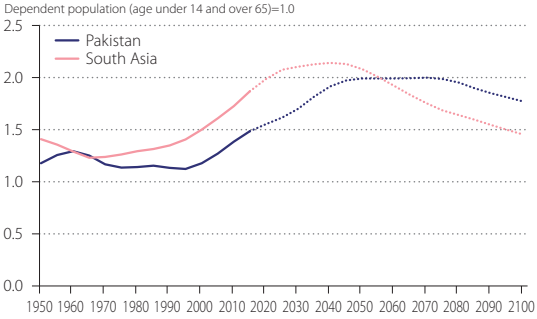

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

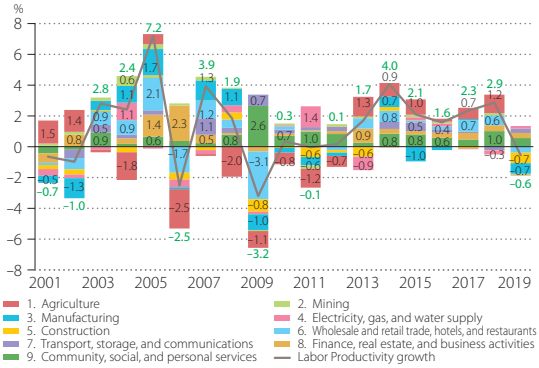

Figure 7 Industry Origins of Labor Productivity Growth

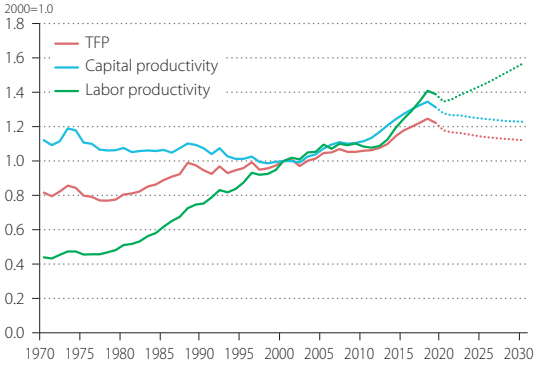

Figure 8 Productivity Indicators

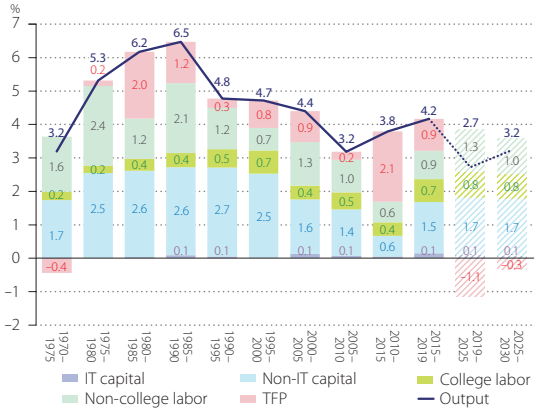

Figure 9 Decomposition of Economic Growth

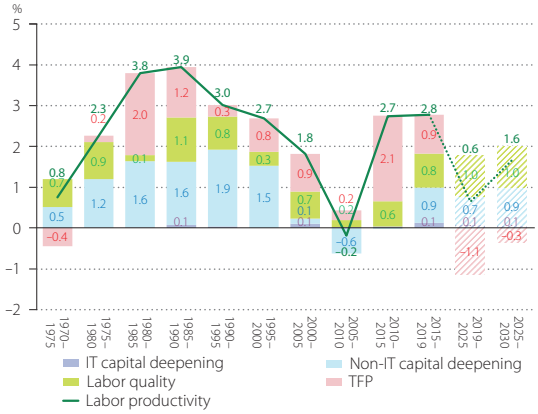

Figure 10 Decomposition of Labor Productivity Growth

Philippines

Key Indicators

GDP in 2019	1,000	Billions of US dollars (as of 2019)
(exchange rate based)	377	Billions of US dollars (as of 2019)
Per capita GDP in 2019	9.4	Thousands of US dollars (as of 2019)
(exchange rate based)	3.5	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	21.5	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	10.5	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	20.0	US dollars (as of 2019)
Energy productivity levels in 2018	26.4	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	147.8	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	43,852	Thousands persons
Employment rate in 2019	41.0	%
Female employment share in 2019	38.7	%
Average schooling years of workers in 2019	6.0	Years
Investment share in 2019	26.2	%
ICT investment share in GFCF in 2019	4.0	%
Agriculture share in GDP in 2019	8.8	%
Manufacturing share in GDP in 2019	18.5	%
Agriculture share in employment in 2019	22.1	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	5.8	2.5	3.8	4.8	6.1	6.6	6.8	6.4	5.3	–9.8	5.1	4.9	4.0
Labor input growth	4.6	4.1	3.3	3.3	3.5	4.1	–1.6	3.6	3.5	4.1	4.1	3.8	3.7
Labor quality growth	1.1	1.4	1.3	0.8	1.4	1.8	1.9	0.4	2.0	0.6	1.8	1.7	1.7
Hours worked growth	3.6	2.7	2.0	2.5	2.1	2.4	–3.5	3.2	1.6	3.5	2.3	2.1	2.1
College labor input growth	5.4	5.3	3.8	3.9	3.6	4.0	–0.8	3.1	5.1	5.9	5.1	4.7	4.6
Non-college labor input growth	4.1	3.1	2.8	2.6	3.3	4.3	–2.6	4.3	1.6	2.0	2.9	2.6	2.6
IT capital input growth	10.0	8.7	10.3	6.5	10.1	12.7	12.7	13.5	12.0	8.5	2.7	3.8	4.0
Non-IT capital input growth	7.7	4.1	4.3	3.1	6.0	7.2	7.5	7.6	7.4	6.9	5.1	5.0	4.9
Per-worker labor productivity growth	1.9	–0.3	1.7	2.1	3.9	3.5	8.7	4.2	3.0	–12.1	2.7	2.8	1.9
Per-hour labor productivity growth	2.3	–0.2	1.8	2.3	4.0	4.2	10.4	3.2	3.8	–13.3	2.8	2.8	1.9
Capital productivity growth	–7.7	–4.2	–4.5	–3.2	–6.0	–7.3	–7.6	–7.7	–7.4	–16.7	0.1	–0.1	–0.9
TFP growth	–0.6	–1.6	–0.2	1.5	1.0	0.5	2.7	0.3	–0.6	–15.6	0.4	0.4	–0.5

Production

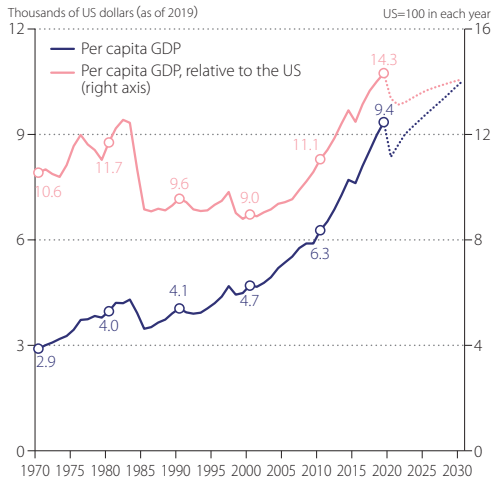

Figure 1 Per Capita GDP

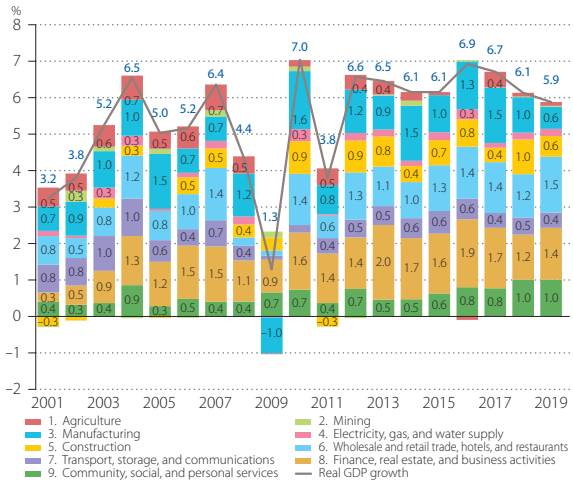

Figure 2 Industry Origins of Economic Growth

Labor

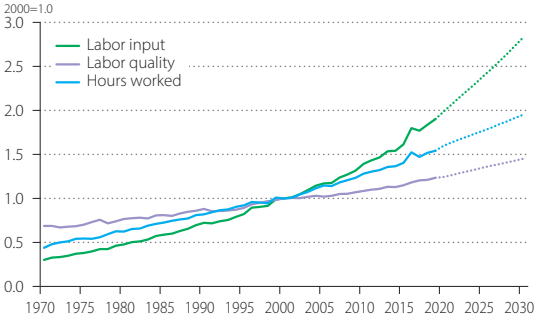

Figure 3 Labor Inputs

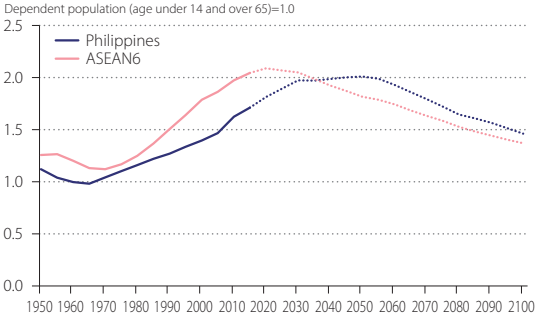

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

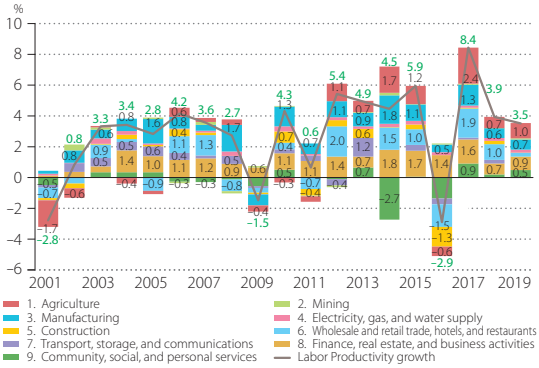

Figure 7 Industry Origins of Labor Productivity Growth

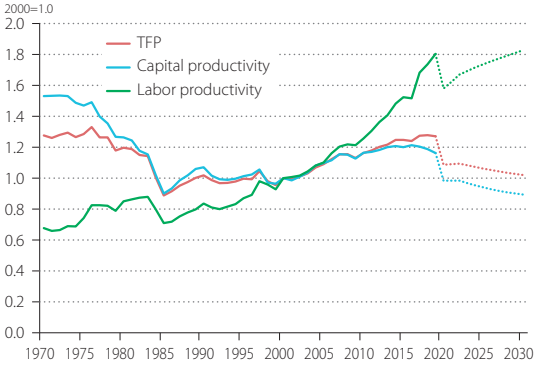

Figure 8 Productivity Indicators

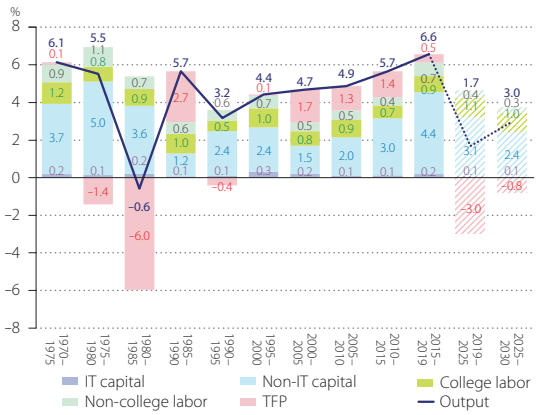

Figure 9 Decomposition of Economic Growth

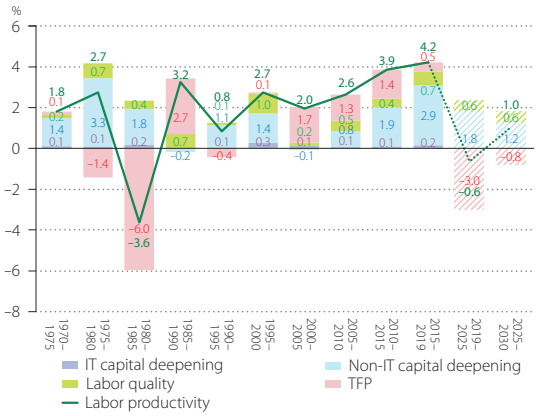

Figure 10 Decomposition of Labor Productivity Growth

Singapore

Key Indicators

GDP in 2019	584	Billions of US dollars (as of 2019)
(exchange rate based)	374	Billions of US dollars (as of 2019)
Per capita GDP in 2019	102.4	Thousands of US dollars (as of 2019)
(exchange rate based)	65.6	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	151.1	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	67.3	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	144.6	US dollars (as of 2019)
Energy productivity levels in 2018	27.3	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	87.0	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	3,630	Thousands persons
Employment rate in 2019	63.6	%
Female employment share in 2019	48.0	%
Average schooling years of workers in 2019	11.1	Years
Investment share in 2019	24.7	%
ICT investment share in GFCF in 2019	27.3	%
Agriculture share in GDP in 2019	0.0	%
Manufacturing share in GDP in 2019	20.5	%
Agriculture share in employment in 2019	0.6	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	8.4	7.1	7.3	6.1	4.2	3.7	5.6	4.0	0.7	-5.5	4.9	3.5	2.2
Labor input growth	6.0	6.3	6.5	5.0	2.7	1.3	−0.3	1.2	2.5	1.6	0.2	0.4	0.3
Labor quality growth	1.1	2.2	3.0	1.6	1.2	1.0	2.0	1.0	0.8	0.2	0.7	0.7	0.8
Hours worked growth	4.9	4.1	3.6	3.4	1.6	0.3	−2.2	0.2	1.7	1.3	−0.4	−0.4	−0.5
College labor input growth	9.6	13.5	14.5	7.2	4.2	3.0	2.6	2.2	3.8	1.9	0.8	1.0	0.9
Non-college labor input growth	5.7	5.2	2.8	2.5	0.4	−1.5	−5.0	−0.6	0.4	1.0	−0.8	−0.7	−0.8
IT capital input growth	15.8	21.1	12.5	9.3	12.9	12.9	17.4	15.0	8.6	5.4	5.0	7.4	7.5
Non-IT capital input growth	8.8	6.5	6.3	3.5	3.4	2.6	2.6	2.4	2.2	0.9	0.6	0.6	0.5
Per-worker labor productivity growth	3.2	3.7	4.3	2.3	2.3	2.9	6.2	3.3	−0.8	−6.3	5.2	3.6	2.4
Per-hour labor productivity growth	3.5	3.0	3.7	2.6	2.7	3.4	7.9	3.8	−1.0	−6.9	5.4	3.8	2.6
Capital productivity growth	−9.0	−7.3	−6.7	−3.9	−4.2	−3.6	−3.9	−3.7	−2.9	−6.9	3.9	2.2	1.0
TFP growth	0.9	0.3	0.6	1.7	0.7	1.1	3.6	1.3	−2.0	−7.0	4.2	2.6	1.4

Production

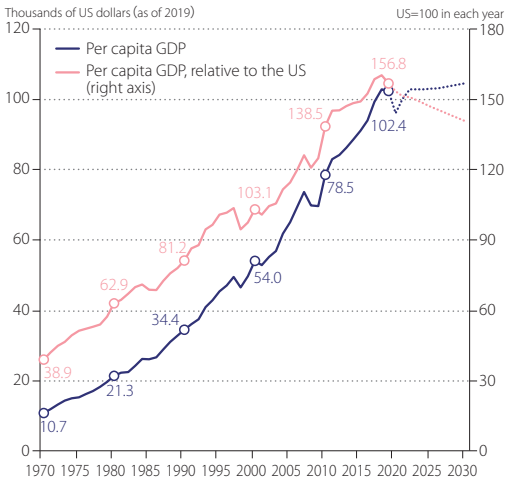

Figure 1 Per Capita GDP

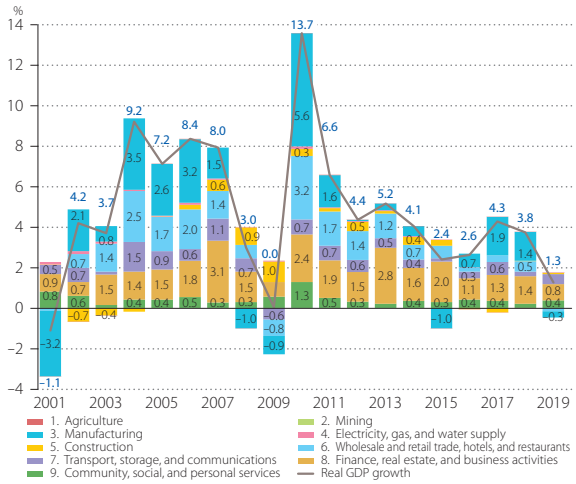

Figure 2 Industry Origins of Economic Growth

Labor

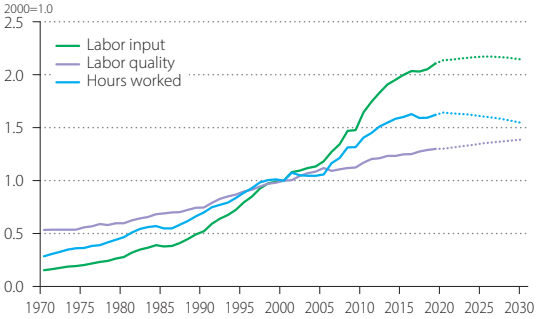

Figure 3 Labor Inputs

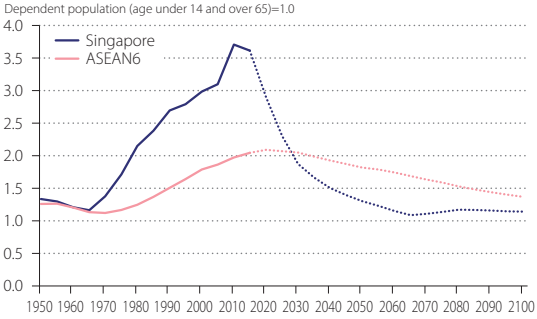

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

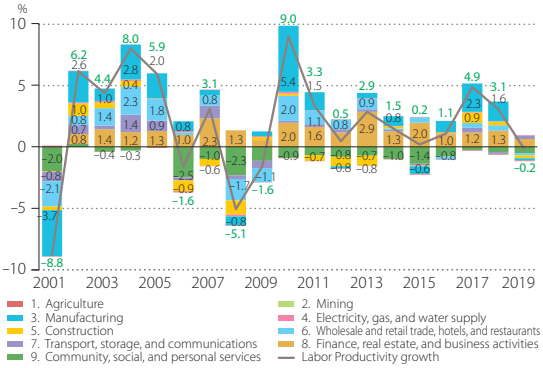

Figure 7 Industry Origins of Labor Productivity Growth

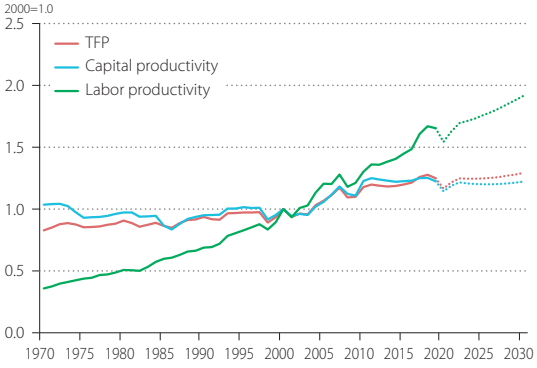

Figure 8 Productivity Indicators

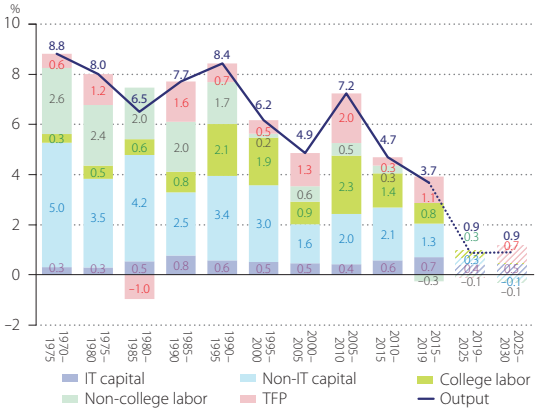

Figure 9 Decomposition of Economic Growth

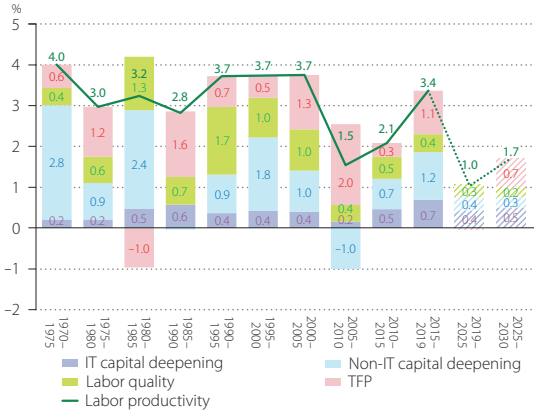

Figure 10 Decomposition of Labor Productivity Growth

Sri Lanka

Key Indicators

GDP in 2019	294	Billions of US dollars (as of 2019)
(exchange rate based)	84	Billions of US dollars (as of 2019)
Per capita GDP in 2019	13.5	Thousands of US dollars (as of 2019)
(exchange rate based)	3.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	32.9	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	17.1	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	35.9	US dollars (as of 2019)
Energy productivity levels in 2018	25.8	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	79.7	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	8,181	Thousands persons
Employment rate in 2019	37.5	%
Female employment share in 2019	34.4	%
Average schooling years of workers in 2019	11.7	Years
Investment share in 2019	26.7	%
ICT investment share in GFCF in 2019	2.4	%
Agriculture share in GDP in 2019	8.1	%
Manufacturing share in GDP in 2019	17.6	%
Agriculture share in employment in 2019	25.3	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.0	4.1	5.2	5.5	3.8	3.1	7.3	1.3	4.1	−4.0	3.1	3.1	3.4
Labor input growth	2.4	2.9	3.3	1.4	1.5	2.3	4.4	−1.8	2.6	2.9	1.5	1.5	1.5
Labor quality growth	0.6	1.2	0.9	0.7	1.0	1.2	1.2	0.4	0.7	2.0	0.7	0.7	0.7
Hours worked growth	1.8	1.7	2.3	0.7	0.5	1.1	3.2	−2.2	1.9	0.9	0.8	0.8	0.7
College labor input growth	0.6	12.1	7.0	4.3	4.7	6.1	6.7	−0.9	8.5	3.0	2.1	2.1	2.0
Non-college labor input growth	2.5	1.7	2.3	0.2	−0.5	−0.3	2.8	−2.4	−1.8	2.8	1.0	1.0	1.0
IT capital input growth	18.3	7.2	11.4	16.4	7.4	8.4	7.9	8.5	8.7	9.1	4.8	4.6	4.7
Non-IT capital input growth	4.6	3.6	2.1	5.3	5.6	4.8	5.1	4.9	4.7	5.1	4.0	3.9	3.8
Per-worker labor productivity growth	2.6	2.5	3.0	4.2	3.7	2.0	4.1	3.6	2.1	−4.9	2.2	2.2	2.5
Per-hour labor productivity growth	2.2	2.4	2.9	4.9	3.4	2.1	4.1	3.5	2.3	−4.8	2.4	2.4	2.6
Capital productivity growth	−4.6	−3.6	−2.1	−5.4	−5.6	−4.8	−5.0	−5.0	−4.7	−9.1	−0.9	−0.7	−0.4
TFP growth	0.5	0.8	2.5	1.8	−0.4	−0.8	2.4	−1.4	0.1	−8.3	0.0	0.1	0.4

Production

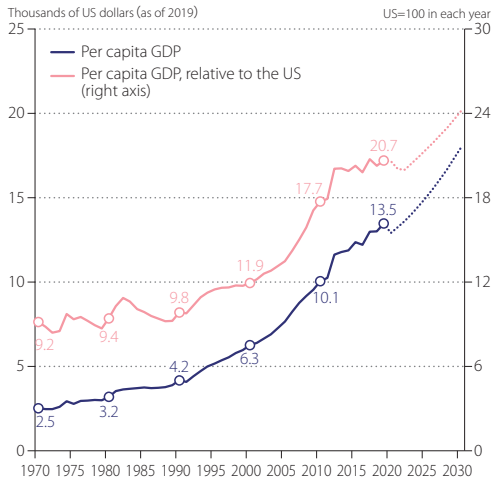

Figure 1 Per Capita GDP

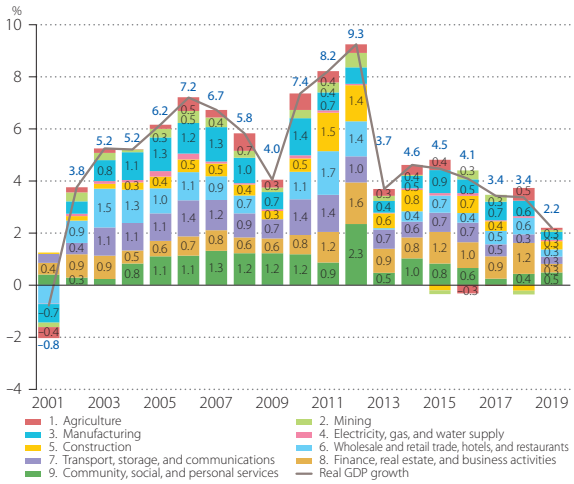

Figure 2 Industry Origins of Economic Growth

Labor

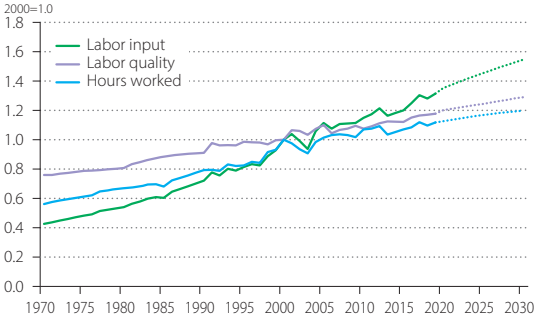

Figure 3 Labor Inputs

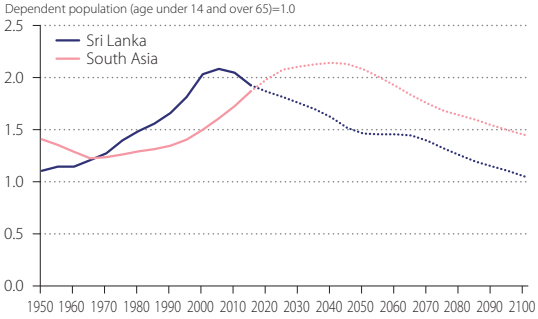

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

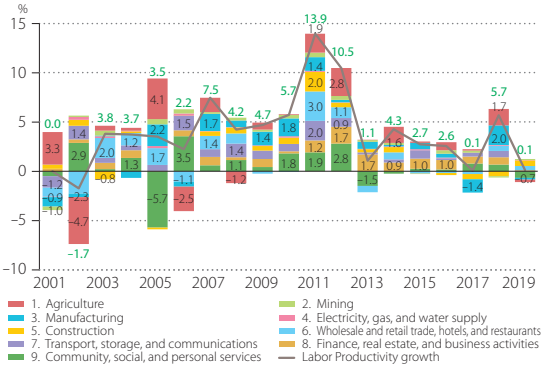

Figure 7 Industry Origins of Labor Productivity Growth

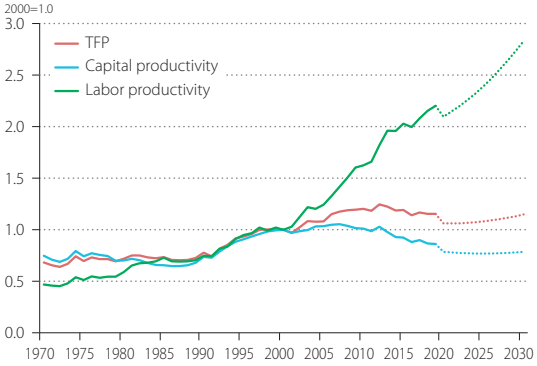

Figure 8 Productivity Indicators

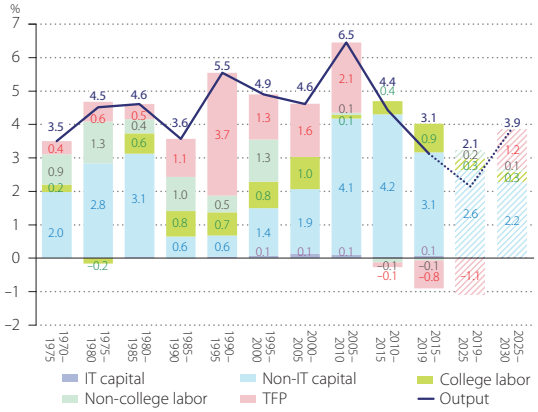

Figure 9 Decomposition of Economic Growth

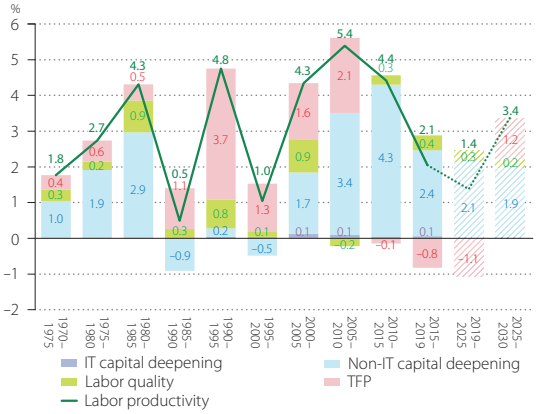

Figure 10 Decomposition of Labor Productivity Growth

Thailand

Key Indicators

GDP in 2019	1,350	Billions of US dollars (as of 2019)
(exchange rate based)	550	Billions of US dollars (as of 2019)
Per capita GDP in 2019	19.8	Thousands of US dollars (as of 2019)
(exchange rate based)	8.0	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	32.8	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	15.0	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	37.6	US dollars (as of 2019)
Energy productivity levels in 2018	12.0	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	201.1	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	37,417	Thousands persons
Employment rate in 2019	54.8	%
Female employment share in 2019	47.9	%
Average schooling years of workers in 2019	9.0	Years
Investment share in 2019	24.5	%
ICT investment share in GFCF in 2019	16.6	%
Agriculture share in GDP in 2019	8.1	%
Manufacturing share in GDP in 2019	25.6	%
Agriculture share in employment in 2019	31.9	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	7.0	7.8	4.5	4.5	3.3	3.6	4.4	3.6	2.6	−6.4	2.7	5.1	3.7
Labor input growth	7.7	7.0	5.4	4.1	1.6	0.9	2.8	0.4	−1.2	2.2	1.9	1.8	1.7
Labor quality growth	3.2	4.2	4.6	3.3	2.8	1.3	3.2	0.1	0.5	2.9	1.6	1.6	1.6
Hours worked growth	4.5	2.8	0.7	0.7	−1.2	−0.4	−0.3	0.3	−1.7	−0.7	0.2	0.2	0.1
College labor input growth	15.1	11.3	6.8	3.9	3.6	1.9	5.3	1.1	−0.6	3.9	3.1	3.0	2.8
Non-college labor input growth	6.2	5.0	4.1	4.4	−0.4	−0.2	0.2	−0.4	−1.8	0.1	0.3	0.3	0.2
IT capital input growth	16.9	18.8	11.6	11.5	8.0	3.4	2.9	3.6	2.8	0.6	−0.6	0.8	2.0
Non-IT capital input growth	5.1	6.6	6.8	1.9	2.4	2.7	2.6	2.8	2.8	1.9	1.4	1.4	1.5
Per-worker labor productivity growth	3.0	4.2	3.4	3.1	3.6	3.9	4.5	2.4	4.4	−5.5	2.2	4.6	3.3
Per-hour labor productivity growth	2.0	4.7	3.7	3.8	4.4	4.0	4.7	3.8	3.9	−5.7	2.5	4.9	3.6
Capital productivity growth	−5.3	−6.9	−6.9	−2.5	−2.9	−2.7	−2.6	−2.8	−2.8	−8.2	1.6	3.8	2.1
TFP growth	0.2	0.5	−2.0	1.3	0.8	1.5	1.6	2.2	0.9	−8.3	1.3	3.6	2.1

Production

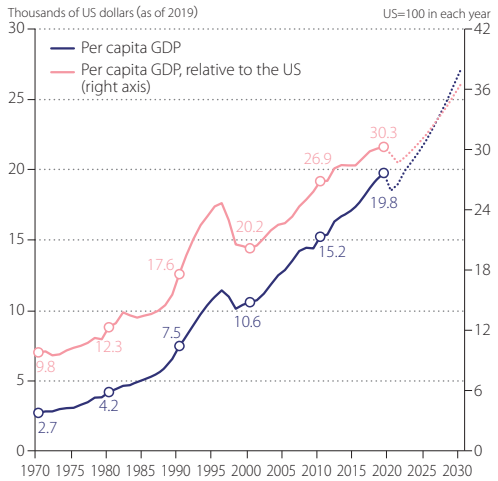

Figure 1 Per Capita GDP

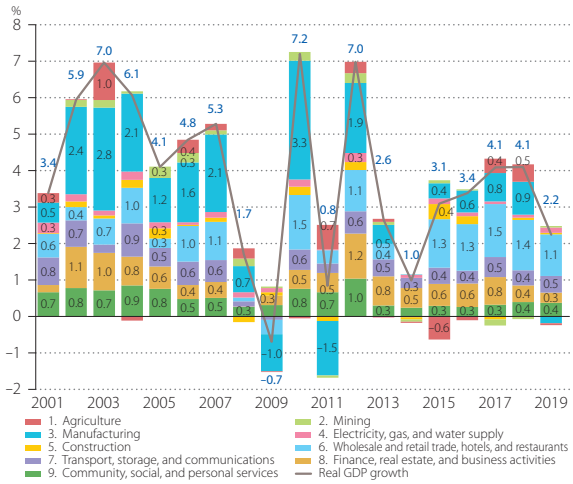

Figure 2 Industry Origins of Economic Growth

Labor

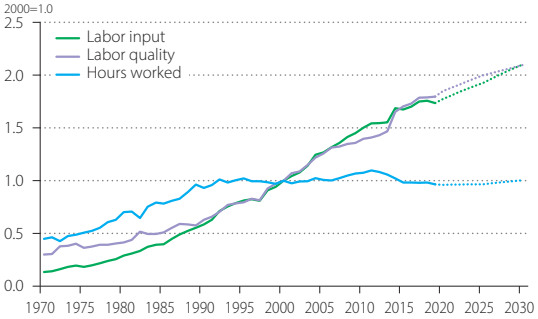

Figure 3 Labor Inputs

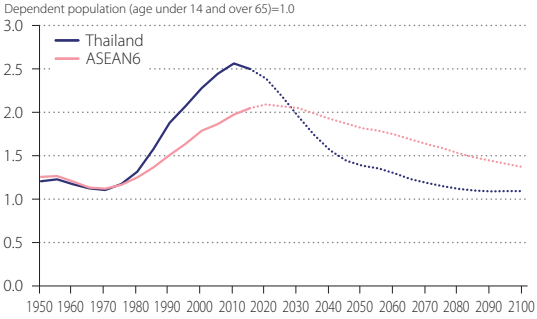

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

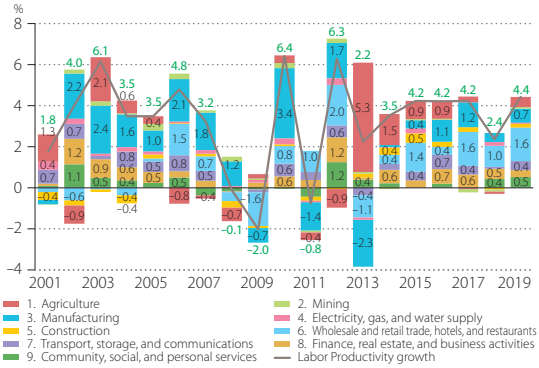

Figure 7 Industry Origins of Labor Productivity Growth

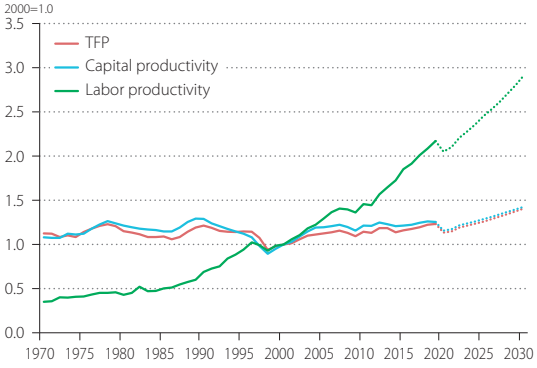

Figure 8 Productivity Indicators

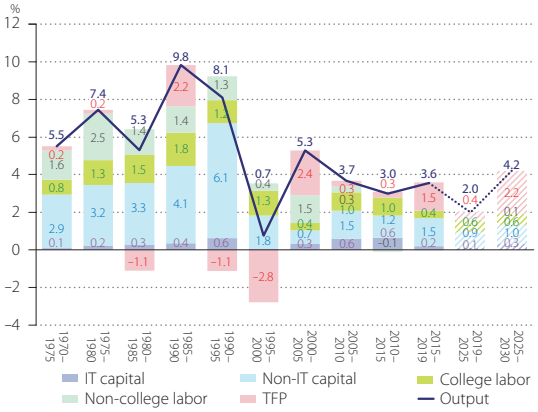

Figure 9 Decomposition of Economic Growth

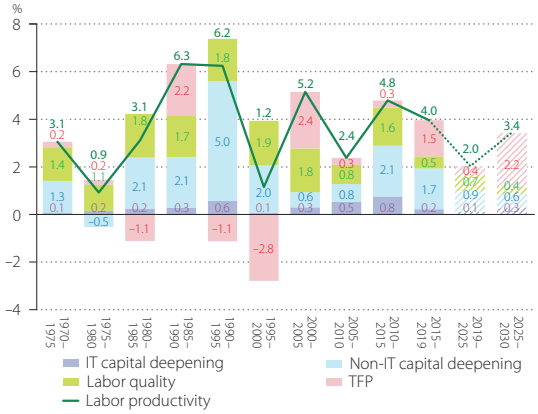

Figure 10 Decomposition of Labor Productivity Growth

Turkey

Key Indicators

GDP in 2019	2,636	Billions of US dollars (as of 2019)
(exchange rate based)	761	Billions of US dollars (as of 2019)
Per capita GDP in 2019	31.7	Thousands of US dollars (as of 2019)
(exchange rate based)	9.2	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	84.7	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	42.0	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	106.1	US dollars (as of 2019)
Energy productivity levels in 2018	22.5	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	161.5	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	28,230	Thousands persons
Employment rate in 2019	33.9	%
Female employment share in 2019	29.3	%
Average schooling years of workers in 2019	8.9	Years
Investment share in 2019	24.8	%
ICT investment share in GFCF in 2019	5.6	%
Agriculture share in GDP in 2019	7.1	%
Manufacturing share in GDP in 2019	20.3	%
Agriculture share in employment in 2019	18.2	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.7	4.6	3.8	4.3	6.2	5.5	9.1	7.1	3.2	1.6	5.1	4.7	3.8
Labor input growth	3.7	4.0	2.2	4.1	3.5	2.0	3.2	1.8	−0.8	2.6	2.1	1.7	1.6
Labor quality growth	1.0	0.9	1.6	2.1	1.9	1.7	0.8	1.5	2.6	0.3	1.0	1.0	1.0
Hours worked growth	2.8	3.1	0.6	1.9	1.6	0.3	2.5	0.4	−3.3	2.3	1.1	0.7	0.6
College labor input growth	13.1	6.8	5.8	9.0	7.4	5.4	4.6	3.3	5.7	4.6	3.8	3.4	3.3
Non-college labor input growth	3.1	3.6	1.6	2.6	1.2	−0.1	2.4	0.9	−4.9	1.2	0.9	0.5	0.4
IT capital input growth	14.5	16.5	14.7	7.1	10.1	6.9	7.5	8.0	5.4	7.8	9.5	8.5	7.7
Non-IT capital input growth	7.0	4.0	4.6	5.0	5.4	5.4	5.2	5.2	5.5	3.6	4.2	4.1	3.9
Per-worker labor productivity growth	2.1	1.9	3.2	2.7	3.8	4.3	5.6	5.3	5.6	1.3	4.0	3.8	3.1
Per-hour labor productivity growth	2.0	1.5	3.2	2.4	4.7	5.3	6.6	6.8	6.6	−0.7	4.0	3.9	3.2
Capital productivity growth	−7.1	−4.2	−4.8	−5.1	−5.4	−5.3	−5.2	−5.2	−5.4	−2.2	0.8	0.4	−0.2
TFP growth	−1.4	0.4	−0.2	−0.5	1.5	1.4	4.6	3.1	0.1	−1.7	1.6	1.4	0.7

Production

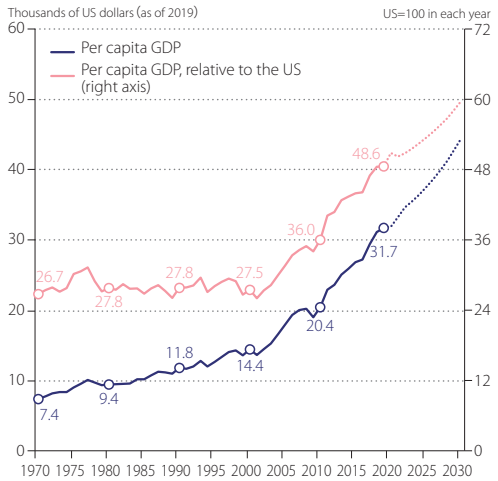

Figure 1 Per Capita GDP

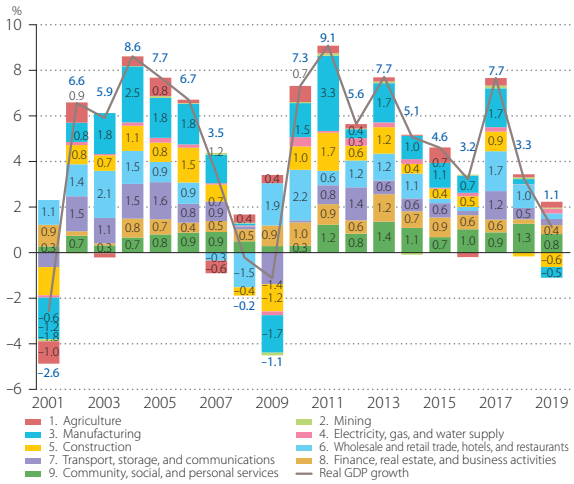

Figure 2 Industry Origins of Economic Growth

Labor

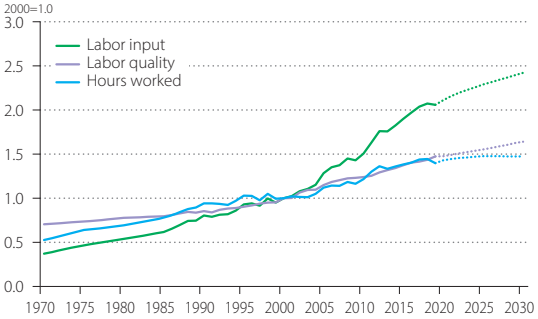

Figure 3 Labor Inputs

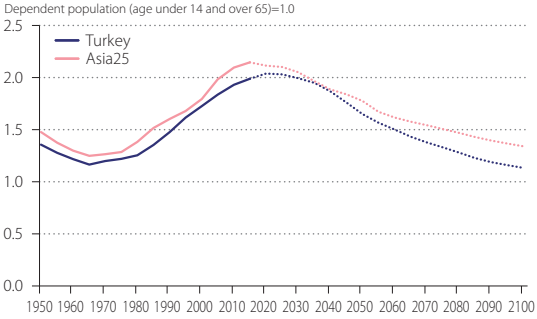

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

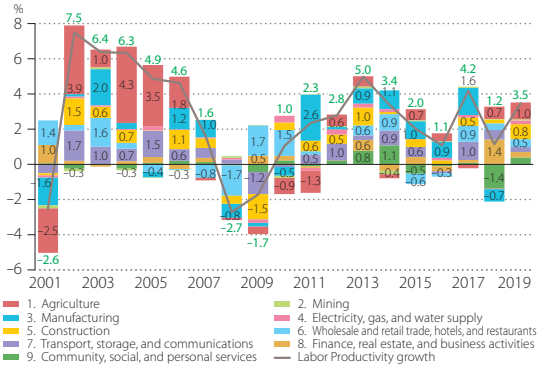

Figure 7 Industry Origins of Labor Productivity Growth

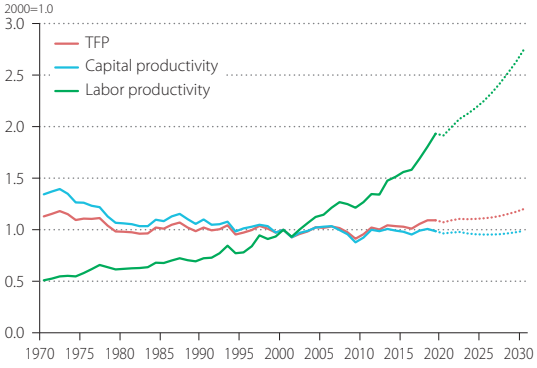

Figure 8 Productivity Indicators

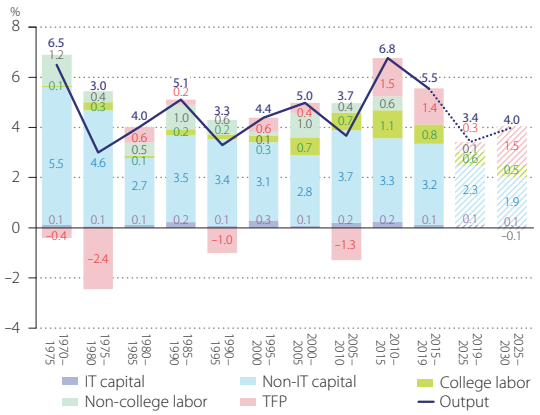

Figure 9 Decomposition of Economic Growth

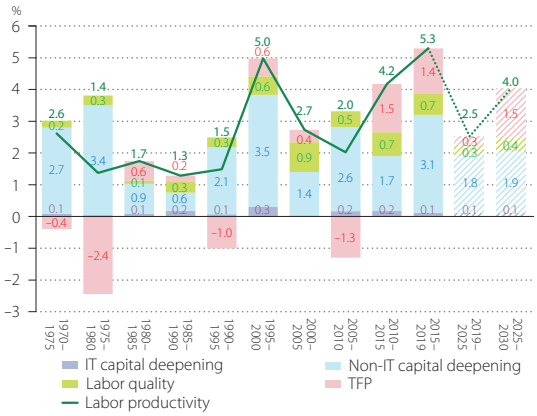

Figure 10 Decomposition of Labor Productivity Growth

Vietnam

Key Indicators

GDP in 2019	812	Billions of US dollars (as of 2019)
(exchange rate based)	264	Billions of US dollars (as of 2019)
Per capita GDP in 2019	8.4	Thousands of US dollars (as of 2019)
(exchange rate based)	2.7	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	13.3	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	6.1	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	12.7	US dollars (as of 2019)
Energy productivity levels in 2018	11.6	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	325.2	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	54,824	Thousands persons
Employment rate in 2019	56.8	%
Female employment share in 2019	46.3	%
Average schooling years of workers in 2019	9.2	Years
Investment share in 2019	27.4	%
ICT investment share in GFCF in 2019	3.7	%
Agriculture share in GDP in 2019	15.5	%
Manufacturing share in GDP in 2019	18.3	%
Agriculture share in employment in 2019	34.5	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.1	3.3	7.3	6.6	5.7	6.4	7.1	8.5	4.8	2.8	6.3	7.5	6.2
Labor input growth	5.1	3.5	2.7	4.6	2.0	3.3	–0.1	6.9	2.9	1.1	2.8	2.7	2.6
Labor quality growth	0.9	0.3	0.2	2.6	1.4	2.3	1.7	2.5	1.5	1.3	1.6	1.5	1.4
Hours worked growth	4.2	3.2	2.4	2.0	0.6	1.0	–1.7	4.3	1.4	–0.2	1.2	1.2	1.2
College labor input growth	7.4	15.9	6.2	10.4	8.4	5.6	4.3	9.2	3.7	4.3	5.8	5.5	5.3
Non-college labor input growth	5.1	3.2	2.5	3.8	0.5	2.7	–1.2	6.2	2.6	0.2	1.9	1.8	1.8
IT capital input growth	7.4	16.2	14.0	20.5	18.2	14.6	17.4	17.5	10.5	6.0	5.5	6.5	7.1
Non-IT capital input growth	5.3	5.9	9.1	9.2	6.4	6.4	5.8	6.4	6.6	6.4	6.1	6.2	6.4
Per-worker labor productivity growth	0.0	0.1	5.2	4.1	4.7	5.5	6.3	7.5	4.1	1.6	4.8	6.0	4.8
Per-hour labor productivity growth	–0.1	0.1	4.9	4.5	5.1	5.4	8.8	4.2	3.4	3.0	5.0	6.2	5.1
Capital productivity growth	–5.3	–5.9	–9.1	–9.3	–6.6	–6.5	–6.0	–6.6	–6.7	–3.7	0.2	1.2	–0.2
TFP growth	–1.2	–1.3	0.9	–0.8	1.4	1.4	4.1	1.7	0.0	–1.0	1.8	3.0	1.7

Production

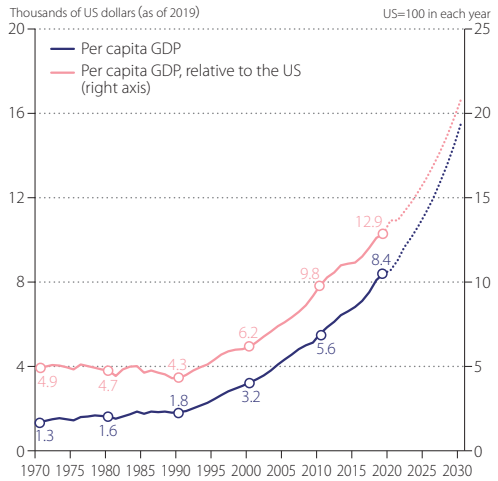

Figure 1 Per Capita GDP

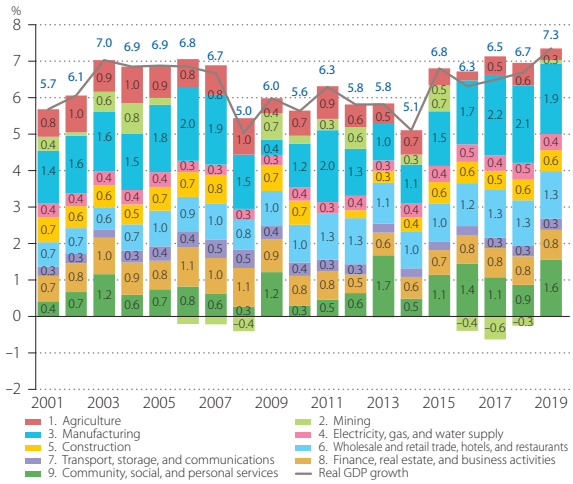

Figure 2 Industry Origins of Economic Growth

Labor

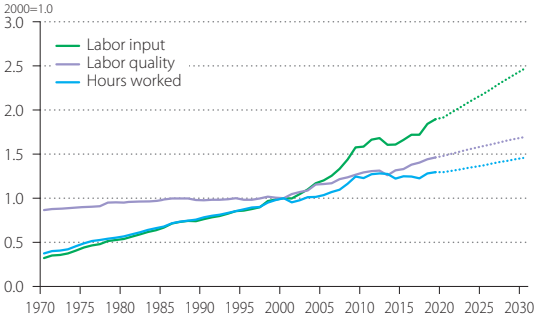

Figure 3 Labor Inputs

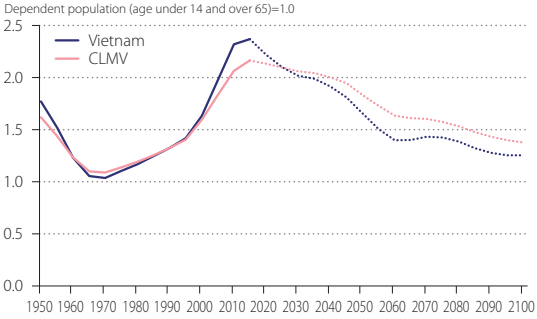

Figure 4 Demographic Dividend

Productivity

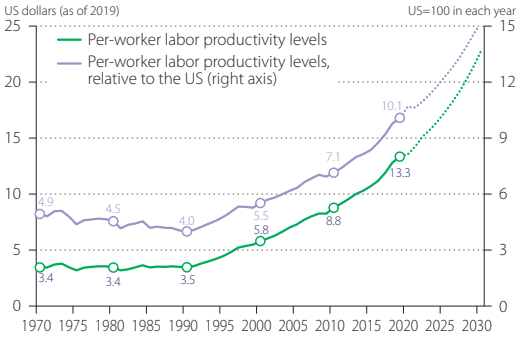

Figure 5 Per-Worker Labor Productivity Level

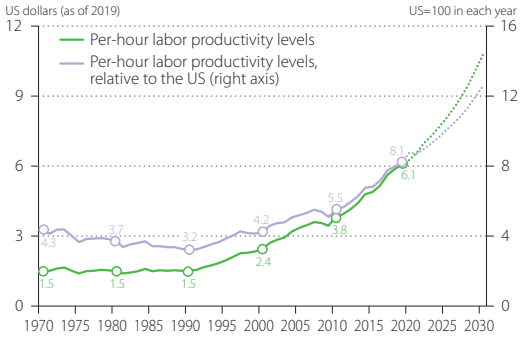

Figure 6 Per-Hour Labor Productivity Level

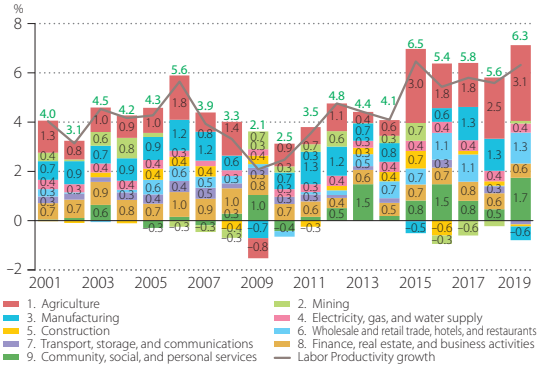

Figure 7 Industry Origins of Labor Productivity Growth

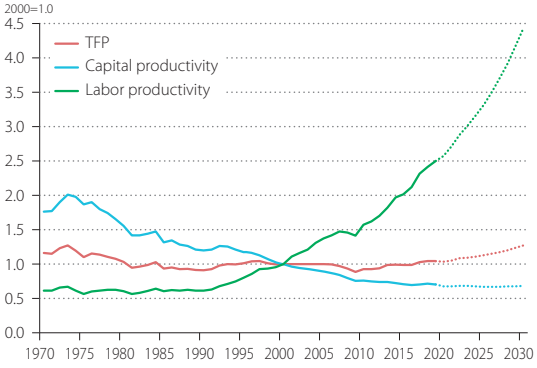

Figure 8 Productivity Indicators

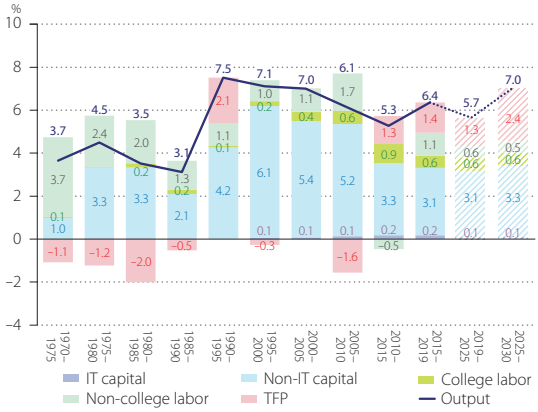

Figure 9 Decomposition of Economic Growth

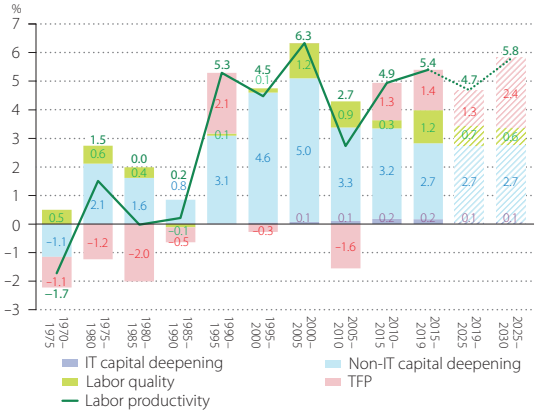

Figure 10 Decomposition of Labor Productivity Growth

APO21

Key Indicators

GDP in 2019	33,328	Billions of US dollars (as of 2019)
(exchange rate based)	16,019	Billions of US dollars (as of 2019)
Per capita GDP in 2019	12.0	Thousands of US dollars (as of 2019)
(exchange rate based)	5.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	28.7	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	13.8	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	34.9	US dollars (as of 2019)
Energy productivity levels in 2018	15.4	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	n.a.	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	1,131,845	Thousands persons
Employment rate in 2019	40.9	%
Female employment share in 2019	32.0	%
Average schooling years of workers in 2019	7.8	Years
Investment share in 2019	27.8	%
ICT investment share in GFCF in 2019	7.6	%
Agriculture share in GDP in 2019	10.0	%
Manufacturing share in GDP in 2019	18.3	%
Agriculture share in employment in 2019	33.1	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.8	5.1	3.6	4.3	4.1	4.0	4.7	4.3	2.3	–3.8	4.5	4.2	3.9
Labor input growth	3.2	3.3	2.6	2.9	2.3	1.9	1.7	1.7	1.7	2.8	2.5	2.4	2.3
Labor quality growth	0.6	1.0	1.0	1.3	1.2	0.9	0.8	0.7	0.5	1.4	1.5	1.4	1.4
Hours worked growth	2.6	2.2	1.6	1.6	1.0	1.1	0.9	1.0	1.2	1.4	1.0	1.0	1.0
College labor input growth	7.0	6.6	5.2	5.0	3.6	2.8	3.0	2.2	2.5	3.9	3.3	3.2	3.1
Non-college labor input growth	2.6	2.5	1.7	1.8	1.5	1.4	0.7	1.5	1.2	2.1	1.9	1.9	1.8
IT capital input growth	13.8	16.4	9.2	5.3	5.2	5.4	5.5	5.6	5.3	3.5	3.0	3.1	3.1
Non-IT capital input growth	5.8	4.7	4.0	3.3	4.1	4.3	4.3	4.4	4.3	4.4	3.7	3.9	3.9
Per-worker labor productivity growth	2.1	2.9	2.0	2.6	2.9	2.8	3.9	2.7	1.4	–4.9	3.5	3.1	2.9
Per-hour labor productivity growth	2.1	2.9	2.1	2.6	3.0	3.0	4.2	3.1	1.4	–5.2	3.5	3.2	2.9
Capital productivity growth	–6.0	–5.1	–4.2	–3.4	–4.1	–4.3	–4.3	–4.4	–4.3	–8.5	0.6	0.1	–0.2
TFP growth	0.2	1.0	0.3	1.0	0.9	1.0	2.0	1.1	–0.4	–7.1	1.8	1.4	1.1

Production

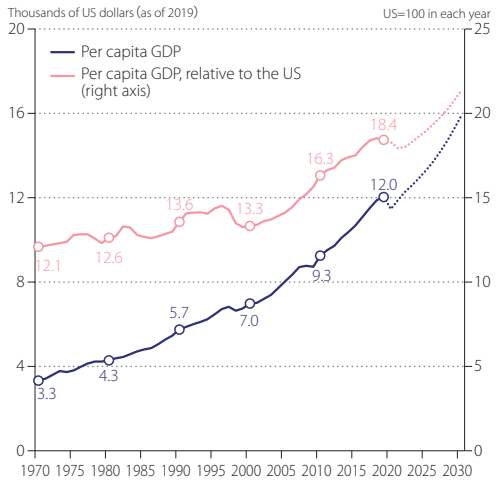

Figure 1 Per Capita GDP

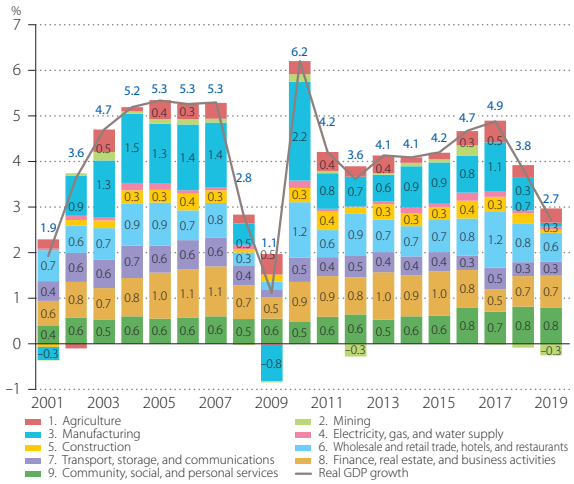

Figure 2 Industry Origins of Economic Growth

Labor

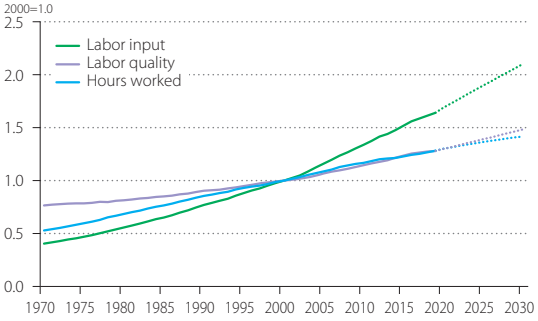

Figure 3 Labor Inputs

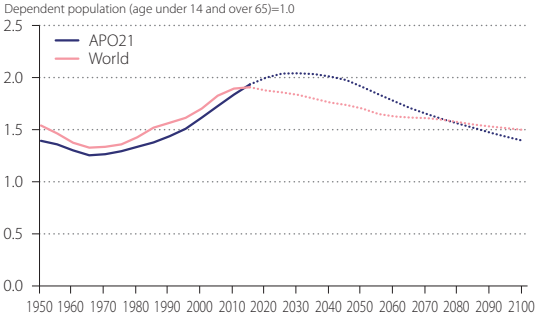

Figure 4 Demographic Dividend

Productivity

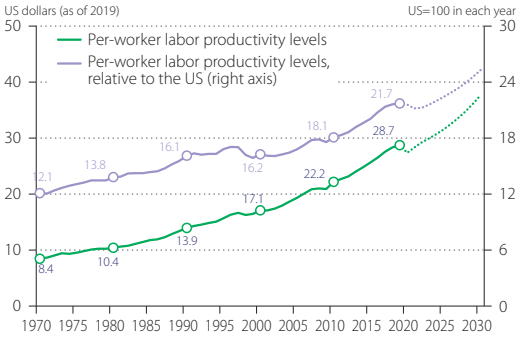

Figure 5 Per-Worker Labor Productivity Level

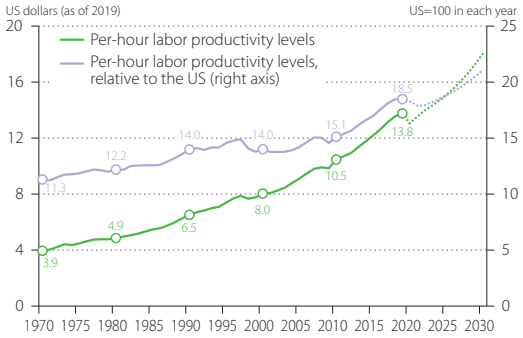

Figure 6 Per-Hour Labor Productivity Level

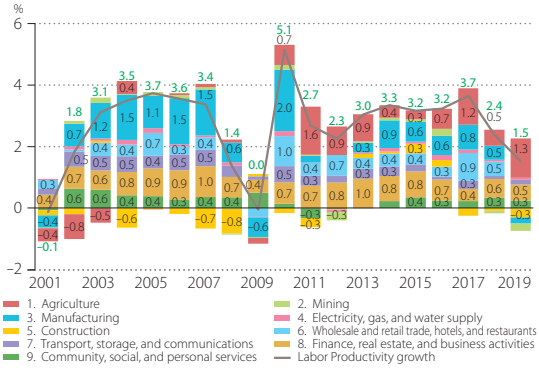

Figure 7 Industry Origins of Labor Productivity Growth

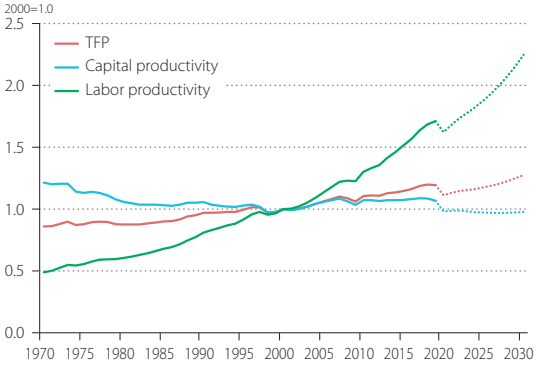

Figure 8 Productivity Indicators

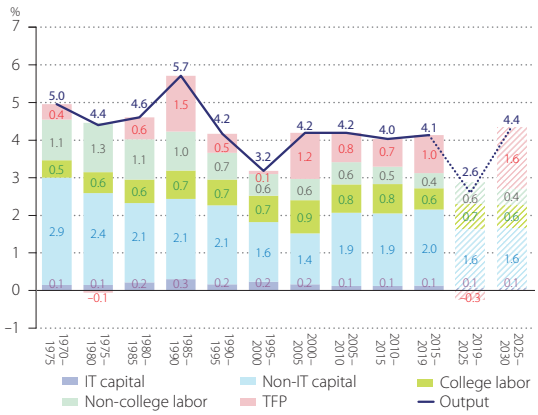

Figure 9 Decomposition of Economic Growth

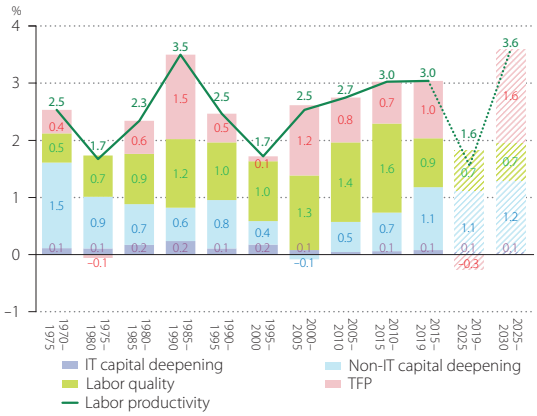

Figure 10 Decomposition of Labor Productivity Growth

Asia25

Key Indicators

GDP in 2019	57,422	Billions of US dollars (as of 2019)
(exchange rate based)	30,986	Billions of US dollars (as of 2019)
Per capita GDP in 2019	13.6	Thousands of US dollars (as of 2019)
(exchange rate based)	7.3	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	29.0	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	13.7	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	37.1	US dollars (as of 2019)
Energy productivity levels in 2018	13.1	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	n.a.	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	1,930,166	Thousands persons
Employment rate in 2019	45.7	%
Female employment share in 2019	37.0	%
Average schooling years of workers in 2019	8.5	Years
Investment share in 2019	33.6	%
ICT investment share in GFCF in 2019	7.9	%
Agriculture share in GDP in 2019	8.8	%
Manufacturing share in GDP in 2019	21.7	%
Agriculture share in employment in 2019	29.4	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	4.8	5.3	4.6	5.8	5.2	4.8	5.4	5.0	3.3	–1.4	6.5	3.9	4.0
Labor input growth	3.5	3.5	2.7	2.8	1.2	0.7	0.2	0.6	–0.3	1.8	1.0	0.9	0.9
Labor quality growth	0.8	1.0	1.2	1.5	0.6	–0.3	–0.2	–0.4	–1.0	1.9	0.8	0.8	0.8
Hours worked growth	2.7	2.6	1.5	1.3	0.6	1.0	0.4	1.0	0.7	-0.1	0.2	0.1	0.1
College labor input growth	7.0	7.1	5.9	5.8	4.0	2.4	1.8	2.8	1.1	3.8	2.7	2.6	2.5
Non-college labor input growth	3.3	3.1	2.2	2.0	0.1	0.0	–0.5	–0.3	–0.9	1.0	0.2	0.2	0.1
IT capital input growth	13.8	16.4	9.6	7.7	9.7	9.3	9.4	9.3	8.6	5.8	5.2	5.3	5.0
Non-IT capital input growth	6.0	5.1	4.8	5.6	6.6	6.2	6.5	6.2	5.7	6.4	5.7	5.8	5.5
Per-worker labor productivity growth	2.0	2.8	3.3	4.6	4.4	4.1	4.8	4.0	2.9	–1.8	6.2	3.6	3.7
Per-hour labor productivity growth	2.0	2.8	3.1	4.5	4.6	3.9	5.2	3.9	2.7	–1.3	6.4	3.7	3.9
Capital productivity growth	–6.2	–5.5	–5.0	–5.7	–6.8	–6.4	–6.6	–6.4	–5.9	–8.3	0.5	–2.3	–1.8
TFP growth	0.0	1.0	0.8	1.4	1.2	1.3	2.1	1.3	0.6	–5.2	3.5	0.8	1.1

Production

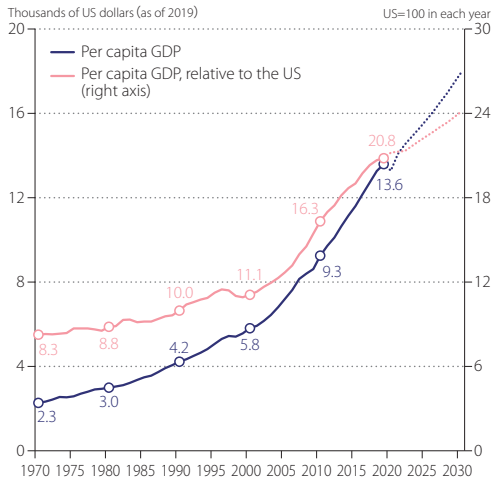

Figure 1 Per Capita GDP

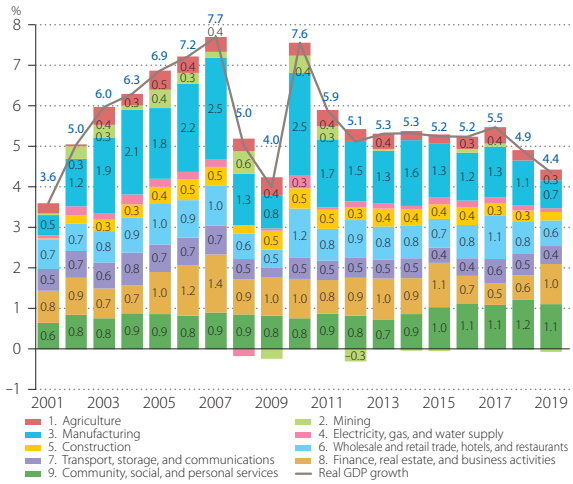

Figure 2 Industry Origins of Economic Growth

Labor

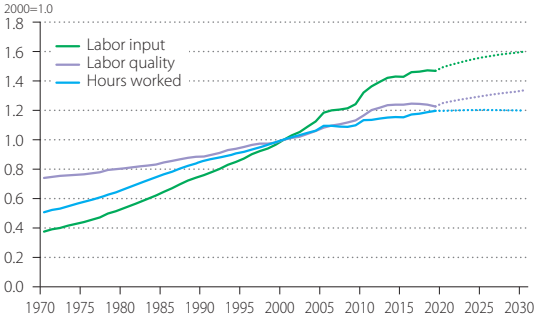

Figure 3 Labor Inputs

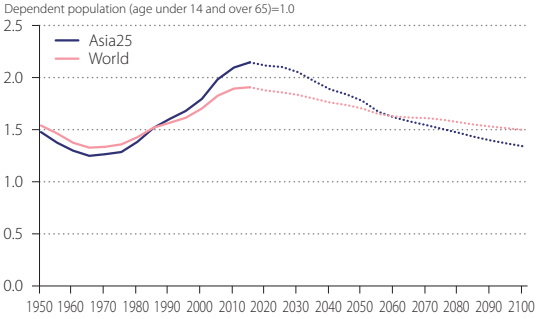

Figure 4 Demographic Dividend

Productivity

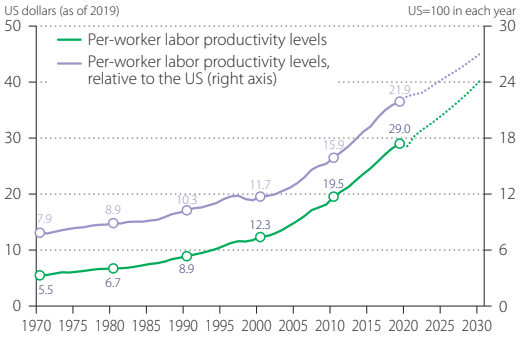

Figure 5 Per-Worker Labor Productivity Level

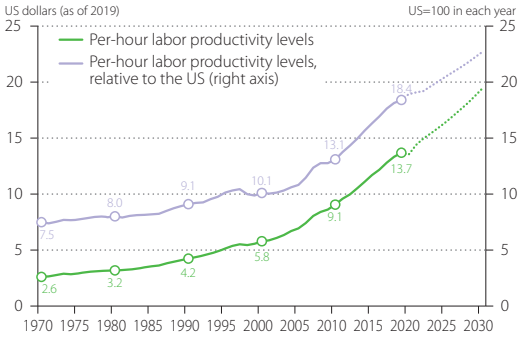

Figure 6 Per-Hour Labor Productivity Level

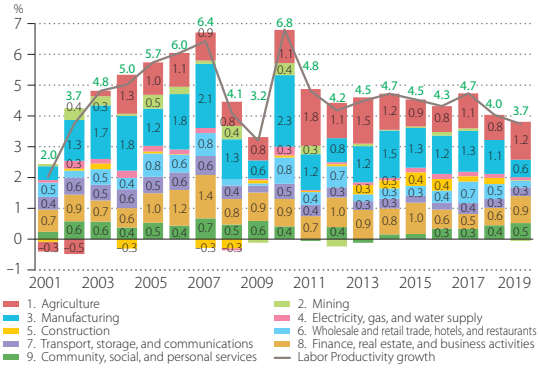

Figure 7 Industry Origins of Labor Productivity Growth

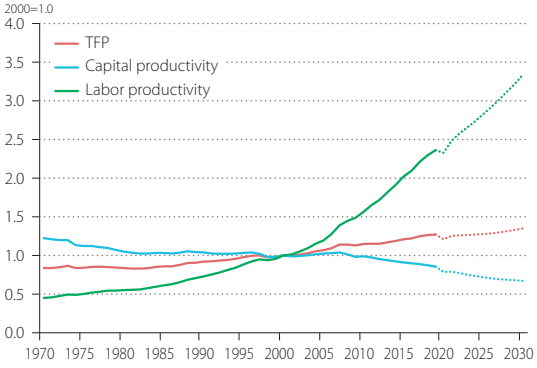

Figure 8 Productivity Indicators

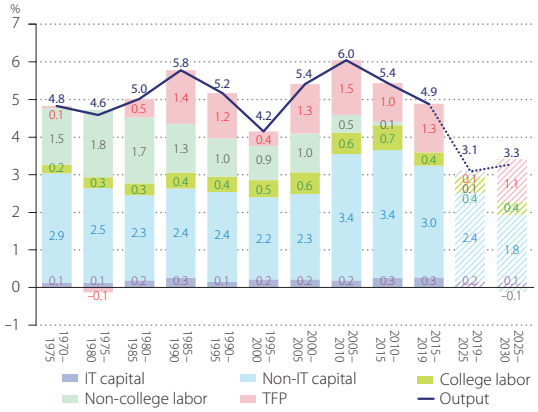

Figure 9 Decomposition of Economic Growth

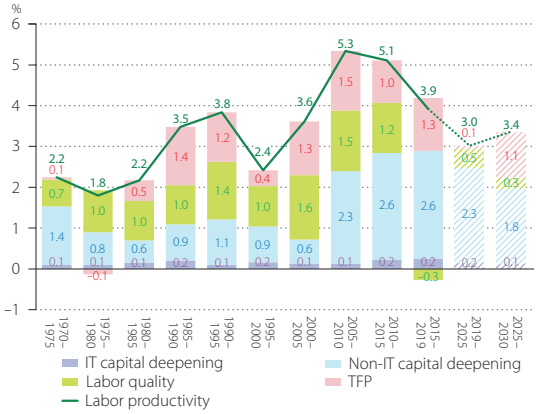

Figure 10 Decomposition of Labor Productivity Growth

East Asia

Key Indicators

GDP in 2019	33,448	Billions of US dollars (as of 2019)
(exchange rate based)	22,694	Billions of US dollars (as of 2019)
Per capita GDP in 2019	20.7	Thousands of US dollars (as of 2019)
(exchange rate based)	14.1	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	36.8	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	17.4	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	52.4	US dollars (as of 2019)
Energy productivity levels in 2018	12.1	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	n.a.	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	885,128	Thousands persons
Employment rate in 2019	54.9	%
Female employment share in 2019	44.2	%
Average schooling years of workers in 2019	10.2	Years
Investment share in 2019	37.3	%
ICT investment share in GFCF in 2019	8.7	%
Agriculture share in GDP in 2019	5.6	%
Manufacturing share in GDP in 2019	25.2	%
Agriculture share in employment in 2019	21.1	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	5.1	5.7	4.6	5.7	5.2	4.7	5.1	4.7	3.6	0.5	6.9	4.2	4.2
Labor input growth	3.5	3.5	2.5	2.4	0.3	−0.4	−0.8	−0.2	−2.1	0.9	−0.4	−0.4	−0.5
Labor quality growth	1.0	0.8	1.2	1.7	0.2	−1.1	−0.7	−1.1	−2.0	3.0	0.8	0.8	0.7
Hours worked growth	2.5	2.8	1.3	0.7	0.1	0.7	−0.1	1.0	0.0	−2.1	−1.1	−1.2	−1.2
College labor input growth	5.5	6.6	5.9	5.8	4.0	1.6	0.5	3.3	−1.1	3.4	1.5	1.5	1.3
Non-college labor input growth	3.4	3.3	2.1	1.8	−0.8	−1.0	−1.3	−1.4	−2.4	0.0	−1.0	−1.1	−1.1
IT capital input growth	13.9	16.4	9.2	7.0	9.4	9.1	9.1	9.0	8.5	5.8	5.2	5.4	5.0
Non-IT capital input growth	6.2	5.3	4.6	6.0	7.0	6.4	6.7	6.4	5.7	6.6	5.9	6.1	5.7
Per-worker labor productivity growth	2.4	2.9	3.6	5.2	4.9	4.5	5.0	4.5	3.7	1.3	7.8	5.1	5.2
Per-hour labor productivity growth	2.5	3.0	3.3	5.0	5.1	3.9	5.2	3.7	3.6	2.6	8.1	5.4	5.4
Capital productivity growth	−6.5	−5.8	−4.8	−6.0	−7.1	−6.6	−6.9	−6.6	−5.8	−6.6	0.6	−2.3	−1.9
TFP growth	0.3	1.2	1.0	1.5	1.5	1.5	2.1	1.4	1.6	−2.9	4.4	1.6	1.8

Production

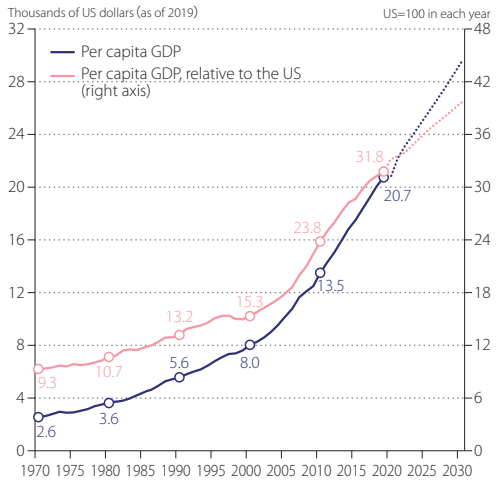

Figure 1 Per Capita GDP

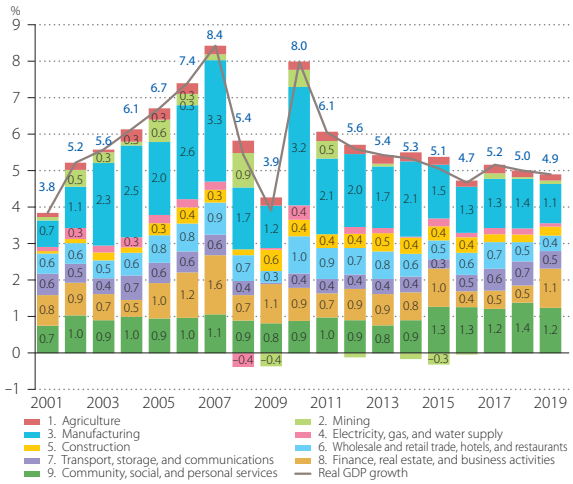

Figure 2 Industry Origins of Economic Growth

Labor

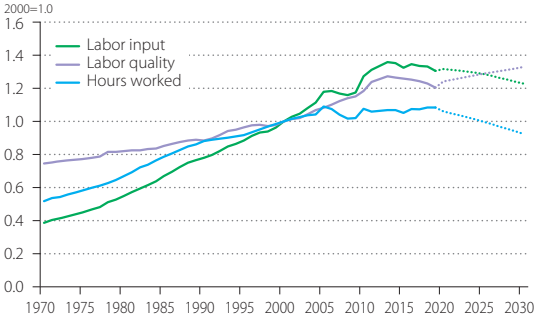

Figure 3 Labor Inputs

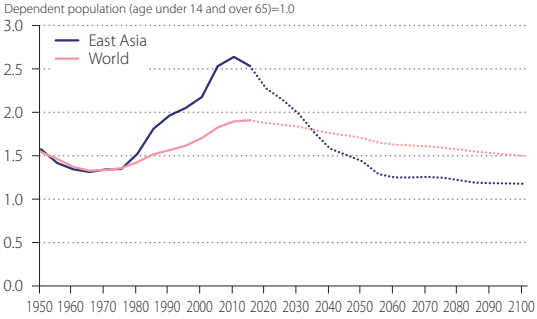

Figure 4 Demographic Dividend

Productivity

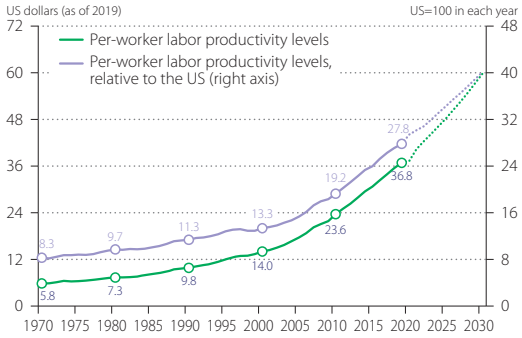

Figure 5 Per-Worker Labor Productivity Level

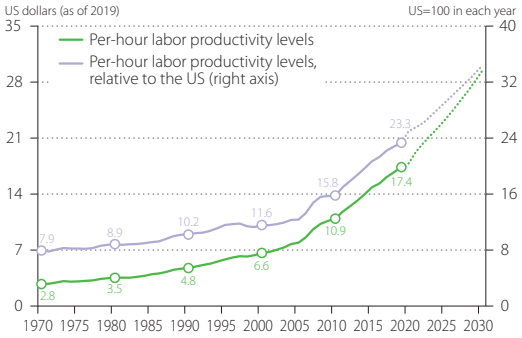

Figure 6 Per-Hour Labor Productivity Level

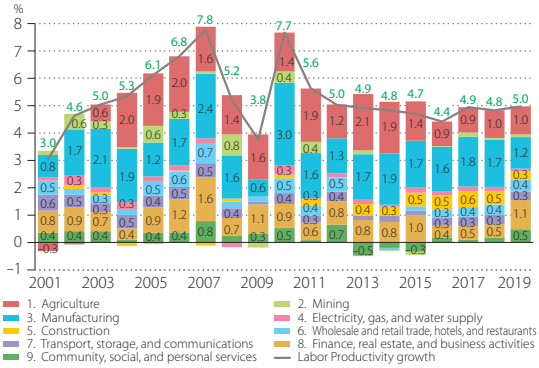

Figure 7 Industry Origins of Labor Productivity Growth

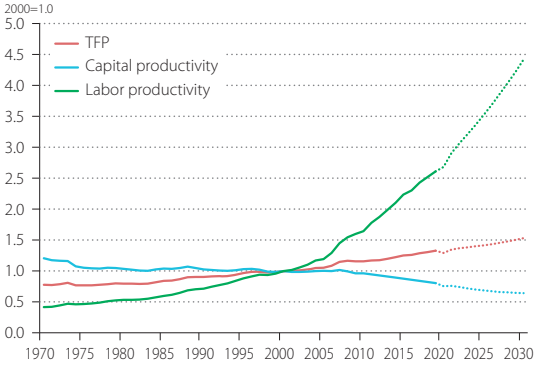

Figure 8 Productivity Indicators

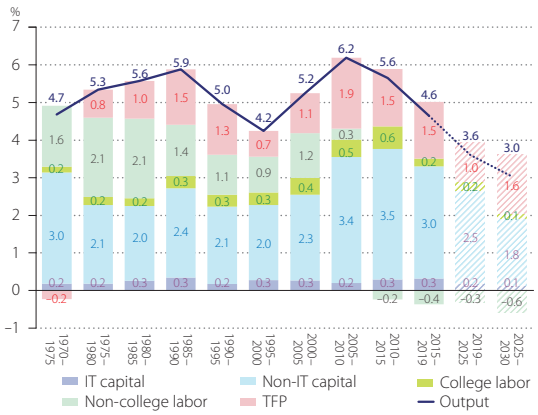

Figure 9 Decomposition of Economic Growth

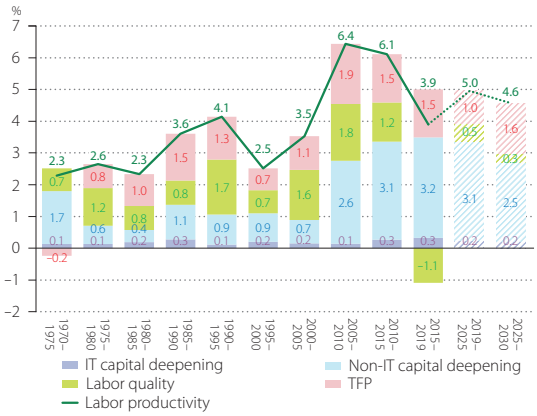

Figure 10 Decomposition of Labor Productivity Growth

South Asia

Key Indicators

GDP in 2019	11,695	Billions of US dollars (as of 2019)
(exchange rate based)	3,546	Billions of US dollars (as of 2019)
Per capita GDP in 2019	6.5	Thousands of US dollars (as of 2019)
(exchange rate based)	2.0	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	17.1	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	8.1	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	16.6	US dollars (as of 2019)
Energy productivity levels in 2018	14.5	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	n.a.	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	670,613	Thousands persons
Employment rate in 2019	37.4	%
Female employment share in 2019	26.2	%
Average schooling years of workers in 2019	6.2	Years
Investment share in 2019	29.1	%
ICT investment share in GFCF in 2019	5.7	%
Agriculture share in GDP in 2019	17.4	%
Manufacturing share in GDP in 2019	13.0	%
Agriculture share in employment in 2019	41.6	%

(%: average annual growth rate)	1970 –80	1980 –90	1990 –2000	2000 –10	2010 –19	2015 –19	2016 –17	2017 –18	2018 –19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	2.8	5.0	4.8	6.8	5.9	5.7	5.7	6.6	3.1	–6.3	6.6	5.6	5.6
Labor input growth	3.1	3.2	2.8	3.0	2.1	1.7	1.8	1.6	1.7	3.1	3.1	3.1	3.1
Labor quality growth	0.6	1.1	1.0	1.4	1.1	0.8	0.8	0.6	0.5	1.4	1.8	1.8	1.8
Hours worked growth	2.5	2.1	1.7	1.6	1.1	1.0	1.0	1.1	1.2	1.6	1.3	1.3	1.3
College labor input growth	9.7	7.4	5.6	5.6	2.8	2.5	2.4	2.5	2.5	3.8	4.1	4.0	3.9
Non-college labor input growth	2.5	2.5	2.0	2.0	1.8	1.4	1.5	1.3	1.3	2.7	2.7	2.7	2.6
IT capital input growth	10.3	15.1	13.8	15.2	13.2	14.2	14.5	14.5	14.0	6.5	5.4	5.7	5.8
Non-IT capital input growth	4.3	5.0	5.2	6.5	7.1	6.8	6.9	6.8	6.7	6.5	5.3	5.7	5.8
Per-worker labor productivity growth	0.2	3.4	3.4	5.0	4.9	4.9	5.6	4.9	2.9	–7.8	5.3	4.3	4.3
Per-hour labor productivity growth	0.3	3.3	3.4	4.9	4.8	5.0	5.7	5.1	2.9	–7.9	5.3	4.3	4.3
Capital productivity growth	–4.3	–5.1	–5.4	–6.7	–7.3	–7.0	–7.1	–7.0	–7.0	–13.1	1.0	–0.4	–0.4
TFP growth	–0.7	1.5	1.4	1.9	1.6	2.0	2.6	2.2	0.2	–10.5	2.8	1.7	1.7

Production

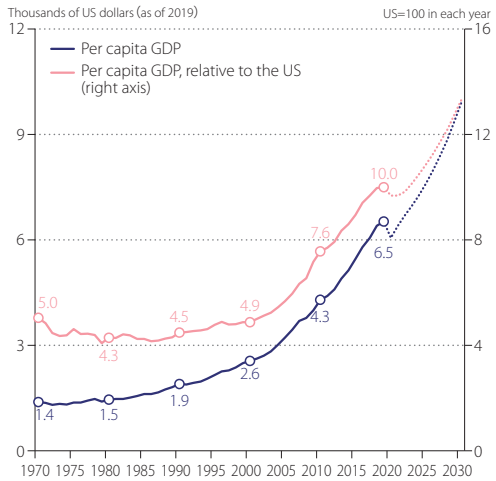

Figure 1 Per Capita GDP

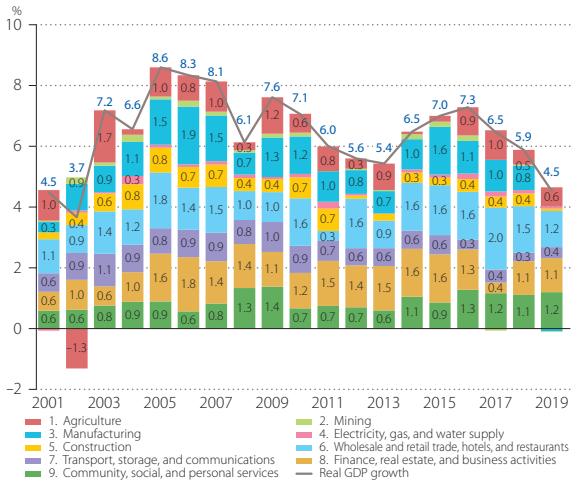

Figure 2 Industry Origins of Economic Growth

Labor

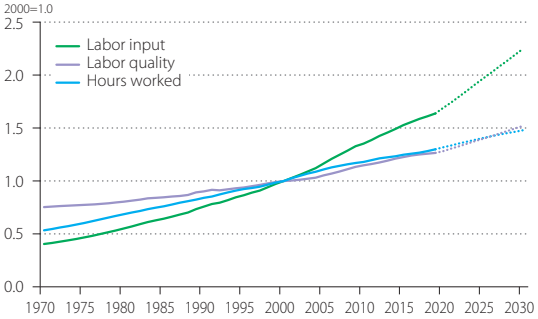

Figure 3 Labor Inputs

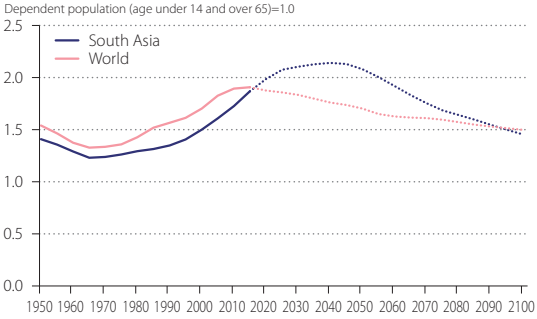

Figure 4 Demographic Dividend

Productivity

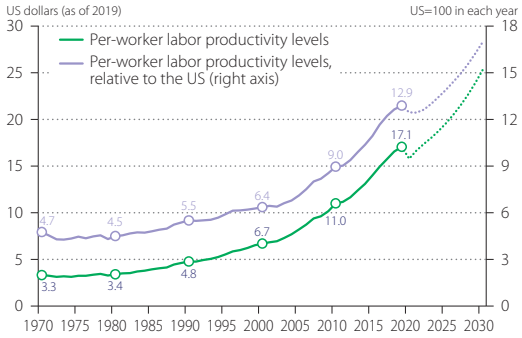

Figure 5 Per-Worker Labor Productivity Level

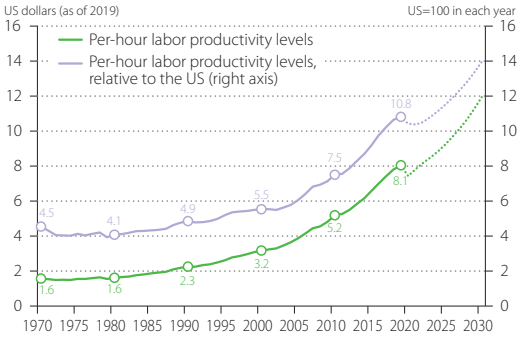

Figure 6 Per-Hour Labor Productivity Level

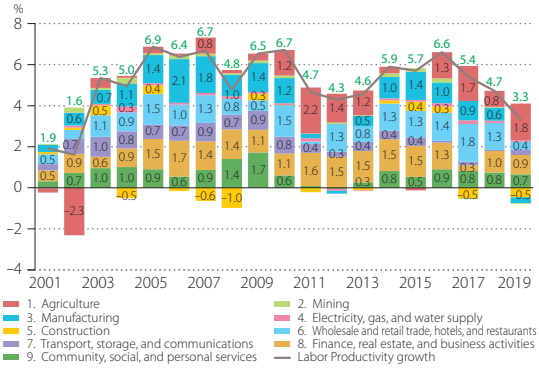

Figure 7 Industry Origins of Labor Productivity Growth

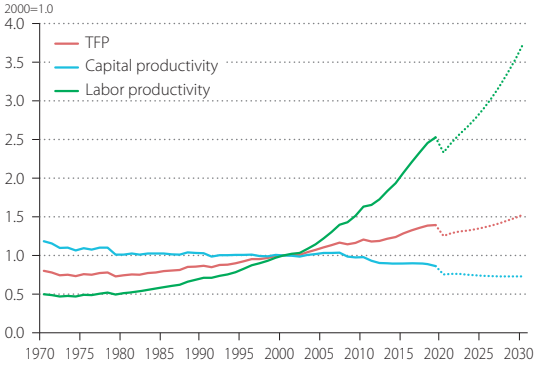

Figure 8 Productivity Indicators

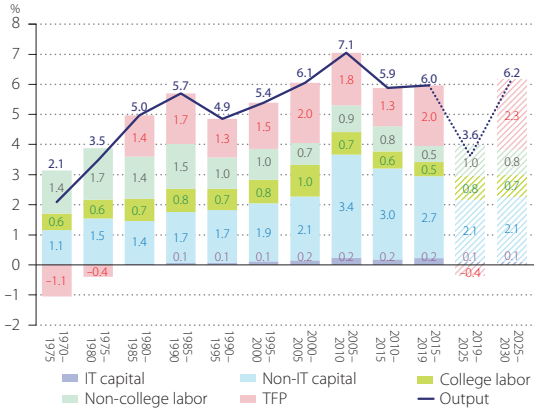

Figure 9 Decomposition of Economic Growth

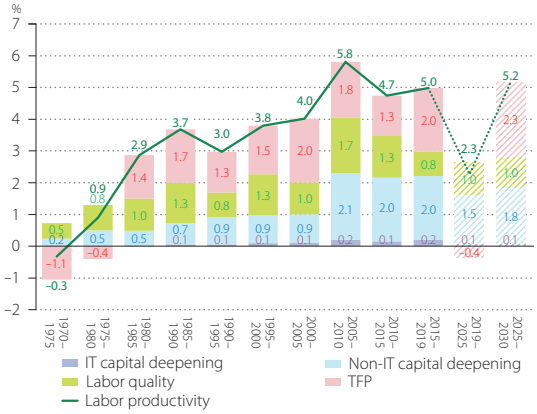

Figure 10 Decomposition of Labor Productivity Growth

ASEAN

Key Indicators

GDP in 2019	8,366	Billions of US dollars (as of 2019)
(exchange rate based)	3,158	Billions of US dollars (as of 2019)
Per capita GDP in 2019	12.8	Thousands of US dollars (as of 2019)
(exchange rate based)	4.8	Thousands of US dollars (as of 2019)
Per-worker labor productivity level in 2019	25.3	Thousands of US dollars per worker (as of 2019)
Per-hour labor productivity level in 2019	12.0	US dollars per hour worked (as of 2019)
Capital stock per hour worked in 2019	30.8	US dollars (as of 2019)
Energy productivity levels in 2018	16.9	Thousands of US dollars per toe (as of 2019)
Carbon intensity of GDP in 2018	n.a.	g-CO2 per US dollar (as of 2019)

Number of employment in 2019	321,627	Thousands persons
Employment rate in 2019	49.2	%
Female employment share in 2019	42.1	%
Average schooling years of workers in 2019	8.5	Years
Investment share in 2019	28.8	%
ICT investment share in GFCF in 2019	7.5	%
Agriculture share in GDP in 2019	10.7	%
Manufacturing share in GDP in 2019	20.7	%
Agriculture share in employment in 2019	28.9	%

(%: average annual growth rate)	1970–80	1980–90	1990–2000	2000–10	2010–19	2015–19	2016–17	2017–18	2018–19	projection 2019–20	2020–21	2021–22	2020–25
GDP growth	6.8	5.4	4.9	5.1	4.8	4.8	5.2	5.0	4.2	–3.7	3.6	4.7	3.9
Labor input growth	4.9	4.5	4.2	4.2	3.3	3.2	1.4	2.6	3.5	3.4	3.2	3.0	2.9
Labor quality growth	1.1	1.5	2.2	2.2	2.3	1.7	1.1	1.3	1.5	2.2	2.2	2.1	2.0
Hours worked growth	3.8	3.1	2.0	2.0	1.1	1.5	0.3	1.3	2.0	1.3	1.0	0.9	0.9
College labor input growth	7.2	7.8	6.2	5.9	5.7	4.4	4.1	2.3	4.7	4.8	4.3	4.2	4.0
Non-college labor input growth	4.6	3.8	3.6	3.5	1.9	2.5	–0.4	2.8	2.7	2.6	2.4	2.3	2.2
IT capital input growth	14.5	17.4	12.8	11.4	10.6	8.9	9.8	9.7	7.2	5.6	4.7	4.6	4.6
Non-IT capital input growth	6.6	6.5	6.8	3.9	5.4	5.5	5.5	5.4	5.3	5.8	5.0	4.9	4.8
Per-worker labor productivity growth	3.3	2.1	3.0	3.0	3.3	2.9	4.0	3.1	2.6	–4.6	2.5	3.6	2.9
Per-hour labor productivity growth	2.9	2.4	2.8	3.1	3.7	3.3	4.9	3.8	2.1	–4.9	2.6	3.8	3.0
Capital productivity growth	–6.7	–6.6	–6.9	–4.2	–5.5	–5.5	–5.5	–5.5	–5.3	–9.8	–1.7	–0.4	–1.1
TFP growth	0.7	–0.4	–1.0	0.9	0.2	0.2	1.4	0.7	–0.5	–7.9	–0.1	1.1	0.4

Production

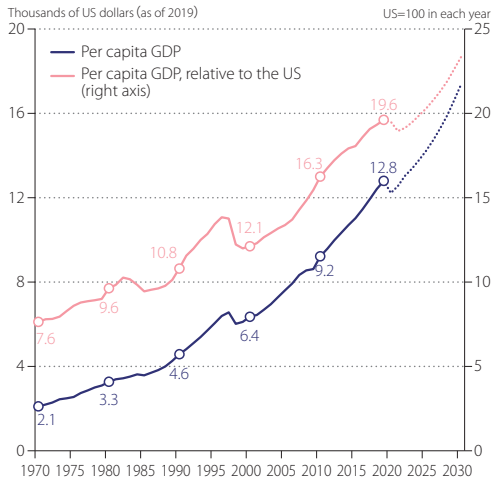

Figure 1 Per Capita GDP

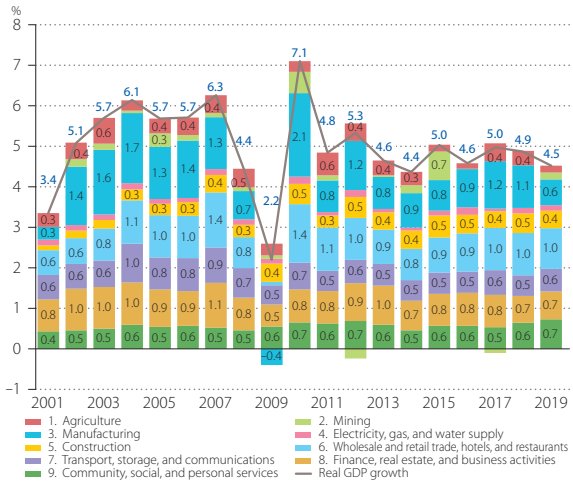

Figure 2 Industry Origins of Economic Growth

Labor

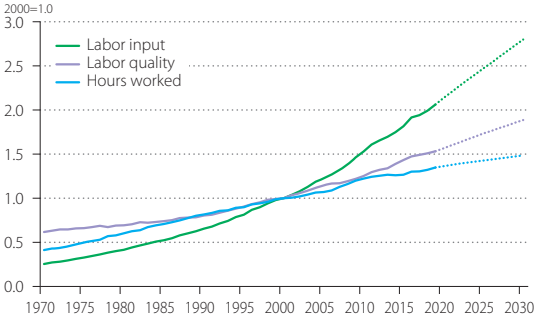

Figure 3 Labor Inputs

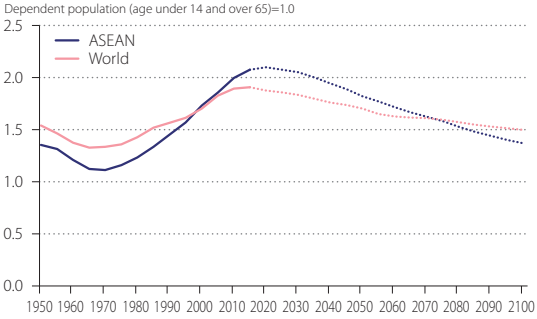

Figure 4 Demographic Dividend

Productivity

Figure 5 Per-Worker Labor Productivity Level

Figure 6 Per-Hour Labor Productivity Level

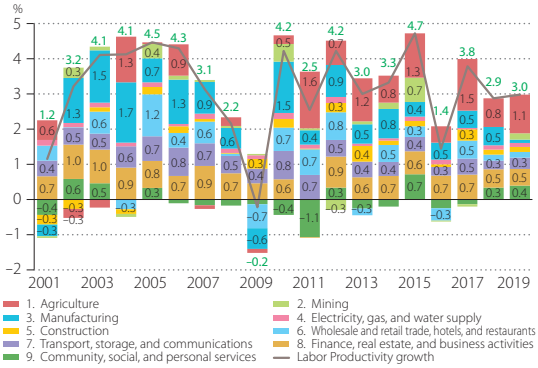

Figure 7 Industry Origins of Labor Productivity Growth

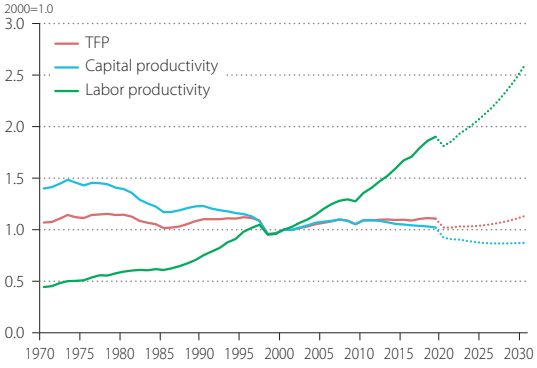

Figure 8 Productivity Indicators

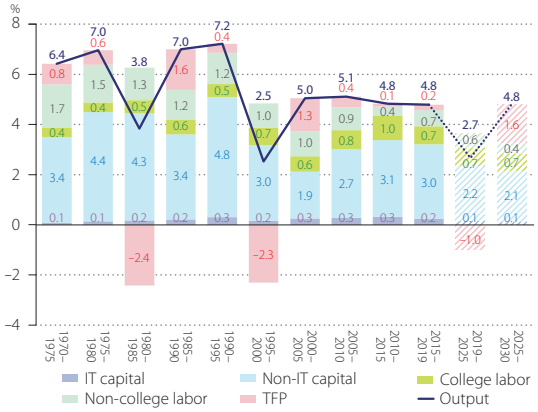

Figure 9 Decomposition of Economic Growth

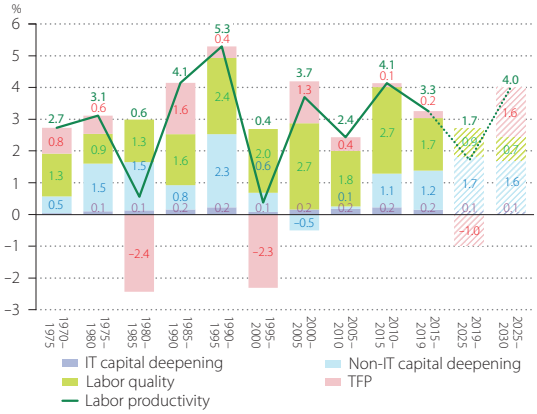

Figure 10 Decomposition of Labor Productivity Growth

9 Methodological Note

9.1 Measurement of Output

9.1.1 SNA Compilation

Understanding data comparability is essential for the construction of an international database and requires continuous effort and expert knowledge. Broadly speaking, cross-country data inconsistency can arise from variations in one or more of the three aspects of a statistic: definition, coverage, and methodology. The international definitions and guidelines work to standardize countries' measurement efforts. However, country data can deviate from the international best practice and vary in terms of omissions and coverage achieved. Countries can also vary in their estimation methodology and assumptions in benchmark and/or annual revisions. This may account for part of the differences observed in the data, as well as interfere with comparisons of countries' underlying economic performance.

Between February and June in 2021, the APO Productivity Database project conducted the Metadata Survey 2021 on the national accounts and other statistical data required for international comparisons of productivity among the APO member economies. Since most of the economic performance indicators in this report are GDP-related, the surveys put much emphasis on discerning countries' GDP compilation practices. The 2008 SNA is used as the standard, noting how countries' practices deviate from it. Since there are differences between the 2008 SNA and its predecessors (1993 SNA or 1968 SNA) in some concepts and coverage, it is important to know in which year the data series definitions and classification started to switch over. This allows identification in breaks in the time series.

Figure 77 presents the current situation in compilations and data availability of the backward estimates based on the 1968 SNA, the 1993 SNA, and the 2008 SNA (including the plan for introducing the 2008 SNA), based on our Metadata Survey 2021 and our further investigation at KEO. For example, this chart indicates that Japan started to publish national accounts based on the 1968 SNA in 1978 (at present, backward estimates based on the 1968 SNA are available from 1955), national accounts based on the 1993 SNA in 2000 (backward estimates based on the 1993 SNA are available from 1980 to 2014), and national accounts based on the 2008 SNA in 2016 (backward estimates based on the 2008 SNA are available from 1994 to present).

Countries differ in their year of introduction, the extent of implementation, and the availability of backward estimates, as Figure 77 suggests. In the Asia25, 17 economies are currently 2008 SNA compliant (partially or fully). The starting year of the official 2008 or 1993 SNA compliant time series varies a great deal across countries, reflecting the differences in the availability of backward estimates. Countries may have adopted the 2008/1993 SNA as the framework for their national accounts, but the extent of compliance in terms of coverage may also vary. The APO Productivity Database tries to reconcile the national accounts variations, in order to provide harmonized estimates for international comparison. See Section 9.1 for details of the adjustments.

The Databook incorporates some significant revisions to the national accounts. Recent developments for upgrading their national accounts based on the 2008 SNA have resulted in Sri Lanka as of March 2016, Thailand as of May 2016, Japan and Turkey as of December 2016, Iran as of August 2017. In Vietnam and Cambodia, a similar revision is planned as of December 2021. As discussed in Appendix 1, 17 economies of the Asia25 are 2008 SNA-compliant and others are 1993 SNA-compliant, although it should be noted that the extent of compliance in terms of coverage may vary. The different statuses of SNA adaptions among economies explain the huge variations of data definitions and coverage in national accounts, calling for data harmonization to better perform comparative productivity analyses.

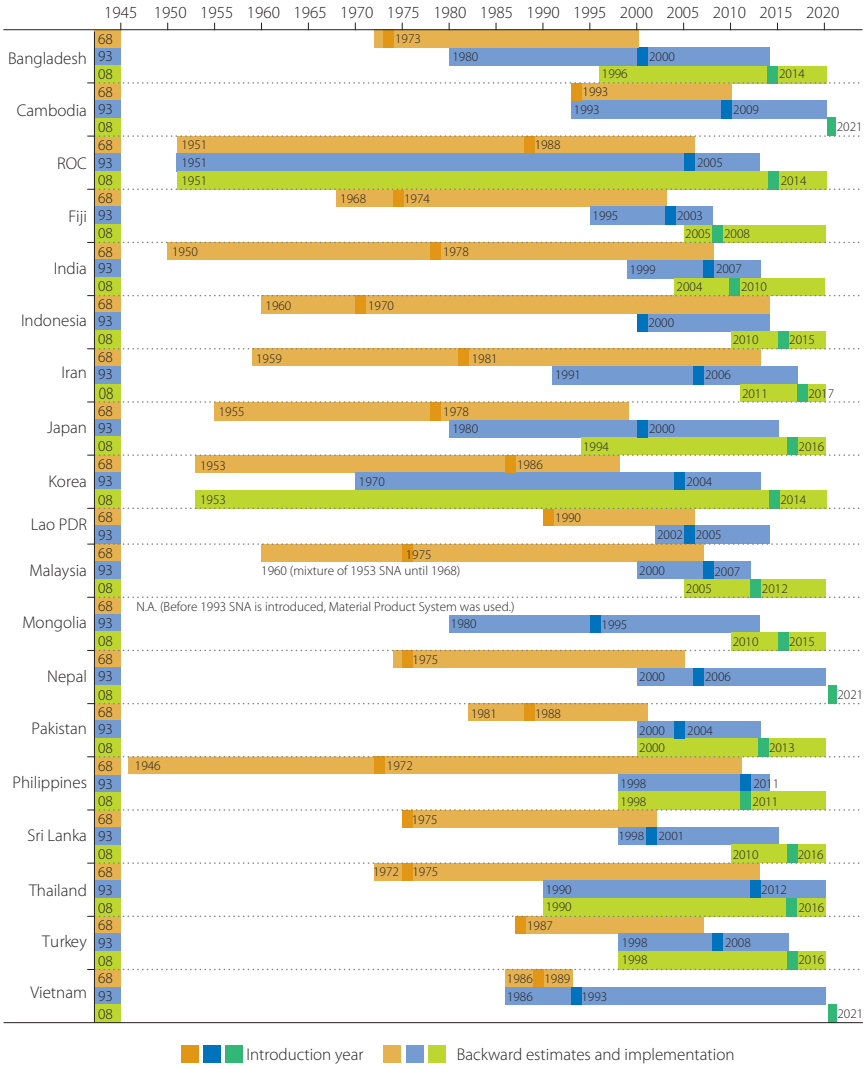

Figure 77 Implementation of the 1968, 1993, and 2008 SNA

Sources: APO Metadata Survey 2021 and our investigation at KEO.

This edition of the Databook largely follows the concepts and definitions of the 2008 SNA and tries to reconcile the national accounts variations, in particular on the difference in the treatment of research and development (R&D), military weapon systems, software investment, and financial intermediation services indirectly measured (FISIM).[58] In order to create long-time series data, it is necessary to use the past estimates based on the 1968/1993 SNA, with exceptions in the ROC, Korea, and Singapore, who already published the backward estimates based on the 2008 SNA from the 1950s or 1960. In addition, some additional adjustments are necessary to harmonize the long-term estimates of GDP at current prices. Procedures for these adjustments in the APO Productivity Database 2021 are explained below.

58: The introductions of the 2008 SNA are usually conducted with the benchmark revisions. Thus, in some countries there are large revisions in data due to the uses of the newly available survey (e.g., a new survey on services) or of the new benchmark data (e.g., a new development of the supply and use table), not largely due to the revisions from the 1993 SNA. The information required to reconcile the different benchmark-year series is collected for through our questionnaire to the national experts in our metadata survey or based on our investigation at KEO.

9.1.2 Consumption of FISIM

FISIM is an indirect measure of the value of financial intermediation services provided. It represents a significant part of the output of the finance sector. The 1993 SNA (United Nations, 1993) recommends that FISIM should be allocated to users (to individual industries and final demands). This contrasts with the 1968 SNA, where the imputed banking services were allocated exclusively to the business sector. The common practice was to create a notional industry that buys the entire service as an intermediate expense and generates an equivalent negative value added. As such, the imputed banking services have no impact on GDP. Therefore, the 1993/2008 SNA recommendation, if fully implemented, will impact industry GDP and the overall GDP for the total economy (by the part of FISIM allocated to final demands).

Among the 21 APO member economies, three countries – Cambodia, the Lao PDR, and Nepal – do not allocate FISIM to final demands in their official national accounts, because they do not follow the 1993/2008 SNA recommendation. Thus, the official estimates of GDP in these countries are smaller than others by definition. In addition, in the countries whose national accounts follow the 1993/2008 SNA's recommendation on FISIM, sometimes the available data does not cover the entire periods of our observations.

To harmonize the GDP concept among countries and over periods, final demands of FISIM are estimated for those countries in the APO Productivity Database, using available estimates of value added in Imputed Bank Service Charge (IBSC) or financial intermediation (in instances where IBSC data is not available). The ratios of value added of IBSC or financial intermediation on FISIM allocated to final demand are assumed to be identical with the average ratios observed in the countries in which data is available. Figure 78 describes the countries, years, and methods to adjust FISIM in the official national

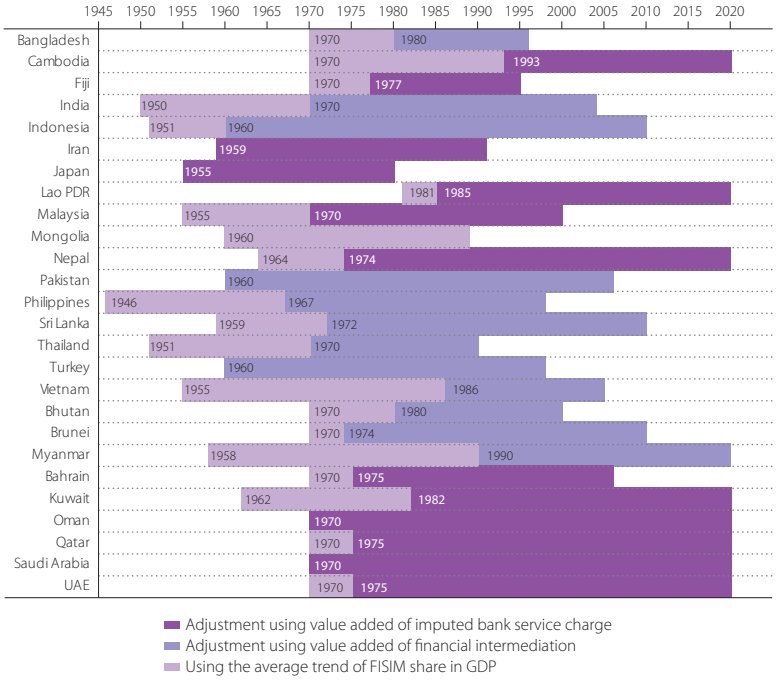

Figure 78 Adjustment of FISIM

Sources: APO Metadata Survey 2021 and our investigation at KEO.

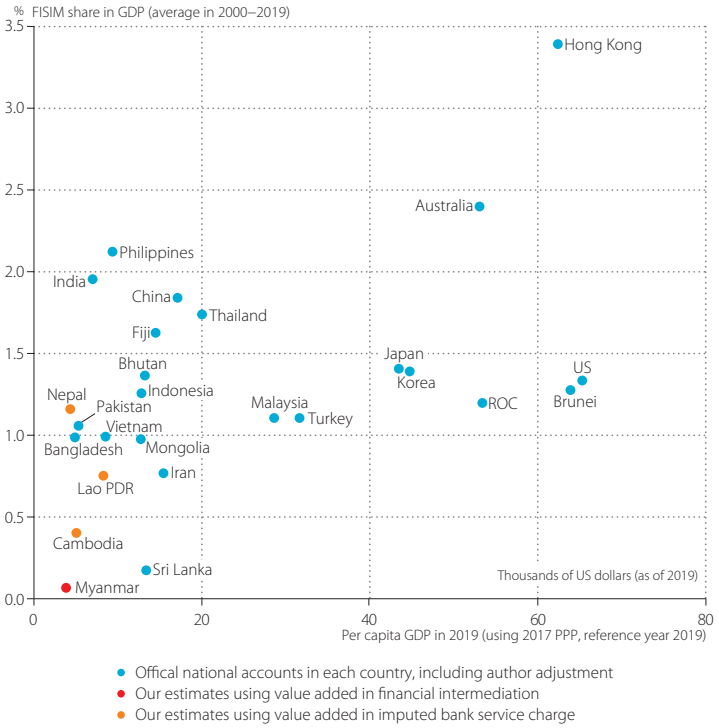

Figure 79 FISIM Shares in GDP
——Average shares of FISIM production in GDP at current market prices in 2000–2019

Sources: Official national accounts in each country and author estimates.

accounts. As described, in instances where both value-added data are not available, the trend of the FISIM share on GDP is applied to extrapolate past estimates (although the impacts on GDP are minor).

Figure 79 plots per capita GDP levels in 2019 and the FISIM share in GDP as an average in 2000–2019 (including both of the original estimates in the official national accounts and our estimates). In countries where GDP at current prices is adjusted, the proportions by which author adjustments for FISIM increases GDP stand at 0.8–1.2% for Nepal and the Lao PDR and less than 0.4% GDP in others.

9.1.3 Government Consumption

Definitions of government output can differ among countries and periods. For example, as of February 2012, Thailand officially switched to the 1993 SNA, and its national accounts became compatible with the 1993 framework for the first time. In this series, government consumption includes the consumption of fixed capital (CFC) owned by the government since 1990, as described in Figure 77. To construct the long time-series data in the Databook series, the past data based on the 1968 SNA has been adjusted to be consistent with the new series. In the APO Productivity Database, government capital stock and its CFC for the period 1970–1989 are estimated and the past government consumption and GDP at current prices are adjusted accordingly. A similar adjustment on the CFC of the assets owned by government was conducted for Bangladesh (for the period 1970–1995), Malaysia (1970–1999), and Mongolia (1970–2004).

Another harmonization is conducted in the price for government consumption, which consists primarily of non-market products. In the APO Productivity Database, the quality of the official price index for government consumption has been examined in each country, compared to our own cost-index estimate for government consumption based on our quality-adjusted price indices of capital and labor inputs. For the countries in which the official estimates fluctuate in unrealistic ways, those are replaced by our cost-index estimates. This revision may yield modest impacts on the real GDP growth rates, as one of the differences between the official estimates and the APO Productivity Database.

9.1.4 Software Investment

The 2008 SNA recommends the capitalization of intellectual property products (IPP), which changes not only GDP but also capital input. One of the IPP capitalized in the Databook is computer software, which includes pre-packaged software, custom software, and own-account software. Among the Asia25 economies, 16 economies have capitalized all three types of software in the most recent national accounts. Another three countries exclude own-account software in their capitalization, and in two countries (Indonesia and Sri Lanka), only custom software is capitalized (others still do not capitalize software in their national accounts). In addition, the availability of the official estimates on software investment varies considerably among countries and over periods. Figure 80 presents the availability of the official estimates in the national accounts and the benchmark SUT/IOT, based on the APO Metadata Survey 2021 and our investigation at KEO.

The Databook tries to include all software as assets for better harmonization, even in the countries and the periods in which the official estimates were not available. This edition reflects the new estimates on

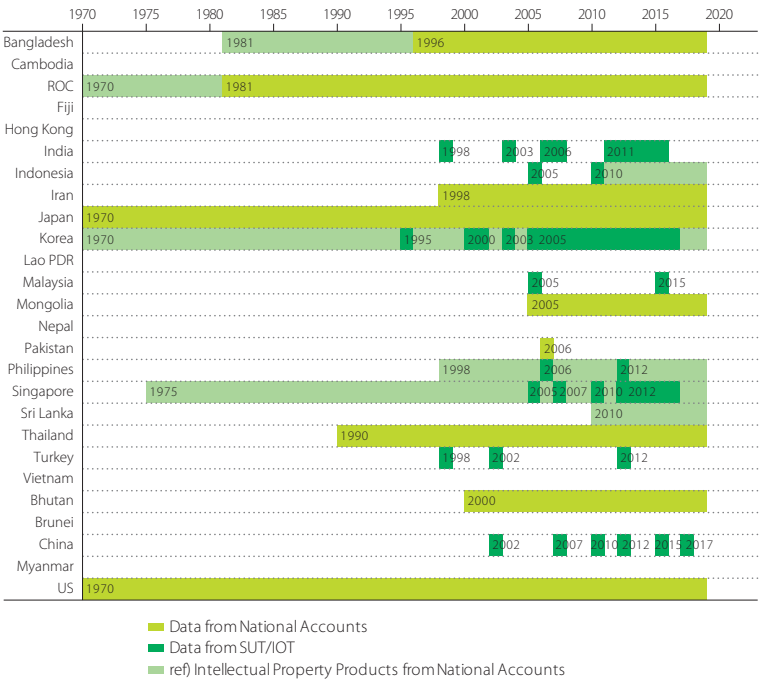

Figure 80 Availability of Software Investment Estimates

Sources: APO Metadata Survey 2021 and our investigation at KEO.

software investment, developed in the APO Productivity Database 2021.[59] First, the labor cost of the domestically produced software is estimated based on the number of workers in software development, which is defined as the sum of 25.Information and communications technology professionals and 35. Information and communications technicians based on the International Standard Classification of Occupations 2008 (ISCO-08), and the corresponding average wages in ILO (2020). Based on this gross measure of labor cost, the deduction rates are assumed to exclude the hours worked not for software development. In addition, by assuming the non-labor cost shares (based on the experiences in other countries, in which the cost compositions in software industry are available in their SUT/IOT), the total domestic output is estimated. Second, the value of imported software is assumed to be the same as the import of "computer services" recorded in Balance of Payment in WTO (2020). The sum of the domestically produced and imported software values is used to extrapolate the official estimates of software investment (Figure 80) or simply used as the software investment in each country.

The impacts of this revision are presented in Figure 81 as the changes in software share in investment every ten years during 1970–2018 and in Figure 82 as the changes in software share in net capital stock as of the beginning of 2018. Software investment in this edition was revised upwardly in China, India, Malaysia, and Pakistan and downwardly in Cambodia, Indonesia, Lao PDR, and Vietnam.

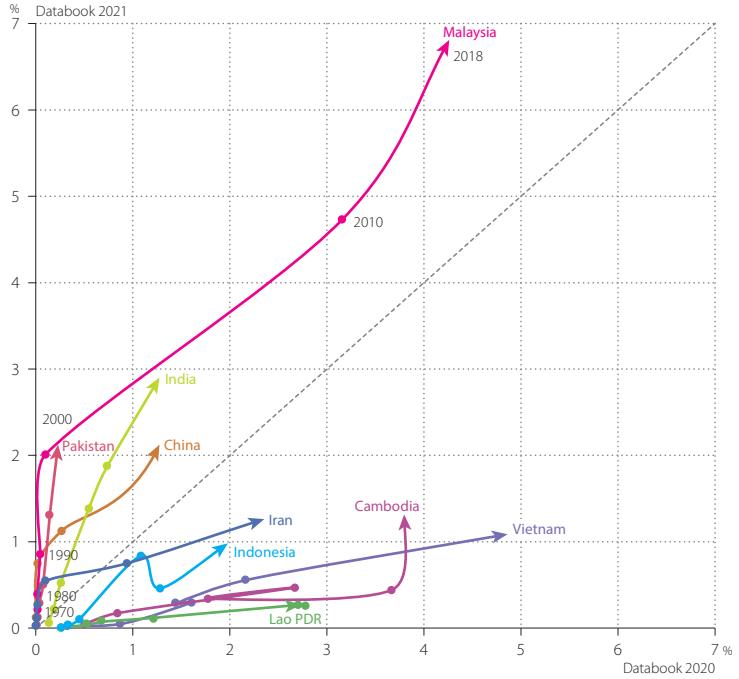

Figure 81 Software Investment Revision
——Software shares to GFCF in every ten years during 1970–2018

Sources: APO Productivity Database 2020 and 2021. Note: The countries, in which the revision had a small impact, are excluded.

59: Until the previous editions of the Databook, the crude estimates based on other countries' experiences on the software share to GFCF have been used.

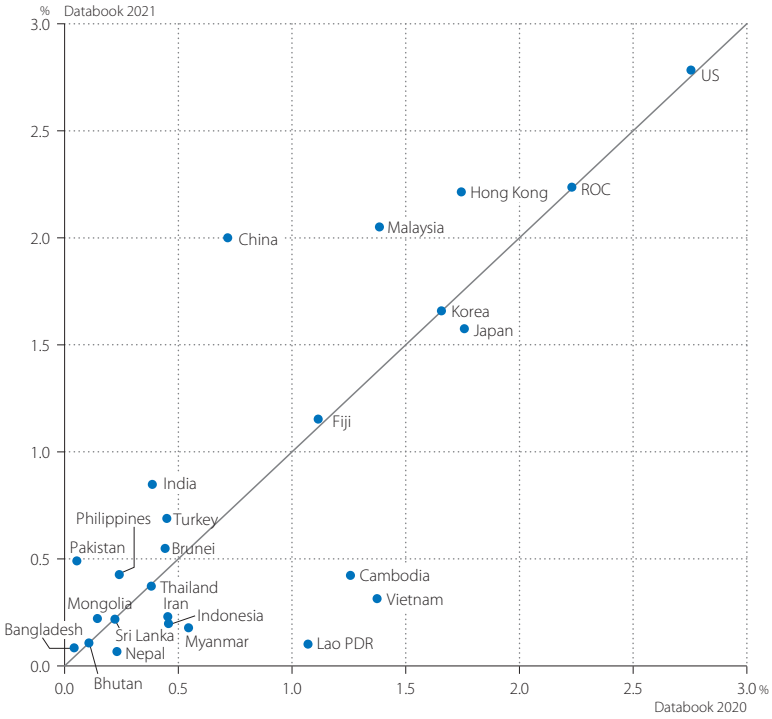

Figure 82 Software Stock Revision
——Software stock shares to the beginning-of-period net capital stock in 2018

Sources: APO Productivity Database 2020 and 2021. Note: This comparison includes the changes not due to our revisions.

9.1.5 R&D Investment

The R&D is capitalized in the Databook by following the 2008 SNA recommendations. In the countries that still do not follow the 2008 SNA, the R&D expenditures are not allocated to GFCF (but to intermediate uses). To harmonize the GDP concept among countries and over periods, the R&D investment is estimated for those countries in the APO Productivity Database. As a preferable approach, the data on the R&D expenditure are collected based on the official surveys in each country, to estimate the R&D investment. Figure 83 describes the countries, years, and methods to estimate R&D investment and adds it to GFCF in the official national accounts. If the data on R&D expenditures are not available, as a crude estimate, the trend of R&D investment shares on GFCF or GDP are applied to extrapolate past estimates, using the other countries' experiences. Although the countries with no data on R&D expenditure tend to have the smaller shares, further examinations may be required in the future.

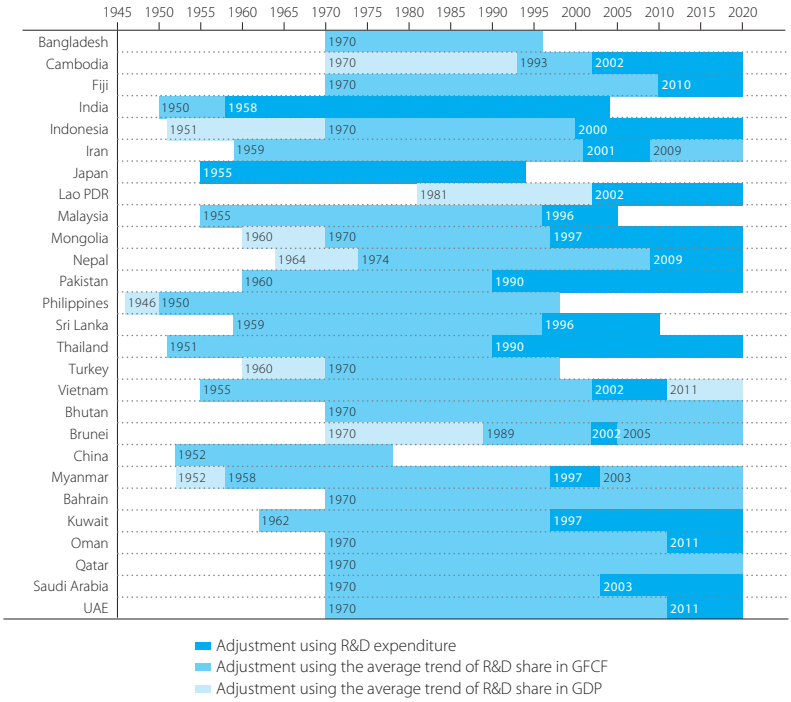

Figure 83 Adjustment of R&D

Source: APO Productivity Database 2021.

9.1.6 Net Acquisitions of Valuables

Valuables are defined as "goods of considerable value that are not used primarily for purposes of production or consumption but are held as stores of value over time" (United Nations 1993, para. 10.7).[60] They are defined as the third type of produced non-financial assets, after fixed assets and inventory. Based on the APO Metadata Survey 2021 and our investigation at KEO, net acquisitions (acquisitions less disposals) of valuables are recorded as the final demand in ten countries in Asia, such as Bhutan, India, Iran, Korea, Malaysia, Mongolia, Philippines, ROC, Sri Lanka, and Vietnam. For example, the SNA in India has included it since 1999. However, the estimates of net acquisitions of valuables are not separately published (within the changes in inventories) in Korea, Malaysia, and ROC. The current decision in the Databook is to harmonize the data by excluding net acquisitions of valuables from GDP.

9.1.7 Basic-Price GDP

GDP can be valued using different price concepts: factor cost, basic prices, and market prices. If the price concept is not standardized across countries, it will interfere with the international comparisons. All the countries covered in this Databook officially report GDP at market prices (or at purchasers' prices), but this is not true for GDP at factor cost and GDP at basic prices. International comparisons in Chapter 3 and Chapter 4 are based on GDP at market prices. However, by valuing output and input at the prices that producers actually pay and receive, GDP at basic prices is a more appropriate measure of countries'

60: They are held under the expectation that their prices will not deteriorate and will rise in the long run. Valuables consist of precious stones and metals such as diamonds; artwork such as paintings and sculptures; and other valuables such as jewelry made from stones and metals.

output for international comparisons of TFP and industry performance, as it is a measure from the producers' perspective. Hence, Chapter 5 on productivity performance is based on GDP at basic prices, including our estimates.

These concepts of GDP differ in the treatment of indirect tax and subsidies (and import duties). The difference between GDP at basic prices and GDP at market prices is "taxes on products" minus "subsidies on products."[61] Since GDP at basic prices is available for some economies in Asia, such as Hong Kong, India, Korea, Mongolia, Nepal, Singapore, and Sri Lanka, a GDP at basic prices calculation, needs to be constructed for all other countries. To obtain GDP at basic prices, "taxes on products" and "duties on imports" are subtracted from GDP at market prices, which are available for all the countries studied, and "subsidies on products" is added. The main data sources for estimating "taxes on products" and "subsidies on products" are tax data in national accounts, the IMF's Government Finance Statistics, and the SUT/IOT in each country (Table 3).

Readers should bear in mind these caveats when interpreting the results in Chapter 6, since the definition of GDP by industry differs among countries due to data availability. GDP is valued at: factor cost for Fiji, and Pakistan; basic prices for Bangladesh, Cambodia, Hong Kong, India, Korea, the Lao PDR, Mongolia, Nepal, Singapore, and Vietnam; producers' prices for Iran, the ROC, and the Philippines; and market prices for Indonesia, Japan, Malaysia, Sri Lanka, Thailand, and Turkey. In this sense, the industry data provided in the Databook series should be treated as a work in progress, as it is difficult to advise on data uncertainty. These issues will be examined in the future.

Table 3 SUT/IOT in Asia

	Input-Output Tables and Supply and Use Tables
Bangladesh	1981/1982, 1986/1987, 1992/1993, 1993/1994, 2000, 2005/2006, 2010/2011
Cambodia	2003**, 2005*, 2010–2017*
ROC	Benchmark (1981, 1986, 1991, 1996, 2001, 2004, 2006, 2011, 2016) Extended (1984, 1989, 1994, 1999, 2004) Annual (2006–2019)
Fiji	1972, 1981, 2002, 2005, 2008, 2011
India	1993/1994, 1998/1999, 2003/2004, 2006/2007, 2007/2008, 2011/2012, 2012/2013, 2013/2014, 2014/2015, 2015/2016
Indonesia	1971, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010
Iran	1962, 1973, 1974, 1986, 1988, 1991, 1999, 2001, 2004, 2011
Japan	1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2011, 2015
Korea	Benchmark (1960, 1963, 1966, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015) Updated (1973, 1978, 1983, 1986-1988, 1993, 1998, 2003, 2006–2018)
Lao PDR	2012, 2010–2017*
Malaysia	1978, 1983, 1987, 1991, 2000, 2005, 2010, 2015
Mongolia	Benchmark (1963, 1966, 1970, 1977, 1983, 1987, 1997, 2000, 2005, 2010) Annual (2010–2018)
Nepal	2004, 2010
Pakistan	1975/1976, 1984/1985, 1989/1990, 1999/2000
Philippines	1961, 1965, 1969, 1974, 1979, 1985, 1988, 1994, 2000, 2006, 2012
Singapore	1973, 1978, 1983, 1988, 2000, 2005, 2007, 2010, 2012, 2013, 2014, 2015, 2016
Sri Lanka	2006, 2010
Thailand	1975, 1980, 1985, 1990, 1995, 1998, 2000, 2005, 2007, 2010, 2015
Turkey	1973, 1979, 1985, 1990, 1996, 1998, 2002, 2012
Vietnam	1989, 1996, 2000, 2007, 2012
China	Benchmark (1987, 1992, 1997, 2002, 2007, 2012, 2017) Updated (2000, 2005, 2010, 2015)
Bhutan	2007
Brunei	2005, 2010, 2010–2017*

Source: APO Productivity Database 2021. Note: These SUT/IOT are collected and used in development of APO Productivity Database 2021. The Databook 2021 newly reflects the SUT/IOT of China for 2000, 2005, 2010, 2015, and 2017, the ROC for in 2018 and 2019, Mongolia for annual IO (2010–2018), Nepal for 2004 and 2016, Singapore for 2016, Sri Lanka for 2010, and Thailand for 2015. *ADB (2018), **Kobayashi et al. (2012).

61: "Taxes on products" are the indirect taxes payable on goods and services mainly when they are produced, sold, and imported, and "subsidies on products" are subsidies payable on goods and services mainly when they are produced, sold, and imported.

9.2 Measurement of Capital Input

9.2.1 GFCF by Type of Assets

Quality changes in the aggregate measure of capital input can originate from two kinds of sources, namely the composition changes in capital stock by type of asset, and the quality improvement in each type of asset. To take the composition change of assets into account, the APO Productivity Database 2021 classifies 16 types of assets: 11 types of fixed assets, four types of land, and inventory. And the fixed assets consist of three types of B&C (building and construction), five types of M&E (machinery and equipment), and three types of IPP (intellectual property products). The classification of fixed assets and land will be provided in Table 4 in Section 9.2.2 and Table 5 in Section 9.2.5, respectively.

However, the detailed investment data is not always available in the official national accounts. Figure 84 presents the availability of GFCF data in the national accounts or benchmark SUT/IOT by country. The SUT/IOT used in the APO Productivity Database 2021 is listed in Table 3 in Section 9.1.7. For countries in which detailed investment data is not available from national accounts, 11 types of investment data are estimated based on the benchmark and annual SUT/IOT and our own estimates on the production data for B&C and the product flow of domestic production and export/import of assets for M&E. The IPP is based on the estimates in Sections 9.1.4 and 9.1.5.

In particular, when the division for three types of B&C is difficult for the countries, in which the detailed construction data is not available, they are still crude estimates based on other countries' experiences in this Databook. Readers are cautioned about data uncertainty and should expect that the decomposition of contributions of capital services into IT and non-IT capital may be revised for some countries when more reliable data sources for estimation will become available.

9.2.2 Fixed Assets Stock

About half of APO member economies publish estimates of capital stocks in their systems of national accounts. Even where official estimates are available, users must be mindful of differences in methodologies and assumptions used to estimate capital stock and its consumption, as well as a large diversity in the treatment of quality adjustment in price statistics among countries. In the APO Productivity Database 2021, a harmonized framework is applied in estimating capital stock and capital services, covering the Asia25 economies and the US as a reference country. The geometric approach is used to measure net capital stock.[62] The standard parameters on geometric depreciation rates are assumed in Table 4, by the country groups (D1–D6) that are defined in Table 2 in Section 6.1.

Table 4 Depreciation Rates of Fixed Assets

asset code	δ					
	D1	D2	D3	D4	D5	D6
1. IT hardware	0.294	0.294	0.294	0.294	0.294	0.294
2. Communications equipment	0.246	0.246	0.246	0.246	0.246	0.246
3. Transportation equipment	0.219	0.219	0.162	0.138	0.138	0.138
4. Other machinery and equipment and weapon systems	0.178	0.178	0.138	0.117	0.117	0.117
5. Dwellings	0.049	0.049	0.041	0.037	0.033	0.033
6. Non-residential buildings	0.084	0.084	0.062	0.056	0.050	0.045
7. Other structures	0.026	0.026	0.019	0.018	0.017	0.016
8. Cultivated biological resources	0.215	0.215	0.202	0.161	0.145	0.131
9. Research and development (R&D)	0.190	0.190	0.180	0.162	0.162	0.162
10. Computer software	0.330	0.330	0.330	0.330	0.330	0.330
11. Other intellectual property products	0.270	0.270	0.270	0.270	0.270	0.270

Source: APO Productivity Database 2021. Note: See Table 2 in Section 6.1 for the country groups (D1–D6). B&C, IPP, and M&E consists of asset code: 5–7, 9–11, and the others, respectively.

62: In this edition of the Databook, the damages by natural disasters were newly reflected in capital stock measurement of produced assets. See Box 6 for the impacts on the productivity accounts by this revision.

Figure 84 Availability of GFCF Estimates

Sources: Official national accounts and SUT/IOT in each country. Note: B&C is building and construction, M&E is machinery and equipment, and IPP is intellectual property products. The numbers indicate the available number of the types in each of B&C, M&E, and IPP. The parenthesis indicates the data but the national accounts and SUT/IOT.

It is well known that prices of constant-quality IT capital have been falling rapidly. For cross-country comparisons, it has been noted that there is great disparity in the treatment of quality adjustment in price statistics among countries. Cross-country comparisons will be significantly biased if some countries adjust their deflators for quality change while others do not. Price harmonization is sometimes used to control for methodological differences in the compilation of price indexes, under the assumption that individual countries' price data fails to capture quality improvements. If the relative price of IT to non-IT capital in the countries compared is set equal to the IT to non-IT prices relative in the reference country, the harmonized price is formulated as: $\Delta \ln \tilde{P}_{IT}^{X} = \Delta \ln P_{nIT}^{X} + (\Delta \ln P_{IT}^{ref} - \Delta \ln P_{nIT}^{ref})$, where the superscript X denotes the country included in the comparisons, P_{IT} is the price of IT capital, and P_{nIT} is the price of non-IT capital. The price of IT capital in country X, $\tilde{P}_{IT}^{X}$, is computed by the observed prices P_{IT}^{ref} and P_{nIT}^{ref} in the reference country and P_{nIT}^{X} in X. Schreyer, Bignon, and Dupont (2003) applied price harmonization to OECD capital services, with the US as a reference country, since the possible error due to using a harmonized price index would be smaller than the bias arising from comparing capital services based on national deflators.

In the Databook series, the same price harmonization method is applied to adjust the quality improvement for IT hardware and communications equipment in countries where the appropriate quality-adjusted price data is not available, using Japan's prices as a reference country. A similar procedure was applied in cases where the prices for some assets of B&C and M&E were not available, to estimate missing data based on the relative price of these assets to total GFCF.

9.2.3 Inventory Stock

In this edition of the Databook, inventory stock is newly estimated. The official estimates of the changes in inventory recorded in the national accounts are used to estimate the inventory stock. When the official estimates of the price index for changes in inventory fluctuate in unrealistic ways, they are replaced by our estimates of the aggregate price index of products consisting of domestically produced goods (by agriculture, mining, and manufacturing sectors) and the imported goods. Estimated inventory stocks tend to be too large compared to their GDP, if official estimates of inventory changes may have characteristics as a balancing item in the compilation of national accounts. In such cases, inventory stock at current price is actually limited to no more than 8% of nominal GDP.

9.2.4 Stock-Output Ratio

Figure 85 presents the estimated capital-output ratio (capital stock coefficient) that is defined by the ratio of the beginning-of-period net capital stock (all types of produced assets owned by private and public institutions) to the basic-price GDP at current prices. Bhutan has the highest capital-output ratio among the Asia25 economies, at 4.6 in 2019, reflecting the industry structure highly skewing to electricity (hydropower). Compared to the 1980 level in each country, all Asian countries, except Cambodia, Mongolia, Iran, and Pakistan have an increasing trend of capital-output ratio.

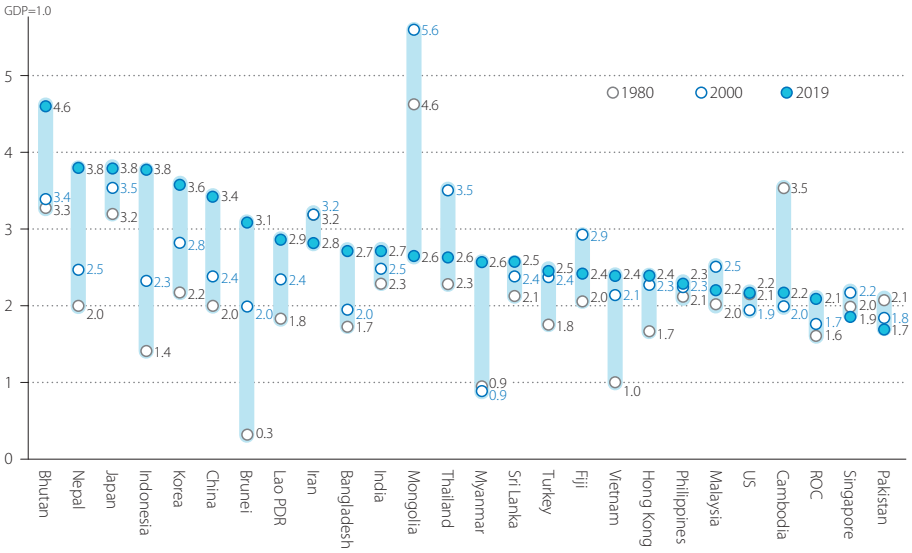

Figure 85 Capital-Output Ratio (Produced Assets)
——Ratio of the beginning-of-period net capital stock to basic-price GDP at current prices in 1980, 2000, and 2019

Source: APO Productivity Database 2021. Note: Net capital stock consists of fixed assets and inventory.

9.2.5 Land Stock

Land is an important factor of production not only in the agriculture sector, but also in manufacturing and service sectors. In densely populated countries, land occupies a large share of nominal capital stock. Regardless of its importance, land has not been considered as capital until the 2018 edition of the Databook due to data availability. In Asia, only Japan and Korea publish the estimates of land stocks in their national balance sheets of the national accounts.

The land database has been developed at KEO since 2016 and these estimates have been involved in the growth accounting frameworks since the 2019 edition of the Databook. The latest land database used in this edition covers the Asia25 economies. Table 5 defines the types of land use. In this edition, four types of land for economical use (land code: L1100, L1211, L1212, and L1213) from the land database are treated as non-produced assets (asset code: 12–15).

The land stock data consists of the estimates at current and constant prices by four types of land uses. The data on land area (m^2) is available in FAOSTAT for agricultural use (asset code 12) and in national data resources for non-agricultural use (code: 13-15). For countries in which the data of national land area for residential use (code 15) is not available, they are estimated based on multiple approaches using available information and our estimates; e.g., number of households, average area per unit of household, population/household density in rural and urban areas, stock estimates of dwellings (see Section 9.2.2), and per capita GDP, and so on. If land for industrial use (code 13) is not available from national surveys like the manufacturing census, it is estimated

Table 5 Classification of Land

asset code	type of land classification
	L0000 Total land
	L1000 Land for economical use
12	L1100 Land for agricultural use
	L1200 Land for non-agricultural use
	L1210 Land for building use
13	L1211 Land for industrial use
14	L1212 Land for commercial use
15	L1213 Land for residential use
	L1220 Land for other use
	L2000 Land for forest use
	L3000 Land for inland water use

Source: Land database and APO Productivity Database 2021.

based on our estimates of productivity of industry-use land and the manufacturing GDP. Similarly, land for commercial use (code 14) is estimated based on our estimates of productivity of commercial-use land and the service-sector GDP, if it is not available in national data resources.

For countries in which the land stocks at current prices are not available, the samples of land price data are collected to estimate the current-price land stocks. The land price data are available mainly in the urban area and are collected from market data and survey results such as *The World Land Value Survey* (Japan Association of Real Estate Appraisers: JAREA), *Report on Survey of Urban Land Prices in the Developing World* (International Housing Coalition: IHC), and *Survey on Business Conditions of Japanese Companies in Asia and Oceania* (Japan External Trade Organization: JETRO). With our assumptions on the price gaps between urban and rural areas in each country, these survey prices of urban land area are discounted to estimate the national level averages. On the land prices for agricultural use, the national level average price is estimated in each country based on our estimates of the discounted present value of future rents, which are based on our estimates of mixed income in agriculture sector and the rate of return (see Section 9.3.3).

Although further efforts to improve the estimates are required, Figure 86 presents our current estimates of the ratios of total capital stock to basic-price GDP and the land shares of total capital stocks (right axis) as of the beginning of 2019. When including land stocks, the country order of capital-output ratios is considerably revised from Figure 85, which is based on only produced assets. In ROC, Singapore, and Hong Kong, the estimated land shares exceed 70% of total capital stock, which are almost twice of 35% in Japan and 30% in the US. As the capital-output ratios are over 5 in Asian Tigers and Japan, the consideration of land stocks is expected to eliminate a bias to underestimate TFP growth.

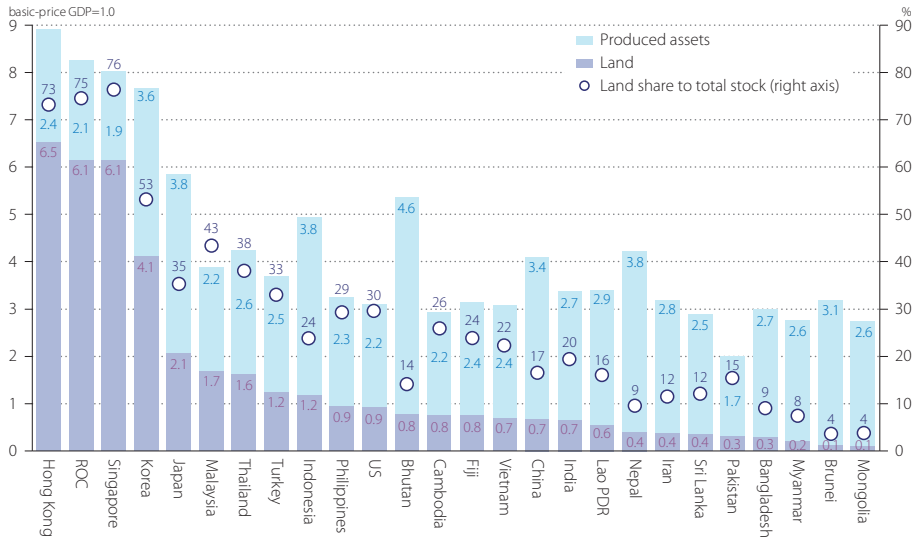

Figure 86 Capital-Output Ratio (Produced Assets and Land)
——Ratio of the beginning-of-period net capital stock to basic-price GDP at current prices in 2019

Sources: Land database and APO Productivity Database 2021.

9.2.6 Capital Services

In the analysis of production, capital service provides an appropriate concept of capital inputs as recommended in the 2008 SNA. The fundamental assumption in measuring capital services is proportionality between the (productive) capital stock and capital services in each type of asset. Thus, the growth rates of

capital services can differ from that of capital stock only at the aggregate level. For aggregating different types of capital, the user cost of capital by type of asset is required. This section outlines the methodology of the user cost of capital estimation and presents the estimated results of endogenous rate of return for Asian countries in the APO Productivity Database 2021.

The user cost of capital of a new asset (with type of asset denoted as k of the period t), $u^k_{t,0}$, is defined as $q^k_{t-1,0}\{r_t + (1 + \pi^k_t)\,\delta^k_{P,t,0} - \pi^k_t\}$, where r_t, $\delta^k_{P,t,0}$, and $q^k_{t,0}$ are the expected nominal rate of return, cross-section depreciation rate, and asset price, respectively. The asset-specific inflation rate π^k_t is defined as $(q^k_{t,0} / q^k_{t-1,0} - 1)$. The OECD assumes the country-specific ex-ante real rate of return r^* that is constant for the whole period, and defines the nominal rate of return as $r_t = (1 + r^*)(1 + p_t) - 1$, where p_t represents the expected overall inflation rate, defined by a five-year centered moving average of the rate of change of the CPI (Schreyer, Bignon, and Dupont 2003).

One of the main difficulties in applying the ex-ante approach for measuring user cost of capital is obtaining proper estimates for real rates of return, which can differ considerably among countries and over time. On the other hand, the ex-post approach originated by Jorgenson and Griliches (1967) allows an estimation based on observed data. Assuming constant returns to scale and competitive markets, capital compensation can be derived from the summation of the capital service cost V^k_t for each asset, which is defined as the product of the user cost of capital and the productive capital stock (i.e., $V_t = \sum_k V^k_t = \sum_k u^k_{t,0} S^k_t$). Based on this identity and the n-equations of user cost of capital, the n+1 variables of $u^k_{t,0}$ and r_t are simultaneously determined, using the observed capital compensation V_t as the total sum of V^k_t that is not observable in each asset. Note that the depreciation rate $\delta^k_{P,t,0}$ is not independent of the estimated r_t.

The estimated results of the ex-post real rate of return based on $r^*_t = (1 + r_t) / (1 + p_t) - 1$ for the Asia25 economies and the US are presented Table 6, as the five-year averages in the entire observation period 1970–2019. In 2015–2019, the real rate of return ranged from 3.6–5.2% in Hong Kong, Japan, Korea, and Singapore to over 15% in Myanmar and Pakistan. Using these ex-post estimates, the aggregate capital services are measured in this report. The difference caused by the ex-ante and ex-post approaches may

Table 6 Average Ex-Post Real Rate of Return in Asia

	1970–1974	1975–1979	1980–1984	1985–1989	1990–1994	1995–1999	2000–2004	2005–2009	2010–2014	2015–2019
Bangladesh	20.5	15.3	12.7	19.8	20.7	18.8	18.9	16.7	15.0	16.0
Bhutan	6.5	10.0	1.9	6.6	1.9	4.3	7.6	4.6	1.7	4.9
Brunei	64.3	110.5	137.6	60.6	33.4	20.4	29.7	36.5	28.7	13.1
Cambodia	17.4	14.9	4.3	−24.8	−21.2	16.9	18.6	14.7	19.1	13.1
China	15.6	13.7	10.7	8.5	9.2	14.0	16.7	13.4	10.1	8.6
ROC	14.1	10.7	8.8	15.2	3.3	5.6	5.7	3.9	6.6	4.8
Fiji	10.6	11.0	6.8	8.0	16.7	8.7	9.0	10.0	10.3	14.1
Hong Kong	16.2	12.6	1.0	7.9	0.3	2.9	7.6	7.4	3.9	4.7
India	3.1	5.5	0.6	2.1	1.0	3.0	8.4	7.0	3.6	5.8
Indonesia	22.4	21.7	24.1	19.1	16.4	16.5	8.8	11.6	11.3	9.5
Iran	21.6	14.7	3.3	−1.6	6.2	−1.8	12.3	15.6	9.4	11.2
Japan	−1.1	−2.4	2.5	5.3	1.9	1.2	2.4	3.1	2.3	3.6
Korea	10.3	6.1	3.3	9.8	2.5	0.8	4.7	5.3	3.7	5.2
Lao PDR	−1.3	−12.9	−20.1	−14.6	4.9	−12.7	3.8	17.0	18.7	20.3
Malaysia	19.0	20.6	14.5	12.8	13.0	12.1	14.5	17.9	17.3	14.7
Mongolia	10.0	9.2	8.0	12.9	−42.5	−5.7	9.9	16.4	12.2	16.2
Myanmar	31.6	45.9	43.1	24.6	19.5	19.3	22.5	24.5	42.1	13.9
Nepal	12.9	11.4	7.4	5.6	3.6	4.9	8.5	7.6	2.7	5.6
Pakistan	12.5	10.3	11.4	15.7	12.0	16.6	23.9	16.2	19.0	18.4
Philippines	13.3	14.3	7.7	7.8	7.7	10.6	17.0	14.7	19.1	19.2
Singapore	7.0	8.1	6.4	7.6	6.2	4.3	4.8	8.1	3.7	4.2
Sri Lanka	23.1	24.0	7.4	7.1	5.1	7.1	9.3	10.9	19.9	18.0
Thailand	14.7	11.1	9.5	14.2	10.7	5.6	9.7	10.9	11.0	10.7
Turkey	33.8	14.1	1.3	−1.7	−14.9	−19.0	−0.1	15.6	14.6	9.7
Vietnam	15.9	16.1	0.5	−3.0	19.2	23.4	20.3	10.2	9.7	12.1
US	6.3	3.7	3.1	7.0	5.3	8.9	8.0	6.4	8.3	9.2

Unit: Percentage. Source: APO Productivity Database 2021.

provide a modest difference in the growth measure of capital services, regardless of the substantial differences in the rates of return and capital compensations.

9.3 Measurement of Labor Input

9.3.1 Hours Worked

Volume in each category of labor can be measured in three units: number of persons in employment; number of filled jobs; and hours actually worked. Given the variations in working patterns and employment legislation both over time and across countries, hours worked, if accurately measured, offers the most time-consistent and somewhat internationally comparable unit measuring the volume in each of different types of labor. This is the primary underlying reason for the importance of choosing hours actually worked in productivity analysis, but, due to the difficulty in accurately estimating average hours actually worked, it is not always available or comparable across countries. The variety of data sources, definitions, and methodologies available in estimating these labor market variables often leads to a fragmentation of labor market statistics of an individual country concerned, dubious data quality, and incomparability across countries. Here follows an attempt to outline some of these intricate measurement issues.

Data on labor volume comes from two main statistical surveys on establishment and household, with respective strengths and weaknesses. Establishment surveys are surveys of firms with stratified sample frames by the size of establishments. The concentration of total employment in a relatively small number of establishments means that this sampling strategy is cost-effective in delivering high-precision labor

Table 7 Sources of Labor Data

	Sources of Labor Data
Bangladesh	Population and Housing Census, Labour Force Survey
Bhutan	Population and Housing Census, Labour Force Survey, Labour Market Information Bulletin,
Brunei	Population and Housing Census, Labour Force Survey
Cambodia	General Population Census, Inter-Censal Population Survey, Labor Force Survey, Socio-Economic Survey
China	China Statistical Yearbook, China Labor Statistical Yearbook, Population Census, 1% National Population Sample Survey
ROC	Population and Housing Census, Yearbook of Manpower Survey Statistics in Taiwan Area, Manpower Utilization Survey
Fiji	Census of Population and Housing, Employment and Unemployment Survey, Annual Employment Survey
Hong Kong	Population Census, Population By-Census, General Household Survey, Annual Earnings and Hours Survey
India	Census of India, Employment and Unemployment Survey, National Sample Survey
Indonesia	Population and Housing Census, Labor Force Situation in Indonesia, Laborer Situation in Indonesia
Iran	National Population and Housing Census, Labour Force Survey, Iran Salary Report
Japan	Population Census, Labor Force Survey, Census of Manufacture, Basic Survey on Wage Structure, Monthly Labour Survey, Japan's System of National Accounts
Korea	Population and Housing Census, Economically Active Population Survey, Employment Structure Survey, Wage Structure Survey
Lao PDR	Population Census, Labour Force Survey, Urban Labour Force Survey, ADB Key Indicators for Asia and the Pacific
Malaysia	Population and Housing Census, Labour Force Survey, Salaries & Wages Survey
Mongolia	Population and Housing Census, Labour Force Survey, Survey on Wages and Salaries, A Pilot Time Use Survey
Myanmar	Population and Housing Census, Labour Force Survey, Salary Survey Report, Survey on Business Conditions of Japanese Companies in Asia and Oceania
Nepal	Population and Housing Census, Labor Force Survey
Pakistan	Population Census, Labour Force Survey, Census of Manufacturing Industries
Philippines	Labor Force Survey
Singapore	Population Census, Labor Force Survey, Singapore Yearbook of Manpower Statistics, General Household Survey
Sri Lanka	Census of Population and Housing, Labour Force Survey
Thailand	Population and Housing Census, Labor Force Survey
Turkey	Population and Housing Census, Labour Force Survey, Income and Living Conditions Survey
Vietnam	Population and Housing Census, Labour Force and Employment Survey, Living Stabdards Survey, Vietnam Statistical Data in the 20th Century, Vietnam Economy 1986–1991

Source: Asia QALI Database 2021 in Section 9.3.2.

market estimates with a small sampling error. Questionnaires are designed to be close to the concepts used in company administration. This has both strengths and weaknesses. Data collected is of high quality and accuracy. On the other hand, changes in legislation and regulation could be a source of instability to the definitions, and of the data collected. Furthermore, data that companies do not collect for administrative purpose, such as unpaid hours and worker characteristics, are unavailable. This greatly limits the varieties of labor market data that can be collected through establishments.[63] Information on hours is on paid hours rather than hours actually worked. Certain categories of employment, most notably the self-employed, are not covered. Sometimes small firms, informal employment (represents more than 50% in some developing Asian countries) or the public sector is also excluded. Because of these limitations, labor market data from establishment surveys often requires a raft of adjustments for omissions and definition modifications during the compilation process.

Household-based labor force surveys (LFS), in contrast, have full coverage of the economy, although they sometimes incorporate age or geographic exclusions and may have imperfect coverage of the armed forces and other institutional households. Nonetheless, they provide valuable data on certain employment groups such as the self-employed and unpaid family workers, and on the number of multiple job workers. Employment status in LFS is independently determined and is not subject to the criteria used in company records. Most countries follow the International Labour Organization (ILO) definitions. As LFS are surveys from the socio-economic perspective, they also provide rich data on worker characteristics that are relevant to productivity analysis.[64] Table 7 presents the main labor statistics used in this edition of the Databook.

The common practice of statistical offices has been to combine information from both establishment and household surveys in the national accounts, with a view of making use of the most reliable aspects of each of the surveys. This seems to be the most promising avenue forward in improving the quality and consistency of data on labor input. However, statistical offices could still differ a great deal in their methodologies, especially in estimating the annual average hours worked per job/person, depending on their starting

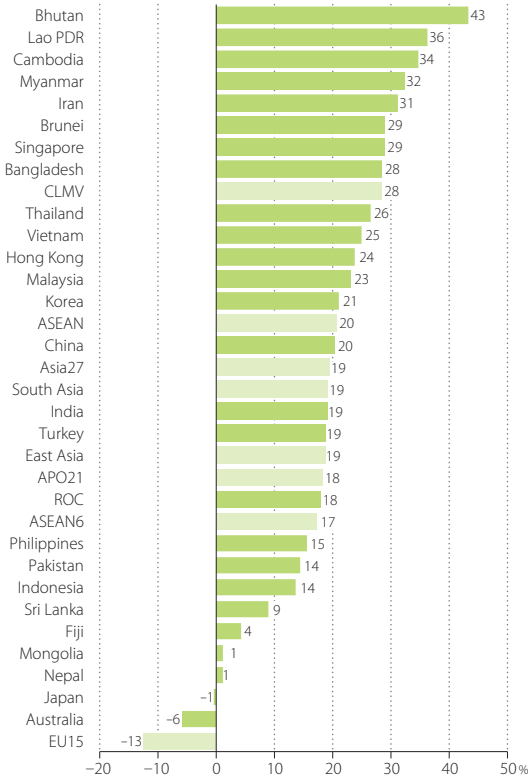

Figure 87 Hours Worked Per Worker, Relative to the US

——Average annual hours worked per worker in 2010–2019

Sources: Official national accounts and labor force survey in each country, including author adjustments, for Asian countries and OECD Stat for the EU15.

63: Employment as measured is necessarily based on jobs rather than on persons employed, as persons holding multiple jobs with different establishments cannot be identified and will be counted more than once.

64: The major weakness of the LFS, however, is data precision. By relying on the recollection of the respondents, their response also depends on perception. Response errors could, therefore, arise from confusion of concepts and imprecise recollection of the respondents concerning work patterns and pay during the reference week. Another source of error originates from proxy response, which relies on the proxy's perception and knowledge of another household's member. A high level of proxy responses could, therefore, reduce the reliability of data collected.

points, namely LFS data or enterprise data. All these must be considered in international comparisons of productivity.

Figure 87 presents a cross-country comparison of average annual hours worked per worker for 2010–2019, relative to the level of the US, based on the Asia QALI Database 2021 in Section 9.3.2. It indicates that workers in Asian countries tend to work much longer hours than those in the US and Europe. In many of the countries sampled, the difference in annual hours worked per person relative to the US is more than 10% of the US level.[65] Prolonged working hours are observed in Asian countries regardless of their stage of development, spanning low-income countries such as Bangladesh and Cambodia to high-income countries such as Singapore and Korea. An exception is Japan. Workers in Japan are likely to work much shorter hours than those in other Asian countries. However, compared with the EU15, hours worked by workers in Japan are still about 12 percentage points greater.

9.3.2 Quality-adjusted Labor Input

In productivity analysis, labor inputs at the aggregate level are expected to be quality adjusted to reflect workforce heterogeneity, as recommended in the SNA 2008 (United Nations 2009). To adjust total hours worked for quality would require information on worker characteristics to differentiate the workforce into different types, which are then weighed by their marginal productivity and approximated by their respective shares of total compensation. In the stage of high economic growth, labor quality growth can be a significant factor as well as the increase in hours worked, improvement in education attainment of workers, and a shift from the self-employed (e.g., in agriculture or informal service sectors) to employees (in manufacturing or formal service sectors).

Deriving a quality adjusted labor input (QALI) measure is a data-demanding exercise. Even if LFS provides the required information, researchers often run into the consistency issues discussed in Section 9.3.1, as well as sample size problems as they break down the workforce into fine categories. Covering the Asia25 economies, the data on employment and wage/incomes has been collected by type of labor categories since 2013 at KEO, based mainly on LFS and Population Census listed in Table 7. The developed data is called as Asia QALI Database. This data consists of number of workers, hours worked per worker, and hourly wages, which are cross-classified by gender, education attainment, age, and employment status. The first report on development of Asia QALI Database for South Asian countries was published in Nomura and Akashi (2017). And, as the second report, a comprehensive revision was conducted in Nomura and Shirane (2020) for the Vietnamese economy. The Asia QALI Database 2021 is used to provide the estimates of total hours worked, labor qualities, and QALI in the APO Productivity Database 2021.[66]

Figure 88 presents the long time-series comparisons of the average schooling years observed in terms of workers from 1970 to 2019, as an intuitive indicator of labor quality based on the Asia QALI Database 2021. Although there is a significant range in 2019 from 4.8 years (Nepal) to 13.3 years (Japan), the average years have increased since 1970 in almost all economies in Asia. In this measure, three country groups are observed: i) countries with over 11 schooling years on average, ii) countries with 8–11 years, and iii) countries with less than 7 years in 2019. The first group consists of East Asian countries and Asian Tigers; as Japan and Korea are the leading countries (13.3 years), followed by the ROC (13.2 years), Hong Kong (12.4 years), Mongolia (12.1 years), and Singapore (11.1 years). The second group consists of ASEAN6, China, Fiji, Turkey, and Vietnam. The third group consists of South Asian countries and CLMV

65: Shorter hours worked in Nepal is due to frequent general strikes called "Banda", which are mainly lead by some political parties. According to the Nepal Human Rights Commission, Banda were called 821 times in various regions in 2009, and economic activities were closed during Banda.

66: Data on hours worked of self-employed and contributing family workers by type of labor category in the Asia QALI Database is also used to estimate labor income within mixed income (Section 9.3.3).

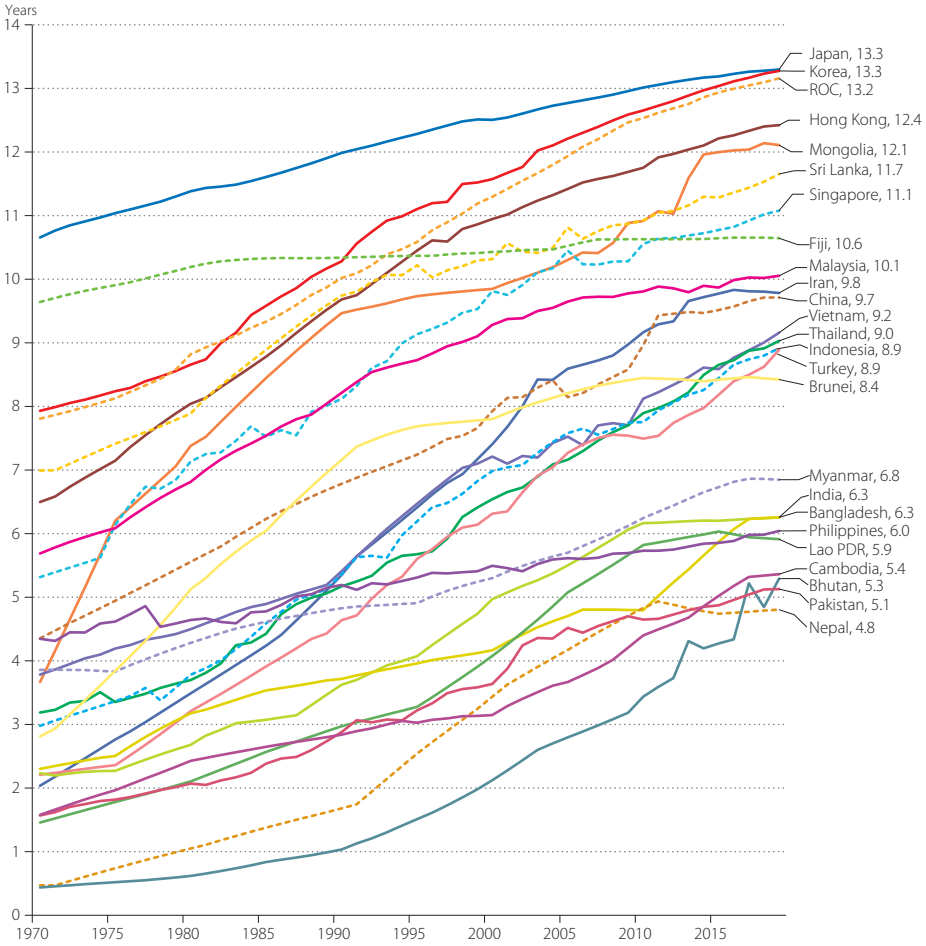

Figure 88 Average Schooling Years of Workers

Source: Asia QALI Database 2021.

but Vietnam. This chart shows that it takes a long time for each country to improve its average educational background.

9.3.3 Labor Share

The labor share, which is defined as the ratio of labor compensation of total employment to GDP at basic prices, is one of the key factors to determine TFP growth. The estimates on the COE (compensation of employees), however, are not fully available in the official national accounts in Asian countries. Figure 89 summarizes the availability of the COE estimates in the official national accounts and the input-output tables in each country (Table 3 in Section 9.1.7). Currently the national accounts in Bangladesh, Bhutan, Indonesia, the Lao PDR, Myanmar, Pakistan, and Vietnam do not fully publish the COE estimates. In addition, in some countries like Cambodia and Iran, the estimates are not fully available for the entire period of our observation of 1970–2019. In such cases, the COE is estimated or extrapolated by the estimates based on the Asia QALI Database.

The compensation for the self-employed and contributing family workers is not separately estimated in the national accounts but is combined with returns to capital in mixed income. This edition of the

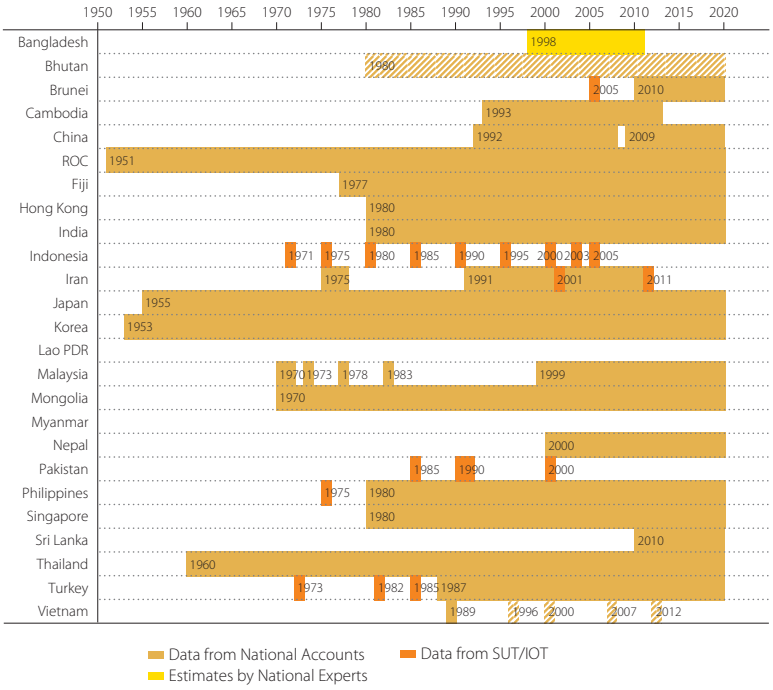

Figure 89 Availability of COE Estimates

Sources: Official national accounts and SUT/IOT in each country. Note: Hatched areas show the periods in which only the data mingled with operating surplus or mixed income is available.

Databook follows the revised estimates in the Asia QALI Database 2021 (Section 9.3.2), in which the different methodologies are applied in agriculture and non-agriculture industries. In agriculture industry, the capital income is measured based on our estimates on the returns to capital of land for agriculture use (code:12 in Table 5) and of other fixed assets.[67] And the labor income in agriculture is measured as a residual of the basic-price GDP minus our estimates of the returns to capital. In non-agriculture industries, the wage differential ratio (WDR) in hourly wages of non-employees to employees in each elementary group of labor category is assumed in each country. Time-invariant WDR is assumed with a range of 0.2–0.5 by country.[68]

67: Since the capital stock is not measured at industry level in the APO Productivity Database, the capital stock shares are estimated based on the value-added share of agriculture industry in the case that the industry-level official estimates are not available.
68: The WDR is set at 0.5 for Japan, 0.3 for the Asian Tigers, and 0.5 for CLMV (except Myanmar), Iran and Turkey, and 0.2 for other countries.

Appendix

A.1 Purchasing Power Parities

Purchasing power parities (PPPs) are indispensable inputs into economic research and policy analysis involving cross-country comparisons of macroeconomic aggregates. They affect a double conversion of macroeconomic measures, estimated in national currencies and price levels, into comparable cross-country volume measures. These are expressed in a common currency and at a uniform price level. PPPs are price relatives that show the ratio of the prices in national currencies of single or composite goods and services in different countries. They are compiled within the International Comparisons Program (ICP). Comparisons are made from the expenditure side of GDP. To this end, the ICP compiles PPPs by conducting worldwide surveys at regular intervals (currently, every six years) to collect comparable price and expenditure data for the entire range of final goods and services that make up the final expenditures on GDP. In April 2020, the new benchmark PPP estimates were published by the ICP 2017 round (World Bank 2020a).

Chapter 3 mainly provides the cross-country comparison of economic volumes. To obtain comparable volume measures, the Databook uses the constant PPP approach, which relies not on a time series of PPPs, but on one of the benchmark estimates. This edition of the Databook uses the benchmark estimates by the ICP 2017 round. The use of this approach creates national series for volumes at the prices of a common reference year (2019), and deflates these by the PPP for a fixed year (2017).

The left chart of Figure 90 shows the revisions of PPPs in Asian countries at the ICP 2017 round, in comparison with the ICP 2011 round, which has provided the benchmark estimate for the past Databook

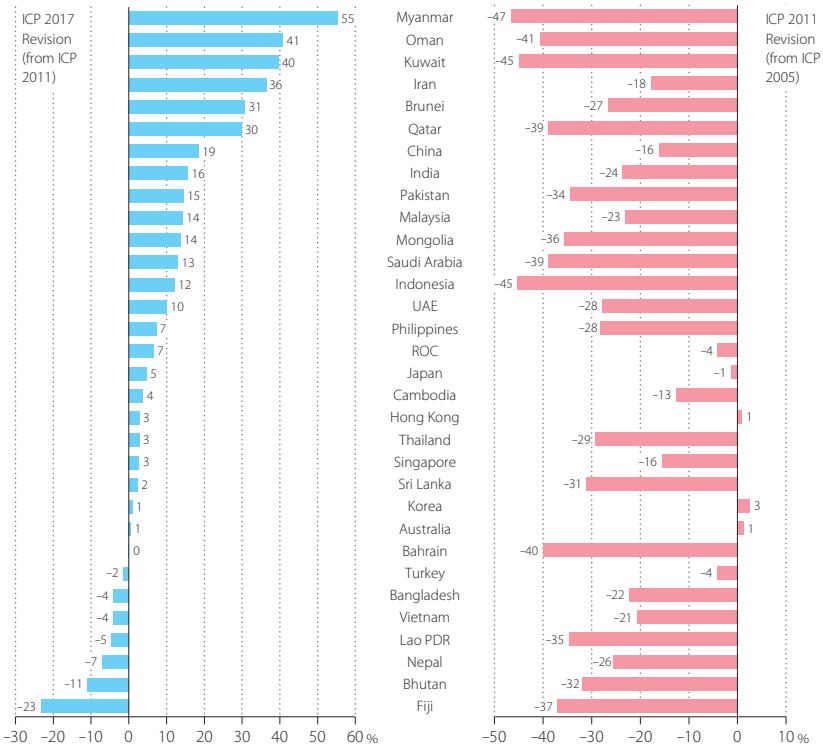

Figure 90 Revisions of PPP for GDP in the ICP 2017 and 2011 Rounds
——Ratios of the 2017 PPP to the 2011 PPP (extrapolated for 2017) and the 2011 PPP to the 2005 PPP (extrapolated for 2011).

Source: World Bank (2021).

series in 2014–2019. The revision at the ICP 2011 round from the ICP 2005 round is presented in the right chart. The 2017 benchmark PPP for 17 Asian economies is more than 5% higher than suggested by their extrapolated equivalents from the 2011 benchmark. The upward revision on PPP revises to reduce the relative sizes of these economies in cross-country level comparison. Compared to the revision on the ICP 2011 round from the 2005 round (in the right chart of Figure 90), the upward revisions by the ICP 2017 round have a property to partly offset the past downward revisions on PPP by the 2011 round. The cross-country level comparison has to face a larger opportunity to be revised, compared to the cross-country growth comparison. The readers should bear in mind these circumstances.

A.2 Other Data

For China, multiple data sources have been used; GDP for the whole economy, industry GDP, final demands, employment, and income data are taken from *China Statistical Yearbook* (and *China National Income 1952–1995* for our backward estimates before 1969); time-series data of GFCF by type of asset during 1952–2019 at current and constant prices are estimated at KEO based on *Statistics on Investment in Fixed Assets of China 1950–2000*, *China Statistical Yearbook*, *1987, 1992, 1997, 2002, 2007, 2012, and 2017 Input–Output Tables of China*, *Manufacturing Census in China*, and the import data from China Customs Statistics.[69]

Zhang and Zhu (2015) point out that the official Chinese national accounts have significantly underestimated the household consumption. In this edition of the Databook, the productivity account for China was revised based on our intensive study with Professor W. Erwin Diewert (University of British Columbia). Our revision work on the Chinese growth accounting focused mainly on the imputed rent, the labor share and quality adjusted labor input, the price index on government consumption. In particular, some imputed rents for free housing and owner-occupied housing (including land) were added in household consumption and GDP in the Chinese official national accounts. Based on our examinations, China's TFP growth rate has been revised to drop significantly (see footnote 31 in Section 5.3).

The data source for the EU15 and the EU28 is the OECD.Stat (http://stats.oecd.org/) and the Eurostat (http://ec.europa.eu/). The data for the US, Australia, and Bhutan is taken from the website of the US Bureau of Economic Analysis (http://www.bea.gov), the Australian Bureau of Statistics (http://www.abs.gov.au/), and the National Statistics Bureau of Bhutan (http://www.nsb.gov.bt/) and UNDESA (2016), respectively.

The exchange rates used in the Databook series are adjusted rates, called the Analysis of Main Aggregate (UNSD database) rates, in the UNSD National Accounts Main Aggregate Database. The AMA rates coincide with IMF rates except for some periods in countries with official fixed exchange rates and high inflation, when there could be a serious disparity between real GDP growth and growth converted to US dollars based on IMF rates. In such cases, the AMA adjusts the IMF-based rates by multiplying the growth rate of the GDP deflator relative to the US.

Tax data of member economies are supplemented by the IMF's Government Finance Statistics. From its tax revenue data, "taxes on goods and services" and "taxes on imports" are used for calculating taxes on products. From its expenditure data, "subsidies" are taken. Data taken from Government Finance Statistics play a key role in adjusting GDP at market prices to GDP at basic prices. The data for energy consumptions and CO2 emissions is based on IEA (2020a and 2020b).

69: Holz (2006) provides a useful reference on Chinese official statistics.

A.3 Supplementary Tables

Table 8 GDP using Exchange Rate

——GDP at current market prices, using annual average exchange rate

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
Japan	209	100.0	Japan	1,111	100.0	Japan	3,185	100.0	Japan	4,968	100.0	China	6,417	100.0	China	14,907	100.0
China	104	49.9	China	344	31.0	China	426	13.4	China	1,298	26.1	Japan	5,759	89.7	Japan	5,149	34.5
India	64	30.4	India	190	17.1	India	335	10.5	Korea	576	11.6	India	1,670	26.0	India	2,872	19.3
Turkey	24	11.7	Saudi Arabia	165	14.9	Korea	283	8.9	India	482	9.7	Korea	1,144	17.8	Korea	1,647	11.0
Iran	11	5.4	Iran	98	8.8	Turkey	204	6.4	ROC	331	6.7	Turkey	777	12.1	Indonesia	1,124	7.5
Pakistan	10	4.8	Turkey	92	8.3	ROC	166	5.2	Turkey	274	5.5	Indonesia	756	11.8	Iran	821	5.5
Indonesia	10	4.7	Indonesia	80	7.2	Indonesia	127	4.0	Saudi Arabia	191	3.9	Saudi Arabia	533	8.3	Saudi Arabia	803	5.4
Bangladesh	9.9	4.7	Korea	65	5.9	Saudi Arabia	119	3.7	Hong Kong	172	3.5	Iran	516	8.0	Turkey	761	5.1
Korea	9.0	4.3	UAE	44	4.0	Iran	95	3.0	Indonesia	168	3.4	ROC	444	6.9	ROC	612	4.1
Thailand	7.3	3.5	ROC	42	3.8	Thailand	89	2.8	Thailand	127	2.6	Thailand	342	5.3	Thailand	550	3.7
Philippines	6.8	3.2	Thailand	33	3.0	Hong Kong	77	2.4	Iran	113	2.3	UAE	298	4.6	UAE	436	2.9
ROC	5.8	2.8	Philippines	33	3.0	UAE	51	1.6	UAE	106	2.1	Malaysia	255	4.0	Philippines	377	2.5
Saudi Arabia	5.4	2.6	Kuwait	30	2.7	Philippines	47	1.5	Singapore	96	1.9	Singapore	240	3.7	Singapore	374	2.5
Malaysia	3.9	1.9	Hong Kong	29	2.6	Pakistan	46	1.4	Malaysia	95	1.9	Hong Kong	229	3.6	Hong Kong	366	2.5
Hong Kong	3.8	1.8	Malaysia	25	2.2	Malaysia	45	1.4	Philippines	84	1.7	Philippines	208	3.2	Malaysia	365	2.4
Kuwait	3.0	1.4	Pakistan	24	2.2	Singapore	39	1.2	Pakistan	79	1.6	Pakistan	175	2.7	Bangladesh	301	2.0
Sri Lanka	2.8	1.4	Bangladesh	19	1.7	Bangladesh	31	1.0	Bangladesh	51	1.0	Qatar	128	2.0	Vietnam	264	1.8
Myanmar	2.7	1.3	Singapore	12	1.1	Kuwait	19	0.6	Kuwait	38	0.8	Kuwait	118	1.8	Pakistan	253	1.7
Singapore	1.9	0.9	Qatar	7.9	0.7	Oman	12	0.4	Vietnam	33	0.7	Vietnam	116	1.8	Qatar	181	1.2
Vietnam	1.2	0.6	Oman	6.3	0.6	Sri Lanka	9.4	0.3	Oman	20	0.4	Bangladesh	115	1.8	Kuwait	141	0.9
Nepal	1.1	0.5	Brunei	6.2	0.6	Qatar	7.5	0.2	Sri Lanka	19	0.4	Oman	58	0.9	Sri Lanka	84	0.6
UAE	1.1	0.5	Myanmar	5.9	0.5	Vietnam	6.5	0.2	Qatar	18	0.4	Sri Lanka	56	0.9	Oman	78	0.5
Cambodia	0.8	0.4	Sri Lanka	4.9	0.4	Myanmar	6.1	0.2	Bahrain	8.4	0.2	Myanmar	37	0.6	Myanmar	44	0.3
Qatar	0.5	0.3	Bahrain	3.5	0.3	Bahrain	4.5	0.1	Myanmar	7.8	0.2	Bahrain	26	0.4	Bahrain	39	0.3
Bahrain	0.4	0.2	Nepal	2.6	0.2	Nepal	4.4	0.1	Brunei	6.6	0.1	Nepal	19	0.3	Nepal	34	0.2
Oman	0.3	0.1	Fiji	1.2	0.1	Brunei	3.9	0.1	Nepal	6.3	0.1	Brunei	14	0.2	Cambodia	27	0.2
Brunei	0.2	0.1	Vietnam	1.0	0.1	Cambodia	1.8	0.1	Cambodia	3.7	0.1	Cambodia	11	0.2	Lao PDR	19	0.1
Fiji	0.2	0.1	Cambodia	0.7	0.1	Mongolia	1.6	0.0	Lao PDR	1.8	0.0	Lao PDR	7.4	0.1	Mongolia	14	0.1
Lao PDR	0.1	0.1	Mongolia	0.5	0.0	Fiji	1.4	0.0	Fiji	1.7	0.0	Mongolia	7.2	0.1	Brunei	13	0.1
Mongolia	0.1	0.1	Lao PDR	0.3	0.0	Lao PDR	0.9	0.0	Mongolia	1.4	0.0	Fiji	3.1	0.0	Fiji	5.5	0.0
Bhutan	0.1	0.0	Bhutan	0.1	0.0	Bhutan	0.3	0.0	Bhutan	0.4	0.0	Bhutan	1.5	0.0	Bhutan	2.5	0.0
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	383	183.3	APO21	1,865	167.9	APO21	4,796	150.6	APO21	7,683	154.6	APO21	12,850	200.3	APO21	16,019	107.5
Asia25	490	234.6	Asia25	2,221	200.0	Asia25	5,232	164.3	Asia25	8,996	181.1	Asia25	19,319	301.1	Asia25	30,986	207.9
Asia31	501	239.7	Asia31	2,478	223.1	Asia31	5,445	171.0	Asia31	9,377	188.7	Asia31	20,480	319.2	Asia31	32,663	219.1
East Asia	332	158.9	East Asia	1,592	143.3	East Asia	4,139	130.0	East Asia	7,347	147.9	East Asia	14,000	218.2	East Asia	22,694	152.2
South Asia	88	41.9	South Asia	241	21.7	South Asia	427	13.4	South Asia	638	12.8	South Asia	2,036	31.7	South Asia	3,546	23.8
ASEAN	35	16.7	ASEAN	197	17.7	ASEAN	366	11.5	ASEAN	622	12.5	ASEAN	1,987	31.0	ASEAN	3,158	21.2
ASEAN6	30	14.4	ASEAN6	189	17.0	ASEAN6	351	11.0	ASEAN6	576	11.6	ASEAN6	1,815	28.3	ASEAN6	2,803	18.8
CLMV	4.8	2.3	CLMV	8.0	0.7	CLMV	15	0.5	CLMV	46	0.9	CLMV	172	2.7	CLMV	355	2.4
GCC	11	5.1	GCC	257	23.1	GCC	213	6.7	GCC	382	7.7	GCC	1,160	18.1	GCC	1,677	11.3
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	1,073	514.0	US	2,857	257.2	US	5,963	187.2	US	10,252	206.4	US	14,992	233.6	US	21,433	143.8
EU15	1,250	598.4	EU15	3,334	300.2	EU15	6,417	201.5	EU15	9,928	199.8	EU15	14,595	227.4	EU15	21,086	141.5
									EU28	11,035	222.1	EU28	16,807	261.9	EU28	24,745	166.0
Australia	45	21.6	Australia	173	15.6	Australia	324	10.2	Australia	409	8.2	Australia	1,299	20.3	Australia	1,380	9.3

Unit: Billions of US dollars.
Sources: Official national accounts in each country, including author adjustments.
Note: See Section 9.1 for the adjustments made to harmonize GDP coverage across countries.

App.

Table 9 GDP using PPP

——GDP at constant market prices, using 2017 PPP, reference year 2019

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
Japan	1,688	100.0	Japan	2,709	100.0	Japan	4,235	100.0	China	5,013	100.0	China	12,736	100.0	China	23,859	100.0
India	709	42.0	China	1,081	39.9	China	2,157	50.9	Japan	4,782	95.4	India	5,410	42.5	India	9,423	39.5
China	668	39.6	India	953	35.2	India	1,557	36.8	India	2,548	50.8	Japan	5,055	39.7	Japan	5,509	23.1
Saudi Arabia	456	27.0	Saudi Arabia	655	24.2	Indonesia	853	20.1	Indonesia	1,285	25.6	Indonesia	2,111	16.6	Indonesia	3,329	14.0
Iran	276	16.3	Indonesia	466	17.2	Saudi Arabia	733	17.3	Korea	1,123	22.4	Korea	1,800	14.1	Turkey	2,636	11.0
Turkey	262	15.5	Turkey	421	15.5	Turkey	665	15.7	Turkey	977	19.5	Turkey	1,505	11.8	Korea	2,311	9.7
Indonesia	209	12.4	Iran	372	13.7	Korea	567	13.4	Saudi Arabia	919	18.3	Saudi Arabia	1,288	10.1	Saudi Arabia	1,729	7.2
Kuwait	154	9.1	Korea	212	7.8	Iran	467	11.0	Iran	676	13.5	Iran	1,248	9.8	Thailand	1,350	5.7
Bangladesh	121	7.1	Philippines	191	7.0	Thailand	407	9.6	ROC	644	12.8	Thailand	1,004	7.9	Iran	1,265	5.3
Pakistan	109	6.5	Thailand	187	6.9	ROC	327	7.7	Thailand	641	12.8	ROC	968	7.6	ROC	1,261	5.3
Philippines	107	6.3	Pakistan	167	6.2	Pakistan	315	7.4	Pakistan	506	10.1	Pakistan	740	5.8	Pakistan	1,057	4.4
Thailand	93	5.5	UAE	150	5.5	Philippines	246	5.8	Malaysia	365	7.3	Malaysia	608	4.8	Philippines	1,000	4.2
Korea	85	5.1	ROC	130	4.8	UAE	193	4.6	Philippines	360	7.2	Philippines	580	4.6	Malaysia	928	3.9
Vietnam	57	3.4	Kuwait	123	4.5	Malaysia	180	4.2	UAE	332	6.6	Vietnam	484	3.8	Vietnam	812	3.4
Malaysia	46	2.7	Bangladesh	114	4.2	Bangladesh	167	3.9	Hong Kong	254	5.1	UAE	480	3.8	Bangladesh	799	3.3
ROC	45	2.7	Malaysia	100	3.7	Hong Kong	166	3.9	Bangladesh	252	5.0	Bangladesh	445	3.5	UAE	698	2.9
Hong Kong	35	2.1	Vietnam	86	3.2	Vietnam	120	2.8	Vietnam	251	5.0	Singapore	399	3.1	Singapore	584	2.4
Sri Lanka	32	1.9	Hong Kong	86	3.2	Singapore	105	2.5	Singapore	218	4.3	Hong Kong	377	3.0	Hong Kong	468	2.0
Qatar	24	1.4	Singapore	51	1.9	Kuwait	91	2.1	Kuwait	131	2.6	Sri Lanka	208	1.6	Sri Lanka	294	1.2
Singapore	22	1.3	Sri Lanka	47	1.7	Sri Lanka	71	1.7	Sri Lanka	120	2.4	Kuwait	192	1.5	Qatar	263	1.1
Myanmar	21	1.2	Myanmar	34	1.3	Oman	50	1.2	Oman	82	1.6	Qatar	191	1.5	Kuwait	232	1.0
Nepal	16	1.0	Qatar	32	1.2	Myanmar	42	1.0	Myanmar	72	1.4	Myanmar	121	0.9	Myanmar	196	0.8
Cambodia	14	0.8	Brunei	25	0.9	Nepal	34	0.8	Qatar	60	1.2	Oman	110	0.9	Oman	150	0.6
Brunei	12	0.7	Oman	24	0.9	Qatar	31	0.7	Nepal	51	1.0	Nepal	74	0.6	Nepal	113	0.5
Bahrain	8.8	0.5	Nepal	22	0.8	Bahrain	19	0.4	Bahrain	29	0.6	Bahrain	56	0.4	Bahrain	78	0.3
Lao PDR	8.4	0.5	Bahrain	17	0.6	Brunei	19	0.4	Brunei	25	0.5	Cambodia	47	0.4	Cambodia	78	0.3
Oman	8.3	0.5	Lao PDR	10	0.4	Lao PDR	13	0.3	Lao PDR	23	0.5	Lao PDR	41	0.3	Lao PDR	60	0.3
UAE	7.8	0.5	Cambodia	8.3	0.3	Cambodia	12	0.3	Cambodia	22	0.4	Brunei	26	0.2	Mongolia	41	0.2
Mongolia	3.3	0.2	Mongolia	6.1	0.2	Mongolia	10	0.2	Mongolia	11	0.2	Mongolia	21	0.2	Brunei	29	0.1
Fiji	3.3	0.2	Fiji	5.2	0.2	Fiji	6.5	0.2	Fiji	8.3	0.2	Fiji	9.4	0.1	Fiji	13	0.1
Bhutan	0.5	0.0	Bhutan	0.8	0.0	Bhutan	1.5	0.0	Bhutan	2.5	0.0	Bhutan	5.6	0.0	Bhutan	10	0.0
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	3,941	233.5	APO21	6,344	234.2	APO21	10,524	248.5	APO21	15,115	301.5	APO21	23,134	181.7	APO21	32,575	136.5
Asia25	4,642	275.0	Asia25	7,485	276.3	Asia25	12,744	300.9	Asia25	20,227	403.5	Asia25	36,023	282.8	Asia25	55,574	232.9
Asia31	5,301	314.1	Asia31	8,486	313.2	Asia31	13,860	327.3	Asia31	21,780	434.5	Asia31	38,340	301.0	Asia31	58,627	245.7
East Asia	2,525	149.6	East Asia	4,224	155.9	East Asia	7,462	176.2	East Asia	11,827	235.9	East Asia	20,957	164.6	East Asia	32,278	135.3
South Asia	987	58.5	South Asia	1,304	48.1	South Asia	2,146	50.7	South Asia	3,479	69.4	South Asia	6,882	54.0	South Asia	11,335	47.5
ASEAN	588	34.8	ASEAN	1,158	42.7	ASEAN	1,996	47.1	ASEAN	3,260	65.0	ASEAN	5,420	42.6	ASEAN	8,025	33.6
ASEAN6	488	28.9	ASEAN6	1,020	37.6	ASEAN6	1,809	42.7	ASEAN6	2,892	57.7	ASEAN6	4,727	37.1	ASEAN6	6,948	29.1
CLMV	101	6.0	CLMV	138	5.1	CLMV	187	4.4	CLMV	367	7.3	CLMV	692	5.4	CLMV	1,077	4.5
GCC	658	39.0	GCC	1,001	37.0	GCC	1,117	26.4	GCC	1,553	31.0	GCC	2,317	18.2	GCC	3,053	12.8
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	5,643	334.3	US	7,705	284.4	US	10,573	249.7	US	14,792	295.1	US	17,546	137.8	US	20,973	87.9
EU15	7,288	431.8	EU15	9,971	368.0	EU15	12,741	300.8	EU15	15,977	318.7	EU15	18,067	141.9	EU15	20,121	84.3
									EU28	18,132	361.7	EU28	20,805	163.4	EU28	23,496	98.5
Australia	314	18.6	Australia	420	15.5	Australia	565	13.3	Australia	801	16.0	Australia	1,086	8.5	Australia	1,342	5.6

Unit: Billions of US dollars (as of 2019).
Sources: Official national accounts in each country, including author adjustments.
Note: See Section 9.1 for the adjustments made to harmonize GDP coverage across countries.

Table 10 GDP Growth

——Average annual growth rate of GDP at constant market prices

1990–1995		1995–2000		2000–2005		2005–2010		2010–2015		2015–2019		2018–2019	
China	9.5	Qatar	8.8	Qatar	9.7	Qatar	13.4	Mongolia	9.8	Cambodia	7.3	Myanmar	11.6
Malaysia	9.3	Cambodia	7.7	Cambodia	9.2	China	9.9	China	7.8	Bangladesh	7.3	Cambodia	7.6
Thailand	8.6	China	7.4	China	8.7	Bhutan	9.7	Turkey	6.8	Philippines	6.6	Bangladesh	6.5
Singapore	8.4	Myanmar	7.2	Kuwait	7.2	India	8.1	India	6.5	Vietnam	6.4	Lao PDR	5.6
Korea	8.3	Vietnam	7.1	Iran	7.0	Singapore	7.2	Bhutan	6.5	Lao PDR	6.3	Brunei	5.5
ROC	7.5	Lao PDR	7.1	Vietnam	7.0	Bahrain	6.5	Qatar	6.3	China	6.0	Bhutan	5.5
Vietnam	7.5	Bhutan	6.7	India	6.9	Sri Lanka	6.5	Myanmar	6.1	Nepal	5.8	Philippines	5.3
Indonesia	7.5	UAE	6.6	Lao PDR	6.6	Mongolia	6.4	Bangladesh	5.9	India	5.8	Mongolia	4.9
Hong Kong	5.9	Singapore	6.2	Bahrain	6.4	Vietnam	6.1	UAE	5.8	Turkey	5.5	Vietnam	4.8
Kuwait	5.7	ROC	6.0	Bhutan	6.4	Bangladesh	6.0	Philippines	5.7	Bhutan	5.2	Indonesia	4.7
Oman	5.6	India	5.4	Mongolia	6.3	Cambodia	5.9	Indonesia	5.3	Indonesia	4.8	China	4.6
Sri Lanka	5.5	Korea	5.4	Myanmar	5.6	Indonesia	5.4	Vietnam	5.3	Mongolia	4.6	Saudi Arabia	4.3
Bahrain	5.5	Sri Lanka	4.9	Bangladesh	5.4	Iran	5.2	Malaysia	5.1	Myanmar	4.5	Sri Lanka	4.1
Lao PDR	4.8	Malaysia	4.8	Malaysia	5.4	Lao PDR	4.9	Saudi Arabia	5.0	Pakistan	4.2	Turkey	3.2
Pakistan	4.8	Pakistan	4.7	Thailand	5.1	Philippines	4.9	Singapore	4.7	Malaysia	4.2	ROC	3.1
Qatar	4.7	Philippines	4.4	Korea	5.1	Malaysia	4.8	Sri Lanka	4.4	Singapore	3.7	India	3.0
Cambodia	4.5	Bangladesh	4.4	Turkey	5.0	Myanmar	4.8	Cambodia	4.2	Thailand	3.6	Malaysia	3.0
India	4.5	Turkey	4.4	UAE	4.9	Nepal	4.4	Bahrain	3.9	Bahrain	3.5	UAE	2.7
UAE	4.3	Oman	4.2	Singapore	4.9	Korea	4.3	Pakistan	3.8	Sri Lanka	3.1	Thailand	2.6
Nepal	4.1	Iran	4.1	Philippines	4.7	ROC	4.1	Nepal	3.8	Oman	3.1	Bahrain	2.5
Bangladesh	3.8	Nepal	3.8	Sri Lanka	4.6	Thailand	3.9	Fiji	3.7	ROC	3.0	Korea	2.3
Saudi Arabia	3.4	Mongolia	3.6	Indonesia	4.5	Hong Kong	3.8	Oman	3.7	Korea	2.8	Nepal	2.2
Myanmar	3.3	Bahrain	3.5	Pakistan	4.4	Turkey	3.7	Kuwait	3.5	Fiji	2.7	Qatar	1.4
Iran	3.3	Brunei	2.8	Saudi Arabia	4.3	Pakistan	3.2	Thailand	3.1	UAE	2.1	Kuwait	1.3
Turkey	3.3	Hong Kong	2.7	Hong Kong	4.1	Oman	3.0	ROC	2.9	Brunei	1.9	Pakistan	1.1
Philippines	3.2	Fiji	2.0	ROC	4.0	UAE	2.5	Hong Kong	2.8	Hong Kong	1.8	Singapore	0.7
Bhutan	3.0	Kuwait	1.7	Nepal	3.1	Saudi Arabia	2.4	Korea	2.7	Saudi Arabia	1.1	Japan	0.2
Brunei	3.0	Saudi Arabia	1.1	Oman	3.0	Fiji	0.7	Lao PDR	2.7	Iran	0.9	Fiji	−0.4
Fiji	2.6	Japan	1.0	Fiji	2.0	Kuwait	0.4	Japan	1.1	Japan	0.8	Oman	−1.0
Japan	1.4	Indonesia	0.7	Japan	1.2	Brunei	0.1	Brunei	0.9	Kuwait	0.5	Hong Kong	−1.3
Mongolia	−1.8	Thailand	0.4	Brunei	0.9	Japan	−0.1	Iran	−0.4	Qatar	0.1	Iran	−8.0
(region)		(region)		(region)		(region)		(region)		(region)		(region)	
APO21	4.1	APO21	3.1	APO21	4.3	APO21	4.3	APO21	4.1	APO21	4.0	APO21	2.3
Asia25	5.2	Asia25	4.1	Asia25	5.5	Asia25	6.1	Asia25	5.5	Asia25	4.8	Asia25	3.3
Asia31	5.1	Asia31	4.0	Asia31	5.4	Asia31	5.9	Asia31	5.4	Asia31	4.6	Asia31	3.3
East Asia	5.0	East Asia	4.2	East Asia	5.3	East Asia	6.2	East Asia	5.6	East Asia	4.7	East Asia	3.6
South Asia	4.5	South Asia	5.2	South Asia	6.3	South Asia	7.3	South Asia	6.1	South Asia	5.7	South Asia	3.1
ASEAN	7.3	ASEAN	2.5	ASEAN	5.0	ASEAN	5.2	ASEAN	4.8	ASEAN	4.8	ASEAN	4.2
ASEAN6	7.4	ASEAN6	1.9	ASEAN6	4.8	ASEAN6	5.1	ASEAN6	4.8	ASEAN6	4.6	ASEAN6	3.8
CLMV	6.3	CLMV	7.2	CLMV	6.9	CLMV	5.8	CLMV	5.2	CLMV	6.1	CLMV	6.2
GCC	3.9	GCC	2.7	GCC	4.9	GCC	3.1	GCC	5.1	GCC	1.4	GCC	3.2
(reference)		(reference)		(reference)		(reference)		(reference)		(reference)		(reference)	
US	2.5	US	4.2	US	2.5	US	0.9	US	2.2	US	2.3	US	2.2
EU15	1.6	EU15	2.9	EU15	1.7	EU15	0.7	EU15	1.0	EU15	1.8	EU15	1.3
		EU28	2.9	EU28	1.9	EU28	0.9	EU28	1.1	EU28	2.0	EU28	1.5
Australia	3.2	Australia	3.8	Australia	3.4	Australia	2.8	Australia	2.8	Australia	1.8	Australia	−0.2

Unit: Percentage.
Sources: Official national accounts in each country, including author adjustments.
Note: See Section 9.1 for the adjustments made to harmonize GDP coverage across countries.

Table 11 Population

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
China	829.9	40.3	China	987.1	39.0	China	1143.3	37.5	China	1267.4	35.9	China	1340.9	33.8	China	1400.1	32.4
India	555.2	26.9	India	699.0	27.6	India	873.3	28.6	India	1056.6	29.9	India	1234.3	31.2	India	1366.4	31.7
Indonesia	116.1	5.6	Indonesia	147.5	5.8	Indonesia	179.4	5.9	Indonesia	206.3	5.8	Indonesia	237.6	6.0	Indonesia	265.9	6.2
Japan	104.7	5.1	Japan	117.1	4.6	Japan	123.6	4.1	Pakistan	137.9	3.9	Pakistan	173.5	4.4	Pakistan	209.2	4.8
Bangladesh	71.2	3.5	Bangladesh	85.4	3.4	Pakistan	112.1	3.7	Japan	126.9	3.6	Bangladesh	147.3	3.7	Bangladesh	165.6	3.8
Pakistan	60.6	2.9	Pakistan	82.6	3.3	Bangladesh	109.0	3.6	Bangladesh	124.1	3.5	Japan	128.1	3.2	Japan	126.2	2.9
Vietnam	42.7	2.1	Vietnam	53.7	2.1	Vietnam	66.0	2.2	Vietnam	77.6	2.2	Philippines	92.3	2.3	Philippines	106.9	2.5
Philippines	36.7	1.8	Philippines	48.1	1.9	Philippines	60.7	2.0	Philippines	76.5	2.2	Vietnam	87.1	2.2	Vietnam	96.5	2.2
Turkey	35.6	1.7	Thailand	44.8	1.8	Turkey	56.5	1.9	Turkey	67.8	1.9	Iran	74.3	1.9	Iran	83.5	1.9
Thailand	34.4	1.7	Turkey	44.7	1.8	Iran	55.1	1.8	Iran	64.2	1.8	Turkey	73.7	1.9	Turkey	83.2	1.9
Korea	32.2	1.6	Iran	38.8	1.5	Thailand	54.5	1.8	Thailand	60.6	1.7	Thailand	65.9	1.7	Thailand	68.3	1.6
Iran	28.4	1.4	Korea	38.1	1.5	Korea	42.9	1.4	Korea	47.0	1.3	Myanmar	50.6	1.3	Myanmar	54.0	1.3
Myanmar	27.3	1.3	Myanmar	34.2	1.4	Myanmar	41.3	1.4	Myanmar	46.7	1.3	Korea	49.6	1.3	Korea	51.7	1.2
ROC	14.8	0.7	ROC	17.9	0.7	ROC	20.4	0.7	Malaysia	23.5	0.7	Malaysia	28.6	0.7	Saudi Arabia	34.3	0.8
Sri Lanka	12.5	0.6	Sri Lanka	14.7	0.6	Malaysia	18.1	0.6	Nepal	22.8	0.6	Saudi Arabia	27.4	0.7	Malaysia	32.6	0.8
Nepal	11.3	0.5	Nepal	14.6	0.6	Nepal	18.1	0.6	ROC	22.3	0.6	Nepal	26.4	0.7	Nepal	28.0	0.6
Malaysia	10.9	0.5	Malaysia	13.9	0.5	Sri Lanka	17.0	0.6	Saudi Arabia	20.7	0.6	ROC	23.2	0.6	ROC	23.6	0.5
Cambodia	6.77	0.3	Saudi Arabia	9.69	0.4	Saudi Arabia	16.2	0.5	Sri Lanka	19.1	0.5	Sri Lanka	20.7	0.5	Sri Lanka	21.8	0.5
Saudi Arabia	5.84	0.3	Cambodia	6.59	0.3	Cambodia	8.84	0.3	Cambodia	11.9	0.3	Cambodia	13.8	0.3	Cambodia	15.6	0.4
Hong Kong	3.96	0.2	Hong Kong	5.06	0.2	Hong Kong	5.70	0.2	Hong Kong	6.67	0.2	UAE	8.26	0.2	UAE	9.44	0.2
Lao PDR	2.50	0.1	Lao PDR	3.20	0.1	Lao PDR	4.14	0.1	Lao PDR	5.22	0.1	Hong Kong	7.02	0.2	Hong Kong	7.51	0.2
Singapore	2.07	0.1	Singapore	2.41	0.1	Singapore	3.05	0.1	Singapore	4.03	0.1	Lao PDR	6.26	0.2	Lao PDR	7.25	0.2
Mongolia	1.25	0.1	Mongolia	1.66	0.1	Kuwait	2.10	0.1	UAE	3.00	0.1	Singapore	5.08	0.1	Singapore	5.70	0.1
Kuwait	0.74	0.0	Kuwait	1.36	0.1	Mongolia	2.07	0.1	Oman	2.40	0.1	Kuwait	2.91	0.1	Oman	5.09	0.1
Oman	0.68	0.0	Oman	1.09	0.0	UAE	1.77	0.1	Mongolia	2.39	0.1	Oman	2.77	0.1	Kuwait	3.89	0.1
Fiji	0.52	0.0	UAE	1.04	0.0	Oman	1.63	0.1	Kuwait	1.86	0.1	Mongolia	2.76	0.1	Mongolia	3.27	0.1
Bhutan	0.30	0.0	Fiji	0.63	0.0	Fiji	0.74	0.0	Fiji	0.80	0.0	Qatar	1.70	0.0	Qatar	2.59	0.1
UAE	0.25	0.0	Bhutan	0.41	0.0	Bhutan	0.53	0.0	Bahrain	0.64	0.0	Bahrain	1.23	0.0	Bahrain	1.48	0.0
Bahrain	0.21	0.0	Bahrain	0.34	0.0	Bahrain	0.49	0.0	Qatar	0.61	0.0	Fiji	0.86	0.0	Fiji	0.89	0.0
Brunei	0.13	0.0	Qatar	0.22	0.0	Qatar	0.42	0.0	Bhutan	0.60	0.0	Bhutan	0.68	0.0	Bhutan	0.74	0.0
Qatar	0.11	0.0	Brunei	0.19	0.0	Brunei	0.25	0.0	Brunei	0.32	0.0	Brunei	0.39	0.0	Brunei	0.46	0.0
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	1184.3	57.5	APO21	1480.4	58.5	APO21	1831.1	60.0	APO21	2164.2	61.3	APO21	2498.2	63.1	APO21	2769.6	64.2
Asia25	2052.9	99.6	Asia25	2515.5	99.5	Asia25	3028.8	99.3	Asia25	3499.3	99.2	Asia25	3917.5	98.9	Asia25	4259.2	98.7
Asia31	2060.8	100.0	Asia31	2529.2	100.0	Asia31	3051.4	100.0	Asia31	3528.5	100.0	Asia31	3961.8	100.0	Asia31	4316.0	100.0
East Asia	986.8	47.9	East Asia	1166.8	46.1	East Asia	1338.0	43.8	East Asia	1472.7	41.7	East Asia	1551.5	39.2	East Asia	1612.3	37.4
South Asia	711.1	34.5	South Asia	896.7	35.5	South Asia	1129.9	37.0	South Asia	1361.0	38.6	South Asia	1602.8	40.5	South Asia	1791.8	41.5
ASEAN	279.5	13.6	ASEAN	354.6	14.0	ASEAN	436.4	14.3	ASEAN	512.7	14.5	ASEAN	587.6	14.8	ASEAN	653.2	15.1
ASEAN6	200.3	9.7	ASEAN6	256.9	10.2	ASEAN6	316.0	10.4	ASEAN6	371.2	10.5	ASEAN6	430.0	10.9	ASEAN6	479.9	11.1
CLMV	79.3	3.8	CLMV	97.7	3.9	CLMV	120.3	3.9	CLMV	141.5	4.0	CLMV	157.7	4.0	CLMV	173.3	4.0
GCC	7.82	0.4	GCC	13.7	0.5	GCC	22.6	0.7	GCC	29.2	0.8	GCC	44.3	1.1	GCC	56.8	1.3
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	205.1	10.0	US	227.2	9.0	US	249.6	8.2	US	282.2	8.0	US	309.3	7.8	US	328.3	7.6
EU15	342.1	16.6	EU15	357.3	14.1	EU15	366.3	12.0	EU15	377.7	10.7	EU15	397.4	10.0	EU15	410.7	9.5
EU28	439.9	21.3	EU28	461.8	18.3	EU28	475.2	15.6	EU28	487.3	13.8	EU28	503.2	12.7	EU28	513.5	11.9
Australia	12.6	0.6	Australia	14.7	0.6	Australia	17.1	0.6	Australia	19.0	0.5	Australia	22.0	0.6	Australia	25.4	0.6

Unit: Millions of persons.
Sources: Population census and other official data in each country, including author interpolations.

Table 12 Per Capita GDP using Exchange Rate

——GDP at current market prices per person, using annual average exchange rate

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
Japan	2.00	100.0	Japan	9.49	100.0	Japan	25.8	100.0	Japan	39.1	100.0	Singapore	47.2	100.0	Singapore	65.6	100.0
Hong Kong	0.96	48.3	Hong Kong	5.70	60.1	Hong Kong	13.5	52.3	Hong Kong	25.8	65.8	Japan	45.0	95.2	Hong Kong	48.7	74.2
Singapore	0.93	46.4	Singapore	5.00	52.7	Singapore	12.8	49.5	Singapore	23.9	60.9	Hong Kong	32.6	68.9	Japan	40.8	62.2
Turkey	0.68	34.3	Iran	2.51	26.5	ROC	8.16	31.7	ROC	14.8	37.9	Korea	23.1	48.9	Korea	31.8	48.5
Fiji	0.43	21.4	ROC	2.37	24.9	Korea	6.61	25.7	Korea	12.3	31.3	ROC	19.2	40.6	ROC	25.9	39.5
Iran	0.40	19.9	Turkey	2.07	21.8	Turkey	3.62	14.0	Turkey	4.05	10.3	Turkey	10.5	22.3	Malaysia	11.2	17.1
ROC	0.39	19.7	Fiji	1.92	20.2	Malaysia	2.50	9.7	Malaysia	4.04	10.3	Malaysia	8.92	18.9	China	10.6	16.2
Malaysia	0.36	17.9	Malaysia	1.78	18.7	Fiji	1.85	7.2	Fiji	2.10	5.4	Iran	6.94	14.7	Iran	9.83	15.0
Korea	0.28	14.0	Korea	1.72	18.1	Iran	1.72	6.7	Thailand	2.09	5.3	Thailand	5.18	11.0	Turkey	9.16	13.9
Sri Lanka	0.23	11.4	Thailand	0.74	7.8	Thailand	1.63	6.3	Iran	1.75	4.5	China	4.79	10.1	Thailand	8.05	12.3
Bhutan	0.22	11.2	Philippines	0.69	7.2	Philippines	0.77	3.0	Philippines	1.09	2.8	Fiji	3.65	7.7	Fiji	6.18	9.4
Thailand	0.21	10.6	Indonesia	0.54	5.7	Mongolia	0.77	3.0	China	1.02	2.6	Indonesia	3.18	6.7	Mongolia	4.29	6.5
Philippines	0.18	9.3	China	0.35	3.7	Indonesia	0.71	2.8	Sri Lanka	1.01	2.6	Sri Lanka	2.73	5.8	Indonesia	4.23	6.4
Pakistan	0.17	8.4	Bhutan	0.34	3.6	Bhutan	0.58	2.3	Indonesia	0.82	2.1	Mongolia	2.61	5.5	Sri Lanka	3.84	5.9
Bangladesh	0.14	7.0	Sri Lanka	0.33	3.5	Sri Lanka	0.55	2.2	Bhutan	0.74	1.9	Bhutan	2.28	4.8	Philippines	3.52	5.4
China	0.13	6.3	Pakistan	0.29	3.1	Pakistan	0.41	1.6	Mongolia	0.60	1.5	Philippines	2.26	4.8	Bhutan	3.43	5.2
Cambodia	0.12	5.9	Mongolia	0.29	3.0	India	0.38	1.5	Pakistan	0.57	1.5	India	1.35	2.9	Vietnam	2.73	4.2
India	0.11	5.7	India	0.27	2.9	China	0.37	1.4	India	0.46	1.2	Vietnam	1.34	2.8	Lao PDR	2.64	4.0
Nepal	0.10	5.0	Bangladesh	0.22	2.3	Bangladesh	0.29	1.1	Vietnam	0.42	1.1	Lao PDR	1.18	2.5	India	2.10	3.2
Myanmar	0.10	5.0	Nepal	0.18	1.9	Nepal	0.25	1.0	Bangladesh	0.42	1.1	Pakistan	1.01	2.1	Bangladesh	1.82	2.8
Mongolia	0.09	4.7	Myanmar	0.17	1.8	Lao PDR	0.22	0.8	Lao PDR	0.35	0.9	Cambodia	0.82	1.7	Cambodia	1.76	2.7
Indonesia	0.09	4.3	Cambodia	0.11	1.2	Cambodia	0.20	0.8	Cambodia	0.31	0.8	Bangladesh	0.78	1.6	Nepal	1.21	1.8
Lao PDR	0.05	2.4	Lao PDR	0.10	1.1	Myanmar	0.15	0.6	Nepal	0.28	0.7	Myanmar	0.73	1.6	Pakistan	1.21	1.8
Vietnam	0.03	1.4	Vietnam	0.02	0.2	Vietnam	0.10	0.4	Myanmar	0.17	0.4	Nepal	0.72	1.5	Myanmar	0.82	1.3
Bahrain	1.88	94.4	Bahrain	10.3	108.5	Bahrain	9.25	35.9	Bahrain	13.2	33.7	Bahrain	20.8	44.1	Bahrain	26.0	39.5
Kuwait	4.00	200.6	Kuwait	21.8	229.9	Kuwait	9.10	35.3	Kuwait	20.6	52.7	Kuwait	40.7	86.1	Kuwait	36.2	55.1
Oman	0.40	19.8	Oman	5.79	61.0	Oman	7.21	28.0	Oman	8.22	21.0	Oman	20.8	44.1	Oman	15.3	23.3
Qatar	4.97	249.1	Qatar	35.4	373.3	Qatar	17.8	69.2	Qatar	29.5	75.5	Qatar	75.3	159.3	Qatar	70.0	106.6
Saudi Arabia	0.92	46.3	Saudi Arabia	17.1	179.7	Saudi Arabia	7.30	28.3	Saudi Arabia	9.26	23.7	Saudi Arabia	19.4	41.1	Saudi Arabia	23.4	35.7
UAE	4.28	214.6	UAE	42.3	445.4	UAE	28.9	112.3	UAE	35.3	90.2	UAE	36.0	76.3	UAE	46.2	70.3
Brunei	1.72	86.4	Brunei	33.0	347.7	Brunei	15.4	59.9	Brunei	20.5	52.3	Brunei	35.4	75.0	Brunei	29.3	44.7
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	0.32	16.2	APO21	1.26	13.3	APO21	2.62	10.2	APO21	3.55	9.1	APO21	5.14	10.9	APO21	5.78	8.8
Asia25	0.24	12.0	Asia25	0.89	9.4	Asia25	1.73	6.7	Asia25	2.59	6.6	Asia25	4.97	10.5	Asia25	7.33	11.2
Asia31	0.24	12.2	Asia31	0.98	10.4	Asia31	1.79	7.0	Asia31	2.67	6.8	Asia31	5.20	11.0	Asia31	7.63	11.6
East Asia	0.34	16.9	East Asia	1.36	14.4	East Asia	3.09	12.0	East Asia	4.99	12.7	East Asia	9.02	19.1	East Asia	14.1	21.4
South Asia	0.12	6.2	South Asia	0.27	2.8	South Asia	0.38	1.5	South Asia	0.47	1.2	South Asia	1.27	2.7	South Asia	1.98	3.0
ASEAN	0.12	6.2	ASEAN	0.56	5.9	ASEAN	0.84	3.3	ASEAN	1.21	3.1	ASEAN	3.38	7.2	ASEAN	4.83	7.4
ASEAN6	0.15	7.5	ASEAN6	0.74	7.8	ASEAN6	1.11	4.3	ASEAN6	1.55	4.0	ASEAN6	4.22	8.9	ASEAN6	5.84	8.9
CLMV	0.06	3.0	CLMV	0.08	0.9	CLMV	0.13	0.5	CLMV	0.33	0.8	CLMV	1.09	2.3	CLMV	2.05	3.1
GCC	1.36	68.0	GCC	18.7	196.8	GCC	9.39	36.5	GCC	13.1	33.4	GCC	26.2	55.4	GCC	29.5	45.0
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	5.23	262.3	US	12.6	132.5	US	23.9	92.7	US	36.3	92.8	US	48.5	102.6	US	65.3	99.4
EU15	3.65	183.1	EU15	9.33	98.3	EU15	17.5	68.0	EU15	26.3	67.2	EU15	36.7	77.8	EU15	51.3	78.2
									EU28	22.6	57.9	EU28	33.4	70.7	EU28	48.2	73.4
Australia	3.57	179.1	Australia	11.8	124.2	Australia	19.0	73.6	Australia	21.5	54.9	Australia	59.0	124.9	Australia	54.4	82.9

Unit: Thousands of US dollars.
Sources: Official national accounts in each country, including author adjustments.
Note: See Section 9.1 for the adjustments made to harmonize GDP coverage across countries.

Table 13 Per Capita GDP

——GDP at constant market prices per person, using 2017 PPP, reference year 2019

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
Japan	16.1	100.0	Japan	23.1	100.0	Singapore	34.4	100.0	Singapore	54.0	100.0	Singapore	78.5	100.0	Singapore	102.4	100.0
Singapore	10.7	66.3	Singapore	21.3	92.2	Japan	34.3	99.6	Hong Kong	38.1	70.6	Hong Kong	53.7	68.4	Hong Kong	62.3	60.8
Iran	9.70	60.1	Hong Kong	16.9	73.0	Hong Kong	29.0	84.4	Japan	37.7	69.7	ROC	41.8	53.2	ROC	53.4	52.2
Hong Kong	8.87	55.0	Iran	9.58	41.4	ROC	16.0	46.6	ROC	28.9	53.5	Japan	39.5	50.3	Korea	44.7	43.6
Turkey	7.36	45.6	Turkey	9.42	40.7	Korea	13.2	38.5	Korea	23.9	44.2	Korea	36.3	46.3	Japan	43.7	42.6
Fiji	6.32	39.2	Fiji	8.26	35.7	Turkey	11.8	34.2	Malaysia	15.5	28.7	Malaysia	21.3	27.1	Turkey	31.7	31.0
Malaysia	4.21	26.1	ROC	7.28	31.5	Malaysia	9.94	28.9	Turkey	14.4	26.7	Turkey	20.4	26.0	Malaysia	28.5	27.8
Lao PDR	3.37	20.9	Malaysia	7.17	31.0	Fiji	8.88	25.8	Thailand	10.6	19.6	Iran	16.8	21.4	Thailand	19.8	19.3
ROC	3.07	19.1	Korea	5.57	24.0	Iran	8.48	24.7	Iran	10.5	19.5	Thailand	15.2	19.4	China	17.0	16.6
Philippines	2.90	18.0	Thailand	4.17	18.0	Thailand	7.45	21.7	Fiji	10.3	19.1	Fiji	11.0	14.0	Iran	15.2	14.8
Thailand	2.69	16.7	Philippines	3.97	17.1	Mongolia	4.92	14.3	Sri Lanka	6.26	11.6	Sri Lanka	10.1	12.8	Fiji	14.2	13.9
Mongolia	2.68	16.6	Mongolia	3.64	15.7	Indonesia	4.76	13.8	Indonesia	6.23	11.5	China	9.50	12.1	Sri Lanka	13.5	13.2
Korea	2.65	16.4	Sri Lanka	3.19	13.8	Sri Lanka	4.17	12.1	Philippines	4.70	8.7	Indonesia	8.88	11.3	Bhutan	12.8	12.5
Sri Lanka	2.52	15.6	Indonesia	3.16	13.6	Philippines	4.05	11.8	Mongolia	4.66	8.6	Bhutan	8.26	10.5	Mongolia	12.6	12.3
Cambodia	2.09	13.0	Lao PDR	3.00	13.0	Lao PDR	3.06	8.9	Lao PDR	4.41	8.2	Mongolia	7.61	9.7	Indonesia	12.5	12.2
Pakistan	1.80	11.2	Bhutan	2.04	8.8	Bhutan	2.88	8.4	Bhutan	4.19	7.8	Lao PDR	6.54	8.3	Philippines	9.35	9.1
Indonesia	1.80	11.1	Pakistan	2.03	8.8	Pakistan	2.81	8.2	China	3.96	7.3	Philippines	6.28	8.0	Vietnam	8.41	8.2
Bangladesh	1.69	10.5	Vietnam	1.61	7.0	Nepal	1.90	5.5	Pakistan	3.67	6.8	Vietnam	5.56	7.1	Lao PDR	8.31	8.1
Bhutan	1.69	10.5	Nepal	1.53	6.6	China	1.89	5.5	Vietnam	3.23	6.0	India	4.38	5.6	India	6.90	6.7
Nepal	1.43	8.9	India	1.36	5.9	Vietnam	1.82	5.3	India	2.41	4.5	Pakistan	4.26	5.4	Pakistan	5.05	4.9
Vietnam	1.34	8.3	Bangladesh	1.34	5.8	India	1.78	5.2	Nepal	2.24	4.1	Cambodia	3.42	4.4	Cambodia	5.00	4.9
India	1.28	7.9	Cambodia	1.26	5.4	Bangladesh	1.53	4.5	Bangladesh	2.03	3.8	Bangladesh	3.02	3.8	Bangladesh	4.82	4.7
China	0.81	5.0	China	1.10	4.7	Cambodia	1.36	3.9	Cambodia	1.86	3.4	Nepal	2.82	3.6	Nepal	4.03	3.9
Myanmar	0.75	4.7	Myanmar	1.00	4.3	Myanmar	1.02	3.0	Myanmar	1.53	2.8	Myanmar	2.39	3.0	Myanmar	3.62	3.5
Bahrain	42.4	263.0	Bahrain	49.4	213.5	Bahrain	38.3	111.2	Bahrain	46.3	85.6	Bahrain	45.5	57.9	Bahrain	52.9	51.7
Kuwait	208.9	1295.4	Kuwait	90.7	391.9	Kuwait	43.2	125.5	Kuwait	70.3	130.0	Kuwait	65.9	84.0	Kuwait	59.8	58.4
Oman	12.1	75.1	Oman	21.6	93.2	Oman	30.6	89.0	Oman	33.9	62.8	Oman	39.7	50.5	Oman	29.4	28.7
Qatar	223.5	1385.8	Qatar	141.1	609.5	Qatar	72.7	211.4	Qatar	97.9	181.2	Qatar	112.3	143.0	Qatar	101.3	99.0
Saudi Arabia	78.2	484.8	Saudi Arabia	67.6	292.2	Saudi Arabia	45.2	131.3	Saudi Arabia	44.5	82.3	Saudi Arabia	47.0	59.8	Saudi Arabia	50.4	49.3
UAE	31.5	195.6	UAE	143.8	621.4	UAE	109.0	316.8	UAE	110.8	205.1	UAE	58.1	74.0	UAE	74.0	72.2
Brunei	88.6	549.3	Brunei	132.5	572.5	Brunei	73.6	213.8	Brunei	76.4	141.3	Brunei	67.5	86.0	Brunei	64.0	62.5
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	3.33	20.6	APO21	4.29	18.5	APO21	5.75	16.7	APO21	6.98	12.9	APO21	9.26	11.8	APO21	12.0	11.8
Asia25	2.27	14.1	Asia25	2.99	12.9	Asia25	4.22	12.3	Asia25	5.81	10.8	Asia25	9.26	11.8	Asia25	13.6	13.3
Asia31	2.59	16.0	Asia31	3.37	14.6	Asia31	4.56	13.3	Asia31	6.21	11.5	Asia31	9.74	12.4	Asia31	14.1	13.8
East Asia	2.56	15.9	East Asia	3.62	15.6	East Asia	5.58	16.2	East Asia	8.03	14.9	East Asia	13.5	17.2	East Asia	20.7	20.3
South Asia	1.39	8.6	South Asia	1.45	6.3	South Asia	1.90	5.5	South Asia	2.56	4.7	South Asia	4.29	5.5	South Asia	6.53	6.4
ASEAN	2.10	13.0	ASEAN	3.27	14.1	ASEAN	4.57	13.3	ASEAN	6.36	11.8	ASEAN	9.22	11.7	ASEAN	12.8	12.5
ASEAN6	2.43	15.1	ASEAN6	3.97	17.1	ASEAN6	5.72	16.6	ASEAN6	7.79	14.4	ASEAN6	11.0	14.0	ASEAN6	15.0	14.7
CLMV	1.27	7.9	CLMV	1.42	6.1	CLMV	1.56	4.5	CLMV	2.60	4.8	CLMV	4.39	5.6	CLMV	6.61	6.5
GCC	84.1	521.7	GCC	72.8	314.7	GCC	49.3	143.4	GCC	53.2	98.5	GCC	52.3	66.6	GCC	55.5	54.2
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	27.5	170.6	US	33.9	146.5	US	42.4	123.1	US	52.4	97.0	US	56.7	72.2	US	65.3	63.8
EU15	21.3	132.1	EU15	27.9	120.6	EU15	34.8	101.1	EU15	42.3	78.3	EU15	45.5	57.9	EU15	49.6	48.5
									EU28	37.2	68.9	EU28	41.3	52.6	EU28	46.4	45.4
Australia	24.9	154.3	Australia	28.6	123.5	Australia	33.1	96.2	Australia	42.1	77.9	Australia	49.3	62.8	Australia	52.8	51.5

Unit: Thousands of US dollars (as of 2019).
Sources: Official national accounts in each country, including author adjustments.
Note: See Section 9.1 for the adjustments made to harmonize GDP coverage across countries.

Table 14 Final Demand Shares in GDP

——Share of final demands with respect to GDP at current market prices

	1970				1990				2000				2010				2019			
	Household consumption	Government consumption	Investment	Net exports	Household consumption	Government consumption	Investment	Net exports	Household consumption	Government consumption	Investment	Net exports	Household consumption	Government consumption	Investment	Net exports	Household consumption	Government consumption	Investment	Net exports
Bahrain	67.8	14.8	21.3	−3.9	62.1	23.4	12.8	1.8	48.9	17.3	10.1	23.8	41.2	12.9	27.3	18.6	39.8	15.7	33.1	11.3
Bangladesh	89.0	1.3	9.8	−0.1	84.7	4.6	17.5	−6.8	75.9	5.0	23.8	−4.6	74.4	5.1	26.2	−5.8	68.3	6.3	31.6	−6.1
Bhutan	68.5	33.6	24.6	−26.7	49.6	32.6	21.1	−3.3	51.2	21.9	45.8	−18.9	51.9	20.5	56.7	−29.0	62.0	18.2	36.1	−16.3
Brunei	21.2	8.3	15.2	55.3	39.2	21.8	19.5	19.5	30.4	25.5	18.8	25.3	14.9	22.2	23.5	39.4	29.1	25.0	38.4	7.4
Cambodia	69.0	22.5	10.2	−1.8	96.0	5.7	6.6	−8.3	89.1	5.2	17.5	−11.9	81.7	6.3	17.4	−5.4	72.2	4.8	24.4	−1.4
China	60.3	9.9	29.8	0.1	53.2	12.7	31.7	2.5	50.7	15.7	31.3	2.2	38.5	13.8	44.2	3.5	40.9	16.1	41.6	1.4
ROC	55.9	17.7	26.4	0.0	52.3	18.0	25.5	4.2	55.2	15.7	27.2	1.8	53.2	15.1	25.1	6.6	52.2	14.0	23.6	10.2
Fiji	66.9	14.0	22.3	−3.1	73.5	17.1	14.0	−4.7	66.5	17.2	21.3	−5.1	72.6	15.0	18.7	−6.4	74.7	19.8	15.8	−10.3
Hong Kong	66.2	5.7	20.4	7.7	57.5	6.8	27.2	8.5	58.6	9.4	27.6	4.4	61.4	8.9	23.9	5.9	68.7	10.8	18.9	1.7
India	74.0	9.4	16.7	−0.1	62.4	11.9	27.1	−1.4	64.2	12.8	23.9	−0.9	57.5	11.7	35.3	−4.5	61.0	11.3	30.2	−2.5
Indonesia	73.0	8.2	21.1	−2.2	61.8	7.9	27.7	2.5	61.1	6.4	22.2	10.3	56.1	9.0	33.0	1.9	57.7	8.7	34.1	−0.5
Iran	54.3	17.6	28.7	−0.6	55.9	11.7	40.5	−8.1	51.9	15.0	25.3	7.8	44.6	18.8	31.8	4.8	48.0	13.3	27.5	11.3
Japan	46.9	10.5	41.5	1.1	50.4	13.4	35.5	0.8	53.7	16.5	28.4	1.4	56.9	19.2	22.6	1.3	54.5	19.8	25.8	0.0
Korea	73.5	9.9	26.3	−9.7	50.2	11.0	39.6	−0.8	54.4	10.9	32.9	1.8	50.4	14.2	32.6	2.8	48.6	17.2	31.3	2.9
Kuwait	39.8	13.2	12.3	34.7	59.6	37.4	15.7	−12.7	42.2	21.1	10.9	25.9	30.0	16.7	17.8	35.4	46.3	24.4	21.2	8.1
Lao PDR	81.4	35.0	20.2	−36.5	79.4	7.2	26.5	−13.2	79.8	6.7	27.6	−14.1	79.5	11.5	22.5	−13.5	55.8	13.4	39.7	−8.9
Malaysia	57.4	18.2	20.2	4.2	52.6	13.4	31.9	2.0	43.8	10.0	27.1	19.0	48.1	12.6	23.4	15.9	59.8	11.7	21.0	7.4
Mongolia	77.8	24.1	32.6	−34.6	64.8	20.4	31.4	−16.7	72.4	14.4	24.3	−11.1	55.2	12.7	42.1	−10.0	54.5	12.1	39.4	−6.0
Myanmar	90.7	8.1	10.1	−8.9	91.0	7.6	8.2	−6.7	84.8	3.6	11.2	0.4	42.6	4.7	16.8	36.0	39.4	11.2	35.8	13.6
Nepal	90.0	6.1	7.4	−3.5	83.9	7.6	20.9	−12.4	80.3	8.0	22.3	−10.6	76.5	9.5	37.7	−23.7	70.5	11.4	49.7	−31.5
Oman	19.8	12.7	13.8	53.7	41.3	27.0	17.6	14.1	35.0	21.2	15.6	28.2	33.6	18.4	23.5	24.5	40.4	24.0	21.3	14.3
Pakistan	76.9	10.1	15.8	−2.7	71.8	13.0	19.9	−4.7	75.5	8.1	17.6	−1.1	79.7	10.3	15.8	−5.8	82.9	11.7	15.6	−10.2
Philippines	66.2	10.1	24.6	−0.8	70.1	10.6	26.3	−7.0	71.7	11.1	15.7	1.5	70.2	9.7	20.4	−0.4	73.2	12.5	26.2	−11.9
Qatar	21.7	20.3	23.4	34.6	28.1	32.2	18.7	20.9	15.6	19.3	21.1	44.0	16.8	13.7	31.8	37.7	25.3	17.9	42.9	13.9
Saudi Arabia	32.6	15.8	22.4	29.2	46.6	28.8	15.7	8.9	36.5	25.6	19.4	18.5	32.4	20.0	31.2	16.4	38.8	23.6	29.3	8.3
Singapore	69.0	11.8	38.2	−19.0	44.8	9.5	35.7	10.1	42.0	10.5	35.2	12.3	36.3	9.7	27.7	26.3	36.8	10.3	24.7	28.3
Sri Lanka	79.4	6.3	16.9	−2.5	81.1	7.0	18.7	−6.7	73.0	7.6	28.3	−8.9	68.9	8.5	29.9	−7.3	70.0	9.5	26.7	−6.1
Thailand	67.0	11.9	25.3	−4.2	55.8	10.0	41.7	−7.4	55.6	13.5	22.5	8.4	53.0	15.8	25.5	5.7	50.3	16.0	24.5	9.3
Turkey	76.9	7.9	15.6	−0.4	68.7	9.3	23.2	−1.2	66.9	11.9	23.7	−2.6	62.7	14.9	26.8	−4.3	56.9	15.5	24.8	2.8
UAE	38.5	6.0	21.7	33.8	56.9	9.5	17.3	16.2	58.0	9.3	20.8	11.9	40.5	9.8	29.7	20.1	33.7	12.8	30.3	23.2
Vietnam	69.5	33.5	21.8	−24.8	87.3	7.5	14.3	−9.2	67.9	6.1	28.4	−2.3	66.3	6.0	36.0	−8.2	63.0	6.4	27.4	3.2
(region)																				
APO21	60.9	10.7	29.0	−0.6	57.3	11.8	31.6	−0.7	58.9	12.8	26.0	2.3	57.2	13.7	28.6	0.5	58.2	13.3	27.8	0.6
Asia25	60.7	10.7	29.2	−0.6	56.5	12.0	31.8	−0.3	56.4	13.7	27.5	2.3	49.6	14.0	34.7	1.7	50.1	14.7	34.2	1.0
Asia31	57.3	11.3	28.0	3.4	55.9	13.2	30.5	0.4	55.3	14.2	26.9	3.6	48.6	14.2	34.4	2.8	49.5	15.0	33.9	1.6
East Asia	50.1	10.7	38.7	0.6	50.4	13.3	34.8	1.4	51.5	15.9	30.8	1.9	43.2	15.6	38.0	3.2	42.9	17.1	38.4	1.7
South Asia	76.4	8.4	15.7	−0.5	66.5	11.2	24.9	−2.6	67.2	11.3	23.1	−1.6	61.5	11.0	32.5	−5.0	63.8	11.0	29.1	−3.9
ASEAN	69.7	13.1	22.7	−5.5	62.1	9.3	30.1	−1.4	59.1	9.1	23.1	8.6	55.5	10.5	28.4	5.6	57.2	10.7	28.8	3.3
ASEAN6	68.6	10.5	23.4	−2.5	59.6	9.4	31.6	−0.7	57.4	9.5	23.0	10.1	54.3	11.1	28.1	6.5	56.9	11.2	28.8	3.1
CLMV	75.7	27.6	18.9	−22.2	87.7	7.5	13.7	−8.9	73.2	5.6	24.3	−3.1	64.0	6.1	30.6	−0.6	59.0	7.5	29.4	4.1
GCC	34.2	15.2	20.0	30.6	49.0	26.1	16.1	8.9	40.9	21.1	18.7	19.3	32.8	16.9	29.4	21.0	37.3	20.7	29.8	12.2
(reference)																				
US	60.3	18.0	21.4	0.4	63.9	15.9	21.5	−1.3	66.0	14.0	23.7	−3.7	67.9	16.7	18.7	−3.4	67.9	14.0	21.0	−2.8
EU15	56.5	16.0	28.0	−0.5	56.7	19.5	24.6	−0.7	57.7	19.1	22.8	0.4	56.9	21.7	20.2	1.1	55.1	20.5	21.6	2.9
EU28									57.9	19.1	22.7	0.3	56.8	21.6	20.5	1.1	54.9	20.4	21.8	2.9
Australia	54.2	13.9	32.1	−0.3	57.7	18.2	24.3	−0.1	58.7	17.8	23.5	0.1	54.7	17.8	26.5	1.0	53.5	20.2	22.3	3.9

Unit: Percentage.
Sources: Official national accounts in each country, including author adjustments.
Note: Final demand shares in country groups are computed by using the PPP for GDP. Household consumption includes consumption of NPISHs. Investment includes GFCF plus changes in inventories.

App.

Table 15 Per-Worker Labor Productivity Level

——GDP at constant basic prices per worker, using 2017 PPP, reference year 2019

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
Iran	35.8	100.0	Japan	45.6	100.0	Japan	65.0	100.0	Singapore	97.6	100.0	Singapore	122.9	100.0	Singapore	151.1	100.0
Singapore	31.9	89.2	Singapore	44.0	96.6	Singapore	63.5	97.6	Hong Kong	76.1	78.0	Hong Kong	104.3	84.9	Hong Kong	117.7	77.9
Japan	30.9	86.4	Iran	37.4	82.1	Hong Kong	59.1	90.9	Japan	71.0	72.8	ROC	87.4	71.1	ROC	104.1	68.9
Hong Kong	22.3	62.3	Hong Kong	36.7	80.6	ROC	36.8	56.6	ROC	63.6	65.2	Japan	76.3	62.1	Turkey	84.7	56.1
Turkey	22.1	61.7	Turkey	27.3	59.9	Iran	36.5	56.1	Korea	46.6	47.7	Korea	65.9	53.6	Japan	78.9	52.3
Fiji	19.9	55.6	Fiji	23.2	51.0	Turkey	33.1	51.0	Turkey	45.8	47.0	Iran	60.2	49.0	Korea	76.1	50.4
Malaysia	12.2	34.0	Malaysia	19.3	42.3	Korea	27.2	41.9	Iran	39.6	40.5	Turkey	60.2	49.0	Malaysia	56.9	37.7
ROC	8.9	24.8	ROC	18.5	40.5	Malaysia	25.0	38.5	Malaysia	36.7	37.6	Malaysia	47.4	38.6	Iran	51.9	34.3
Philippines	8.8	24.7	Korea	13.9	30.6	Fiji	22.6	34.8	Fiji	24.0	24.6	Fiji	24.6	20.1	Sri Lanka	32.9	21.8
Korea	8.2	23.0	Philippines	10.7	23.5	Thailand	12.3	18.9	Thailand	17.3	17.7	Sri Lanka	23.7	19.3	Thailand	32.8	21.7
Sri Lanka	6.9	19.4	Mongolia	10.0	22.0	Mongolia	11.8	18.2	Sri Lanka	15.6	15.9	Thailand	23.7	19.3	Mongolia	32.7	21.6
Mongolia	6.7	18.6	Sri Lanka	9.0	19.7	Sri Lanka	11.5	17.7	Indonesia	13.7	14.1	Indonesia	18.7	15.2	Fiji	29.5	19.5
Thailand	6.0	16.7	Indonesia	8.7	19.0	Indonesia	10.8	16.6	Pakistan	12.6	13.0	Mongolia	18.5	15.0	China	27.5	18.2
Lao PDR	6.0	16.6	Thailand	8.1	17.7	Philippines	10.4	16.0	Mongolia	12.5	12.8	Bhutan	15.8	12.8	Indonesia	24.6	16.3
Pakistan	5.7	15.9	Pakistan	6.6	14.4	Pakistan	9.6	14.7	Philippines	12.3	12.7	Philippines	15.2	12.3	Bhutan	22.3	14.8
Indonesia	5.5	15.2	Lao PDR	6.2	13.6	Bhutan	7.9	12.1	Bhutan	11.3	11.6	China	14.9	12.2	Philippines	21.5	14.2
Bangladesh	4.9	13.6	Bhutan	5.4	12.0	Lao PDR	6.3	9.6	Lao PDR	8.5	8.7	Pakistan	13.4	10.9	India	16.5	10.9
Cambodia	4.5	12.5	Bangladesh	3.5	7.7	Nepal	4.3	6.6	China	6.2	6.4	Lao PDR	11.8	9.6	Pakistan	15.6	10.3
Bhutan	4.5	12.4	Vietnam	3.4	7.5	Bangladesh	4.2	6.4	Vietnam	5.8	5.9	India	10.2	8.3	Lao PDR	14.7	9.7
Vietnam	3.4	9.6	Nepal	3.1	6.7	India	3.9	6.1	India	5.7	5.8	Vietnam	8.8	7.1	Vietnam	13.3	8.8
Nepal	3.1	8.6	Myanmar	3.0	6.6	Vietnam	3.5	5.3	Nepal	5.1	5.2	Bangladesh	6.9	5.6	Bangladesh	10.8	7.2
India	2.7	7.4	India	2.8	6.1	China	3.0	4.6	Bangladesh	5.0	5.2	Nepal	6.5	5.3	Nepal	8.5	5.6
Myanmar	2.3	6.5	Cambodia	2.5	5.6	Myanmar	2.9	4.5	Myanmar	3.9	4.0	Cambodia	5.6	4.5	Myanmar	8.3	5.5
China	1.7	4.6	China	2.0	4.4	Cambodia	2.9	4.4	Cambodia	3.6	3.7	Myanmar	5.6	4.5	Cambodia	7.3	4.8
Bahrain	151.6	423.5	Bahrain	126.0	276.5	Bahrain	90.6	139.2	Bahrain	104.8	107.4	Bahrain	78.4	63.8	Bahrain	80.1	53.0
Kuwait	694.8	1941.3	Kuwait	268.9	590.2	Kuwait	106.0	163.0	Kuwait	168.2	172.4	Kuwait	121.1	98.6	Kuwait	108.0	71.5
Oman	93.0	260.0	Oman	126.9	278.5	Oman	135.7	208.6	Oman	117.4	120.3	Oman	81.1	66.0	Oman	64.7	42.8
Qatar	416.1	1162.5	Qatar	262.7	576.6	Qatar	141.5	217.6	Qatar	194.7	199.5	Qatar	150.1	122.1	Qatar	124.5	82.4
Saudi Arabia	212.9	594.7	Saudi Arabia	214.6	471.1	Saudi Arabia	145.9	224.2	Saudi Arabia	159.4	163.4	Saudi Arabia	144.5	117.6	Saudi Arabia	139.1	92.1
UAE	72.7	203.3	UAE	266.9	585.8	UAE	208.9	321.2	UAE	188.6	193.3	UAE	137.1	111.6	UAE	172.5	114.2
Brunei	299.8	837.7	Brunei	370.6	813.5	Brunei	182.6	280.7	Brunei	171.1	175.4	Brunei	145.3	118.3	Brunei	150.6	99.7
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	8.4	23.6	APO21	10.4	22.9	APO21	13.9	21.4	APO21	17.1	17.5	APO21	22.2	18.1	APO21	28.7	19.0
Asia25	5.5	15.3	Asia25	6.7	14.7	Asia25	8.9	13.7	Asia25	12.3	12.6	Asia25	19.5	15.9	Asia25	29.0	19.2
Asia31	6.2	17.4	Asia31	7.6	16.6	Asia31	9.6	14.8	Asia31	13.2	13.5	Asia31	20.6	16.7	Asia31	30.2	20.0
East Asia	5.8	16.1	East Asia	7.3	16.1	East Asia	9.8	15.1	East Asia	14.0	14.4	East Asia	23.6	19.2	East Asia	36.8	24.4
South Asia	3.3	9.3	South Asia	3.4	7.5	South Asia	4.8	7.3	South Asia	6.7	6.9	South Asia	11.0	8.9	South Asia	17.1	11.3
ASEAN	6.1	17.0	ASEAN	8.4	18.5	ASEAN	10.4	15.9	ASEAN	13.9	14.3	ASEAN	18.9	15.3	ASEAN	25.3	16.8
ASEAN6	7.1	20.0	ASEAN6	10.4	22.8	ASEAN6	12.9	19.8	ASEAN6	17.3	17.8	ASEAN6	23.2	18.9	ASEAN6	30.5	20.2
CLMV	3.5	9.8	CLMV	3.5	7.7	CLMV	3.6	5.5	CLMV	5.5	5.6	CLMV	8.2	6.7	CLMV	12.2	8.1
GCC	240.2	671.2	GCC	216.8	475.8	GCC	143.4	220.4	GCC	158.3	162.2	GCC	130.4	106.1	GCC	128.1	84.8
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	69.8	195.0	US	75.5	165.7	US	86.6	133.2	US	105.2	107.8	US	122.7	99.9	US	132.4	87.6
EU15	46.3	129.5	EU15	59.9	131.5	EU15	71.6	110.1	EU15	84.4	86.5	EU15	89.7	73.0	EU15	93.8	62.1
									EU28	75.4	77.2	EU28	82.4	67.1	EU28	88.1	58.3
Australia	54.2	151.5	Australia	62.2	136.6	Australia	66.9	102.8	Australia	83.7	85.8	Australia	91.7	74.7	Australia	96.8	64.1

Unit: Thousands of US dollars (as of 2019).
Source: APO Productivity Database 2021.

Table 16 Per-Worker Labor Productivity Growth

——Average annual growth rate of GDP at constant basic prices per worker, using 2017 PPP

1990–1995		1995–2000		2000–2005		2005–2010		2010–2015		2015–2019		2018–2019	
Kuwait	9.5	Oman	6.4	China	8.0	China	9.5	Mongolia	7.7	China	6.0	Mongolia	13.8
China	8.5	China	6.2	Cambodia	6.5	India	7.0	China	7.4	Bangladesh	5.9	Myanmar	13.8
Malaysia	6.7	Vietnam	5.2	India	4.7	Bhutan	6.6	India	5.3	Vietnam	5.5	Turkey	5.6
Thailand	6.5	ROC	5.1	Vietnam	4.6	Sri Lanka	5.2	Sri Lanka	5.0	India	5.4	Bangladesh	5.2
Indonesia	6.4	Korea	4.8	Turkey	4.4	Mongolia	5.1	Myanmar	4.7	Mongolia	4.7	Cambodia	5.2
Korea	5.9	Lao PDR	4.8	Lao PDR	4.3	Iran	5.1	Bhutan	4.5	Cambodia	4.6	China	4.7
ROC	5.8	Myanmar	4.5	Malaysia	3.8	Myanmar	3.7	Bangladesh	4.4	Lao PDR	4.3	Brunei	4.6
Vietnam	5.1	Turkey	4.5	Thailand	3.8	Vietnam	3.7	Philippines	4.2	Turkey	4.3	Thailand	4.4
Bhutan	4.6	Singapore	4.2	Myanmar	3.6	Bangladesh	3.4	Indonesia	4.1	Myanmar	4.1	Vietnam	4.1
Hong Kong	4.5	India	4.2	Indonesia	3.6	Korea	3.4	Vietnam	4.0	Thailand	3.9	Lao PDR	3.4
Singapore	4.4	Cambodia	4.1	Korea	3.5	Hong Kong	3.1	UAE	3.6	Philippines	3.5	India	3.3
Sri Lanka	4.4	Qatar	3.7	Iran	3.3	ROC	3.1	Nepal	3.5	Bhutan	3.0	Bhutan	3.2
India	3.1	Philippines	3.1	Singapore	3.3	Nepal	3.1	Turkey	3.4	Singapore	2.9	Philippines	3.0
Pakistan	3.0	Bangladesh	2.8	ROC	3.3	Philippines	2.7	Thailand	3.4	Malaysia	2.4	ROC	2.6
Bahrain	3.0	Mongolia	2.5	Hong Kong	3.2	Indonesia	2.6	Fiji	2.5	Nepal	2.4	Sri Lanka	2.1
Qatar	2.7	Bhutan	2.5	Sri Lanka	3.2	Thailand	2.5	Bahrain	2.2	ROC	2.3	Oman	1.7
Turkey	2.0	Pakistan	2.5	Bangladesh	2.8	Lao PDR	2.4	Singapore	1.8	Sri Lanka	2.0	Saudi Arabia	1.6
Saudi Arabia	1.7	Nepal	1.8	Mongolia	2.7	Cambodia	2.0	Pakistan	1.8	Korea	1.9	UAE	1.5
Nepal	1.6	Sri Lanka	1.6	Nepal	1.8	Malaysia	1.3	Malaysia	1.7	Brunei	1.8	Indonesia	1.5
Lao PDR	1.3	Fiji	1.4	Pakistan	1.6	Singapore	1.3	ROC	1.6	Indonesia	1.7	Malaysia	1.1
Myanmar	1.2	Japan	1.2	Philippines	1.4	Turkey	1.0	Cambodia	1.6	Pakistan	1.6	Korea	1.0
Iran	1.0	UAE	1.0	Japan	1.4	Fiji	0.5	Korea	1.4	Hong Kong	1.5	Qatar	0.3
Bangladesh	1.0	Malaysia	1.0	Oman	1.1	Japan	0.1	Hong Kong	1.2	Fiji	1.4	Japan	0.3
Cambodia	0.8	Iran	0.6	Qatar	0.9	Pakistan	−0.5	Lao PDR	0.9	UAE	1.3	Kuwait	−0.3
Japan	0.6	Hong Kong	0.5	Kuwait	0.9	Bahrain	−1.5	Japan	0.7	Oman	0.5	Hong Kong	−0.7
Philippines	0.3	Thailand	0.3	Bhutan	0.1	Brunei	−1.6	Saudi Arabia	−0.3	Japan	0.0	Singapore	−0.8
Fiji	−0.3	Saudi Arabia	0.0	Fiji	0.0	Saudi Arabia	−1.9	Kuwait	−0.7	Saudi Arabia	−0.6	Pakistan	−1.3
Brunei	−0.8	Bahrain	−0.1	Saudi Arabia	−0.1	UAE	−4.1	Brunei	−0.7	Iran	−1.6	Nepal	−1.4
Mongolia	−1.4	Kuwait	−0.2	Brunei	−1.7	Qatar	−6.1	Iran	−1.7	Qatar	−1.8	Fiji	−1.7
UAE	−3.0	Brunei	−0.5	UAE	−2.3	Kuwait	−7.4	Qatar	−2.3	Kuwait	−2.0	Bahrain	−3.2
Oman	−9.3	Indonesia	−1.6	Bahrain	−4.3	Oman	−8.5	Oman	−4.9	Bahrain	−2.2	Iran	−10.0
(region)		(region)		(region)		(region)		(region)		(region)		(region)	
APO21	2.4	APO21	1.7	APO21	2.5	APO21	2.8	APO21	2.9	APO21	2.8	APO21	1.4
Asia25	3.7	Asia25	2.8	Asia25	4.1	Asia25	5.1	Asia25	4.6	Asia25	4.1	Asia25	2.9
Asia31	3.6	Asia31	2.7	Asia31	4.1	Asia31	4.8	Asia31	4.6	Asia31	3.9	Asia31	2.8
East Asia	3.9	East Asia	3.2	East Asia	4.6	East Asia	5.8	East Asia	5.2	East Asia	4.5	East Asia	3.7
South Asia	2.9	South Asia	3.8	South Asia	4.1	South Asia	5.9	South Asia	4.8	South Asia	4.9	South Asia	2.9
ASEAN	5.4	ASEAN	0.6	ASEAN	3.3	ASEAN	2.7	ASEAN	3.6	ASEAN	2.9	ASEAN	2.6
ASEAN6	5.7	ASEAN6	0.2	ASEAN6	3.3	ASEAN6	2.6	ASEAN6	3.7	ASEAN6	2.3	ASEAN6	1.7
CLMV	3.8	CLMV	4.9	CLMV	4.5	CLMV	3.6	CLMV	3.7	CLMV	5.1	CLMV	5.9
GCC	1.1	GCC	0.9	GCC	−0.4	GCC	−3.5	GCC	0.0	GCC	−0.5	GCC	1.4
(reference)		(reference)		(reference)		(reference)		(reference)		(reference)		(reference)	
US	1.5	US	2.4	US	1.8	US	1.3	US	0.8	US	0.8	US	1.0
EU15	1.9	EU15	1.4	EU15	0.9	EU15	0.3	EU15	0.6	EU15	0.4	EU15	0.1
		EU28	1.9	EU28	1.3	EU28	0.5	EU28	0.8	EU28	0.7	EU28	0.5
Australia	2.3	Australia	2.1	Australia	1.3	Australia	0.6	Australia	1.5	Australia	−0.5	Australia	−2.5

Unit: Percentage.
Source: APO Productivity Database 2021.

Table 17 Per-Hour Labor Productivity Level

——GDP at constant basic prices per hour, using 2017 PPP, reference year 2019

1970		(%)	1980		(%)	1990		(%)	2000		(%)	2010		(%)	2019		(%)
Singapore	14.6	100.0	Japan	21.2	100.0	Japan	31.1	100.0	Singapore	40.7	100.0	Singapore	53.0	100.0	Singapore	67.3	100.0
Iran	14.2	97.5	Singapore	20.7	97.5	Singapore	28.0	90.0	Japan	37.6	92.5	Hong Kong	45.3	85.5	Hong Kong	54.2	80.5
Japan	13.7	93.8	Iran	14.8	69.9	Hong Kong	25.9	83.3	Hong Kong	32.7	80.3	ROC	42.4	80.0	ROC	49.7	73.9
Turkey	11.1	75.9	Hong Kong	14.8	69.8	ROC	16.5	53.1	ROC	29.2	71.7	Japan	42.4	79.9	Japan	46.1	68.6
Fiji	10.7	73.3	Turkey	13.5	63.8	Turkey	15.7	50.6	Turkey	21.7	53.5	Korea	29.3	55.3	Turkey	42.0	62.4
Hong Kong	8.8	60.4	Fiji	12.3	58.0	Iran	14.3	46.1	Korea	18.5	45.4	Turkey	27.6	52.0	Korea	37.7	56.1
Malaysia	5.5	37.4	Malaysia	8.6	40.6	Fiji	12.5	40.0	Malaysia	16.3	40.1	Iran	25.3	47.7	Malaysia	26.1	38.7
Philippines	4.0	27.1	ROC	8.0	37.6	Malaysia	11.2	35.9	Iran	15.7	38.7	Malaysia	21.3	40.2	Iran	22.7	33.8
ROC	3.9	26.5	Korea	5.2	24.4	Korea	10.2	32.7	Fiji	12.9	31.8	Fiji	13.6	25.7	Mongolia	17.2	25.6
Sri Lanka	3.7	25.0	Philippines	5.0	23.5	Sri Lanka	5.8	18.7	Sri Lanka	7.8	19.1	Sri Lanka	12.6	23.9	Sri Lanka	17.1	25.5
Mongolia	3.3	22.3	Mongolia	4.9	23.2	Mongolia	5.8	18.6	Indonesia	6.9	17.0	Mongolia	11.0	20.7	Fiji	15.5	23.1
Korea	3.1	21.0	Sri Lanka	4.6	21.6	Indonesia	5.7	18.2	Thailand	6.9	17.0	Thailand	10.1	19.0	Thailand	15.0	22.3
Indonesia	2.9	19.7	Indonesia	4.3	20.4	Philippines	4.9	15.7	Mongolia	6.6	16.3	Indonesia	9.1	17.1	China	12.7	18.9
Pakistan	2.5	17.4	Thailand	3.0	14.0	Thailand	4.8	15.3	Philippines	5.8	14.4	Philippines	7.4	13.9	Indonesia	12.3	18.2
Lao PDR	2.5	16.8	Pakistan	3.0	13.9	Pakistan	4.3	14.0	Pakistan	5.8	14.2	China	6.8	12.9	Philippines	10.5	15.7
Thailand	2.4	16.7	Lao PDR	2.6	12.0	Bhutan	2.8	9.0	Bhutan	4.0	9.7	Pakistan	6.3	11.8	Bhutan	8.8	13.1
Bangladesh	2.2	15.4	Bhutan	1.9	9.0	Lao PDR	2.6	8.3	Lao PDR	3.5	8.6	Bhutan	5.8	10.9	Pakistan	8.0	11.9
Cambodia	2.1	14.2	Nepal	1.8	8.4	Nepal	2.4	7.7	China	2.9	7.2	Lao PDR	4.9	9.2	India	7.8	11.6
Nepal	1.8	12.1	Bangladesh	1.6	7.5	India	1.9	6.1	Nepal	2.8	6.9	India	4.8	9.1	Lao PDR	6.1	9.0
Bhutan	1.6	10.7	Vietnam	1.5	6.9	Bangladesh	1.8	5.8	India	2.7	6.7	Vietnam	3.8	7.2	Vietnam	6.1	9.0
Vietnam	1.5	10.2	India	1.3	6.3	Vietnam	1.5	4.8	Vietnam	2.4	6.0	Nepal	3.6	6.8	Nepal	4.8	7.1
India	1.3	8.7	Myanmar	1.2	5.9	China	1.5	4.7	Bangladesh	2.3	5.6	Bangladesh	3.1	5.9	Bangladesh	4.7	6.9
Myanmar	1.0	6.6	Cambodia	1.2	5.5	Cambodia	1.3	4.2	Myanmar	1.6	3.9	Cambodia	2.3	4.4	Myanmar	3.8	5.7
China	0.8	5.6	China	1.0	4.7	Myanmar	1.2	3.9	Cambodia	1.6	3.9	Myanmar	2.3	4.4	Cambodia	3.0	4.5
Brunei	128.9	882.7	Brunei	159.7	752.6	Brunei	79.0	253.7	Brunei	74.3	182.8	Brunei	63.1	119.1	Brunei	66.2	98.4
(region)			(region)			(region)			(region)			(region)			(region)		
APO21	3.9	27.0	APO21	4.9	22.9	APO21	6.5	20.9	APO21	8.0	19.8	APO21	10.5	19.8	APO21	13.8	20.4
Asia25	2.6	17.9	Asia25	3.2	15.1	Asia25	4.2	13.6	Asia25	5.8	14.3	Asia25	9.1	17.1	Asia25	13.7	20.4
East Asia	2.8	19.0	East Asia	3.5	16.7	East Asia	4.8	15.3	East Asia	6.6	16.3	East Asia	10.9	20.6	East Asia	17.4	25.8
South Asia	1.6	10.9	South Asia	1.6	7.7	South Asia	2.3	7.3	South Asia	3.2	7.8	South Asia	5.2	9.8	South Asia	8.1	12.0
ASEAN	2.8	19.2	ASEAN	3.8	17.7	ASEAN	4.8	15.3	ASEAN	6.3	15.5	ASEAN	8.6	16.2	ASEAN	12.0	17.9
ASEAN6	3.4	23.3	ASEAN6	4.7	22.2	ASEAN6	6.1	19.6	ASEAN6	8.1	20.0	ASEAN6	10.9	20.5	ASEAN6	14.8	22.1
CLMV	1.5	10.3	CLMV	1.5	7.1	CLMV	1.5	4.9	CLMV	2.3	5.6	CLMV	3.5	6.6	CLMV	5.5	8.2
(reference)			(reference)			(reference)			(reference)			(reference)			(reference)		
US	34.9	239.1	US	39.9	188.3	US	46.6	149.8	US	57.4	141.2	US	69.3	130.7	US	74.4	110.6
									EU15	52.2	128.5	EU15	57.2	107.9	EU15	60.8	90.3
			Australia	34.2	161.1	Australia	37.6	120.7	Australia	47.3	116.4	Australia	54.3	102.5	Australia	58.7	87.2

Unit: US dollar (as of 2019).
Source: APO Productivity Database 2021.

Table 18 Per-Hour Labor Productivity Growth

——Average annual growth rate of GDP at constant basic prices per hour, using 2017 PPP

1990–1995		1995–2000		2000–2005		2005–2010		2010–2015		2015–2019		2018–2019	
China	8.6	Korea	5.6	China	6.8	China	10.2	China	8.4	Myanmar	6.7	Myanmar	14.5
Malaysia	6.6	ROC	5.5	Vietnam	6.3	India	6.9	Bhutan	6.9	Bangladesh	5.7	Mongolia	12.4
Korea	6.4	China	5.3	Cambodia	5.9	Iran	6.1	Mongolia	6.2	Vietnam	5.4	Turkey	6.6
Thailand	6.2	Turkey	5.0	Thailand	5.2	Mongolia	6.0	India	5.2	India	5.4	Bangladesh	5.2
Indonesia	6.2	Lao PDR	4.7	India	4.6	Bhutan	5.9	Vietnam	4.9	Turkey	5.3	Cambodia	5.2
ROC	5.9	Myanmar	4.5	Korea	4.6	Sri Lanka	5.4	Thailand	4.8	China	5.1	Brunei	4.6
Vietnam	5.3	Vietnam	4.5	Sri Lanka	4.3	Korea	4.7	Myanmar	4.7	Lao PDR	4.3	China	4.5
Sri Lanka	4.8	India	4.1	Lao PDR	4.3	Bangladesh	3.8	Indonesia	4.5	Philippines	4.2	Thailand	3.9
Hong Kong	4.7	Mongolia	4.0	Mongolia	4.0	Myanmar	3.7	Sri Lanka	4.4	Korea	4.1	Philippines	3.8
Bhutan	4.6	Singapore	3.7	ROC	3.8	ROC	3.7	Turkey	4.2	Cambodia	4.0	Vietnam	3.4
Singapore	3.7	Bangladesh	3.3	Singapore	3.7	Hong Kong	3.5	Philippines	3.9	Thailand	4.0	Lao PDR	3.4
India	3.1	Cambodia	3.1	Myanmar	3.6	Nepal	2.9	Nepal	3.8	Mongolia	3.6	India	3.3
Pakistan	3.0	Philippines	2.7	Iran	3.4	Vietnam	2.7	Bangladesh	3.3	Singapore	3.4	Korea	2.6
Japan	1.8	Pakistan	2.7	Malaysia	3.3	Philippines	2.6	Pakistan	2.7	ROC	3.0	ROC	2.5
Turkey	1.5	Bhutan	2.4	Indonesia	3.1	Lao PDR	2.4	Hong Kong	2.2	Pakistan	2.8	Bhutan	2.4
Nepal	1.4	Japan	2.0	Hong Kong	3.1	Thailand	2.4	Malaysia	2.2	Nepal	2.3	Sri Lanka	2.3
Bangladesh	1.3	Nepal	1.9	Turkey	2.7	Indonesia	2.2	Singapore	2.1	Malaysia	2.3	Japan	2.1
Lao PDR	1.3	Fiji	1.2	Bangladesh	2.7	Malaysia	2.0	Cambodia	2.1	Sri Lanka	2.1	Malaysia	0.4
Iran	1.2	Thailand	1.2	Philippines	2.0	Turkey	2.0	Fiji	1.8	Brunei	2.0	Indonesia	0.2
Myanmar	1.2	Sri Lanka	1.0	Nepal	1.9	Cambodia	1.9	Korea	1.7	Indonesia	2.0	Hong Kong	−0.8
Philippines	0.8	Malaysia	1.0	Pakistan	1.8	Singapore	1.5	Japan	1.1	Bhutan	1.8	Singapore	−1.0
Cambodia	0.7	Iran	0.7	Japan	1.8	Fiji	1.4	Lao PDR	1.0	Hong Kong	1.6	Pakistan	−1.3
Fiji	−0.5	Hong Kong	−0.1	Bhutan	1.7	Japan	0.6	ROC	0.8	Fiji	1.1	Nepal	−1.6
Brunei	−0.7	Brunei	−0.5	Fiji	−0.4	Pakistan	−0.2	Brunei	−0.6	Japan	0.8	Fiji	−1.7
Mongolia	−1.2	Indonesia	−2.1	Brunei	−1.7	Brunei	−1.6	Iran	−1.5	Iran	−0.8	Iran	−10.2
(region)		(region)		(region)		(region)		(region)		(region)		(region)	
APO21	2.5	APO21	1.7	APO21	2.5	APO21	2.7	APO21	3.0	APO21	3.0	APO21	1.4
Asia25	3.8	Asia25	2.4	Asia25	3.6	Asia25	5.3	Asia25	5.1	Asia25	3.9	Asia25	2.7
East Asia	4.1	East Asia	2.5	East Asia	3.5	East Asia	6.4	East Asia	6.1	East Asia	3.9	East Asia	3.6
South Asia	3.0	South Asia	3.8	South Asia	4.0	South Asia	5.8	South Asia	4.7	South Asia	5.0	South Asia	2.9
ASEAN	5.3	ASEAN	0.4	ASEAN	3.7	ASEAN	2.4	ASEAN	4.1	ASEAN	3.3	ASEAN	2.1
ASEAN6	5.6	ASEAN6	0.2	ASEAN6	3.5	ASEAN6	2.4	ASEAN6	4.2	ASEAN6	2.6	ASEAN6	1.1
CLMV	3.9	CLMV	4.4	CLMV	5.5	CLMV	3.0	CLMV	4.3	CLMV	5.7	CLMV	5.7
(reference)		(reference)		(reference)		(reference)		(reference)		(reference)		(reference)	
US	1.6	US	2.5	US	2.2	US	1.5	US	0.7	US	0.9	US	1.3
				EU15	1.2	EU15	0.6	EU15	0.8	EU15	0.5	EU15	0.2
Australia	2.3	Australia	2.4	Australia	1.8	Australia	0.9	Australia	1.7	Australia	−0.1	Australia	−2.0

Unit: Percentage.
Source: APO Productivity Database 2021.

Table 19 TFP Growth

——Average annual growth rate of total factor productivity

1990–1995		1995–2000		2000–2005		2005–2010		2010–2015		2015–2019		2018–2019	
Sri Lanka	3.7	Mongolia	3.7	Mongolia	3.7	Bhutan	3.0	Nepal	2.4	India	2.4	Myanmar	10.0
China	3.7	Iran	2.3	Cambodia	3.3	India	2.3	Fiji	2.4	Cambodia	2.2	Cambodia	3.6
ROC	2.7	ROC	2.0	Iran	3.0	China	2.2	Pakistan	2.1	ROC	1.8	Mongolia	2.0
Vietnam	2.1	Korea	1.9	Lao PDR	2.6	Sri Lanka	2.1	Mongolia	2.0	China	1.6	Brunei	1.8
Iran	1.8	India	1.8	India	2.6	Hong Kong	2.1	India	1.7	Thailand	1.5	ROC	1.7
India	1.6	Cambodia	1.5	Thailand	2.4	Singapore	2.0	Turkey	1.5	Turkey	1.4	China	1.6
Korea	1.5	Sri Lanka	1.3	Hong Kong	1.9	ROC	1.8	China	1.4	Bangladesh	1.4	Japan	1.5
Hong Kong	1.4	Pakistan	0.8	Philippines	1.7	Iran	1.8	Philippines	1.4	Vietnam	1.4	Thailand	0.9
Cambodia	1.4	Turkey	0.6	Malaysia	1.6	Philippines	1.3	Vietnam	1.3	Korea	1.4	Bangladesh	0.9
Singapore	0.7	China	0.5	Sri Lanka	1.6	Korea	1.3	Hong Kong	1.0	Mongolia	1.4	India	0.6
Malaysia	0.4	Singapore	0.5	ROC	1.4	Mongolia	1.0	Bhutan	1.0	Myanmar	1.2	Korea	0.6
Pakistan	0.3	Lao PDR	0.5	Singapore	1.3	Malaysia	0.7	Japan	0.9	Singapore	1.1	Bhutan	0.4
Japan	–0.1	Myanmar	0.5	Pakistan	0.9	Fiji	0.7	ROC	0.4	Hong Kong	1.0	Sri Lanka	0.1
Indonesia	–0.3	Japan	0.4	China	0.8	Nepal	0.6	Malaysia	0.4	Pakistan	0.9	Turkey	0.1
Bhutan	–0.4	Bangladesh	0.1	Korea	0.7	Thailand	0.3	Singapore	0.3	Fiji	0.6	Vietnam	0.0
Philippines	–0.4	Philippines	0.1	Japan	0.7	Pakistan	0.2	Thailand	0.3	Philippines	0.5	Philippines	–0.6
Mongolia	–0.6	Bhutan	–0.2	Turkey	0.4	Bangladesh	0.1	Korea	0.2	Japan	0.4	Malaysia	–1.1
Lao PDR	–0.7	Fiji	–0.2	Vietnam	0.0	Indonesia	0.1	Sri Lanka	–0.1	Malaysia	0.4	Hong Kong	–1.3
Bangladesh	–0.7	Vietnam	–0.3	Indonesia	0.0	Japan	–0.3	Bangladesh	–0.7	Nepal	0.4	Lao PDR	–1.6
Myanmar	–0.8	Brunei	–0.3	Myanmar	–0.1	Lao PDR	–0.4	Indonesia	–1.3	Brunei	0.0	Pakistan	–2.0
Turkey	–1.0	Malaysia	–1.4	Fiji	–0.4	Myanmar	–1.3	Cambodia	–1.9	Lao PDR	0.0	Singapore	–2.0
Thailand	–1.1	Nepal	–1.4	Bangladesh	–0.6	Turkey	–1.3	Myanmar	–2.3	Sri Lanka	–0.8	Indonesia	–2.0
Fiji	–1.5	Hong Kong	–1.6	Nepal	–0.8	Cambodia	–1.5	Lao PDR	–3.1	Indonesia	–1.0	Fiji	–2.6
Nepal	–1.8	Thailand	–2.8	Brunei	–1.3	Vietnam	–1.6	Iran	–3.3	Bhutan	–1.1	Nepal	–3.4
Brunei	–4.7	Indonesia	–5.2	Bhutan	–2.3	Brunei	–3.4	Brunei	–4.5	Iran	–1.2	Iran	–10.2
(region)		(region)		(region)		(region)		(region)		(region)		(region)	
APO21	0.5	APO21	0.1	APO21	1.2	APO21	0.8	APO21	0.7	APO21	1.0	APO21	–0.4
Asia25	1.2	Asia25	0.4	Asia25	1.3	Asia25	1.5	Asia25	1.0	Asia25	1.3	Asia25	0.6
East Asia	1.3	East Asia	0.7	East Asia	1.1	East Asia	1.9	East Asia	1.5	East Asia	1.5	East Asia	1.6
South Asia	1.3	South Asia	1.5	South Asia	2.0	South Asia	1.8	South Asia	1.3	South Asia	2.0	South Asia	0.2
ASEAN	0.4	ASEAN	–2.3	ASEAN	1.3	ASEAN	0.4	ASEAN	0.1	ASEAN	0.2	ASEAN	–0.5
ASEAN6	–0.1	ASEAN6	–2.9	ASEAN6	1.2	ASEAN6	0.6	ASEAN6	–0.2	ASEAN6	–0.1	ASEAN6	–1.1
CLMV	1.4	CLMV	0.1	CLMV	0.4	CLMV	–1.4	CLMV	0.4	CLMV	1.4	CLMV	1.9
(reference)		(reference)		(reference)		(reference)		(reference)		(reference)		(reference)	
US	0.8	US	1.1	US	0.8	US	0.1	US	0.5	US	0.4	US	0.3

Unit: Percentage.
Source: APO Productivity Database 2021.

Table 20 Output Growth and Contributions of Labor, Capital, and TFP

		Out-put	Labor				Capital				TFP	
			Hours Worked		Labor Quality		IT		Non–IT			
Bangladesh	1970–1975	−4.9	0.8	(−17)	0.2	(−4)	0.0	(0)	0.0	(0)	−5.9	(120)
	1975–1980	3.8	1.5	(39)	0.8	(22)	0.1	(2)	1.9	(51)	−0.5	(−14)
	1980–1985	3.0	1.1	(37)	0.5	(17)	0.0	(2)	2.4	(81)	−1.1	(−36)
	1985–1990	4.6	1.5	(32)	0.7	(15)	0.1	(2)	2.4	(53)	−0.1	(−2)
	1990–1995	3.8	1.2	(33)	0.5	(14)	0.1	(2)	2.6	(70)	−0.7	(−18)
	1995–2000	4.4	0.5	(12)	0.1	(3)	0.2	(4)	3.5	(79)	0.1	(1)
	2000–2005	5.4	1.2	(22)	0.4	(8)	0.1	(2)	4.3	(79)	−0.6	(−11)
	2005–2010	6.0	1.0	(16)	0.3	(5)	0.2	(3)	4.4	(74)	0.1	(2)
	2010–2015	5.9	1.1	(19)	0.9	(16)	0.3	(4)	4.3	(73)	−0.7	(−13)
	2015–2019	7.3	0.6	(9)	0.6	(8)	0.3	(4)	4.3	(59)	1.4	(20)
	1970–2019	3.9	1.1	(28)	0.5	(13)	0.1	(3)	3.0	(78)	−0.8	(−22)
Brunei	1970–1975	3.8	0.7	(19)	0.3	(9)	0.0	(0)	2.3	(62)	0.4	(11)
	1975–1980	11.5	0.8	(7)	0.3	(2)	0.6	(5)	3.5	(30)	6.4	(56)
	1980–1985	−4.2	0.4	(−9)	0.4	(−9)	0.1	(−2)	8.5	(−202)	−13.6	(323)
	1985–1990	−1.6	1.1	(−67)	0.4	(−23)	0.0	(3)	3.6	(−226)	−6.6	(414)
	1990–1995	3.0	0.8	(26)	0.2	(7)	0.3	(11)	6.4	(214)	−4.7	(−158)
	1995–2000	2.8	0.7	(24)	0.1	(2)	0.1	(3)	2.3	(82)	−0.3	(−11)
	2000–2005	0.9	0.5	(57)	0.2	(20)	0.1	(6)	1.5	(153)	−1.3	(−136)
	2005–2010	0.1	0.4	(483)	0.2	(254)	0.2	(247)	2.7	(3426)	−3.4	(−4309)
	2010–2015	0.9	0.3	(37)	0.0	(−3)	0.2	(22)	4.8	(565)	−4.5	(−521)
	2015–2019	1.9	0.0	(−1)	−0.1	(−4)	0.1	(3)	2.0	(103)	0.0	(0)
	1970–2019	1.9	0.6	(30)	0.2	(10)	0.2	(8)	3.8	(199)	−2.8	(−148)
China	1970–1975	4.1	1.6	(39)	0.4	(10)	0.0	(1)	3.6	(88)	−1.6	(−38)
	1975–1980	5.5	1.6	(30)	0.7	(13)	0.0	(1)	3.1	(57)	0.0	(0)
	1980–1985	7.4	2.0	(27)	0.4	(6)	0.1	(1)	3.5	(48)	1.4	(19)
	1985–1990	6.4	1.3	(21)	0.4	(6)	0.1	(2)	4.1	(65)	0.4	(7)
	1990–1995	9.5	0.4	(5)	1.0	(10)	0.1	(2)	4.3	(45)	3.7	(39)
	1995–2000	7.4	0.9	(13)	0.4	(5)	0.3	(4)	5.2	(71)	0.5	(7)
	2000–2005	8.7	0.9	(10)	0.8	(9)	0.8	(9)	5.4	(62)	0.8	(10)
	2005–2010	9.9	−0.1	(−1)	0.9	(9)	0.5	(5)	6.5	(66)	2.2	(22)
	2010–2015	7.8	−0.3	(−4)	0.6	(8)	0.6	(7)	5.5	(70)	1.4	(18)
	2015–2019	6.0	0.4	(7)	−0.6	(−10)	0.5	(8)	4.0	(67)	1.6	(27)
	1970–2019	7.3	0.9	(12)	0.5	(7)	0.3	(4)	4.5	(62)	1.0	(14)
Fiji	1970–1975	5.6	2.0	(36)	0.7	(12)	0.1	(1)	2.5	(44)	0.4	(7)
	1975–1980	3.7	1.5	(41)	1.5	(42)	0.0	(1)	2.6	(71)	−2.0	(−55)
	1980–1985	0.7	1.4	(203)	1.2	(176)	0.0	(7)	1.3	(191)	−3.4	(−477)
	1985–1990	3.7	1.0	(27)	1.4	(38)	0.2	(6)	0.3	(8)	0.8	(21)
	1990–1995	2.6	1.5	(57)	1.2	(45)	0.1	(3)	1.4	(51)	−1.5	(−57)
	1995–2000	2.0	0.5	(24)	0.7	(36)	−0.1	(−3)	1.1	(55)	−0.2	(−11)
	2000–2005	2.0	1.2	(60)	0.6	(33)	0.0	(2)	0.5	(24)	−0.4	(−20)
	2005–2010	0.7	−0.3	(−49)	0.3	(40)	0.1	(13)	0.0	(2)	0.7	(94)
	2010–2015	3.7	0.8	(22)	0.1	(2)	0.1	(4)	0.3	(8)	2.4	(64)
	2015–2019	2.7	0.7	(26)	0.2	(7)	0.2	(7)	1.1	(39)	0.6	(20)
	1970–2019	2.8	1.0	(38)	0.8	(29)	0.1	(3)	1.1	(40)	−0.3	(−11)
India	1970–1975	2.8	1.9	(66)	0.3	(12)	0.0	(1)	0.9	(31)	−0.3	(−9)
	1975–1980	3.1	1.8	(60)	0.5	(17)	0.0	(1)	1.2	(39)	−0.5	(−16)
	1980–1985	5.0	1.6	(31)	0.8	(15)	0.0	(1)	1.1	(21)	1.6	(32)
	1985–1990	5.8	1.4	(24)	0.9	(15)	0.1	(1)	1.4	(25)	2.0	(35)
	1990–1995	5.0	1.3	(26)	0.5	(9)	0.1	(2)	1.5	(31)	1.6	(33)
	1995–2000	5.7	1.1	(19)	1.0	(17)	0.1	(3)	1.7	(30)	1.8	(32)
	2000–2005	6.5	1.2	(19)	0.6	(9)	0.2	(2)	2.0	(30)	2.6	(39)
	2005–2010	7.8	0.5	(7)	1.2	(16)	0.3	(4)	3.4	(44)	2.3	(30)
	2010–2015	6.2	0.6	(10)	0.8	(13)	0.2	(3)	3.0	(47)	1.7	(27)
	2015–2019	6.2	0.5	(8)	0.4	(6)	0.2	(4)	2.6	(42)	2.4	(40)
	1970–2019	5.4	1.2	(22)	0.7	(13)	0.1	(2)	1.9	(35)	1.5	(28)
Iran	1970–1975	9.2	0.6	(6)	0.6	(6)	0.1	(1)	4.6	(50)	3.3	(36)
	1975–1980	−3.2	1.0	(−30)	0.1	(−3)	0.0	(0)	4.2	(−130)	−8.6	(264)
	1980–1985	3.5	0.7	(21)	0.1	(2)	0.1	(2)	2.4	(69)	0.2	(6)
	1985–1990	1.0	1.1	(107)	0.7	(65)	0.0	(4)	−0.1	(−6)	−0.7	(−71)
	1990–1995	3.3	0.5	(16)	0.5	(15)	0.1	(2)	0.4	(13)	1.8	(53)
	1995–2000	4.1	0.8	(20)	0.3	(8)	0.1	(2)	0.6	(14)	2.3	(56)
	2000–2005	7.0	0.8	(11)	0.5	(7)	0.2	(3)	2.6	(36)	3.0	(43)
	2005–2010	5.2	−0.2	(−3)	0.4	(7)	0.2	(3)	3.1	(59)	1.8	(34)
	2010–2015	−0.4	0.3	(−65)	0.3	(−83)	0.1	(−26)	2.2	(−523)	−3.3	(798)
	2015–2019	0.8	0.4	(46)	0.0	(5)	0.0	(2)	1.6	(188)	−1.2	(−142)
	1970–2019	3.1	0.6	(20)	0.4	(11)	0.1	(3)	2.2	(70)	−0.1	(−4)
Bhutan	1970–1975	4.0	1.4	(36)	0.1	(3)	0.0	(1)	2.6	(65)	−0.2	(−5)
	1975–1980	6.0	1.5	(25)	−0.2	(−3)	0.1	(1)	1.9	(31)	2.7	(46)
	1980–1985	5.6	1.1	(19)	0.7	(12)	0.1	(1)	2.7	(49)	1.0	(19)
	1985–1990	6.7	1.0	(16)	1.5	(23)	0.1	(1)	2.8	(42)	1.3	(19)
	1990–1995	3.0	−0.7	(−24)	1.5	(50)	0.2	(8)	2.4	(78)	−0.4	(−12)
	1995–2000	6.7	2.1	(31)	0.6	(9)	0.8	(12)	3.5	(51)	−0.2	(−3)
	2000–2005	6.4	2.3	(36)	0.8	(12)	0.0	(0)	5.6	(88)	−2.3	(−36)
	2005–2010	9.7	1.6	(17)	1.1	(11)	0.4	(4)	3.6	(37)	3.0	(31)
	2010–2015	6.5	−0.2	(−3)	0.9	(13)	0.2	(3)	4.7	(72)	1.0	(15)
	2015–2019	5.2	1.5	(29)	1.0	(18)	0.0	(0)	3.8	(74)	−1.1	(−22)
	1970–2019	6.0	1.2	(19)	0.8	(13)	0.2	(3)	3.3	(56)	0.5	(9)
Cambodia	1970–1975	−4.6	0.7	(−15)	0.3	(−7)	0.0	(0)	2.2	(−47)	−7.8	(169)
	1975–1980	−6.1	−0.3	(6)	0.4	(−6)	0.0	(0)	0.2	(−4)	−6.4	(104)
	1980–1985	0.5	1.0	(193)	0.2	(36)	0.0	(2)	0.0	(8)	−0.7	(−138)
	1985–1990	6.9	0.9	(13)	0.2	(3)	0.0	(0)	0.4	(6)	5.4	(78)
	1990–1995	4.5	1.5	(34)	0.3	(7)	0.0	(0)	1.3	(29)	1.4	(30)
	1995–2000	7.7	2.2	(28)	0.7	(9)	0.1	(1)	3.2	(42)	1.5	(20)
	2000–2005	9.2	1.7	(19)	0.6	(6)	0.1	(1)	3.6	(39)	3.3	(35)
	2005–2010	5.9	1.8	(31)	0.4	(6)	0.0	(0)	5.2	(88)	−1.5	(−25)
	2010–2015	4.2	1.0	(25)	1.7	(40)	0.1	(1)	3.3	(80)	−1.9	(−46)
	2015–2019	7.3	1.9	(26)	0.4	(5)	0.1	(1)	2.8	(39)	2.2	(29)
	1970–2019	3.5	1.2	(35)	0.5	(15)	0.0	(1)	2.2	(64)	−0.5	(−15)
ROC	1970–1975	9.8	1.8	(18)	0.1	(1)	0.4	(4)	4.5	(46)	3.0	(31)
	1975–1980	11.3	1.7	(15)	1.1	(10)	0.3	(3)	4.2	(37)	3.9	(35)
	1980–1985	8.9	1.2	(14)	0.2	(3)	0.3	(3)	3.2	(36)	3.9	(44)
	1985–1990	9.6	1.0	(10)	0.8	(8)	0.3	(3)	3.2	(33)	4.3	(45)
	1990–1995	7.5	1.0	(13)	0.6	(8)	0.2	(3)	3.0	(40)	2.7	(35)
	1995–2000	6.0	0.3	(5)	0.6	(10)	0.6	(10)	2.6	(43)	2.0	(33)
	2000–2005	4.0	0.1	(3)	0.9	(21)	0.2	(5)	1.5	(37)	1.4	(34)
	2005–2010	4.1	0.2	(5)	0.9	(22)	0.0	(0)	1.2	(28)	1.8	(44)
	2010–2015	2.9	1.0	(36)	0.6	(21)	0.0	(2)	0.8	(28)	0.4	(14)
	2015–2019	3.0	0.0	(0)	0.3	(11)	0.1	(2)	0.9	(29)	1.8	(59)
	1970–2019	6.8	0.9	(13)	0.6	(9)	0.2	(4)	2.5	(37)	2.5	(37)
Hong Kong	1970–1975	6.6	1.9	(29)	0.1	(2)	0.2	(3)	3.3	(50)	1.0	(16)
	1975–1980	11.2	2.0	(18)	0.7	(7)	0.3	(3)	3.8	(34)	4.4	(39)
	1980–1985	5.3	0.9	(16)	0.6	(11)	0.2	(5)	2.9	(56)	0.7	(12)
	1985–1990	7.9	0.2	(2)	1.0	(13)	0.3	(4)	2.3	(29)	4.1	(52)
	1990–1995	5.9	0.6	(10)	0.9	(15)	0.3	(5)	2.7	(46)	1.4	(24)
	1995–2000	2.7	1.5	(54)	0.5	(17)	0.5	(20)	1.9	(70)	−1.6	(−61)
	2000–2005	4.1	0.5	(13)	0.3	(7)	0.3	(7)	1.1	(27)	1.9	(46)
	2005–2010	3.8	0.2	(5)	0.3	(7)	0.3	(7)	1.0	(27)	2.1	(54)
	2010–2015	2.8	0.3	(11)	0.6	(22)	0.3	(9)	0.6	(23)	1.0	(35)
	2015–2019	1.8	0.1	(6)	0.4	(21)	0.1	(7)	0.2	(14)	1.0	(54)
	1970–2019	5.3	0.8	(16)	0.5	(10)	0.3	(5)	2.0	(38)	1.6	(30)
Indonesia	1970–1975	8.3	1.5	(18)	0.8	(10)	0.0	(0)	4.1	(50)	1.9	(23)
	1975–1980	7.8	1.4	(18)	0.6	(7)	0.1	(2)	5.4	(69)	0.3	(4)
	1980–1985	4.7	1.4	(31)	0.5	(10)	0.1	(2)	5.0	(108)	−2.4	(−51)
	1985–1990	7.5	0.9	(13)	1.2	(17)	0.2	(3)	4.4	(59)	0.7	(9)
	1990–1995	7.5	0.5	(7)	2.5	(33)	0.2	(2)	4.6	(61)	−0.3	(−4)
	1995–2000	0.7	1.1	(163)	1.1	(157)	0.1	(17)	3.6	(538)	−5.2	(−775)
	2000–2005	4.5	0.5	(12)	1.4	(32)	0.2	(4)	2.4	(53)	0.0	(0)
	2005–2010	5.4	1.1	(21)	0.6	(12)	0.1	(2)	3.4	(63)	0.1	(2)
	2010–2015	5.3	0.3	(6)	2.2	(41)	0.2	(3)	4.0	(76)	−1.3	(−25)
	2015–2019	4.8	1.3	(26)	1.0	(21)	0.1	(3)	3.4	(72)	−1.0	(−22)
	1970–2019	5.7	1.0	(18)	1.2	(21)	0.1	(2)	4.1	(72)	−0.7	(−13)
Japan	1970–1975	4.4	−0.4	(−10)	1.1	(24)	0.2	(6)	2.7	(62)	0.8	(18)
	1975–1980	4.7	0.7	(14)	0.8	(18)	0.2	(5)	1.6	(34)	1.4	(29)
	1980–1985	4.3	0.5	(11)	0.6	(15)	0.3	(8)	1.5	(35)	1.4	(32)
	1985–1990	4.9	0.4	(8)	0.6	(12)	0.5	(10)	1.7	(35)	1.7	(35)
	1990–1995	1.3	−0.2	(−18)	0.4	(31)	0.2	(15)	1.0	(78)	−0.1	(−6)
	1995–2000	1.0	−0.6	(−54)	0.4	(39)	0.3	(29)	0.5	(50)	0.4	(37)
	2000–2005	1.2	−0.3	(−28)	0.5	(40)	0.2	(16)	0.2	(15)	0.7	(57)
	2005–2010	0.0	−0.4	(775)	0.4	(−853)	0.1	(−210)	0.1	(−227)	−0.3	(615)
	2010–2015	1.0	0.0	(−1)	0.2	(16)	0.1	(8)	−0.1	(−12)	0.9	(88)
	2015–2019	0.8	0.0	(−1)	0.1	(17)	0.1	(12)	0.2	(19)	0.4	(53)
	1970–2019	2.4	0.0	(−2)	0.5	(22)	0.2	(10)	1.0	(40)	0.7	(31)

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		Output	Labor				Capital				TFP	
			Hours Worked		Labor Quality		IT		Non–IT			
Korea	1970–1975	9.4	1.6	(17)	0.2	(3)	0.1	(1)	4.3	(46)	3.2	(34)
	1975–1980	7.7	1.3	(18)	0.6	(7)	0.4	(5)	6.1	(79)	−0.7	(−9)
	1980–1985	8.9	1.1	(13)	1.7	(20)	0.3	(4)	3.6	(40)	2.2	(24)
	1985–1990	9.9	1.6	(16)	1.4	(14)	0.5	(5)	4.2	(42)	2.1	(22)
	1990–1995	8.3	1.0	(12)	1.6	(19)	0.3	(4)	3.8	(46)	1.5	(18)
	1995–2000	5.6	0.0	(0)	0.7	(12)	0.5	(10)	2.5	(45)	1.9	(34)
	2000–2005	5.0	0.2	(4)	1.2	(25)	0.4	(8)	2.4	(49)	0.7	(15)
	2005–2010	4.4	−0.1	(−3)	1.0	(23)	0.1	(3)	2.1	(49)	1.3	(29)
	2010–2015	3.0	0.6	(21)	0.6	(19)	0.1	(2)	1.6	(52)	0.2	(6)
	2015–2019	2.8	−0.7	(−26)	0.5	(17)	0.1	(3)	1.5	(55)	1.4	(51)
	1970–2019	6.6	0.7	(11)	1.0	(15)	0.3	(5)	3.2	(49)	1.4	(21)
Malaysia	1970–1975	7.6	1.3	(17)	0.4	(5)	0.1	(1)	3.8	(50)	2.0	(27)
	1975–1980	7.9	1.3	(16)	0.8	(10)	0.1	(2)	4.7	(59)	1.1	(14)
	1980–1985	5.2	1.3	(24)	0.9	(16)	0.1	(3)	5.7	(108)	−2.7	(−52)
	1985–1990	6.6	1.4	(21)	0.7	(11)	0.2	(3)	2.7	(41)	1.6	(24)
	1990–1995	9.3	1.1	(11)	1.2	(13)	0.4	(4)	6.3	(68)	0.4	(4)
	1995–2000	4.8	1.3	(28)	0.6	(13)	0.5	(10)	3.7	(78)	−1.4	(−28)
	2000–2005	5.4	0.7	(13)	0.9	(16)	0.7	(13)	1.4	(26)	1.6	(31)
	2005–2010	4.8	1.0	(21)	0.5	(10)	0.6	(13)	2.0	(42)	0.7	(15)
	2010–2015	5.1	1.1	(22)	0.4	(8)	0.4	(9)	2.8	(54)	0.4	(7)
	2015–2019	4.2	0.8	(18)	0.3	(6)	0.4	(8)	2.4	(58)	0.4	(10)
	1970–2019	6.1	1.1	(18)	0.7	(11)	0.4	(6)	3.6	(58)	0.4	(7)
Myanmar	1970–1975	2.5	1.1	(44)	−0.2	(−6)	0.0	(1)	1.7	(70)	−0.2	(−8)
	1975–1980	7.8	1.3	(17)	0.6	(8)	0.1	(2)	4.8	(62)	0.9	(12)
	1980–1985	4.3	1.2	(28)	0.5	(12)	0.1	(2)	4.4	(101)	−1.8	(−43)
	1985–1990	−0.1	1.2	(−1800)	0.6	(−923)	0.0	(−50)	1.0	(−1469)	−3.0	(4342)
	1990–1995	3.3	1.3	(40)	0.2	(6)	0.1	(2)	2.5	(75)	−0.8	(−23)
	1995–2000	7.2	1.6	(23)	0.5	(7)	0.2	(3)	4.4	(61)	0.5	(6)
	2000–2005	5.6	1.0	(19)	0.7	(12)	0.1	(2)	3.9	(69)	−0.1	(−2)
	2005–2010	4.8	0.5	(11)	0.7	(14)	0.1	(3)	4.8	(99)	−1.3	(−27)
	2010–2015	6.1	0.5	(9)	0.6	(9)	0.3	(4)	7.0	(115)	−2.3	(−37)
	2015–2019	4.5	−1.2	(−27)	0.2	(6)	0.2	(3)	4.1	(92)	1.2	(26)
	1970–2019	4.6	0.9	(20)	0.4	(10)	0.1	(3)	3.8	(83)	−0.7	(−16)
Pakistan	1970–1975	3.2	1.2	(38)	0.7	(21)	0.0	(1)	1.7	(54)	−0.4	(−14)
	1975–1980	5.3	1.7	(32)	0.9	(17)	0.0	(0)	2.5	(48)	0.2	(3)
	1980–1985	6.2	1.4	(23)	0.1	(2)	0.0	(0)	2.6	(42)	2.0	(32)
	1985–1990	6.5	1.4	(22)	1.1	(17)	0.1	(1)	2.6	(41)	1.2	(19)
	1990–1995	4.8	1.0	(20)	0.8	(17)	0.1	(1)	2.7	(56)	0.3	(6)
	1995–2000	4.7	1.0	(22)	0.3	(7)	0.0	(0)	2.5	(53)	0.8	(17)
	2000–2005	4.4	1.1	(24)	0.7	(15)	0.1	(3)	1.6	(37)	0.9	(21)
	2005–2010	3.2	1.3	(41)	0.2	(5)	0.1	(2)	1.4	(44)	0.2	(7)
	2010–2015	3.8	0.4	(11)	0.6	(16)	0.0	(1)	0.6	(16)	2.1	(55)
	2015–2019	4.2	0.7	(17)	0.8	(20)	0.1	(4)	1.5	(37)	0.9	(23)
	1970–2019	4.6	1.1	(24)	0.6	(13)	0.1	(1)	2.0	(43)	0.8	(18)
Singapore	1970–1975	8.8	2.6	(29)	0.4	(5)	0.3	(4)	5.0	(56)	0.6	(6)
	1975–1980	8.0	2.3	(29)	0.6	(8)	0.3	(4)	3.5	(44)	1.2	(15)
	1980–1985	6.5	1.4	(21)	1.3	(20)	0.5	(8)	4.2	(65)	−1.0	(−15)
	1985–1990	7.7	2.1	(28)	0.7	(9)	0.8	(10)	2.5	(33)	1.6	(21)
	1990–1995	8.4	2.1	(25)	1.7	(20)	0.6	(7)	3.4	(40)	0.7	(9)
	1995–2000	6.2	1.1	(18)	1.0	(16)	0.5	(8)	3.0	(49)	0.5	(9)
	2000–2005	4.9	0.5	(10)	1.0	(21)	0.5	(9)	1.6	(32)	1.3	(27)
	2005–2010	7.2	2.4	(33)	0.4	(6)	0.4	(6)	2.0	(28)	2.0	(27)
	2010–2015	4.7	1.1	(24)	0.5	(12)	0.6	(12)	2.1	(45)	0.3	(7)
	2015–2019	3.7	0.1	(4)	0.4	(12)	0.7	(19)	1.3	(36)	1.1	(29)
	1970–2019	6.7	1.6	(24)	0.8	(12)	0.5	(8)	2.9	(43)	0.8	(13)
Thailand	1970–1975	5.5	0.9	(17)	1.4	(26)	0.1	(2)	2.9	(52)	0.2	(4)
	1975–1980	7.4	2.7	(36)	1.1	(14)	0.2	(3)	3.2	(43)	0.2	(3)
	1980–1985	5.3	1.0	(19)	1.8	(35)	0.3	(5)	3.3	(62)	−1.1	(−21)
	1985–1990	9.8	1.5	(15)	1.7	(17)	0.4	(4)	4.1	(42)	2.2	(22)
	1990–1995	8.1	0.7	(9)	1.8	(22)	0.6	(8)	6.1	(76)	−1.1	(−14)
	1995–2000	0.7	−0.2	(−22)	1.9	(251)	0.0	(5)	1.8	(237)	−2.8	(−371)
	2000–2005	5.3	0.1	(1)	1.8	(34)	0.3	(6)	0.7	(14)	2.4	(45)
	2005–2010	3.7	0.5	(13)	0.8	(22)	0.6	(16)	1.5	(41)	0.3	(8)
	2010–2015	3.0	−0.7	(−24)	1.6	(53)	0.6	(22)	1.2	(39)	0.3	(10)
	2015–2019	3.6	−0.1	(−4)	0.5	(14)	0.2	(6)	1.5	(42)	1.5	(43)
	1970–2019	5.3	0.6	(12)	1.5	(28)	0.3	(6)	2.6	(50)	0.2	(3)

		Output	Labor				Capital				TFP	
			Hours Worked		Labor Quality		IT		Non–IT			
Lao PDR	1970–1975	2.7	1.0	(38)	0.1	(5)	0.0	(0)	1.5	(57)	0.0	(0)
	1975–1980	0.0	−0.1	(268)	0.1	(−282)	0.0	(−30)	1.3	(−2886)	−1.4	(3029)
	1980–1985	2.0	0.6	(32)	0.2	(9)	0.1	(3)	2.8	(140)	−1.7	(−85)
	1985–1990	3.6	1.7	(46)	0.1	(4)	0.0	(1)	3.1	(87)	−1.4	(−39)
	1990–1995	4.8	1.6	(32)	0.1	(3)	0.2	(3)	3.7	(76)	−0.7	(−14)
	1995–2000	7.1	1.0	(15)	0.5	(7)	0.1	(2)	4.9	(69)	0.5	(7)
	2000–2005	6.6	1.0	(15)	0.4	(6)	0.1	(1)	2.6	(39)	2.6	(39)
	2005–2010	4.9	1.0	(20)	0.8	(16)	0.2	(4)	3.4	(70)	−0.4	(−9)
	2010–2015	2.7	0.7	(24)	0.6	(22)	0.1	(5)	4.5	(163)	−3.1	(−115)
	2015–2019	6.3	0.7	(11)	0.0	(0)	0.1	(1)	5.5	(88)	0.0	(0)
	1970–2019	4.0	0.9	(23)	0.3	(8)	0.1	(2)	3.3	(82)	−0.6	(−14)
Mongolia	1970–1975	6.5	0.6	(8)	2.6	(40)	0.1	(1)	3.0	(46)	0.3	(5)
	1975–1980	5.4	0.9	(17)	0.7	(13)	0.1	(3)	4.4	(82)	−0.8	(−14)
	1980–1985	6.6	0.9	(13)	0.4	(7)	0.2	(2)	5.2	(79)	0.0	(0)
	1985–1990	3.8	1.5	(39)	0.3	(8)	0.1	(2)	2.9	(75)	−0.9	(−24)
	1990–1995	−1.8	−0.2	(12)	−1.2	(66)	0.0	(−2)	0.2	(−10)	−0.6	(34)
	1995–2000	3.6	−0.1	(−2)	0.1	(3)	0.1	(3)	−0.3	(−8)	3.7	(105)
	2000–2005	6.3	0.5	(8)	1.0	(15)	0.3	(4)	0.8	(13)	3.7	(59)
	2005–2010	6.4	0.0	(1)	0.3	(4)	0.4	(6)	4.7	(73)	1.0	(16)
	2010–2015	9.8	1.1	(12)	1.1	(11)	0.0	(0)	5.5	(56)	2.0	(21)
	2015–2019	4.6	0.3	(7)	0.4	(9)	0.3	(6)	2.2	(48)	1.4	(30)
	1970–2019	5.1	0.6	(11)	0.6	(11)	0.2	(3)	2.9	(56)	1.0	(19)
Nepal	1970–1975	3.0	1.9	(63)	0.3	(9)	0.1	(2)	0.9	(28)	−0.1	(−2)
	1975–1980	3.4	1.9	(57)	0.3	(9)	0.1	(2)	1.5	(45)	−0.4	(−13)
	1980–1985	3.9	1.0	(26)	2.3	(58)	0.0	(1)	2.1	(55)	−1.5	(−39)
	1985–1990	4.7	0.7	(15)	2.1	(45)	0.0	(1)	1.9	(41)	0.0	(−1)
	1990–1995	4.1	1.7	(42)	2.1	(51)	0.0	(1)	2.0	(50)	−1.8	(−43)
	1995–2000	3.8	1.3	(34)	2.1	(56)	0.1	(1)	1.8	(47)	−1.4	(−38)
	2000–2005	3.0	0.7	(24)	1.4	(46)	0.0	(1)	1.6	(53)	−0.8	(−25)
	2005–2010	4.1	0.7	(17)	0.8	(19)	0.0	(0)	2.1	(51)	0.6	(14)
	2010–2015	3.5	−0.2	(−5)	−0.5	(−15)	0.0	(0)	1.7	(49)	2.4	(70)
	2015–2019	5.6	1.8	(33)	0.0	(1)	0.0	(0)	3.3	(59)	0.4	(6)
	1970–2019	3.9	1.1	(29)	1.1	(29)	0.0	(1)	1.9	(48)	−0.3	(−7)
Philippines	1970–1975	6.1	1.9	(31)	0.2	(3)	0.2	(3)	3.7	(61)	0.1	(2)
	1975–1980	5.5	1.1	(20)	0.7	(13)	0.1	(2)	5.0	(90)	−1.4	(−26)
	1980–1985	−0.6	1.2	(−197)	0.4	(−69)	0.2	(−36)	3.6	(−618)	−6.0	(1021)
	1985–1990	5.7	1.0	(17)	0.7	(12)	0.1	(1)	1.2	(22)	2.7	(48)
	1990–1995	3.2	1.0	(31)	0.1	(4)	0.1	(3)	2.4	(75)	−0.4	(−13)
	1995–2000	4.4	0.7	(16)	1.0	(22)	0.3	(7)	2.4	(54)	0.1	(1)
	2000–2005	4.7	1.1	(23)	0.2	(3)	0.2	(4)	1.5	(32)	1.7	(37)
	2005–2010	4.9	0.9	(19)	0.5	(11)	0.1	(2)	2.0	(42)	1.3	(26)
	2010–2015	5.7	0.7	(12)	0.4	(8)	0.1	(2)	3.0	(53)	1.4	(25)
	2015–2019	6.6	0.9	(14)	0.7	(10)	0.2	(3)	4.4	(66)	0.5	(7)
	1970–2019	4.6	1.0	(23)	0.5	(11)	0.2	(4)	2.9	(63)	0.0	(0)
Sri Lanka	1970–1975	3.5	0.8	(23)	0.3	(9)	0.0	(0)	2.0	(56)	0.4	(11)
	1975–1980	4.5	0.9	(19)	0.2	(5)	0.0	(1)	2.8	(62)	0.6	(13)
	1980–1985	4.6	0.1	(3)	0.9	(19)	0.0	(1)	3.1	(67)	0.5	(10)
	1985–1990	3.6	1.5	(43)	0.3	(7)	0.0	(0)	0.6	(18)	1.1	(32)
	1990–1995	5.5	0.4	(7)	0.8	(15)	0.0	(1)	0.6	(12)	3.7	(66)
	1995–2000	4.9	1.9	(39)	0.1	(3)	0.1	(1)	1.4	(29)	1.3	(28)
	2000–2005	4.6	0.1	(1)	0.9	(20)	0.1	(3)	1.9	(42)	1.6	(34)
	2005–2010	6.5	0.4	(6)	−0.2	(−3)	0.1	(2)	4.1	(63)	2.1	(33)
	2010–2015	4.4	0.0	(0)	0.3	(6)	0.0	(1)	4.2	(96)	−0.1	(−3)
	2015–2019	3.1	0.4	(12)	0.4	(13)	0.1	(2)	3.1	(99)	−0.8	(−27)
	1970–2019	4.6	0.7	(14)	0.4	(9)	0.1	(1)	2.4	(52)	1.1	(23)
Turkey	1970–1975	6.5	1.1	(17)	0.2	(3)	0.1	(2)	5.5	(84)	−0.4	(−6)
	1975–1980	3.0	0.4	(15)	0.3	(11)	0.1	(2)	4.6	(154)	−2.4	(−81)
	1980–1985	4.0	0.5	(13)	0.1	(2)	0.1	(3)	2.7	(67)	0.6	(15)
	1985–1990	5.1	0.9	(17)	0.3	(7)	0.2	(4)	3.5	(68)	0.2	(4)
	1990–1995	3.3	0.5	(14)	0.3	(10)	0.1	(3)	3.4	(104)	−1.0	(−31)
	1995–2000	4.4	−0.2	(−4)	0.6	(13)	0.3	(7)	3.1	(71)	0.6	(13)
	2000–2005	5.0	0.8	(15)	0.9	(19)	0.1	(2)	2.8	(56)	0.4	(8)
	2005–2010	3.7	0.6	(15)	0.5	(14)	0.2	(5)	3.7	(101)	−1.3	(−35)
	2010–2015	6.8	0.9	(14)	0.7	(11)	0.2	(3)	3.3	(49)	1.5	(22)
	2015–2019	5.5	0.1	(2)	0.7	(12)	0.1	(2)	3.2	(58)	1.4	(26)
	1970–2019	4.7	0.6	(12)	0.5	(10)	0.2	(3)	3.6	(76)	−0.1	(−2)

		Output	Labor				Capital				TFP	
			Hours Worked		Labor Quality		IT		Non–IT			
Vietnam	1970–1975	3.7	3.3	(89)	0.5	(14)	0.0	(0)	1.0	(27)	−1.1	(−29)
	1975–1980	4.5	1.8	(40)	0.6	(14)	0.0	(1)	3.3	(73)	−1.2	(−28)
	1980–1985	3.5	1.8	(52)	0.4	(10)	0.0	(1)	3.3	(94)	−2.0	(−57)
	1985–1990	3.1	1.7	(53)	−0.1	(−4)	0.0	(1)	2.1	(67)	−0.5	(−17)
	1990–1995	7.5	1.1	(14)	0.1	(1)	0.0	(0)	4.2	(56)	2.1	(28)
	1995–2000	7.1	1.1	(15)	0.1	(2)	0.1	(1)	6.1	(86)	−0.3	(−4)
	2000–2005	7.0	0.3	(4)	1.2	(17)	0.1	(1)	5.4	(77)	0.0	(0)
	2005–2010	6.1	1.4	(24)	0.9	(15)	0.1	(2)	5.2	(85)	−1.6	(−25)
	2010–2015	5.3	0.1	(3)	0.3	(5)	0.2	(3)	3.3	(63)	1.3	(25)
	2015–2019	6.4	0.5	(7)	1.2	(18)	0.2	(3)	3.1	(49)	1.4	(22)
	1970–2019	5.4	1.3	(24)	0.5	(9)	0.1	(1)	3.7	(69)	−0.2	(−4)
APO21	1970–1975	5.0	1.3	(26)	0.3	(5)	0.1	(3)	2.9	(58)	0.4	(8)
	1975–1980	4.4	1.5	(34)	0.4	(9)	0.1	(3)	2.4	(56)	−0.1	(−1)
	1980–1985	4.6	1.2	(27)	0.5	(10)	0.2	(5)	2.1	(46)	0.6	(13)
	1985–1990	5.7	1.2	(20)	0.6	(11)	0.3	(5)	2.1	(37)	1.5	(26)
	1990–1995	4.2	0.9	(21)	0.5	(13)	0.2	(4)	2.1	(50)	0.5	(12)
	1995–2000	3.2	0.7	(23)	0.5	(17)	0.2	(7)	1.6	(50)	0.1	(3)
	2000–2005	4.2	0.8	(19)	0.6	(15)	0.2	(4)	1.4	(32)	1.2	(29)
	2005–2010	4.2	0.7	(16)	0.7	(16)	0.1	(3)	1.9	(46)	0.8	(19)
	2010–2015	4.0	0.5	(12)	0.8	(19)	0.1	(3)	1.9	(48)	0.7	(18)
	2015–2019	4.1	0.5	(13)	0.4	(10)	0.1	(3)	2.0	(49)	1.0	(24)
	1970–2019	4.4	0.9	(21)	0.5	(12)	0.2	(4)	2.0	(47)	0.7	(15)
East Asia	1970–1975	4.7	1.4	(29)	0.4	(9)	0.2	(4)	3.0	(63)	−0.2	(−5)
	1975–1980	5.3	1.6	(30)	0.7	(13)	0.2	(3)	2.1	(39)	0.8	(14)
	1980–1985	5.6	1.9	(34)	0.4	(8)	0.3	(5)	2.0	(36)	1.0	(18)
	1985–1990	5.9	1.3	(21)	0.4	(7)	0.3	(6)	2.4	(40)	1.5	(25)
	1990–1995	5.0	0.4	(9)	0.9	(19)	0.2	(3)	2.1	(42)	1.3	(27)
	1995–2000	4.2	0.9	(21)	0.4	(9)	0.3	(6)	2.0	(47)	0.7	(16)
	2000–2005	5.2	0.9	(16)	0.8	(15)	0.3	(5)	2.3	(43)	1.1	(20)
	2005–2010	6.2	−0.1	(−2)	0.9	(14)	0.2	(3)	3.4	(54)	1.9	(31)
	2010–2015	5.6	−0.2	(−4)	0.6	(11)	0.3	(5)	3.5	(61)	1.5	(27)
	2015–2019	4.6	0.4	(8)	−0.5	(−12)	0.3	(7)	3.0	(64)	1.5	(32)
	1970–2019	5.3	0.8	(16)	0.5	(10)	0.2	(5)	2.5	(49)	1.1	(21)
ASEAN	1970–1975	6.4	1.5	(24)	0.6	(9)	0.1	(1)	3.4	(53)	0.8	(13)
	1975–1980	7.0	1.5	(22)	0.4	(5)	0.1	(2)	4.4	(63)	0.6	(8)
	1980–1985	3.8	1.3	(34)	0.5	(14)	0.2	(5)	4.3	(111)	−2.4	(−63)
	1985–1990	7.0	1.1	(16)	0.6	(9)	0.2	(3)	3.4	(48)	1.6	(23)
	1990–1995	7.2	0.8	(11)	1.0	(13)	0.3	(4)	4.8	(66)	0.4	(5)
	1995–2000	2.5	0.9	(34)	0.8	(32)	0.2	(6)	3.0	(119)	−2.3	(−91)
	2000–2005	5.0	0.5	(11)	1.1	(21)	0.3	(5)	1.9	(37)	1.3	(26)
	2005–2010	5.1	1.0	(20)	0.7	(13)	0.3	(6)	2.7	(53)	0.4	(8)
	2010–2015	4.8	0.3	(6)	1.1	(22)	0.3	(7)	3.1	(63)	0.1	(2)
	2015–2019	4.8	0.7	(14)	0.7	(15)	0.2	(5)	3.0	(62)	0.2	(5)
	1970–2019	5.4	1.0	(18)	0.7	(14)	0.2	(4)	3.4	(63)	0.1	(1)
CLMV	1970–1975	2.4	2.2	(92)	0.5	(20)	0.0	(0)	1.3	(56)	−1.6	(−67)
	1975–1980	4.1	1.3	(33)	0.7	(16)	0.0	(1)	2.8	(70)	−0.8	(−20)
	1980–1985	3.5	1.5	(44)	0.4	(12)	0.0	(1)	3.0	(87)	−1.5	(−45)
	1985–1990	2.6	1.5	(57)	0.1	(4)	0.0	(1)	1.9	(71)	−0.9	(−34)
	1990–1995	6.3	1.2	(19)	0.1	(1)	0.0	(1)	3.6	(58)	1.4	(22)
	1995–2000	7.2	1.3	(18)	0.2	(3)	0.1	(1)	5.5	(77)	0.1	(2)
	2000–2005	6.9	0.6	(9)	1.0	(14)	0.1	(1)	4.8	(70)	0.4	(6)
	2005–2010	5.8	1.2	(21)	0.9	(15)	0.1	(2)	5.0	(86)	−1.4	(−25)
	2010–2015	5.2	0.4	(7)	0.4	(7)	0.2	(4)	3.9	(75)	0.4	(7)
	2015–2019	6.1	0.2	(3)	0.9	(15)	0.2	(3)	3.4	(56)	1.4	(23)
	1970–2019	5.0	1.2	(23)	0.5	(10)	0.1	(2)	3.5	(71)	−0.3	(−6)

		Output	Labor				Capital				TFP	
			Hours Worked		Labor Quality		IT		Non–IT			
US	1970–1975	2.6	0.6	(25)	0.1	(3)	0.1	(5)	1.5	(57)	0.3	(10)
	1975–1980	3.6	1.5	(43)	0.0	(0)	0.2	(6)	1.2	(32)	0.7	(19)
	1980–1985	3.2	0.9	(28)	0.2	(6)	0.3	(11)	0.8	(26)	0.9	(29)
	1985–1990	3.2	1.1	(34)	0.2	(7)	0.4	(11)	1.0	(31)	0.5	(17)
	1990–1995	2.5	0.5	(21)	0.3	(13)	0.3	(11)	0.6	(23)	0.8	(33)
	1995–2000	4.2	1.0	(24)	0.4	(10)	0.7	(16)	1.0	(24)	1.1	(25)
	2000–2005	2.5	0.2	(6)	0.4	(15)	0.4	(15)	0.8	(32)	0.8	(31)
	2005–2010	0.9	−0.4	(−41)	0.3	(37)	0.3	(37)	0.5	(61)	0.1	(6)
	2010–2015	2.2	0.8	(38)	0.2	(10)	0.3	(12)	0.3	(15)	0.5	(25)
	2015–2019	2.3	0.8	(34)	0.2	(10)	0.3	(12)	0.6	(25)	0.4	(19)
	1970–2019	2.7	0.7	(26)	0.2	(9)	0.3	(12)	0.8	(31)	0.6	(23)
Asia25	1970–1975	4.8	1.4	(28)	0.4	(7)	0.1	(3)	2.9	(60)	0.1	(1)
	1975–1980	4.6	1.5	(33)	0.6	(12)	0.1	(3)	2.5	(55)	−0.1	(−3)
	1980–1985	5.0	1.5	(31)	0.5	(10)	0.2	(4)	2.3	(45)	0.5	(10)
	1985–1990	5.8	1.2	(21)	0.5	(9)	0.3	(4)	2.4	(41)	1.4	(25)
	1990–1995	5.2	0.7	(13)	0.7	(14)	0.1	(3)	2.4	(46)	1.2	(23)
	1995–2000	4.2	0.9	(21)	0.5	(12)	0.2	(5)	2.2	(53)	0.4	(9)
	2000–2005	5.4	0.9	(16)	0.8	(14)	0.2	(4)	2.3	(42)	1.3	(24)
	2005–2010	6.0	0.3	(6)	0.7	(12)	0.2	(3)	3.4	(56)	1.5	(24)
	2010–2015	5.4	0.2	(3)	0.6	(11)	0.3	(5)	3.4	(62)	1.0	(19)
	2015–2019	4.9	0.5	(10)	−0.1	(−3)	0.3	(5)	3.0	(61)	1.3	(27)
	1970–2019	5.1	0.9	(18)	0.5	(10)	0.2	(4)	2.7	(52)	0.8	(16)
South Asia	1970–1975	2.1	1.6	(79)	0.3	(16)	0.0	(1)	1.1	(55)	−1.1	(−50)
	1975–1980	3.5	1.8	(51)	0.6	(16)	0.0	(1)	1.5	(44)	−0.4	(−12)
	1980–1985	5.0	1.4	(29)	0.7	(14)	0.0	(1)	1.4	(29)	1.4	(28)
	1985–1990	5.7	1.4	(24)	0.9	(15)	0.1	(1)	1.7	(30)	1.7	(29)
	1990–1995	4.9	1.2	(25)	0.5	(10)	0.1	(2)	1.7	(36)	1.3	(27)
	1995–2000	5.4	1.0	(19)	0.8	(15)	0.1	(2)	1.9	(36)	1.5	(28)
	2000–2005	6.1	1.2	(20)	0.6	(10)	0.2	(2)	2.1	(35)	2.0	(33)
	2005–2010	7.1	0.7	(10)	1.0	(14)	0.2	(3)	3.4	(49)	1.8	(25)
	2010–2015	5.9	0.7	(11)	0.8	(13)	0.2	(3)	3.0	(51)	1.3	(22)
	2015–2019	6.0	0.6	(10)	0.4	(7)	0.2	(4)	2.7	(45)	2.0	(34)
	1970–2019	5.1	1.2	(23)	0.7	(13)	0.1	(2)	2.1	(40)	1.1	(22)
ASEAN6	1970–1975	7.2	1.4	(20)	0.7	(10)	0.1	(1)	3.7	(51)	1.3	(18)
	1975–1980	7.4	1.7	(23)	0.5	(7)	0.2	(2)	4.5	(62)	0.5	(7)
	1980–1985	3.9	1.3	(33)	0.7	(17)	0.2	(5)	4.4	(113)	−2.7	(−68)
	1985–1990	7.5	1.1	(15)	1.0	(14)	0.2	(3)	3.5	(47)	1.6	(21)
	1990–1995	7.3	0.7	(9)	1.5	(20)	0.3	(5)	4.9	(67)	−0.1	(−1)
	1995–2000	2.0	0.7	(36)	1.1	(56)	0.2	(9)	2.9	(143)	−2.9	(−144)
	2000–2005	4.8	0.5	(11)	1.2	(24)	0.3	(6)	1.6	(34)	1.2	(25)
	2005–2010	5.0	1.0	(19)	0.6	(12)	0.3	(6)	2.5	(50)	0.6	(13)
	2010–2015	4.8	0.2	(5)	1.4	(30)	0.3	(7)	3.0	(62)	−0.2	(−4)
	2015–2019	4.6	0.8	(18)	0.7	(15)	0.2	(5)	2.9	(63)	−0.1	(−2)
	1970–2019	5.5	0.9	(17)	0.9	(17)	0.2	(4)	3.4	(62)	−0.1	(−1)

Unit: Average annual growth rate (percentage), contribution share in parentheses.
Source: APO Productivity Database 2021.

Table 21 Role of TFP and Capital Deepening in Labor Productivity Growth

		Labor Productivity	Labor Quality		Capital deepening				TFP	
					IT		Non–IT			
Bangladesh	1970–1975	−7.1	0.2	(−2)	0.0	(0)	−1.4	(20)	−5.9	(83)
	1975–1980	0.3	0.8	(274)	0.1	(17)	0.0	(−16)	−0.5	(−175)
	1980–1985	0.7	0.5	(70)	0.0	(5)	1.3	(177)	−1.1	(−152)
	1985–1990	1.6	0.7	(41)	0.1	(5)	1.0	(58)	−0.1	(−4)
	1990–1995	1.3	0.5	(39)	0.1	(4)	1.4	(109)	−0.7	(−52)
	1995–2000	3.3	0.1	(4)	0.2	(5)	2.9	(89)	0.1	(2)
	2000–2005	2.7	0.4	(15)	0.1	(2)	2.8	(104)	−0.6	(−22)
	2005–2010	3.8	0.3	(8)	0.1	(4)	3.2	(85)	0.1	(3)
	2010–2015	3.3	0.9	(29)	0.2	(7)	2.9	(87)	−0.7	(−22)
	2015–2019	5.7	0.6	(11)	0.3	(4)	3.5	(60)	1.4	(25)
	1970–2019	1.2	0.5	(42)	0.1	(8)	1.6	(133)	−1.0	(−83)
Brunei	1970–1975	−1.2	0.3	(−27)	−0.2	(13)	−1.8	(146)	0.4	(−32)
	1975–1980	5.5	0.3	(5)	0.4	(8)	−1.6	(−29)	6.4	(116)
	1980–1985	−6.9	0.4	(−5)	0.0	(0)	6.4	(−93)	−13.6	(199)
	1985–1990	−7.2	0.4	(−5)	−0.1	(2)	−0.9	(12)	−6.6	(91)
	1990–1995	−0.7	0.2	(−30)	0.3	(−40)	3.5	(−492)	−4.7	(662)
	1995–2000	−0.5	0.1	(−10)	0.0	(−3)	−0.3	(52)	−0.3	(61)
	2000–2005	−1.7	0.2	(−11)	0.0	(−1)	−0.6	(36)	−1.3	(77)
	2005–2010	−1.6	0.2	(−13)	0.2	(−11)	1.5	(−92)	−3.4	(215)
	2010–2015	−0.6	0.0	(4)	0.2	(−26)	3.7	(−603)	−4.5	(725)
	2015–2019	2.0	−0.1	(−4)	0.1	(3)	2.0	(101)	0.0	(0)
	1970–2019	−1.6	0.2	(−13)	0.1	(−6)	1.1	(−70)	−3.0	(188)
China	1970–1975	1.3	0.4	(32)	0.0	(2)	2.4	(183)	−1.6	(−116)
	1975–1980	2.6	0.7	(27)	0.0	(1)	1.9	(71)	0.0	(0)
	1980–1985	3.9	0.4	(11)	0.0	(1)	2.0	(51)	1.4	(37)
	1985–1990	3.9	0.4	(10)	0.1	(2)	3.0	(77)	0.4	(11)
	1990–1995	8.6	1.0	(11)	0.1	(2)	3.9	(45)	3.7	(43)
	1995–2000	5.3	0.4	(7)	0.3	(5)	4.2	(78)	0.5	(10)
	2000–2005	6.8	0.8	(12)	0.7	(11)	4.4	(65)	0.8	(12)
	2005–2010	10.2	0.9	(9)	0.5	(5)	6.7	(66)	2.2	(21)
	2010–2015	8.4	0.6	(7)	0.6	(7)	5.8	(69)	1.4	(17)
	2015–2019	5.1	−0.6	(−12)	0.5	(9)	3.6	(71)	1.6	(32)
	1970–2019	5.6	0.6	(11)	0.3	(5)	3.8	(67)	1.0	(18)
Fiji	1970–1975	1.9	0.7	(36)	0.0	(2)	0.8	(41)	0.4	(21)
	1975–1980	1.0	1.5	(161)	0.0	(2)	1.4	(146)	−2.0	(−209)
	1980–1985	−1.7	1.2	(−73)	0.0	(−2)	0.4	(−22)	−3.4	(197)
	1985–1990	1.9	1.4	(74)	0.2	(11)	−0.5	(−26)	0.8	(40)
	1990–1995	−0.5	1.2	(−255)	0.1	(−11)	−0.2	(44)	−1.5	(321)
	1995–2000	1.2	0.7	(59)	−0.1	(−6)	0.8	(65)	−0.2	(−18)
	2000–2005	−0.4	0.6	(−170)	0.0	(−3)	−0.6	(171)	−0.4	(103)
	2005–2010	1.4	0.3	(20)	0.1	(7)	0.3	(25)	0.7	(48)
	2010–2015	1.8	0.1	(4)	0.1	(5)	−0.8	(−43)	2.4	(133)
	2015–2019	1.1	0.2	(18)	0.2	(15)	0.2	(17)	0.6	(51)
	1970–2019	0.7	0.9	(123)	0.1	(8)	0.1	(18)	−0.3	(−49)
India	1970–1975	0.4	0.3	(78)	0.0	(3)	0.3	(80)	−0.3	(−61)
	1975–1980	0.6	0.5	(82)	0.0	(3)	0.6	(94)	−0.5	(−79)
	1980–1985	2.9	0.8	(26)	0.0	(1)	0.5	(18)	1.6	(54)
	1985–1990	3.9	0.9	(23)	0.1	(1)	1.0	(25)	2.0	(51)
	1990–1995	3.1	0.5	(14)	0.1	(2)	1.0	(31)	1.6	(52)
	1995–2000	4.1	1.0	(23)	0.1	(3)	1.2	(29)	1.8	(44)
	2000–2005	4.6	0.6	(13)	0.1	(3)	1.3	(28)	2.6	(56)
	2005–2010	6.9	1.2	(18)	0.3	(4)	3.1	(45)	2.3	(34)
	2010–2015	5.2	0.8	(15)	0.2	(4)	2.6	(49)	1.7	(32)
	2015–2019	5.4	0.4	(7)	0.2	(4)	2.3	(43)	2.4	(46)
	1970–2019	3.6	0.7	(20)	0.1	(3)	1.3	(36)	1.5	(41)
Iran	1970–1975	7.0	0.6	(8)	0.1	(1)	3.0	(43)	3.3	(48)
	1975–1980	−6.2	0.1	(−2)	0.0	(0)	2.3	(−36)	−8.6	(138)
	1980–1985	1.5	0.1	(6)	0.0	(3)	1.1	(76)	0.2	(15)
	1985–1990	−2.1	0.7	(−32)	0.0	(−1)	−2.1	(99)	−0.7	(35)
	1990–1995	1.2	0.5	(43)	0.0	(4)	−1.1	(−95)	1.8	(148)
	1995–2000	0.7	0.3	(49)	0.0	(6)	−2.0	(−300)	2.3	(345)
	2000–2005	3.4	0.5	(13)	0.2	(6)	−0.3	(−7)	3.0	(88)
	2005–2010	6.1	0.4	(6)	0.2	(3)	3.8	(62)	1.8	(29)
	2010–2015	−1.5	0.3	(−22)	0.1	(−6)	1.3	(−85)	−3.3	(213)
	2015–2019	−0.8	0.0	(−6)	0.0	(1)	0.4	(−53)	−1.2	(159)
	1970–2019	1.3	0.4	(29)	0.1	(6)	0.6	(49)	0.2	(16)
Bhutan	1970–1975	1.0	0.1	(13)	0.0	(3)	1.0	(103)	−0.2	(−18)
	1975–1980	3.0	−0.2	(−6)	0.1	(2)	0.4	(13)	2.7	(91)
	1980–1985	3.3	0.7	(20)	0.1	(2)	1.6	(47)	1.0	(32)
	1985–1990	4.2	1.5	(36)	0.1	(1)	1.4	(33)	1.3	(30)
	1990–1995	4.6	1.5	(33)	0.2	(5)	3.2	(70)	−0.4	(−8)
	1995–2000	2.4	0.6	(24)	0.7	(29)	1.3	(55)	−0.2	(−9)
	2000–2005	1.7	0.8	(45)	−0.1	(−8)	3.3	(198)	−2.3	(−135)
	2005–2010	5.9	1.1	(19)	0.3	(5)	1.4	(24)	3.0	(52)
	2010–2015	6.9	0.9	(13)	0.2	(3)	4.9	(71)	1.0	(14)
	2015–2019	1.8	1.0	(54)	−0.1	(−4)	2.0	(114)	−1.1	(−64)
	1970–2019	3.7	0.8	(20)	0.2	(4)	2.1	(56)	0.7	(19)
Cambodia	1970–1975	−6.4	0.3	(−5)	0.0	(0)	1.1	(−17)	−7.8	(122)
	1975–1980	−5.2	0.4	(−7)	0.0	(0)	0.8	(−14)	−6.4	(122)
	1980–1985	−2.0	0.2	(−9)	0.0	(0)	−1.4	(74)	−0.7	(36)
	1985–1990	4.4	0.2	(4)	0.0	(0)	−1.1	(−26)	5.4	(122)
	1990–1995	0.7	0.3	(44)	0.0	(2)	−1.0	(−145)	1.4	(199)
	1995–2000	3.1	0.7	(23)	0.1	(2)	0.8	(26)	1.5	(49)
	2000–2005	5.9	0.6	(10)	0.0	(1)	2.0	(34)	3.3	(56)
	2005–2010	1.9	0.4	(20)	0.0	(1)	3.0	(158)	−1.5	(−79)
	2010–2015	2.1	1.7	(82)	0.1	(3)	2.3	(109)	−1.9	(−94)
	2015–2019	4.0	0.4	(9)	0.0	(1)	1.5	(37)	2.2	(53)
	1970–2019	0.5	0.5	(113)	0.0	(5)	0.7	(147)	−0.8	(−165)
ROC	1970–1975	6.4	0.1	(2)	0.3	(5)	3.0	(46)	3.0	(47)
	1975–1980	8.1	1.1	(14)	0.3	(4)	2.8	(34)	3.9	(49)
	1980–1985	6.7	0.2	(3)	0.3	(4)	2.3	(34)	3.9	(58)
	1985–1990	7.8	0.8	(10)	0.3	(4)	2.4	(31)	4.3	(55)
	1990–1995	5.9	0.6	(11)	0.2	(3)	2.4	(41)	2.7	(45)
	1995–2000	5.5	0.6	(11)	0.6	(11)	2.3	(43)	2.0	(36)
	2000–2005	3.8	0.9	(23)	0.2	(5)	1.3	(35)	1.4	(37)
	2005–2010	3.7	0.9	(25)	0.0	(0)	1.0	(26)	1.8	(49)
	2010–2015	0.8	0.6	(79)	0.0	(0)	−0.2	(−29)	0.4	(50)
	2015–2019	3.0	0.3	(11)	0.1	(2)	0.9	(29)	1.8	(58)
	1970–2019	5.4	0.6	(12)	0.2	(4)	1.9	(35)	2.6	(48)
Hong Kong	1970–1975	3.1	0.1	(4)	0.1	(5)	1.8	(57)	1.0	(34)
	1975–1980	7.3	0.7	(10)	0.2	(3)	1.9	(26)	4.4	(60)
	1980–1985	3.6	0.6	(16)	0.2	(6)	2.1	(59)	0.7	(18)
	1985–1990	7.6	1.0	(14)	0.3	(4)	2.2	(29)	4.1	(54)
	1990–1995	4.7	0.9	(19)	0.3	(6)	2.1	(45)	1.4	(30)
	1995–2000	−0.1	0.5	(−356)	0.5	(−353)	0.6	(−466)	−1.6	(1275)
	2000–2005	3.1	0.3	(9)	0.3	(8)	0.7	(22)	1.9	(61)
	2005–2010	3.5	0.3	(7)	0.3	(8)	0.9	(26)	2.1	(59)
	2010–2015	2.2	0.6	(27)	0.2	(11)	0.4	(18)	1.0	(44)
	2015–2019	1.6	0.4	(23)	0.1	(7)	0.2	(10)	1.0	(60)
	1970–2019	3.9	0.5	(14)	0.3	(7)	1.4	(36)	1.7	(43)
Indonesia	1970–1975	4.4	0.8	(18)	0.0	(0)	1.7	(38)	1.9	(43)
	1975–1980	3.7	0.6	(15)	0.1	(3)	2.7	(73)	0.3	(8)
	1980–1985	0.6	0.5	(81)	0.1	(10)	2.4	(420)	−2.4	(−412)
	1985–1990	4.8	1.2	(26)	0.2	(4)	2.7	(57)	0.7	(14)
	1990–1995	6.2	2.5	(40)	0.2	(3)	3.9	(62)	−0.3	(−4)
	1995–2000	−2.1	1.0	(−46)	0.1	(−4)	1.9	(−89)	−5.2	(242)
	2000–2005	3.1	1.4	(46)	0.2	(5)	1.6	(50)	0.0	(−1)
	2005–2010	2.2	0.6	(29)	0.1	(4)	1.4	(63)	0.1	(5)
	2010–2015	4.5	2.2	(48)	0.2	(4)	3.5	(78)	−1.3	(−29)
	2015–2019	2.0	1.0	(51)	0.1	(6)	1.9	(96)	−1.0	(−53)
	1970–2019	3.0	1.2	(40)	0.1	(4)	2.4	(80)	−0.7	(−24)
Japan	1970–1975	5.1	1.1	(21)	0.3	(5)	3.0	(59)	0.8	(15)
	1975–1980	3.6	0.8	(23)	0.2	(6)	1.2	(33)	1.4	(38)
	1980–1985	3.5	0.6	(18)	0.3	(9)	1.2	(34)	1.4	(39)
	1985–1990	4.2	0.6	(14)	0.5	(11)	1.4	(34)	1.7	(41)
	1990–1995	1.8	0.4	(24)	0.2	(12)	1.2	(69)	−0.1	(−5)
	1995–2000	2.0	0.4	(20)	0.3	(17)	0.9	(44)	0.4	(19)
	2000–2005	1.8	0.5	(27)	0.2	(12)	0.4	(23)	0.7	(39)
	2005–2010	0.6	0.4	(67)	0.1	(21)	0.4	(60)	−0.3	(−49)
	2010–2015	1.1	0.2	(16)	0.1	(8)	−0.1	(−11)	0.9	(87)
	2015–2019	0.8	0.1	(17)	0.1	(12)	0.1	(18)	0.4	(53)
	1970–2019	2.6	0.5	(21)	0.2	(9)	1.0	(41)	0.7	(29)

		Labor Productivity	Labor Quality		Capital deepening				TFP	
					IT		Non–IT			
Korea	1970–1975	5.8	0.2	(4)	0.1	(2)	2.3	(40)	3.2	(54)
	1975–1980	4.7	0.6	(12)	0.4	(8)	4.5	(95)	−0.7	(−15)
	1980–1985	6.7	1.7	(26)	0.3	(4)	2.5	(37)	2.2	(32)
	1985–1990	6.7	1.4	(21)	0.4	(7)	2.7	(40)	2.1	(32)
	1990–1995	6.4	1.6	(25)	0.3	(5)	3.0	(47)	1.5	(23)
	1995–2000	5.6	0.7	(12)	0.5	(9)	2.5	(44)	1.9	(34)
	2000–2005	4.6	1.2	(27)	0.4	(8)	2.2	(49)	0.7	(16)
	2005–2010	4.7	1.0	(21)	0.1	(3)	2.3	(49)	1.3	(27)
	2010–2015	1.7	0.6	(33)	0.0	(1)	1.0	(57)	0.2	(10)
	2015–2019	4.1	0.5	(11)	0.1	(3)	2.1	(52)	1.4	(34)
	1970–2019	5.2	1.0	(19)	0.3	(5)	2.5	(49)	1.4	(26)
Malaysia	1970–1975	4.4	0.4	(9)	0.0	(1)	1.9	(43)	2.0	(46)
	1975–1980	4.7	0.8	(17)	0.1	(2)	2.7	(58)	1.1	(23)
	1980–1985	2.0	0.9	(44)	0.1	(6)	3.7	(188)	−2.7	(−137)
	1985–1990	3.2	0.7	(22)	0.2	(6)	0.7	(23)	1.6	(49)
	1990–1995	6.6	1.2	(18)	0.4	(5)	4.7	(71)	0.4	(6)
	1995–2000	1.0	0.6	(62)	0.4	(39)	1.3	(138)	−1.4	(−139)
	2000–2005	3.3	0.9	(27)	0.6	(19)	0.1	(3)	1.6	(50)
	2005–2010	2.0	0.5	(24)	0.5	(23)	0.4	(19)	0.7	(35)
	2010–2015	2.2	0.4	(18)	0.3	(14)	1.2	(52)	0.4	(16)
	2015–2019	2.3	0.3	(11)	0.3	(12)	1.4	(60)	0.4	(17)
	1970–2019	3.3	0.7	(21)	0.3	(9)	1.9	(57)	0.4	(13)
Myanmar	1970–1975	0.3	−0.2	(−58)	0.0	(4)	0.6	(233)	−0.2	(−80)
	1975–1980	5.0	0.6	(12)	0.1	(3)	3.3	(67)	0.9	(19)
	1980–1985	1.6	0.5	(31)	0.1	(5)	2.9	(176)	−1.8	(−112)
	1985–1990	−2.4	0.6	(−27)	0.0	(−1)	0.0	(2)	−3.0	(126)
	1990–1995	1.2	0.2	(17)	0.1	(5)	1.7	(144)	−0.8	(−67)
	1995–2000	4.5	0.5	(11)	0.2	(5)	3.3	(74))	0.5	(10)
	2000–2005	3.6	0.7	(18)	0.1	(3)	2.9	(81)	−0.1	(−3)
	2005–2010	3.7	0.7	(18)	0.1	(3)	4.2	(113)	−1.3	(−34)
	2010–2015	4.7	0.6	(12)	0.2	(5)	6.1	(131)	−2.3	(−48)
	2015–2019	6.7	0.2	(4)	0.2	(3)	5.1	(76)	1.2	(17)
	1970–2019	2.5	0.5	(19)	0.1	(4)	2.9	(112)	−0.9	(−36)
Pakistan	1970–1975	0.8	0.7	(90)	0.0	(2)	0.5	(66)	−0.4	(−59)
	1975–1980	2.3	0.9	(40)	0.0	(0)	1.2	(52)	0.2	(7)
	1980–1985	3.8	0.1	(4)	0.0	(1)	1.6	(43)	2.0	(53)
	1985–1990	3.9	1.1	(27)	0.1	(2)	1.6	(39)	1.2	(31)
	1990–1995	3.0	0.8	(27)	0.0	(1)	1.9	(62)	0.3	(9)
	1995–2000	2.7	0.3	(13)	0.0	(0)	1.5	(57)	0.8	(30)
	2000–2005	1.8	0.7	(36)	0.1	(6)	0.1	(7)	0.9	(51)
	2005–2010	−0.2	0.2	(−92)	0.0	(−16)	−0.6	(336)	0.2	(−128)
	2010–2015	2.7	0.6	(23)	0.0	(1)	0.0	(−1)	2.1	(77)
	2015–2019	2.8	0.8	(30)	0.1	(5)	0.9	(31)	0.9	(34)
	1970–2019	2.3	0.6	(26)	0.0	(2)	0.9	(37)	0.8	(36)
Singapore	1970–1975	4.0	0.4	(11)	0.2	(5)	2.8	(70)	0.6	(14)
	1975–1980	3.0	0.6	(22)	0.2	(7)	0.9	(30)	1.2	(41)
	1980–1985	3.2	1.3	(40)	0.5	(15)	2.4	(75)	−1.0	(−30)
	1985–1990	2.8	0.7	(24)	0.6	(20)	0.0	(−1)	1.6	(57)
	1990–1995	3.7	1.7	(45)	0.4	(10)	0.9	(25)	0.7	(20)
	1995–2000	3.7	1.0	(26)	0.4	(11)	1.8	(48)	0.5	(14)
	2000–2005	3.7	1.0	(27)	0.4	(11)	1.0	(27)	1.3	(35)
	2005–2010	1.5	0.4	(26)	0.2	(10)	−1.0	(−65)	2.0	(128)
	2010–2015	2.1	0.5	(26)	0.5	(22)	0.7	(36)	0.3	(16)
	2015–2019	3.4	0.4	(13)	0.7	(21)	1.2	(35)	1.1	(32)
	1970–2019	3.1	0.8	(27)	0.4	(12)	1.1	(34)	0.8	(27)
Thailand	1970–1975	3.1	1.4	(46)	0.1	(2)	1.3	(44)	0.2	(8)
	1975–1980	0.9	1.1	(117)	0.2	(18)	−0.5	(−57)	0.2	(23)
	1980–1985	3.1	1.8	(59)	0.2	(8)	2.1	(69)	−1.1	(−36)
	1985–1990	6.3	1.7	(27)	0.3	(4)	2.1	(34)	2.2	(35)
	1990–1995	6.2	1.8	(29)	0.6	(9)	5.0	(80)	−1.1	(−18)
	1995–2000	1.2	1.9	(163)	0.1	(5)	2.0	(173)	−2.8	(−241)
	2000–2005	5.2	1.8	(35)	0.3	(6)	0.6	(13)	2.4	(46)
	2005–2010	2.4	0.8	(34)	0.5	(22)	0.8	(32)	0.3	(13)
	2010–2015	4.8	1.6	(33)	0.8	(16)	2.1	(44)	0.3	(6)
	2015–2019	4.0	0.5	(13)	0.2	(6)	1.7	(43)	1.5	(38)
	1970–2019	3.7	1.5	(42)	0.3	(9)	1.7	(47)	0.1	(3)

		Labor Productivity	Labor Quality		Capital deepening				TFP	
					IT		Non–IT			
Lao PDR	1970–1975	0.6	0.1	(21)	0.0	(−2)	0.5	(79)	0.0	(2)
	1975–1980	0.2	0.1	(66)	0.0	(7)	1.4	(736)	−1.4	(−709)
	1980–1985	0.5	0.2	(33)	0.1	(11)	2.0	(367)	−1.7	(−311)
	1985–1990	−0.3	0.1	(−44)	0.0	(−8)	0.9	(−261)	−1.4	(413)
	1990–1995	1.3	0.1	(10)	0.1	(10)	1.7	(132)	−0.7	(−51)
	1995–2000	4.7	0.5	(11)	0.1	(2)	3.6	(77)	0.5	(11)
	2000–2005	4.3	0.4	(10)	0.1	(1)	1.2	(29)	2.6	(60)
	2005–2010	2.4	0.8	(32)	0.2	(7)	1.9	(79)	−0.4	(−18)
	2010–2015	1.0	0.6	(63)	0.1	(11)	3.4	(352)	−3.1	(−326)
	2015–2019	4.3	0.0	(0)	0.1	(1)	4.3	(99)	0.0	(−1)
	1970–2019	1.7	0.3	(19)	0.1	(4)	1.9	(114)	−0.6	(−37)
Mongolia	1970–1975	5.1	2.6	(51)	0.1	(1)	2.1	(41)	0.3	(6)
	1975–1980	3.1	0.7	(23)	0.1	(4)	3.1	(98)	−0.8	(−25)
	1980–1985	4.0	0.4	(11)	0.1	(3)	3.4	(87)	0.0	(−1)
	1985–1990	−0.7	0.3	(−41)	0.0	(−4)	−0.1	(19)	−0.9	(127)
	1990–1995	−1.2	−1.2	(99)	0.0	(−3)	0.6	(−48)	−0.6	(52)
	1995–2000	4.0	0.1	(3)	0.1	(3)	0.0	(1)	3.7	(94)
	2000–2005	4.0	1.0	(24)	0.2	(6)	−0.9	(−23)	3.7	(93)
	2005–2010	6.0	0.3	(5)	0.4	(7)	4.3	(72)	1.0	(17)
	2010–2015	6.2	1.1	(17)	0.0	(0)	3.1	(50)	2.0	(33)
	2015–2019	3.6	0.4	(12)	0.3	(8)	1.5	(42)	1.4	(38)
	1970–2019	3.3	0.6	(18)	0.1	(4)	1.7	(51)	0.9	(28)
Nepal	1970–1975	0.0	0.3	(37252)	0.0	(5948)	−0.3	(−34675)	−0.1	(−8425)
	1975–1980	0.2	0.3	(156)	0.1	(28)	0.3	(135)	−0.4	(−219)
	1980–1985	2.3	2.3	(99)	0.0	(2)	1.5	(66)	−1.5	(−67)
	1985–1990	3.6	2.1	(58)	0.0	(1)	1.5	(42)	0.0	(−1)
	1990–1995	1.4	2.1	(148)	0.0	(1)	1.1	(77)	−1.8	(−126)
	1995–2000	1.9	2.1	(114)	0.0	(3)	1.1	(61)	−1.4	(−78)
	2000–2005	1.9	1.4	(74)	0.0	(2)	1.2	(64)	−0.8	(−40)
	2005–2010	2.9	0.8	(27)	0.0	(0)	1.6	(54)	0.6	(19)
	2010–2015	3.8	−0.5	(−13)	0.0	(0)	1.8	(48)	2.4	(65)
	2015–2019	2.3	0.0	(2)	0.0	(1)	1.9	(81)	0.4	(16)
	1970–2019	2.1	1.2	(57)	0.0	(1)	1.1	(54)	−0.3	(−13)
Philippines	1970–1975	1.8	0.2	(9)	0.1	(6)	1.4	(77)	0.1	(8)
	1975–1980	2.7	0.7	(27)	0.1	(3)	3.3	(122)	−1.4	(−52)
	1980–1985	−3.6	0.4	(−11)	0.2	(−5)	1.8	(−49)	−6.0	(165)
	1985–1990	3.2	0.7	(21)	0.0	(1)	−0.2	(−5)	2.7	(84)
	1990–1995	0.8	0.1	(15)	0.1	(6)	1.1	(129)	−0.4	(−50)
	1995–2000	2.7	1.0	(35)	0.3	(10)	1.4	(53)	0.1	(2)
	2000–2005	2.0	0.2	(8)	0.1	(7)	−0.1	(−4)	1.7	(90)
	2005–2010	2.6	0.5	(20)	0.1	(2)	0.8	(29)	1.3	(49)
	2010–2015	3.9	0.4	(11)	0.1	(3)	1.9	(50)	1.4	(36)
	2015–2019	4.2	0.7	(16)	0.2	(4)	2.9	(70)	0.5	(11)
	1970–2019	1.8	0.5	(27)	0.1	(6)	1.2	(70)	−0.1	(−4)
Sri Lanka	1970–1975	1.8	0.3	(19)	0.0	(1)	1.0	(58)	0.4	(22)
	1975–1980	2.7	0.2	(9)	0.0	(1)	1.9	(69)	0.6	(21)
	1980–1985	4.3	0.9	(21)	0.0	(1)	2.9	(68)	0.5	(11)
	1985–1990	0.5	0.3	(53)	0.0	(−1)	−0.9	(−184)	1.1	(232)
	1990–1995	4.8	0.8	(17)	0.0	(1)	0.2	(5)	3.7	(77)
	1995–2000	1.0	0.1	(13)	0.0	(4)	−0.5	(−47)	1.3	(129)
	2000–2005	4.3	0.9	(21)	0.1	(3)	1.7	(40)	1.6	(37)
	2005–2010	5.4	−0.2	(−4)	0.1	(2)	3.4	(63)	2.1	(39)
	2010–2015	4.4	0.3	(6)	0.0	(1)	4.3	(96)	−0.1	(−3)
	2015–2019	2.1	0.4	(20)	0.1	(3)	2.4	(117)	−0.8	(−40)
	1970–2019	3.1	0.4	(13)	0.0	(1)	1.6	(50)	1.1	(35)
Turkey	1970–1975	2.6	0.2	(8)	0.1	(4)	2.7	(103)	−0.4	(−15)
	1975–1980	1.4	0.3	(23)	0.0	(4)	3.4	(252)	−2.4	(−178)
	1980–1985	1.7	0.1	(6)	0.1	(5)	0.9	(54)	0.6	(36)
	1985–1990	1.3	0.3	(26)	0.2	(14)	0.6	(44)	0.2	(16)
	1990–1995	1.5	0.3	(22)	0.1	(5)	2.1	(141)	−1.0	(−68)
	1995–2000	5.0	0.6	(12)	0.3	(6)	3.5	(71)	0.6	(11)
	2000–2005	2.7	0.9	(34)	0.0	(1)	1.4	(50)	0.4	(14)
	2005–2010	2.0	0.5	(25)	0.2	(8)	2.6	(131)	−1.3	(−64)
	2010–2015	4.2	0.7	(18)	0.2	(5)	1.7	(41)	1.5	(36)
	2015–2019	5.3	0.7	(13)	0.1	(2)	3.1	(58)	1.4	(27)
	1970–2019	2.5	0.5	(19)	0.1	(5)	2.1	(86)	−0.2	(−10)

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		Labor Productivity	Labor Quality		Capital deepening IT		Capital deepening Non–IT		TFP	
Vietnam	1970–1975	−1.7	0.5	(−29)	0.0	(1)	−1.1	(66)	−1.1	(62)
	1975–1980	1.5	0.6	(42)	0.0	(1)	2.1	(139)	−1.2	(−82)
	1980–1985	0.0	0.4	(−1858)	0.0	(−111)	1.6	(−8038)	−2.0	(10107)
	1985–1990	0.2	−0.1	(−53)	0.0	(10)	0.8	(388)	−0.5	(−245)
	1990–1995	5.3	0.1	(1)	0.0	(0)	3.1	(58)	2.1	(40)
	1995–2000	4.5	0.1	(3)	0.0	(1)	4.6	(102)	−0.3	(−6)
	2000–2005	6.3	1.2	(19)	0.1	(1)	5.0	(79)	0.0	(0)
	2005–2010	2.7	0.9	(33)	0.1	(4)	3.3	(120)	−1.6	(−57)
	2010–2015	4.9	0.3	(6)	0.2	(4)	3.2	(64)	1.3	(27)
	2015–2019	5.4	1.2	(21)	0.2	(3)	2.7	(49)	1.4	(26)
	1970–2019	2.7	0.5	(18)	0.1	(2)	2.5	(93)	−0.4	(−13)
APO21	1970–1975	2.5	0.5	(20)	0.1	(4)	1.5	(59)	0.4	(16)
	1975–1980	1.7	0.7	(43)	0.1	(7)	0.9	(54)	−0.1	(−4)
	1980–1985	2.3	0.9	(37)	0.2	(7)	0.7	(30)	0.6	(25)
	1985–1990	3.5	1.2	(34)	0.2	(7)	0.6	(17)	1.5	(42)
	1990–1995	2.5	1.0	(41)	0.1	(4)	0.8	(34)	0.5	(20)
	1995–2000	1.7	1.0	(61)	0.2	(10)	0.4	(24)	0.1	(5)
	2000–2005	2.5	1.3	(51)	0.1	(3)	−0.1	(−3)	1.2	(49)
	2005–2010	2.7	1.4	(51)	0.0	(2)	0.5	(19)	0.8	(29)
	2010–2015	3.0	1.6	(52)	0.1	(2)	0.7	(22)	0.7	(24)
	2015–2019	3.0	0.9	(28)	0.1	(3)	1.1	(36)	1.0	(33)
	1970–2019	2.5	1.1	(43)	0.1	(5)	0.7	(27)	0.7	(26)
East Asia	1970–1975	2.3	0.7	(31)	0.1	(6)	1.7	(73)	−0.2	(−10)
	1975–1980	2.6	1.2	(45)	0.1	(5)	0.6	(22)	0.8	(28)
	1980–1985	2.3	0.8	(32)	0.2	(8)	0.4	(17)	1.0	(43)
	1985–1990	3.6	0.8	(21)	0.3	(8)	1.1	(30)	1.5	(41)
	1990–1995	4.1	1.7	(42)	0.1	(3)	0.9	(23)	1.3	(33)
	1995–2000	2.5	0.7	(29)	0.2	(8)	0.9	(36)	0.7	(27)
	2000–2005	3.5	1.6	(45)	0.2	(4)	0.7	(21)	1.1	(30)
	2005–2010	6.4	1.8	(28)	0.1	(2)	2.6	(41)	1.9	(29)
	2010–2015	6.1	1.2	(20)	0.3	(4)	3.1	(50)	1.5	(25)
	2015–2019	3.9	−1.1	(−28)	0.3	(8)	3.2	(81)	1.5	(39)
	1970–2019	3.7	1.1	(30)	0.2	(5)	1.4	(36)	1.1	(28)
ASEAN	1970–1975	2.7	1.3	(49)	0.0	(2)	0.5	(19)	0.8	(30)
	1975–1980	3.1	0.9	(30)	0.1	(3)	1.5	(48)	0.6	(18)
	1980–1985	0.6	1.3	(239)	0.1	(24)	1.5	(271)	−2.4	(−434)
	1985–1990	4.1	1.6	(39)	0.2	(4)	0.8	(18)	1.6	(39)
	1990–1995	5.3	2.4	(45)	0.2	(4)	2.3	(43)	0.4	(7)
	1995–2000	0.4	2.0	(527)	0.1	(21)	0.6	(158)	−2.3	(−606)
	2000–2005	3.7	2.7	(73)	0.2	(4)	−0.5	(−13)	1.3	(36)
	2005–2010	2.4	1.8	(72)	0.2	(7)	0.1	(3)	0.4	(17)
	2010–2015	4.1	2.7	(66)	0.2	(5)	1.1	(26)	0.1	(3)
	2015–2019	3.3	1.7	(51)	0.2	(5)	1.2	(38)	0.2	(7)
	1970–2019	2.9	1.9	(64)	0.1	(5)	0.9	(29)	0.0	(1)
CLMV	1970–1975	−1.6	0.9	(−54)	0.0	(1)	−0.8	(53)	−1.6	(100)
	1975–1980	1.6	1.2	(77)	0.0	(2)	1.2	(74)	−0.8	(−53)
	1980–1985	0.3	0.9	(276)	0.0	(12)	0.9	(295)	−1.5	(−484)
	1985–1990	−0.1	0.2	(−153)	0.0	(−15)	0.5	(−340)	−0.9	(609)
	1990–1995	3.9	0.2	(5)	0.0	(1)	2.3	(60)	1.4	(35)
	1995–2000	4.4	0.5	(11)	0.1	(2)	3.7	(85)	0.1	(3)
	2000–2005	5.5	2.3	(41)	0.1	(1)	2.8	(51)	0.4	(7)
	2005–2010	3.0	2.0	(67)	0.1	(3)	2.3	(77)	−1.4	(−47)
	2010–2015	4.3	0.9	(20)	0.2	(4)	3.0	(68)	0.4	(8)
	2015–2019	5.7	1.9	(33)	0.1	(2)	2.3	(40)	1.4	(25)
	1970–2019	2.4	1.0	(43)	0.1	(2)	1.8	(73)	−0.4	(−19)

		Labor Productivity	Labor Quality		Capital deepening IT		Capital deepening Non–IT		TFP	
US	1970–1975	1.6	0.1	(5)	0.1	(7)	1.1	(72)	0.3	(17)
	1975–1980	1.1	0.0	(1)	0.2	(17)	0.2	(20)	0.7	(61)
	1980–1985	1.7	0.2	(11)	0.3	(18)	0.3	(17)	0.9	(54)
	1985–1990	1.4	0.2	(15)	0.3	(22)	0.4	(25)	0.5	(38)
	1990–1995	1.6	0.3	(19)	0.3	(15)	0.3	(15)	0.8	(50)
	1995–2000	2.5	0.4	(16)	0.6	(24)	0.4	(17)	1.1	(43)
	2000–2005	2.2	0.4	(16)	0.4	(17)	0.7	(31)	0.8	(36)
	2005–2010	1.5	0.3	(22)	0.4	(23)	0.8	(51)	0.1	(4)
	2010–2015	0.7	0.2	(30)	0.2	(29)	−0.3	(−36)	0.5	(76)
	2015–2019	0.9	0.2	(25)	0.2	(25)	0.0	(3)	0.4	(47)
	1970–2019	1.6	0.2	(15)	0.3	(19)	0.4	(27)	0.6	(39)
Asia25	1970–1975	2.2	0.7	(29)	0.1	(4)	1.4	(64)	0.1	(3)
	1975–1980	1.8	1.0	(57)	0.1	(5)	0.8	(45)	−0.1	(−7)
	1980–1985	2.2	1.0	(45)	0.1	(7)	0.6	(25)	0.5	(23)
	1985–1990	3.5	1.0	(28)	0.2	(6)	0.9	(26)	1.4	(41)
	1990–1995	3.8	1.4	(37)	0.1	(3)	1.1	(29)	1.2	(32)
	1995–2000	2.4	1.0	(41)	0.2	(7)	0.9	(36)	0.4	(16)
	2000–2005	3.6	1.6	(44)	0.1	(4)	0.6	(16)	1.3	(36)
	2005–2010	5.3	1.5	(28)	0.1	(2)	2.3	(42)	1.5	(27)
	2010–2015	5.1	1.2	(24)	0.2	(4)	2.6	(51)	1.0	(20)
	2015–2019	3.9	−0.3	(−7)	0.2	(6)	2.6	(67)	1.3	(33)
	1970–2019	3.3	1.1	(34)	0.1	(4)	1.3	(37)	0.8	(24)
South Asia	1970–1975	−0.3	0.5	(−150)	0.0	(−4)	0.2	(−70)	−1.1	(324)
	1975–1980	0.9	0.8	(89)	0.0	(2)	0.5	(53)	−0.4	(−44)
	1980–1985	2.9	1.0	(35)	0.0	(1)	0.5	(16)	1.4	(48)
	1985–1990	3.7	1.3	(35)	0.1	(1)	0.7	(18)	1.7	(46)
	1990–1995	3.0	0.8	(26)	0.1	(2)	0.9	(29)	1.3	(43)
	1995–2000	3.8	1.3	(34)	0.1	(2)	0.9	(23)	1.5	(40)
	2000–2005	4.0	1.0	(25)	0.1	(3)	0.9	(22)	2.0	(50)
	2005–2010	5.8	1.7	(30)	0.2	(3)	2.1	(36)	1.8	(30)
	2010–2015	4.7	1.3	(28)	0.1	(3)	2.0	(42)	1.3	(27)
	2015–2019	5.0	0.8	(15)	0.2	(4)	2.0	(40)	2.0	(40)
	1970–2019	3.2	1.1	(33)	0.1	(3)	1.0	(30)	1.1	(34)
ASEAN6	1970–1975	3.6	1.7	(47)	0.0	(1)	0.6	(15)	1.3	(36)
	1975–1980	2.9	1.3	(45)	0.1	(4)	1.0	(33)	0.5	(18)
	1980–1985	0.6	1.8	(323)	0.1	(26)	1.3	(233)	−2.7	(−481)
	1985–1990	4.6	2.7	(59)	0.2	(3)	0.1	(3)	1.6	(35)
	1990–1995	5.6	3.8	(67)	0.2	(4)	1.7	(30)	−0.1	(−2)
	1995–2000	0.2	2.8	(1798)	0.1	(46)	0.2	(98)	−2.9	(−1842)
	2000–2005	3.5	3.0	(86)	0.2	(5)	−0.9	(−26)	1.2	(35)
	2005–2010	2.4	1.6	(67)	0.2	(8)	−0.1	(−2)	0.6	(27)
	2010–2015	4.2	3.7	(90)	0.2	(5)	0.4	(10)	−0.2	(−4)
	2015–2019	2.6	1.6	(63)	0.1	(6)	0.9	(35)	−0.1	(−4)
	1970–2019	3.0	2.5	(83)	0.1	(5)	0.4	(15)	−0.1	(−3)

Unit: Percentage (average annual growth rate, contribution share in parentheses).
Source: APO Productivity Database 2021.

Table 22 Industry Shares of Value Added

——Shares of industry GDP at current prices by Industry

	1980				1990				2000				2010				2019			
	Agriculture	Manufacturing	Service	Others	Agriculture	Manufacturing	Service	Others	Agriculture	Manufacturing	Service	Others	Agriculture	Manufacturing	Service	Others	Agriculture	Manufacturing	Service	Others
Bahrain	0.7	10.9	45.6	42.8	0.7	11.1	58.0	30.2	0.6	11.4	55.1	32.9	0.3	14.6	54.2	30.8	0.3	18.1	56.4	25.2
Bangladesh	30.0	13.2	40.0	6.7	28.8	12.5	40.9	8.4	24.1	14.4	43.4	10.0	17.8	16.9	45.5	9.3	13.3	19.9	55.5	11.3
Bhutan	42.5	3.1	45.8	8.6	34.3	8.5	40.7	16.5	27.4	8.4	36.6	27.6	15.6	9.3	38.8	36.3	16.6	7.5	45.5	30.4
Brunei	0.2	19.4	9.3	71.1	0.9	13.8	35.8	49.5	1.0	18.3	34.3	46.4	0.7	14.6	31.9	52.7	1.0	13.4	37.5	48.1
Cambodia	43.8	10.0	40.7	5.5	49.9	8.6	37.5	4.0	37.8	16.9	39.1	6.2	36.0	15.6	40.7	7.6	22.0	17.3	41.6	19.1
China	26.6	33.1	30.5	9.7	24.9	28.8	37.0	9.4	13.9	30.3	43.5	12.3	9.1	30.5	46.6	13.8	7.1	26.2	55.2	11.5
ROC	8.3	35.7	45.3	10.7	4.2	32.5	54.8	8.5	2.1	26.1	66.0	5.9	1.7	29.5	64.0	4.9	1.7	32.0	61.6	4.6
Fiji	21.0	10.8	58.7	9.5	20.4	10.8	58.6	10.3	16.3	13.3	62.6	7.9	11.7	15.3	67.1	5.9	18.4	14.0	62.2	5.4
Hong Kong	0.8	20.5	70.5	8.2	0.2	14.9	77.3	7.6	0.1	4.8	87.3	7.8	0.1	1.8	93.0	5.2	0.1	1.1	93.4	5.4
India	35.6	17.8	38.5	8.1	29.1	17.2	43.5	10.1	23.1	15.3	50.8	10.8	18.0	14.9	54.4	12.7	17.2	12.3	60.5	10.0
Indonesia	19.2	10.8	46.0	24.1	15.1	16.7	54.9	13.4	12.2	21.2	51.9	14.7	14.2	22.4	42.4	21.1	13.3	20.5	46.1	20.1
Iran	13.1	12.3	49.5	25.2	15.1	18.5	49.0	17.4	11.0	14.6	47.8	26.7	5.9	13.4	46.3	34.4	8.2	17.6	47.1	27.1
Japan	3.5	27.4	57.7	11.4	2.4	26.5	59.4	11.6	1.5	22.2	67.1	9.1	1.2	20.7	71.6	6.5	1.1	20.1	71.5	7.3
Korea	16.0	24.7	48.0	11.3	8.4	27.7	51.4	12.5	4.3	29.3	57.2	9.2	2.4	30.2	60.1	7.3	1.8	27.7	62.4	8.2
Kuwait	0.3	5.6	27.1	67.0	1.6	11.2	49.1	38.1	0.6	6.5	44.2	48.7	0.4	5.3	41.4	52.9	0.3	6.3	48.2	45.1
Lao PDR	65.5	3.8	23.3	7.5	61.2	5.1	24.3	9.4	52.5	10.7	24.6	12.2	31.4	9.8	40.4	18.4	22.2	8.2	38.2	31.4
Malaysia	23.8	17.7	40.3	18.2	15.5	22.9	45.2	16.4	8.6	29.2	46.5	15.7	10.2	23.7	48.9	17.2	7.3	21.7	54.8	16.1
Mongolia	8.1	16.6	56.7	18.7	9.6	19.4	50.6	20.3	24.7	7.4	52.6	15.3	13.1	7.6	50.0	29.4	12.1	10.5	44.8	32.5
Myanmar	46.5	9.5	40.8	3.1	54.7	7.7	35.0	2.5	53.4	8.4	31.2	7.0	24.7	5.4	19.6	50.3	17.9	8.5	27.6	46.0
Nepal	53.0	4.9	36.9	5.2	45.5	6.8	40.9	6.8	36.6	9.0	46.1	8.3	37.1	6.2	48.0	8.7	27.6	5.1	58.1	9.2
Oman	2.5	0.6	28.2	68.7	2.9	2.9	40.5	53.6	2.2	5.6	39.4	52.7	1.4	10.4	35.9	52.4	2.3	10.0	46.2	41.5
Pakistan	34.5	10.1	48.6	6.9	28.8	12.1	51.3	7.8	29.4	10.6	52.6	7.3	24.3	13.6	55.1	6.9	23.4	13.2	57.1	6.2
Philippines	21.7	28.3	36.0	13.9	19.0	27.5	43.0	10.5	13.9	25.3	51.1	9.7	13.7	21.9	53.9	10.4	8.8	18.5	61.0	11.7
Qatar	0.5	3.3	23.5	72.7	0.8	13.0	42.8	43.5	0.4	5.4	29.5	64.7	0.1	8.9	32.4	58.6	0.2	7.5	45.0	47.3
Saudi Arabia	1.0	4.1	27.8	67.1	5.7	8.5	45.3	40.5	4.9	9.6	41.2	44.3	2.6	11.0	39.1	47.3	2.2	12.5	50.4	34.9
Singapore	1.6	27.5	62.2	8.7	0.3	25.6	67.3	6.8	0.1	27.7	65.1	7.1	0.0	22.0	71.8	6.2	0.0	20.5	74.5	5.0
Sri Lanka	20.3	21.3	47.9	10.5	17.4	20.0	53.6	9.1	11.6	20.3	59.8	8.2	9.5	20.1	60.9	9.6	8.1	17.6	62.5	11.9
Thailand	20.3	22.5	50.4	6.9	10.0	27.1	53.1	9.8	8.5	28.4	54.8	8.3	10.5	30.9	49.6	9.0	8.1	25.6	58.3	8.0
Turkey	21.1	22.2	48.2	8.5	13.9	28.1	47.8	10.2	11.2	20.9	58.9	9.0	10.2	17.1	62.0	10.7	7.1	20.3	62.7	9.9
UAE	0.5	3.7	30.8	65.0	1.1	7.1	42.1	49.7	2.2	12.0	46.2	39.6	0.8	7.9	46.7	44.6	0.7	8.7	53.1	37.4
Vietnam	41.7	17.2	35.3	5.7	41.5	5.6	43.1	9.8	26.2	12.7	42.6	18.5	21.0	14.8	42.8	21.3	15.5	18.3	46.8	19.4
(region)																				
APO21	15.1	22.2	50.5	12.2	11.9	23.1	53.7	11.3	10.1	20.8	58.3	10.8	9.9	19.7	58.4	11.9	10.0	18.3	60.6	11.0
Asia25	16.9	23.7	47.3	12.0	14.2	24.0	50.8	11.0	11.2	23.2	54.4	11.2	9.7	23.7	53.8	12.8	8.8	21.7	58.1	11.4
Asia31	15.1	21.5	45.1	18.3	13.4	22.8	50.3	13.5	10.7	22.2	53.6	13.5	9.2	22.9	53.0	14.8	8.4	21.2	57.8	12.6
East Asia	10.3	28.9	50.0	10.9	9.5	27.3	52.4	10.8	7.2	26.2	56.2	10.3	6.3	27.6	55.0	11.1	5.6	25.2	58.9	10.3
South Asia	34.8	16.2	41.2	7.9	29.0	16.0	45.5	9.6	23.9	14.6	51.3	10.1	18.6	14.9	54.7	11.7	17.4	13.0	59.9	9.8
ASEAN	21.8	17.5	43.4	17.2	16.3	20.3	51.4	12.1	12.7	23.3	51.2	12.8	13.0	22.9	47.4	16.7	10.7	20.7	52.5	16.2
ASEAN6	19.1	18.0	44.3	18.7	13.7	21.5	52.4	12.5	10.3	24.6	52.6	12.6	11.6	24.4	48.6	15.5	9.8	21.4	54.0	14.9
CLMV	44.8	13.8	36.3	5.1	46.6	6.2	39.5	7.7	34.2	12.0	38.9	15.0	23.3	12.9	38.4	25.4	16.7	16.0	42.7	24.6
GCC	0.9	4.2	28.4	66.6	4.2	8.4	45.0	42.4	3.6	9.5	42.3	44.7	1.7	9.8	40.5	48.0	1.5	10.8	50.3	37.3
(reference)																				
US	2.2	21.0	66.9	9.9	1.6	17.7	72.7	8.0	1.0	15.1	76.6	7.3	1.1	12.3	79.1	7.6	0.8	10.9	81.1	7.2
Australia	5.9	18.5	57.2	18.5	3.5	13.7	66.4	16.4	3.8	12.0	70.2	13.9	2.4	7.9	69.3	20.4	2.0	6.1	70.5	21.3

Unit: Percentage.

Sources: Official national accounts in each country, including author adjustments.

Note: Services are defined as the total of industries 6–9 and Others are defined as the total of industries 2, 4, and 5 of nine industries, which consists of 1–agriculture; 2–mining; 3–manufacturing; 4–electricity, gas, and water supply; 5–construction; 6–wholesale and retail trade, hotels, and restaurants; 7–transport, storage, and communications; 8–finance, real estate, and business activities; and 9–community, social, and personal services. See the Online Appendix for the concordance with the ISIC, Revisions 3 and 4.

Table 23 Industry Origins of Economic Growth

——Average annual growth rates (contributions) of industry labor productivity in 2010–2019

	1. Agriculture		2. Mining		3. Manufacturing		4. Electricity, gas, and water supply		5. Construction		6. Wholesale and retail trade, hotels, and restaurants		7. Transport, storage, and communications		8. Finance, real estate, and business activities		9. Community, social, and personal services		Total economy
Bahrain	2.4	(0.0)	1.5	(0.4)	3.2	(0.5)	1.2	(0.0)	3.0	(0.2)	2.3	(0.2)	4.8	(0.3)	2.3	(0.5)	5.6	(1.0)	3.1
Bangladesh	3.3	(0.5)	7.2	(0.1)	10.2	(1.8)	8.6	(0.1)	8.2	(0.6)	7.3	(1.1)	6.6	(0.7)	5.0	(0.6)	5.2	(1.1)	6.6
Bhutan	2.9	(0.4)	17.4	(0.7)	3.6	(0.3)	0.3	(0.0)	4.4	(0.8)	13.0	(1.2)	9.3	(1.0)	5.3	(0.4)	3.8	(0.5)	5.4
Brunei	1.3	(0.0)	−2.4	(−1.2)	1.6	(0.2)	4.5	(0.0)	4.8	(0.1)	2.2	(0.1)	0.8	(0.0)	1.8	(0.2)	1.1	(0.2)	−0.4
Cambodia	1.4	(0.5)	18.4	(0.2)	8.3	(1.4)	7.6	(0.0)	16.0	(1.7)	6.4	(0.9)	7.4	(0.6)	9.2	(0.8)	5.3	(0.5)	6.6
China	3.9	(0.3)	0.8	(0.0)	7.4	(2.1)	7.6	(0.2)	7.3	(0.5)	8.0	(0.9)	8.9	(0.6)	5.1	(0.9)	8.8	(1.4)	6.9
ROC	−0.3	(−0.0)	−2.5	(−0.0)	4.4	(1.4)	1.7	(0.0)	0.6	(0.0)	2.4	(0.5)	4.0	(0.2)	2.9	(0.5)	1.3	(0.3)	2.8
Fiji	3.1	(0.5)	−10.3	(−0.1)	2.2	(0.3)	10.4	(0.2)	5.6	(0.2)	2.2	(0.4)	2.8	(0.5)	2.4	(0.4)	2.6	(0.4)	2.7
Hong Kong	−2.3	(−0.0)	−2.3	(−0.0)	0.0	(0.0)	−0.3	(−0.0)	5.2	(0.2)	1.7	(0.5)	3.3	(0.3)	2.6	(1.0)	3.0	(0.5)	2.5
India	3.6	(0.6)	2.3	(0.0)	6.1	(0.9)	6.2	(0.1)	4.3	(0.3)	8.2	(1.5)	6.5	(0.5)	8.4	(1.5)	6.5	(0.9)	6.4
Indonesia	3.9	(0.5)	1.3	(0.1)	4.5	(1.0)	3.9	(0.0)	6.3	(0.6)	5.1	(0.8)	8.1	(0.7)	6.6	(0.6)	5.5	(0.5)	5.0
Iran	3.0	(0.2)	−6.0	(−1.4)	−1.0	(−0.2)	4.7	(0.2)	−0.6	(−0.0)	−0.9	(−0.1)	4.1	(0.3)	4.0	(0.6)	3.6	(0.5)	0.1
Japan	−2.7	(−0.0)	−0.4	(−0.0)	1.2	(0.2)	−1.0	(−0.0)	1.9	(0.1)	0.0	(0.0)	0.9	(0.1)	1.2	(0.2)	0.9	(0.3)	0.9
Korea	0.7	(0.0)	−3.9	(−0.0)	2.8	(0.8)	1.3	(0.0)	1.8	(0.1)	2.7	(0.3)	3.2	(0.3)	3.6	(0.8)	3.0	(0.6)	2.9
Kuwait	1.1	(0.0)	1.6	(1.0)	4.5	(0.3)	7.8	(0.1)	1.8	(0.0)	0.6	(0.0)	0.6	(0.0)	0.5	(0.1)	4.2	(0.7)	2.3
Lao PDR	2.7	(0.7)	2.8	(0.4)	6.0	(0.5)	13.5	(0.8)	16.1	(1.3)	7.6	(1.3)	7.8	(0.3)	7.2	(0.5)	5.0	(0.5)	6.4
Malaysia	1.9	(0.2)	0.5	(0.0)	4.7	(1.1)	4.3	(0.1)	7.6	(0.3)	6.7	(1.2)	7.1	(0.6)	5.1	(0.6)	5.8	(0.8)	4.9
Mongolia	8.8	(1.2)	7.0	(1.3)	8.3	(0.8)	5.3	(0.1)	0.7	(0.0)	7.3	(1.1)	7.6	(0.6)	8.3	(1.1)	1.8	(0.2)	6.6
Myanmar	−0.3	(−0.0)	0.5	(1.3)	9.4	(0.6)	9.6	(0.2)	8.9	(0.7)	4.5	(0.4)	5.2	(0.3)	28.7	(0.1)	10.0	(0.7)	4.3
Nepal	3.0	(0.9)	5.2	(0.0)	3.1	(0.2)	7.4	(0.1)	4.3	(0.3)	5.9	(0.9)	4.7	(0.4)	4.3	(0.7)	5.7	(0.9)	4.4
Oman	8.6	(0.2)	1.6	(0.7)	2.7	(0.3)	9.8	(0.1)	5.4	(0.3)	3.2	(0.2)	4.6	(0.2)	4.0	(0.3)	4.9	(0.8)	3.1
Pakistan	2.2	(0.5)	2.2	(0.1)	3.6	(0.5)	3.7	(0.1)	2.4	(0.1)	3.7	(0.7)	3.9	(0.4)	4.1	(0.3)	7.2	(1.1)	3.8
Philippines	1.9	(0.2)	2.6	(0.0)	5.4	(1.1)	5.5	(0.2)	9.2	(0.6)	6.2	(1.2)	7.1	(0.5)	8.2	(1.6)	5.8	(0.7)	6.1
Qatar	10.0	(0.0)	1.0	(0.7)	4.6	(0.4)	10.4	(0.0)	11.5	(0.9)	4.6	(0.3)	5.7	(0.2)	7.1	(0.9)	5.9	(0.6)	4.0
Saudi Arabia	1.8	(0.0)	2.3	(1.0)	4.0	(0.4)	2.7	(0.0)	2.9	(0.1)	3.8	(0.3)	5.3	(0.3)	4.4	(0.5)	3.3	(0.5)	3.2
Singapore	2.9	(0.0)	0.0	( )	2.9	(0.6)	1.4	(0.0)	2.9	(0.1)	3.4	(0.7)	4.2	(0.5)	5.1	(1.6)	3.1	(0.3)	3.8
Sri Lanka	2.6	(0.2)	6.9	(0.2)	3.2	(0.6)	5.9	(0.1)	7.9	(0.6)	4.8	(0.7)	5.3	(0.7)	8.0	(1.0)	3.8	(0.8)	4.8
Thailand	1.2	(0.1)	0.2	(0.0)	1.4	(0.4)	3.5	(0.1)	2.7	(0.1)	4.9	(0.9)	5.4	(0.4)	5.8	(0.6)	2.8	(0.4)	3.2
Turkey	2.8	(0.2)	3.9	(0.0)	5.9	(1.1)	6.4	(0.2)	6.2	(0.5)	5.1	(0.8)	5.8	(0.7)	4.5	(0.7)	5.7	(1.0)	5.3
UAE	2.6	(0.0)	3.2	(1.1)	4.3	(0.4)	5.5	(0.2)	0.6	(0.1)	4.8	(0.6)	3.5	(0.3)	4.5	(0.7)	4.8	(0.5)	3.8
Vietnam	2.8	(0.5)	0.3	(0.1)	10.4	(1.7)	9.8	(0.4)	6.8	(0.4)	7.9	(1.2)	6.9	(0.3)	5.4	(0.7)	8.5	(1.0)	6.3
(region)																			
APO21	3.0	(0.3)	−0.6	(−0.0)	3.8	(0.7)	4.0	(0.1)	4.4	(0.3)	4.8	(0.8)	4.9	(0.4)	5.0	(0.8)	3.6	(0.7)	4.0
Asia25	3.3	(0.3)	0.1	(0.0)	5.6	(1.3)	5.6	(0.1)	5.6	(0.4)	5.8	(0.8)	6.4	(0.5)	5.1	(0.8)	5.5	(1.0)	5.2
Asia31	3.3	(0.3)	1.0	(0.1)	5.6	(1.2)	5.6	(0.1)	5.5	(0.4)	5.7	(0.8)	6.3	(0.5)	5.0	(0.8)	5.4	(1.0)	5.1
East Asia	3.5	(0.2)	0.8	(0.0)	6.0	(1.6)	5.7	(0.1)	5.9	(0.4)	5.4	(0.6)	6.6	(0.5)	4.1	(0.7)	5.4	(1.1)	5.2
South Asia	3.3	(0.6)	2.8	(0.1)	6.1	(0.9)	6.1	(0.1)	4.7	(0.3)	7.6	(1.4)	6.1	(0.5)	8.0	(1.3)	6.4	(1.0)	6.1
ASEAN	2.7	(0.3)	1.3	(0.1)	4.2	(0.9)	5.3	(0.1)	6.6	(0.4)	5.5	(1.0)	6.8	(0.5)	6.2	(0.8)	5.1	(0.6)	4.8
ASEAN6	2.9	(0.3)	0.9	(0.1)	3.7	(0.8)	4.0	(0.1)	6.3	(0.4)	5.3	(0.9)	6.9	(0.6)	6.3	(0.8)	4.6	(0.6)	4.6
CLMV	2.1	(0.4)	1.5	(0.3)	10.0	(1.4)	10.1	(0.4)	8.5	(0.6)	7.4	(1.1)	6.6	(0.3)	5.7	(0.6)	8.2	(0.9)	6.0
GCC	2.3	(0.0)	2.2	(1.0)	4.1	(0.4)	4.7	(0.1)	3.2	(0.2)	4.0	(0.4)	4.4	(0.3)	4.2	(0.5)	3.9	(0.6)	3.3
(reference)																			
US	2.5	(0.0)	5.4	(0.1)	1.2	(0.2)	0.8	(0.0)	2.2	(0.1)	2.0	(0.2)	4.5	(0.4)	2.6	(0.8)	1.2	(0.3)	2.2
Australia	−1.9	(−0.0)	6.1	(0.5)	2.9	(−0.1)	0.4	(0.0)	1.2	(0.1)	1.8	(0.2)	1.9	(0.2)	2.8	(0.8)	2.9	(0.7)	2.4

Unit: Percentage (average annual growth rate, contribution share in parentheses).
Source: APO Productivity Database 2021.

Table 24 Industry Origins of Labor Productivity Growth

——Average annual growth rates (contributions) of industry labor productivity in 2010–2019

	1. Agriculture		2. Mining		3. Manufacturing		4. Electricity, gas, and water supply		5. Construction		6. Wholesale and retail trade, hotels, and restaurants		7. Transport, storage, and communications		8. Finance, real estate, and business activities		9. Community, social, and personal services		Total economy
Bahrain	0.0	(0.0)	−2.8	(0.4)	0.4	(0.2)	−3.0	(−0.0)	−0.5	(−0.6)	−0.9	(−0.3)	0.6	(0.0)	−1.8	(0.4)	2.1	(−0.2)	−0.3
Bangladesh	4.1	(0.8)	9.1	(0.1)	6.5	(1.3)	8.4	(0.1)	4.9	(0.4)	5.0	(0.7)	3.1	(0.4)	1.9	(0.5)	2.0	(0.7)	5.0
Brunei	−10.4	(−0.7)	−5.3	(−1.4)	0.0	(0.1)	11.3	(0.1)	4.1	(−0.4)	−2.5	(−1.1)	0.3	(0.0)	3.3	(0.2)	4.2	(1.0)	−2.2
Cambodia	4.7	(1.8)	25.5	(0.3)	7.2	(1.3)	−1.0	(−0.0)	5.8	(1.2)	−2.4	(−1.0)	0.2	(0.3)	−1.6	(0.7)	−4.3	(−0.9)	3.7
China	8.5	(1.6)	7.7	(0.1)	7.7	(2.1)	7.7	(0.2)	7.7	(0.5)	4.4	(0.4)	4.4	(0.4)	4.4	(0.9)	4.4	(0.3)	6.6
ROC	−0.5	(−0.0)	−2.4	(−0.0)	3.6	(1.2)	0.9	(0.0)	−0.8	(−0.1)	2.1	(0.4)	2.4	(0.1)	1.8	(0.4)	−0.6	(−0.1)	1.8
Fiji	4.9	(0.6)	−10.4	(−0.1)	5.5	(0.8)	4.5	(−0.1)	2.4	(−0.1)	−0.5	(−0.2)	0.6	(0.2)	−4.5	(0.1)	1.7	(0.1)	1.4
Hong Kong	−3.2	(−0.0)	0.0	( )	2.8	(0.1)	−1.2	(−0.0)	2.6	(0.0)	3.0	(0.8)	2.7	(0.2)	−0.3	(0.4)	0.7	(−0.1)	1.5
India	5.1	(1.3)	6.6	(0.1)	4.2	(0.6)	−2.2	(0.1)	0.9	(−0.1)	5.8	(1.2)	2.6	(0.3)	7.0	(1.4)	2.0	(0.5)	5.5
Indonesia	6.3	(1.3)	0.5	(0.1)	1.5	(0.6)	−0.3	(−0.0)	2.1	(0.4)	1.5	(0.0)	7.0	(0.6)	−8.2	(0.2)	0.1	(−0.5)	2.8
Iran	2.3	(0.1)	−11.7	(−1.4)	−3.4	(−0.6)	−1.1	(0.2)	−1.8	(−0.2)	−2.2	(−0.3)	2.5	(0.2)	0.6	(0.4)	1.1	(0.0)	−1.6
Japan	−1.1	(−0.0)	2.3	(0.0)	0.5	(0.1)	−0.8	(−0.0)	2.4	(0.1)	1.0	(0.2)	0.4	(0.0)	0.3	(0.2)	−0.6	(−0.3)	0.3
Korea	2.1	(0.1)	−0.1	(−0.0)	1.8	(0.7)	3.0	(0.0)	0.4	(0.0)	1.8	(0.1)	1.6	(0.1)	1.8	(0.6)	0.8	(0.0)	1.6
Kuwait	1.4	(0.0)	−1.2	(1.0)	4.1	(0.3)	5.1	(0.1)	−0.3	(−0.2)	1.1	(0.1)	0.0	(0.0)	−2.1	(−0.2)	−0.9	(−2.2)	−1.1
Malaysia	2.3	(0.2)	−4.7	(−0.0)	2.3	(0.7)	2.5	(0.1)	6.0	(0.2)	2.0	(0.0)	4.7	(0.5)	−0.2	(0.1)	4.4	(0.5)	2.2
Mongolia	10.8	(1.7)	1.1	(1.0)	4.6	(0.5)	0.9	(0.0)	−3.2	(−0.2)	5.9	(0.9)	9.9	(0.7)	2.9	(1.0)	−1.2	(−0.5)	5.2
Nepal	2.1	(0.3)	2.6	(0.0)	1.6	(0.1)	4.4	(0.1)	0.9	(0.2)	3.0	(0.7)	1.0	(0.3)	−1.5	(0.6)	3.5	(0.7)	3.0
Oman	9.6	(0.1)	−13.1	(0.3)	−5.7	(−0.6)	−20.3	(0.1)	2.4	(−0.9)	−5.5	(−1.2)	−13.8	(−0.3)	−0.7	(−0.1)	0.4	(−0.4)	−3.0
Pakistan	1.8	(0.4)	−9.0	(−0.0)	−1.0	(−0.2)	2.1	(0.1)	−1.5	(−0.2)	0.9	(0.3)	−0.4	(0.2)	13.0	(0.4)	3.2	(0.7)	1.6
Philippines	4.4	(0.9)	4.1	(0.0)	3.9	(1.0)	6.5	(0.2)	0.9	(0.0)	3.6	(0.6)	3.2	(0.2)	1.8	(1.2)	1.2	(−0.2)	3.8
Qatar	3.1	(−0.1)	1.1	(0.7)	−0.2	(0.1)	−8.2	(−0.1)	5.4	(−1.4)	−2.4	(−0.6)	−2.4	(−0.3)	14.8	(1.0)	0.4	(−0.8)	−1.5
Saudi Arabia	4.3	(0.0)	0.2	(1.0)	−1.9	(−0.0)	−3.0	(−0.0)	−1.7	(−0.6)	0.9	(−0.3)	1.8	(0.1)	10.4	(0.6)	−1.2	(−1.5)	−0.9
Singapore	−6.1	(−0.0)	0.0	( )	3.9	(0.7)	10.8	(0.0)	1.1	(−0.1)	2.0	(0.4)	1.0	(0.1)	3.0	(1.4)	−0.1	(−0.7)	1.9
Sri Lanka	5.2	(1.0)	10.4	(0.2)	2.5	(0.4)	1.8	(0.1)	3.8	(0.3)	3.8	(0.5)	4.0	(0.6)	8.3	(1.0)	2.2	(0.5)	4.6
Thailand	3.6	(0.9)	−4.8	(−0.0)	0.4	(0.2)	−1.5	(0.1)	3.9	(0.1)	4.9	(0.9)	3.0	(0.3)	1.2	(0.5)	1.6	(0.3)	3.4
Turkey	3.1	(0.3)	−0.1	(−0.0)	4.4	(0.8)	−0.2	(0.1)	5.7	(0.5)	2.4	(0.3)	3.2	(0.6)	−1.0	(0.2)	0.5	(0.0)	2.8
UAE	−8.5	(−0.7)	3.9	(1.0)	3.8	(0.3)	7.3	(0.2)	−0.1	(−0.0)	0.4	(−0.3)	0.5	(0.0)	5.5	(0.8)	6.0	(0.8)	2.0
Vietnam	5.7	(1.7)	4.1	(0.1)	4.6	(0.7)	5.9	(0.4)	2.5	(0.1)	4.4	(0.6)	3.4	(0.1)	−3.3	(0.6)	6.5	(0.8)	5.2
(region)																			
APO21	4.5	(0.9)	1.0	(0.0)	1.5	(0.4)	−0.8	(0.1)	1.2	(0.0)	2.6	(0.4)	1.9	(0.2)	1.7	(0.7)	0.0	(0.1)	2.8
Asia25	5.9	(1.2)	4.7	(0.0)	4.6	(1.1)	3.0	(0.1)	3.9	(0.2)	3.0	(0.4)	2.9	(0.3)	2.4	(0.8)	1.6	(0.2)	4.4
Asia31	5.8	(1.1)	5.4	(0.1)	4.5	(1.1)	2.9	(0.1)	3.7	(0.2)	2.9	(0.4)	2.8	(0.3)	2.4	(0.8)	1.5	(0.2)	4.3
East Asia	8.1	(1.4)	7.6	(0.1)	6.2	(1.6)	5.7	(0.1)	6.3	(0.4)	2.5	(0.3)	2.8	(0.3)	3.0	(0.7)	1.5	(0.1)	4.9
South Asia	4.6	(1.2)	6.3	(0.1)	3.8	(0.6)	−0.5	(0.1)	1.2	(0.0)	5.2	(1.1)	2.3	(0.3)	6.8	(1.3)	2.1	(0.5)	5.0
ASEAN	4.9	(1.0)	0.8	(0.1)	1.4	(0.5)	1.8	(0.1)	2.5	(0.2)	2.3	(0.3)	4.2	(0.4)	−1.1	(0.6)	1.2	(0.0)	3.2
ASEAN6	5.2	(1.0)	0.0	(0.1)	1.4	(0.5)	1.1	(0.1)	2.5	(0.2)	2.5	(0.3)	4.7	(0.5)	−2.3	(0.5)	0.4	(−0.2)	2.9
CLMV	3.9	(1.2)	3.0	(0.4)	5.9	(0.8)	5.5	(0.4)	3.7	(0.3)	2.9	(0.3)	2.5	(0.1)	4.6	(0.6)	6.1	(0.7)	4.8
GCC	−0.4	(−0.1)	−0.1	(0.9)	−0.7	(−0.0)	−0.6	(−0.0)	−0.7	(−0.5)	0.2	(−0.3)	−0.1	(−0.0)	5.7	(0.6)	0.1	(−1.0)	−0.3
(reference)																			
US	2.3	(0.0)	5.4	(0.1)	0.6	(0.1)	1.1	(0.0)	−0.4	(−0.1)	1.4	(0.1)	2.2	(0.2)	0.6	(0.4)	0.0	(−0.2)	0.8
Australia	−1.4	(−0.0)	4.0	(0.5)	0.1	(0.0)	−0.2	(−0.0)	−0.4	(−0.0)	0.5	(−0.1)	−0.6	(−0.0)	1.0	(0.6)	0.3	(−0.2)	0.6

Unit: Percentage (average annual growth rate, contribution share in parentheses).
Source: APO Productivity Database 2021.

Table 25 Real Income and Terms of Trade

——Average annual growth rate of real income, real GDP, trading gain, and net primary income transfer from abroad

2000–2005					2005–2010					2010–2015					2015–2019					2018–2019				
	Real income	Real GDP	Trading gain	Net primary income from abroad		Real income	Real GDP	Trading gain	Net primary income from abroad		Real income	Real GDP	Trading gain	Net primary income from abroad		Real income	Real GDP	Trading gain	Net primary income from abroad		Real income	Real GDP	Trading gain	Net primary income from abroad
China	9.7	8.7	0.9	0.1	Myanmar	12.1	4.8	7.3	0.0	Mongolia	10.7	9.9	0.7	0.0	Vietnam	7.2	6.4	1.0	−0.2	Mongolia	10.1	4.7	6.8	−1.4
Iran	9.2	7.1	2.5	−0.3	China	10.1	10.0	0.1	0.1	Lao PDR	8.1	2.6	5.1	0.4	Nepal	7.1	6.5	0.8	−0.1	Bangladesh	6.9	6.5	0.4	−0.1
Cambodia	9.0	9.4	−0.3	−0.1	Bhutan	9.0	9.7	0.2	−0.9	China	8.0	7.8	0.2	0.0	Cambodia	7.0	7.3	−0.1	−0.2	Vietnam	6.6	4.8	1.4	0.4
Mongolia	8.8	5.3	3.7	−0.2	Cambodia	8.8	5.9	2.9	0.0	Myanmar	7.7	6.2	1.0	0.5	Bangladesh	6.9	7.3	0.1	−0.5	Lao PDR	6.5	5.5	−1.3	2.4
Myanmar	8.3	5.6	2.8	−0.1	India	8.3	8.1	0.3	−0.1	Turkey	6.4	6.7	−0.3	0.0	Lao PDR	6.7	6.2	0.0	0.5	Cambodia	6.4	7.6	−1.2	0.0
Vietnam	7.5	7.0	0.6	−0.1	Singapore	7.5	7.3	−1.0	1.3	India	6.1	6.5	−0.3	0.0	India	6.3	5.8	0.5	0.1	China	5.1	4.6	0.2	0.3
Malaysia	7.3	5.3	1.2	0.8	Vietnam	6.9	6.2	1.1	−0.4	Vietnam	5.7	5.2	0.8	−0.3	China	5.8	6.0	−0.3	0.0	Bhutan	5.0	5.5	−0.4	−0.1
Lao PDR	6.8	6.5	−0.1	0.3	Sri Lanka	6.7	6.5	0.2	0.0	Cambodia	5.7	4.1	1.9	−0.3	Philippines	5.5	6.6	−0.7	−0.3	India	4.7	3.1	1.5	0.1
India	6.7	6.9	−0.3	0.1	Lao PDR	6.2	4.8	2.2	−0.8	Bhutan	5.7	6.5	−0.5	−0.3	Mongolia	5.4	4.5	1.8	−0.9	Philippines	4.0	5.3	−0.7	−0.6
Bhutan	6.1	6.4	0.0	−0.3	Bangladesh	6.1	6.0	−0.6	0.7	Bangladesh	5.4	5.9	−0.2	−0.3	Turkey	5.1	5.6	−0.5	0.0	Malaysia	3.7	3.0	0.3	0.5
Bangladesh	5.6	5.4	−0.1	0.2	Malaysia	5.7	4.9	0.6	0.3	Philippines	5.4	5.7	−0.3	0.0	Pakistan	4.9	4.2	0.5	0.1	Indonesia	3.7	4.7	−0.9	−0.1
Sri Lanka	5.4	4.6	0.6	0.1	Nepal	5.4	4.4	1.0	0.0	Malaysia	5.0	5.1	−0.2	0.1	Bhutan	4.6	5.1	0.0	−0.5	Thailand	3.6	2.7	−0.2	1.2
Turkey	4.6	4.9	0.3	−0.6	Philippines	5.2	4.9	0.1	0.3	Sri Lanka	4.9	4.4	0.8	−0.3	Indonesia	4.4	4.8	−0.4	0.1	Nepal	3.2	2.6	0.6	0.0
Thailand	4.6	5.1	0.0	−0.5	Indonesia	5.2	5.5	−0.7	0.4	Indonesia	4.9	5.3	−0.3	−0.1	Malaysia	4.2	4.2	0.1	0.0	Turkey	2.9	3.3	−0.2	−0.1
Korea	4.4	5.1	−0.7	0.0	Iran	5.1	5.3	−0.3	0.2	Nepal	4.4	3.6	0.6	0.2	Thailand	3.8	3.6	−0.2	0.4	Pakistan	2.7	1.1	0.3	1.3
Pakistan	4.2	4.4	−0.8	0.6	Mongolia	4.0	6.3	−0.9	−1.4	Pakistan	4.0	3.8	−0.2	0.4	Singapore	3.1	3.8	0.7	−1.4	ROC	2.3	3.1	−1.0	0.3
Philippines	4.0	4.7	−0.8	0.1	Korea	3.9	4.3	−0.6	0.2	Thailand	3.4	3.1	0.6	−0.2	Sri Lanka	3.0	3.0	0.1	−0.1	Sri Lanka	1.5	3.8	−2.2	−0.1
Indonesia	3.9	4.5	−1.0	0.4	Thailand	3.9	3.8	0.0	0.1	ROC	3.4	2.9	0.6	−0.1	Hong Kong	2.7	1.8	0.1	0.8	Myanmar	0.9	11.7	−5.1	−5.8
Singapore	3.9	5.1	0.0	−1.2	Hong Kong	3.3	3.8	−0.8	0.3	Korea	3.0	2.7	0.3	0.0	Fiji	2.5	3.4	−0.7	−0.1	Japan	0.4	0.2	0.1	0.1
Nepal	3.3	2.9	0.2	0.1	Turkey	3.3	3.7	−0.4	−0.1	Hong Kong	2.8	2.8	0.1	−0.1	Korea	2.3	2.8	−0.7	0.1	Korea	0.3	2.3	−2.5	0.5
Hong Kong	3.0	4.0	−1.0	−0.1	Pakistan	2.6	3.2	−0.9	0.4	Fiji	2.7	3.3	0.0	−0.6	Iran	2.3	0.7	1.5	0.1	Singapore	−0.1	0.7	−0.4	−0.4
ROC	2.7	4.0	−1.6	0.2	ROC	1.9	4.1	−2.3	0.1	Singapore	2.4	4.6	−0.9	−1.3	ROC	2.0	3.0	−0.9	0.0	Fiji	−1.4	0.1	−1.4	−0.1
Fiji	1.8	2.0	0.3	−0.5	Fiji	0.4	0.7	0.0	−0.2	Japan	1.2	1.1	−0.1	0.2	Japan	0.7	0.8	−0.1	0.0	Hong Kong	−1.5	−1.3	−0.4	0.2
Japan	1.0	1.2	−0.3	0.2	Japan	−0.4	−0.1	−0.4	0.1	Iran	−3.5	−0.6	−3.0	0.0	Myanmar	−5.5	4.5	−8.5	−1.5	Iran	−7.6	−8.2	0.9	−0.3
Bahrain	7.9	6.5	1.3	0.0	Bahrain	8.5	6.4	3.5	−1.4	Bahrain	3.1	3.9	−1.5	0.8	Bahrain	3.6	3.5	0.2	−0.1	Bahrain	1.6	2.4	−0.4	−0.4
Kuwait	10.7	7.3	4.6	−1.2	Kuwait	3.2	0.4	3.3	−0.5	Kuwait	−1.5	3.5	−5.5	0.5	Kuwait	3.3	0.5	2.3	0.5	Kuwait	−1.2	1.3	−2.6	0.1
Oman	8.1	3.0	4.9	0.2	Oman	6.4	2.8	4.2	−0.6	Oman	1.9	3.7	−2.5	0.6	Oman	3.4	3.1	1.5	−1.2	Oman	−4.8	−0.4	−2.8	−1.5
Qatar	12.0	9.7	4.6	−2.3	Qatar	14.8	13.3	1.0	0.6	Qatar	5.4	6.3	−2.7	1.7	Qatar	−0.2	0.1	−0.2	−0.1	Qatar	−4.7	1.4	−5.6	−0.5
Saudi Arabia	9.2	4.0	5.3	−0.1	Saudi Arabia	5.4	2.5	2.6	0.2	Saudi Arabia	1.9	5.0	−3.2	0.2	Saudi Arabia	2.6	0.8	2.1	−0.3	Saudi Arabia	0.6	1.0	−0.5	0.1
UAE	6.7	5.0	1.8	−0.1	UAE	5.8	2.5	3.7	−0.3	UAE	5.4	6.1	−0.8	0.1	UAE	4.2	2.5	1.7	0.0	UAE	7.4	2.9	4.4	0.1
Brunei	6.1	1.0	5.2	0.0	Brunei	1.3	0.1	1.4	−0.1	Brunei	1.2	0.9	−0.8	1.1	Brunei	0.1	1.9	−0.4	−1.5	Brunei	3.6	5.5	−4.1	2.2
(reference)					(reference)					(reference)					(reference)					(reference)				
US	2.5	2.5	0.0	0.1	US	1.0	0.9	0.0	0.1	US	2.4	2.2	0.2	0.0	US	2.4	2.3	0.2	0.0	US	2.3	2.2	0.2	−0.1
EU15	1.9	1.7	0.1	0.1	EU15	0.7	0.7	−0.1	0.0	EU15	1.0	0.9	0.1	−0.1	EU15	2.0	1.9	0.0	0.1	EU15	1.5	1.3	0.2	0.0
EU28	1.9	1.8	0.1	0.1	EU28	0.8	0.8	−0.1	0.0	EU28	1.2	1.1	0.1	−0.1	EU28	2.1	2.1	0.0	0.0	EU28	2.1	1.9	0.2	0.0
Australia	4.2	3.3	1.2	−0.2	Australia	4.3	2.8	1.4	0.0	Australia	1.7	2.7	−1.4	0.3	Australia	3.0	1.8	1.2	0.0	Australia	1.0	−0.3	0.2	1.0

Unit: Percentage.
Sources: Official national accounts in each country, including author adjustments.

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