



Online Appendix for
APO Productivity Databook 2019

September 2019

Asian Productivity Organization
and
Keio Economic Observatory, Keio University

The Online Appendix of APO Productivity Databook 2019 provides some figures and tables which were not included in *APO Productivity Databook 2019*.

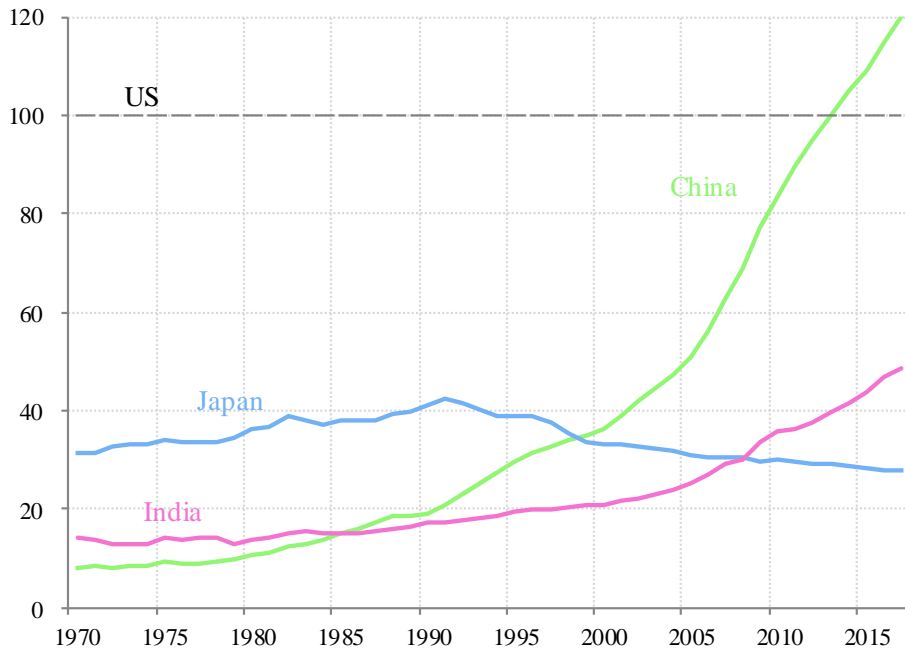
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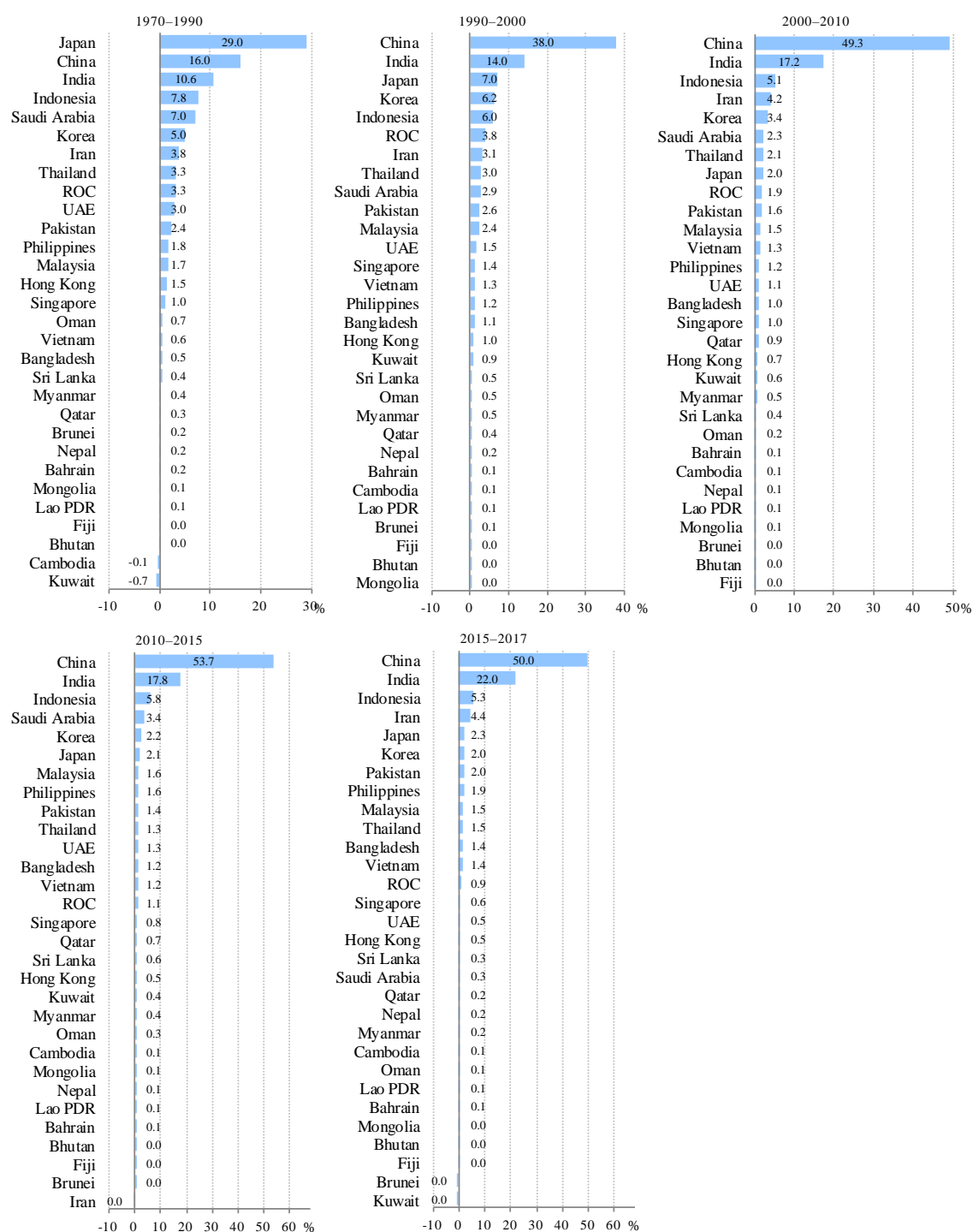
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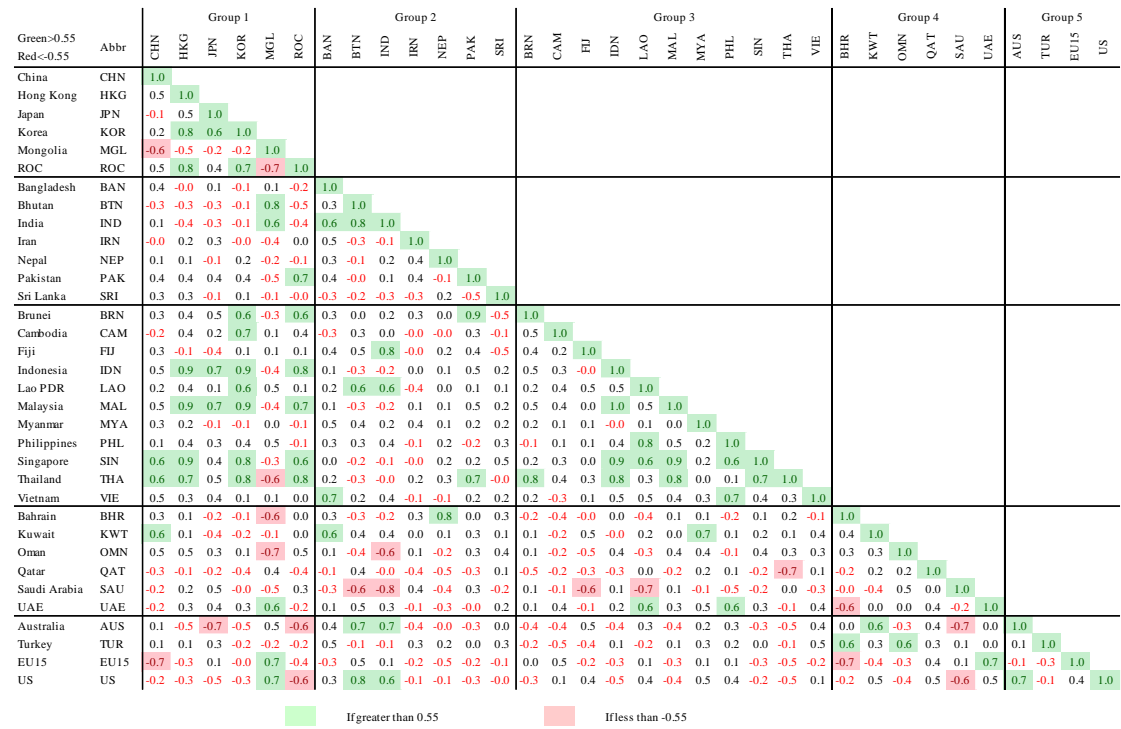
Appendix Figure 1: GDP of China, India, and Japan, Relative to the US
 —Index of GDP at constant market prices in 1970–2017, using 2011 PPP
 Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 2: Country Contributions to GDP Growth of Entire Asia

—Contribution share to the growth of gross regional products (growth rate of Asia30=100) in 1970–1990, 1990–2000, 2000–2010, 2010–2015, and 2015–2017

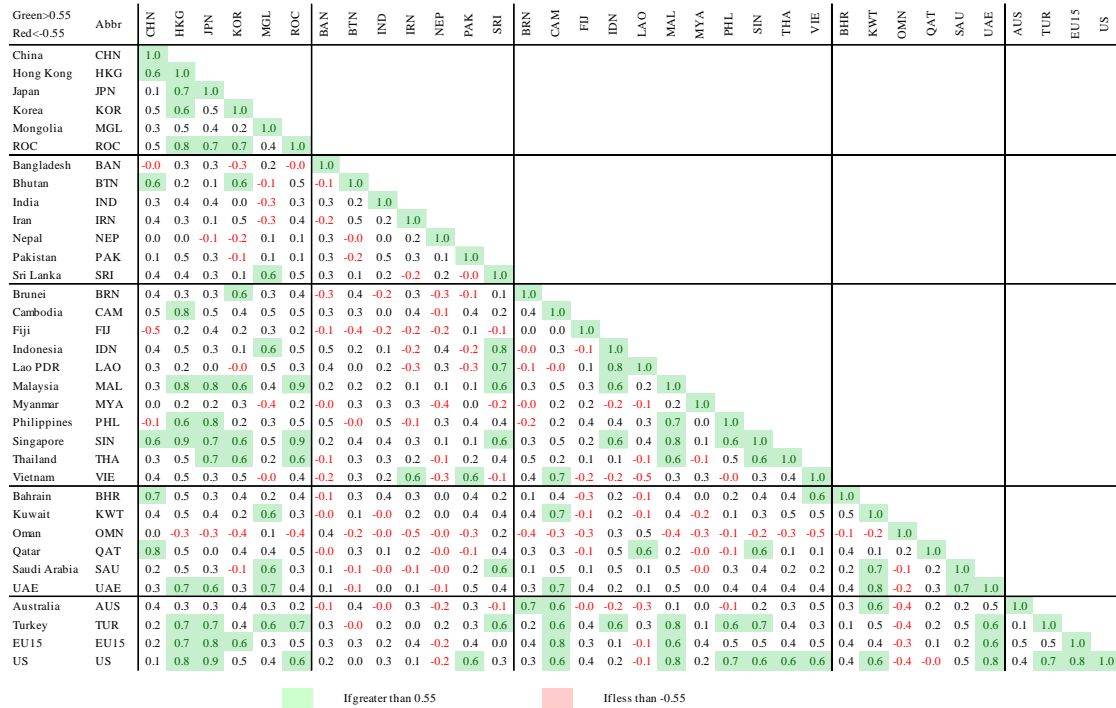
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 3: Correlation of GDP Growth in 1990–2000

—Correlation of GDP growth at constant market prices

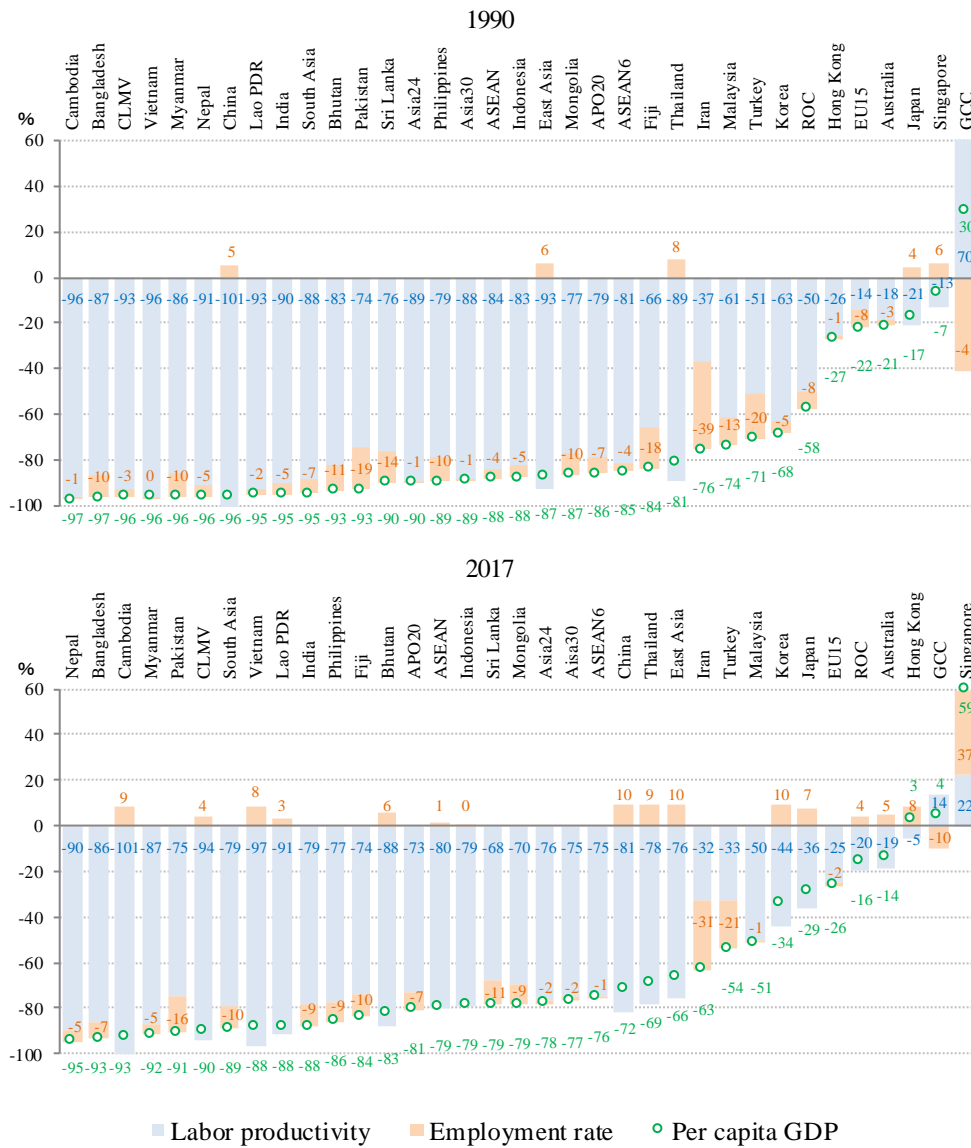
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 4: Correlation of GDP Growth in 2000–2017

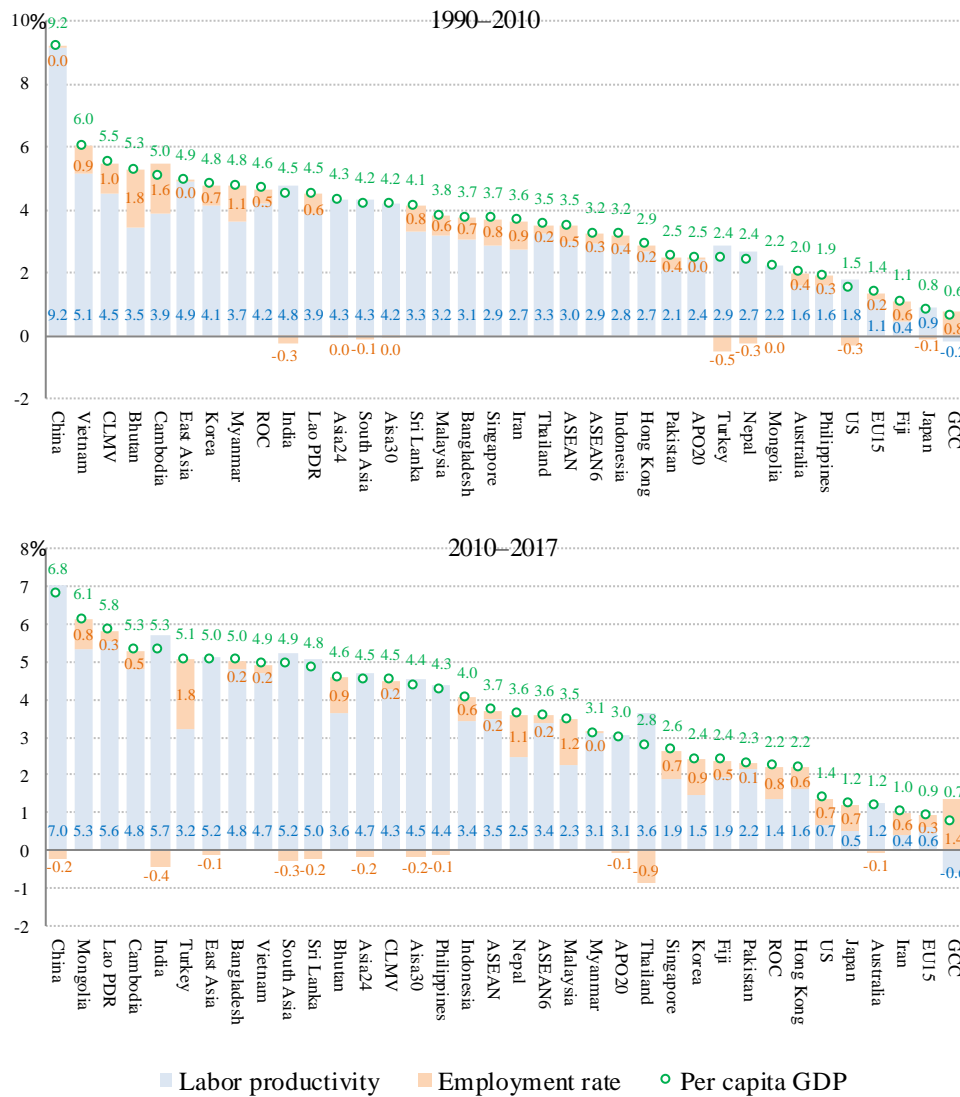
—Correlation of GDP growth at constant market prices

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



Appendix Figure 5: Sources of Per Capita GDP Gap

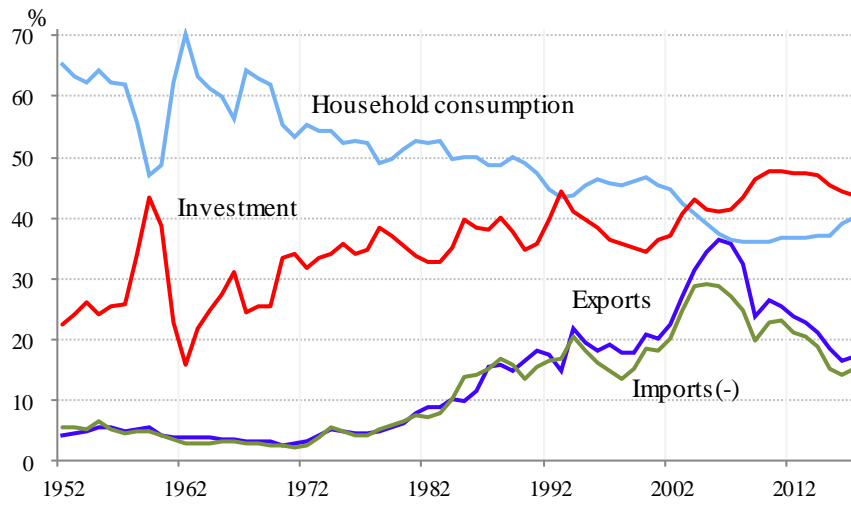
—Percentage point differentials in per capita GDP at constant prices in 1990 and 2017, relative to the US Sources: Official national accounts in each country, including author adjustments.



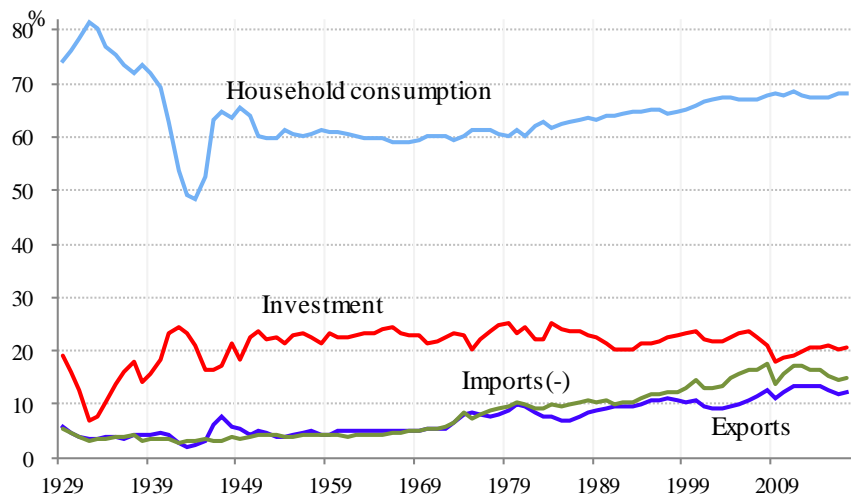
Appendix Figure 6: Sources of Per Capita GDP Growth

—Average annual growth rate of per capita GDP at constant prices in 1990–2010 and 2010–2017

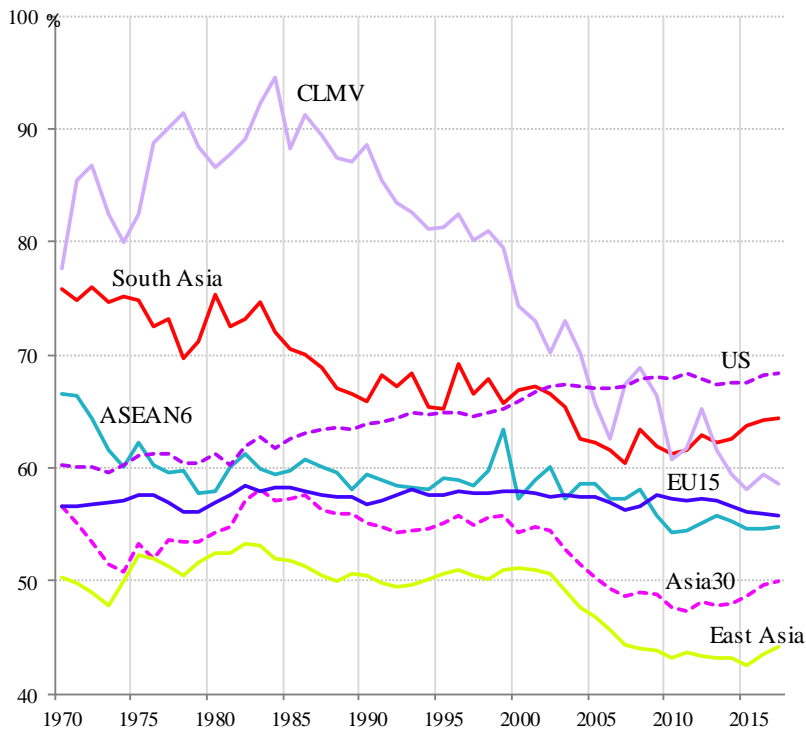
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 7: Historical Final Demand Shares of China since 1952
 —Share of final demands with respect to GDP at current market prices in 1952–2017
 Sources: National accounts by National Bureau Statistics of China, including author interpolation.



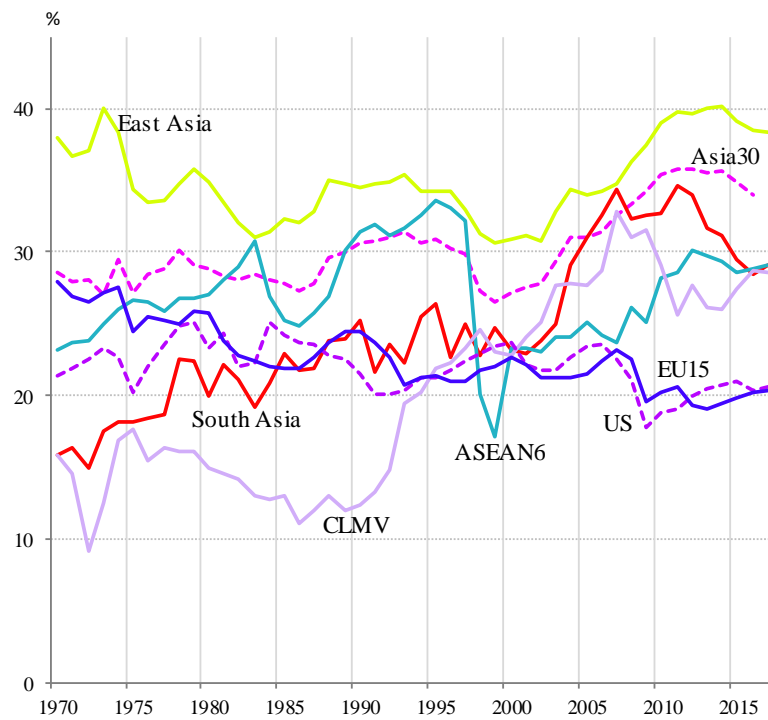
Appendix Figure 8: Historical Final Demand Shares of the US since 1929
 —Share of final demands with respect to GDP at current market prices in 1929–2017
 Sources: National Income and Production Accounts (NIPA), Bureau of Economic Analysis, US.



Appendix Figure 9: Consumption Share by Region

—Share of consumption with respect to GDP at current market prices in 1970–2017

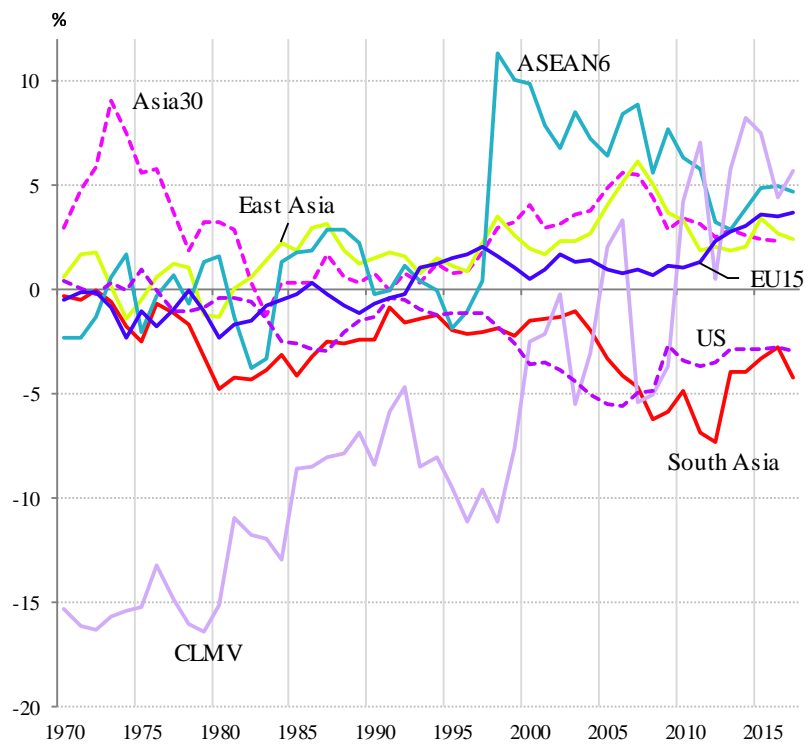
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 10: Investment Share by Region

—Share of investment with respect to GDP at current market prices in 1970–2017

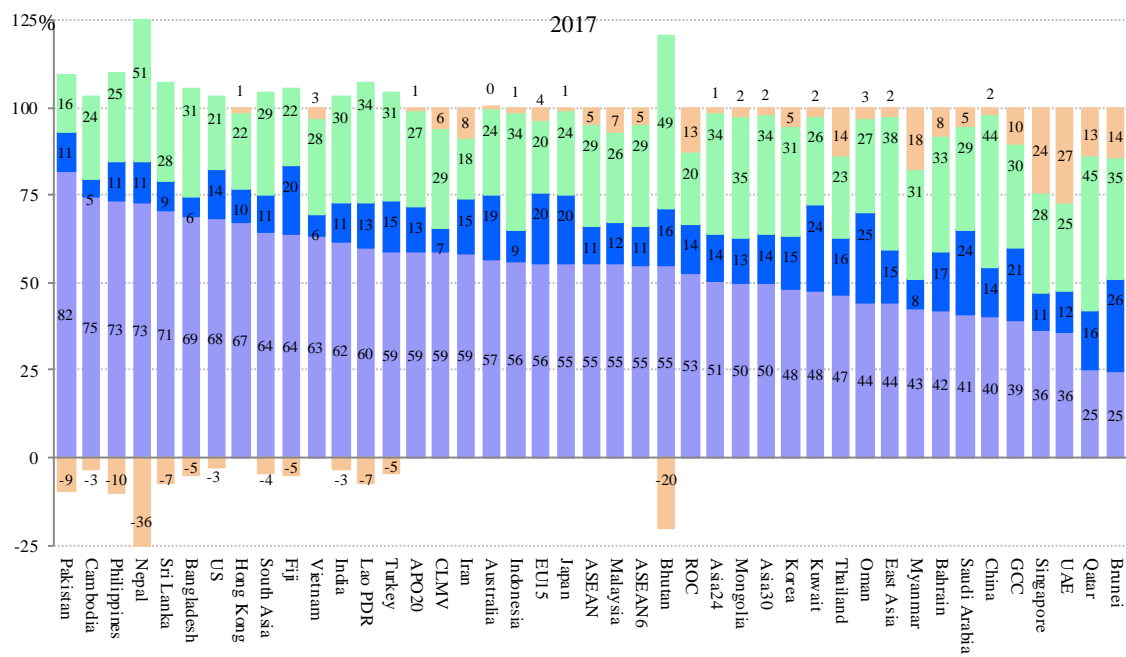
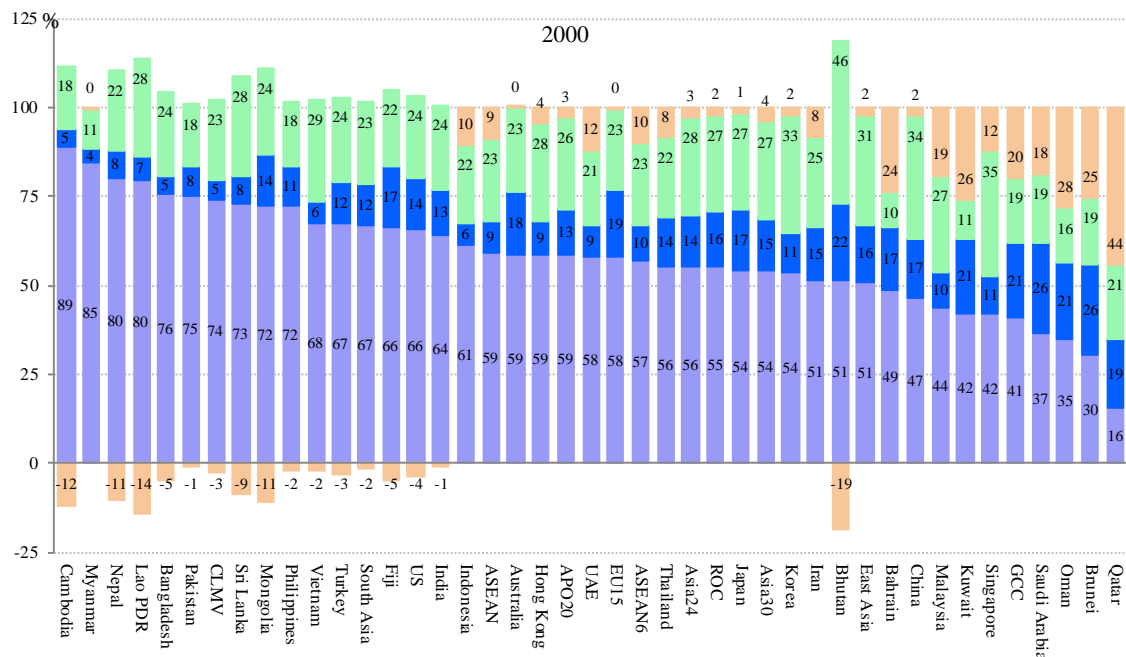
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 11: Net Export Share by Region

—Share of net export with respect to GDP at current market prices in 1970–2017

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



■ Household consumption ■ Government consumption ■ Investment ■ Net exports

Appendix Figure 12: Final Demand Shares in GDP by Country

—Share of final demand with respect to GDP at current market prices in 2000 and 2017

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

Note: Household consumption includes consumption of NPISHs. Investment includes GFCF plus changes in inventories.

Appendix 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 2011 PPP

Per capita GDP level in 1970, relative to the US	Average annual rate of catch-up to the US during 1970–2017					
	(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	Japan, Oman			
(B2) 20% ≤ - < 60%		Iran	Turkey		Hong Kong, Singapore	
(B3) 10% ≤ - < 20%		Fiji	Philippines	Mongolia	Malaysia, Thailand	ROC, Korea
(B4) 0% ≤ - < 10%			Bangladesh, Cambodia, Nepal, Pakistan	India, Lao PDR, Myanmar, Sri Lanka	Bhutan, Indonesia, Vietnam	China

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 1970–2017.

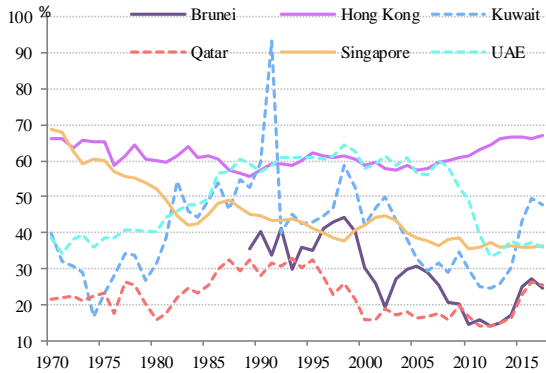
Appendix Table 2: Country Groups Based on the Current Economic Level and the Pace of Catching Up

—Level and average annual growth rate of per capita GDP at constant market prices, using 2011 PPP

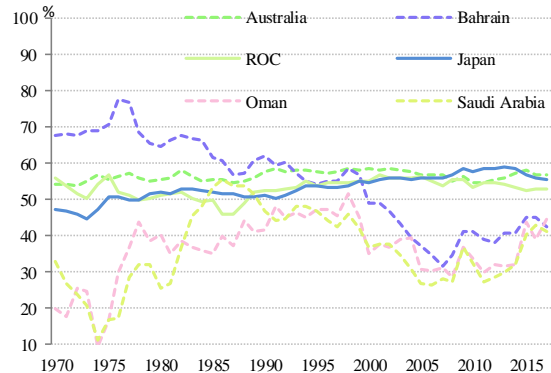
Per capita GDP level in 2017, relative to the US	Average annual rate of catch-up to the US during 2010–2017					
	(C6) < -1%	(C5) -1% ≤ - < 0%	(C4) 0% ≤ - < 1%	(C3) 1% ≤ - < 2%	(C2) 2% ≤ - < 3%	(C1) 3% ≤
(D1) 100% ≤	Brunei, Kuwait, Qatar		Hong Kong	Singapore, UAE		
(D2) 70% ≤ - < 100%	Oman	Australia, Bahrain, EU15, Japan, Saudi	ROC			
(D3) 40% ≤ - < 70%		EU28		Korea	Malaysia	Turkey
(D4) 20% ≤ - < 40%		Iran		Thailand	Indonesia	China, Mongolia, Sri Lanka
(D5) 10% ≤ - < 20%				Fiji	Philippines	Bhutan, India, Lao PDR, Vietnam
(D6) < 10%			Pakistan	Myanmar	Nepal	Bangladesh, Cambodia

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

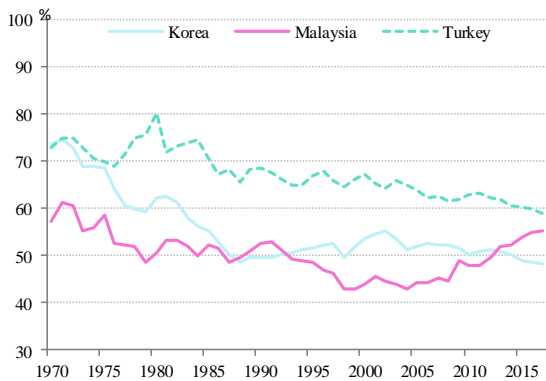
Note: The annual catch-up rates in column are based on the estimates in 2010–2017.



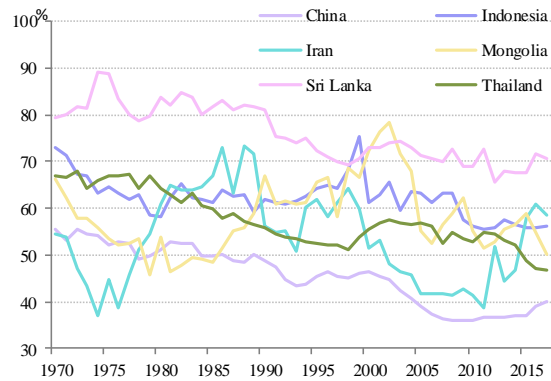
Appendix Figure 13.1: Group-D1 (100% ≤)



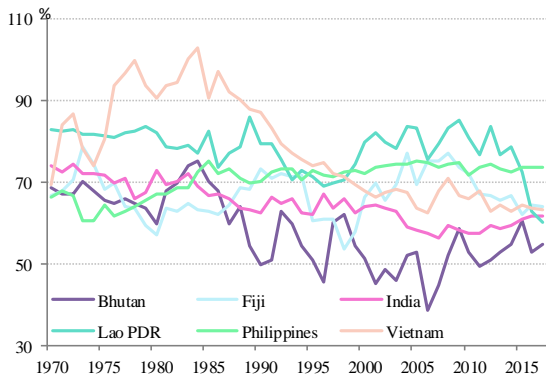
Appendix Figure 13.2: Group-D2 (70% ≤ ... < 100%)



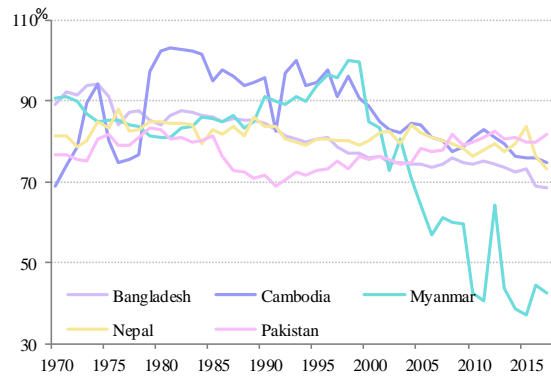
Appendix Figure 13.3: Group-D3 (40% ≤ ... < 70%)



Appendix Figure 13.4: Group-D4 (20% ≤ ... < 40%)



Appendix Figure 13.5: Group-D5 (10% ≤ ... < 20%)



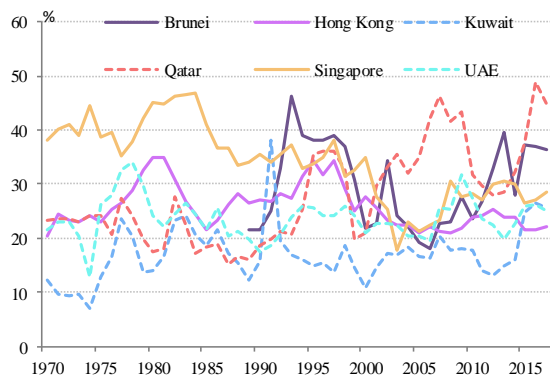
Appendix Figure 13.6: Group-D6 (< 10%)

Appendix Figure 13: Household Consumption Share in GDP

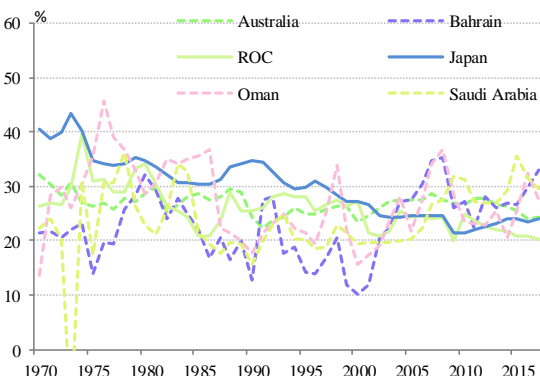
—Share of household consumption with respect to GDP at current market prices in 1970–2017

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

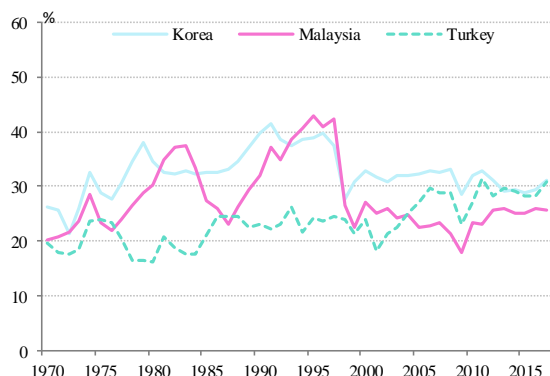
Note: Countries are grouped according to the levels of per-capita income in 2017, relative to the US, defined in Appendix Table 2



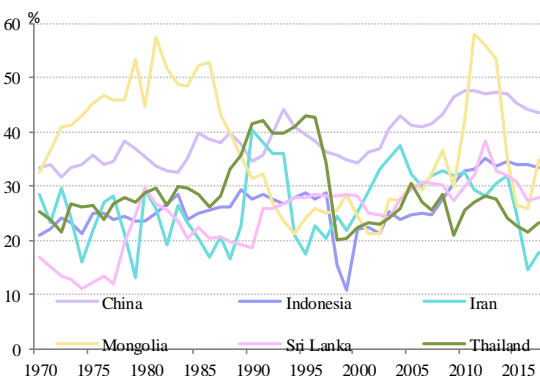
Appendix Figure 14.1: Group–D1 (100%≤)



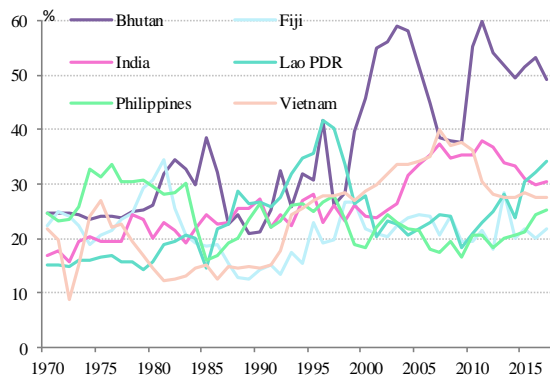
Appendix Figure 14.2: Group–D2 (70%≤ ... <100%)



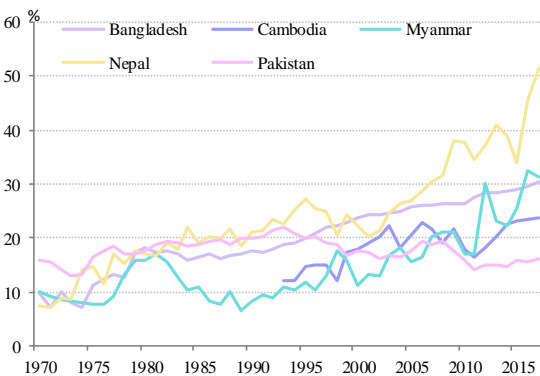
Appendix Figure 14.3: Group–D3 (40%≤ ... <70%)



Appendix Figure 14.4: Group–D4 (20%≤ ... <40%)



Appendix Figure 14.5: Group–D5 (10%≤ ... <20%)



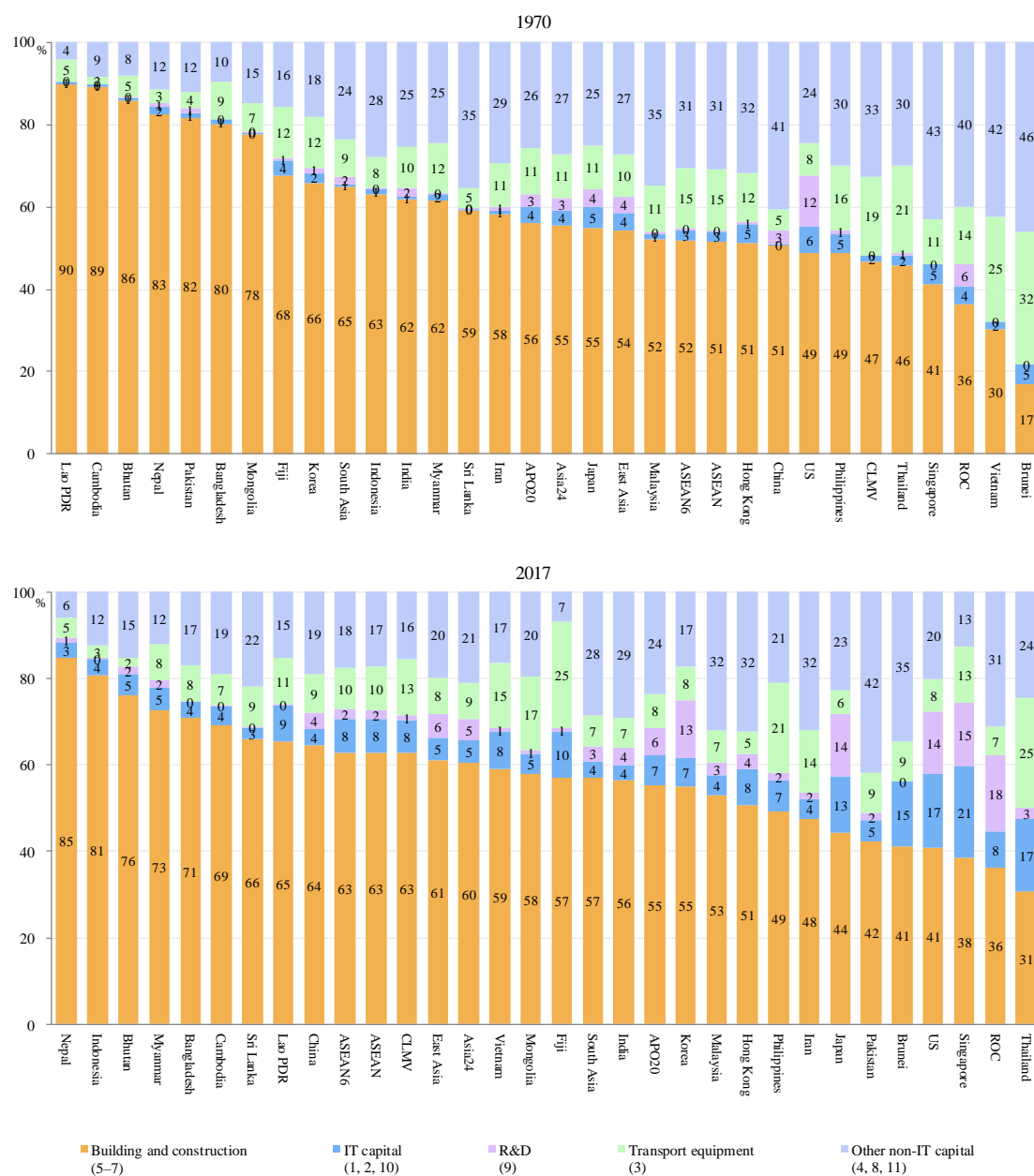
Appendix Figure 14.6: Group–D6 (<10%)

Appendix Figure 14: Investment Share in GDP

—Share of investment with respect to GDP at current market prices in 1970–2017

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

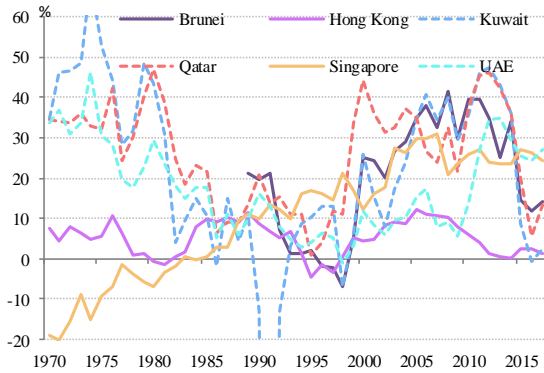
Note: Countries are grouped according to the levels of per-capita income in 2017, relative to the US, defined in Appendix Table 2.



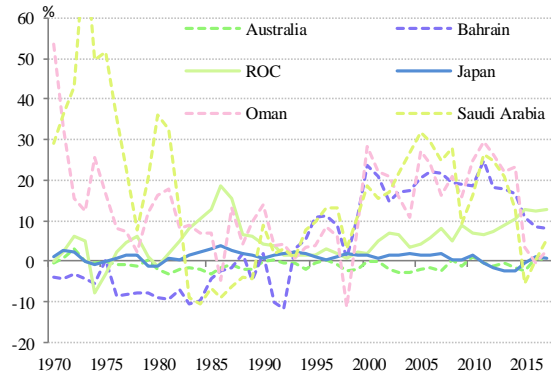
Appendix Figure 15: Investment Shares by Type of Asset

—Share of GFCF at current purchaser's prices by type of assets in 1970 and 2017

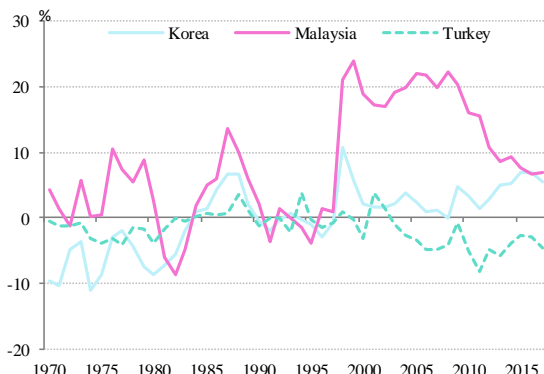
Sources: Official national accounts in each country, including author adjustments based on input-output tables and trade data.



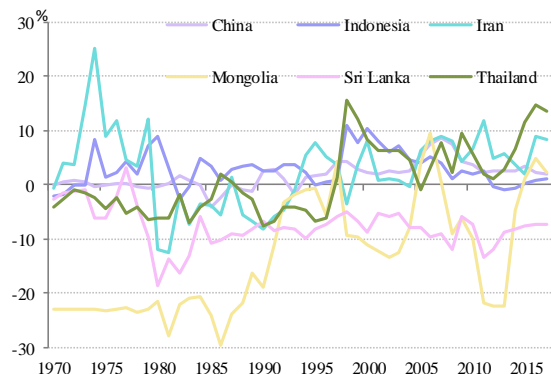
Appendix Figure 16.1: Group-D1 (100%≤)



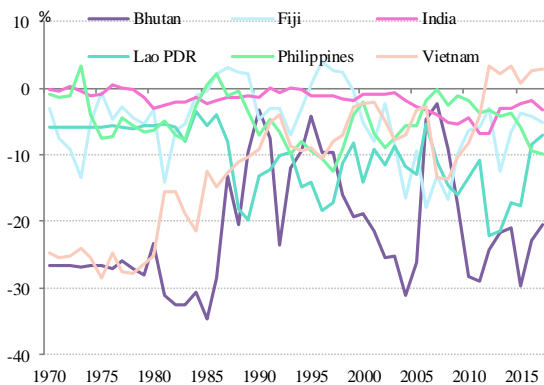
Appendix Figure 16.2: Group-D2 (70%≤ ... <100%)



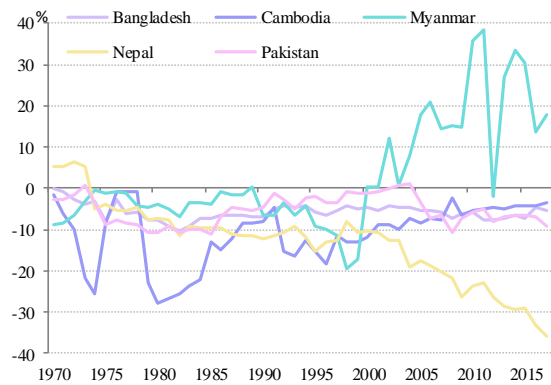
Appendix Figure 16.3: Group-D3 (40%≤ ... <70%)



Appendix Figure 16.4: Group-D4 (20%≤ ... <40%)



Appendix Figure 16.5: Group-D5 (10%≤ ... <20%)



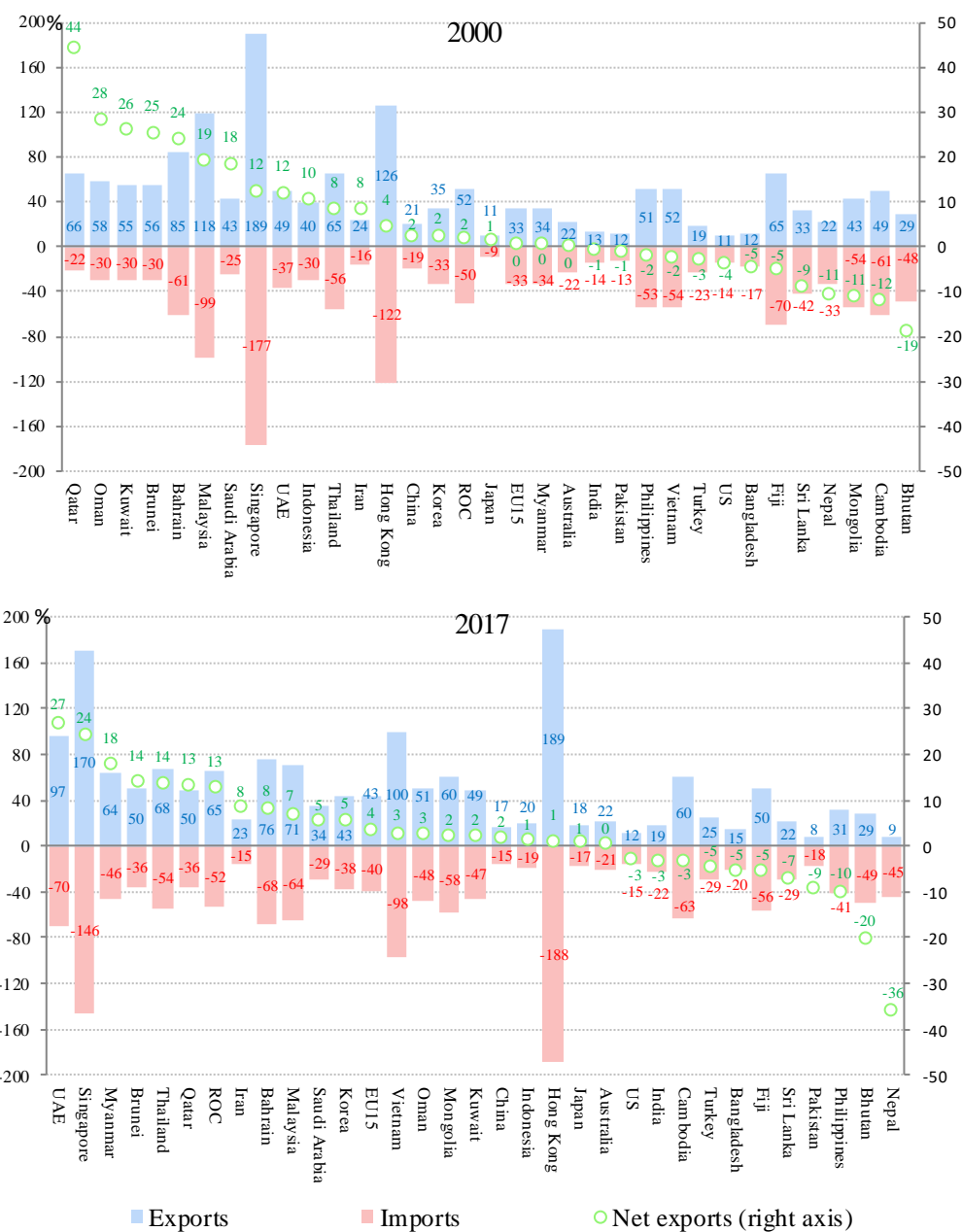
Appendix Figure 16.6: Group-D6 (<10%)

Appendix Figure 16: Net Export Share in GDP

—Share of net exports with respect to GDP at current market prices in 1970–2017

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

Note: Countries are grouped according to the levels of per-capita income in 2017, relative to the US, defined in Appendix Table 2

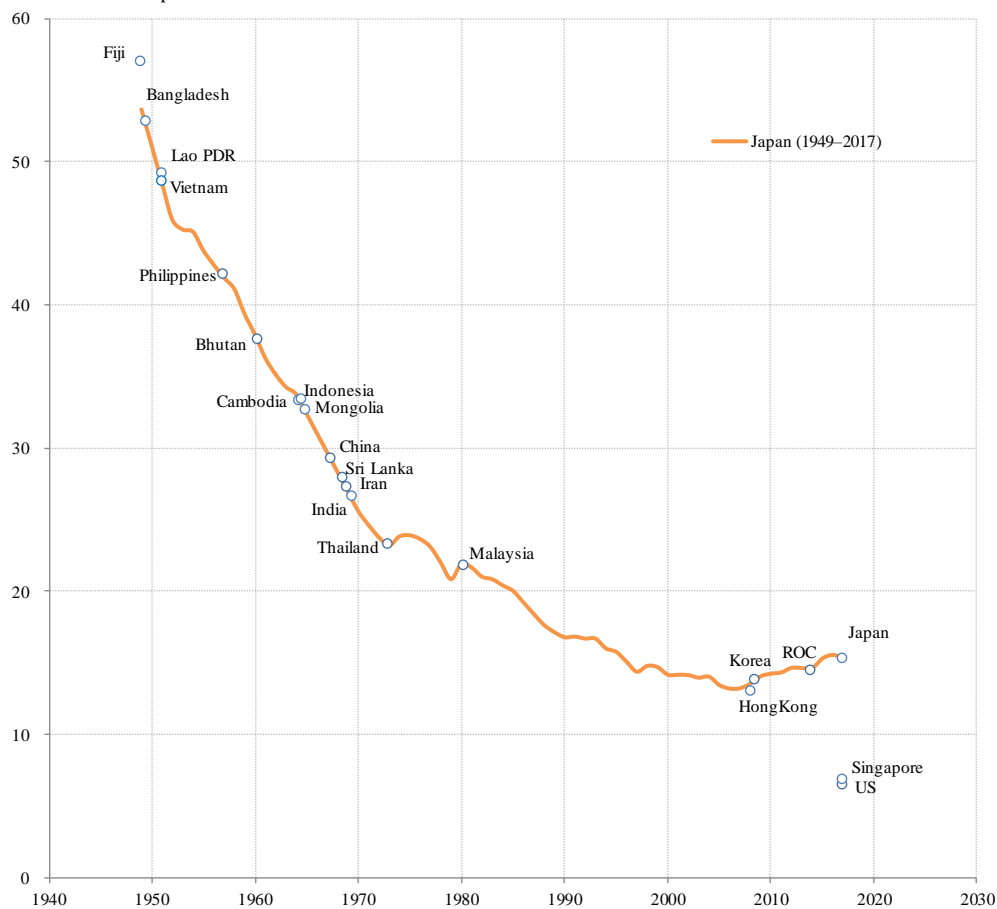


Appendix Figure 17: Export and Import Shares in GDP

—Shares of exports and imports with respect to GDP at current market prices in 2017

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

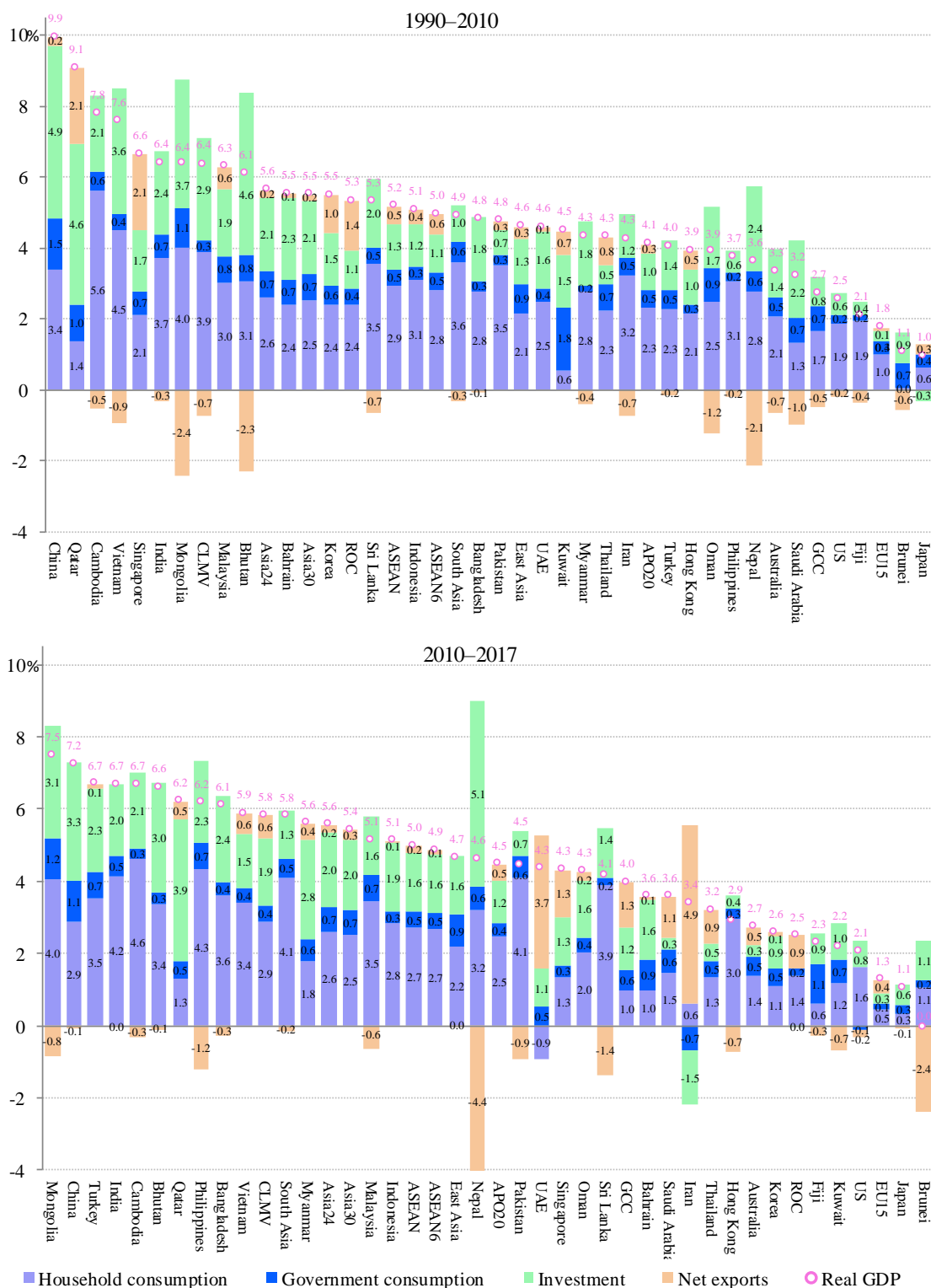
% Food consumption share in 2017



Appendix Figure 18: Historical Engel Curve of Japan since 1949 and Current Level of Asia

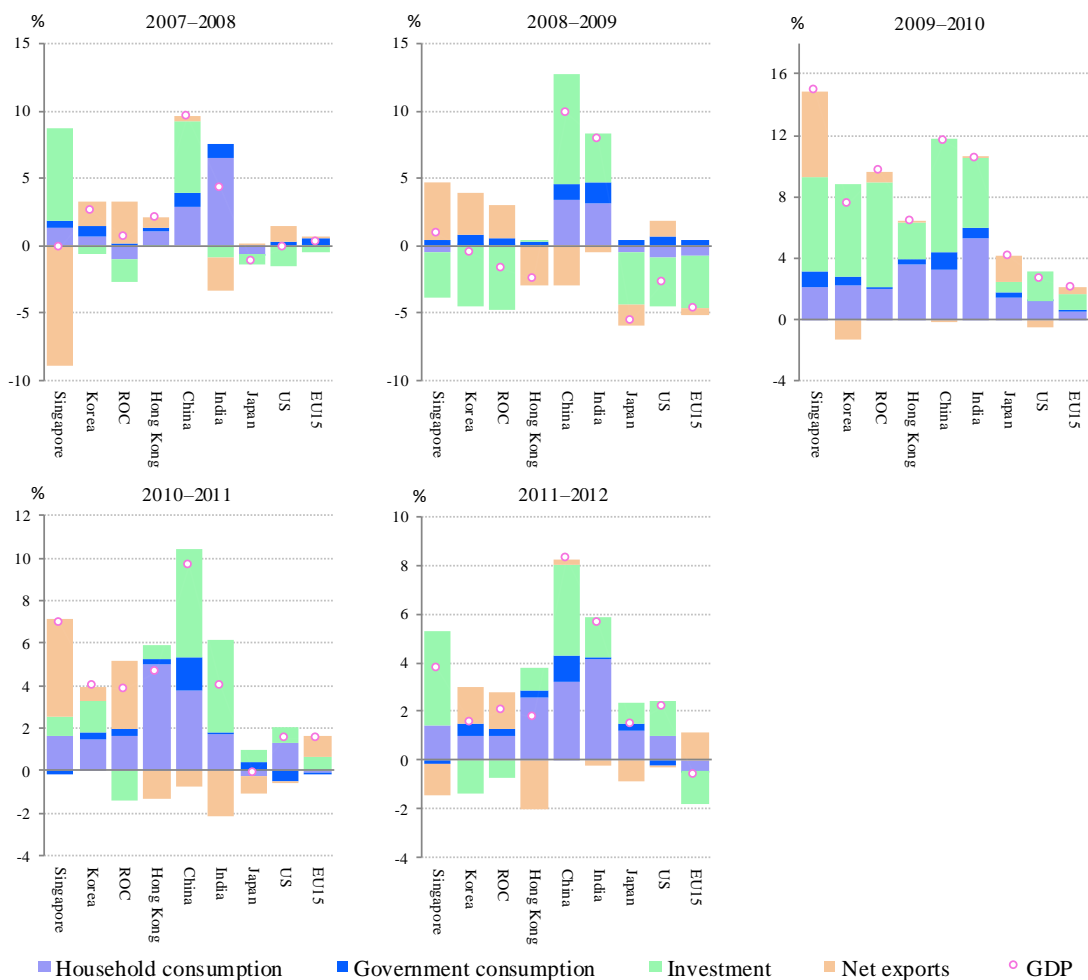
—Share of food in household consumption at current prices for Japan in 1949–2017 and for Asian countries in 2017

Sources: Official national accounts in each country. The historical data of Japan is based on JSNA by ESRI, Cabinet Office of Japan. Note: Food is defined as food and non-alcoholic beverages. For Fiji, the Lao PDR, and Vietnam, the observation periods are 2009, 2005, and 2016, respectively.

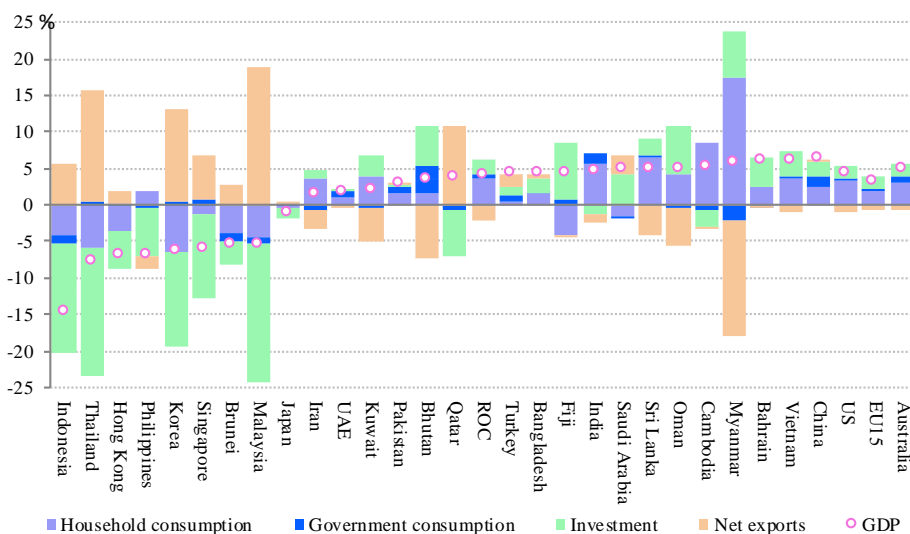


Appendix Figure 19: Final Demand Contributions to Economic Growth
 —Average annual growth rate of constant-price GDP and contributions of final demands in 1990–2010 and 2010–2017

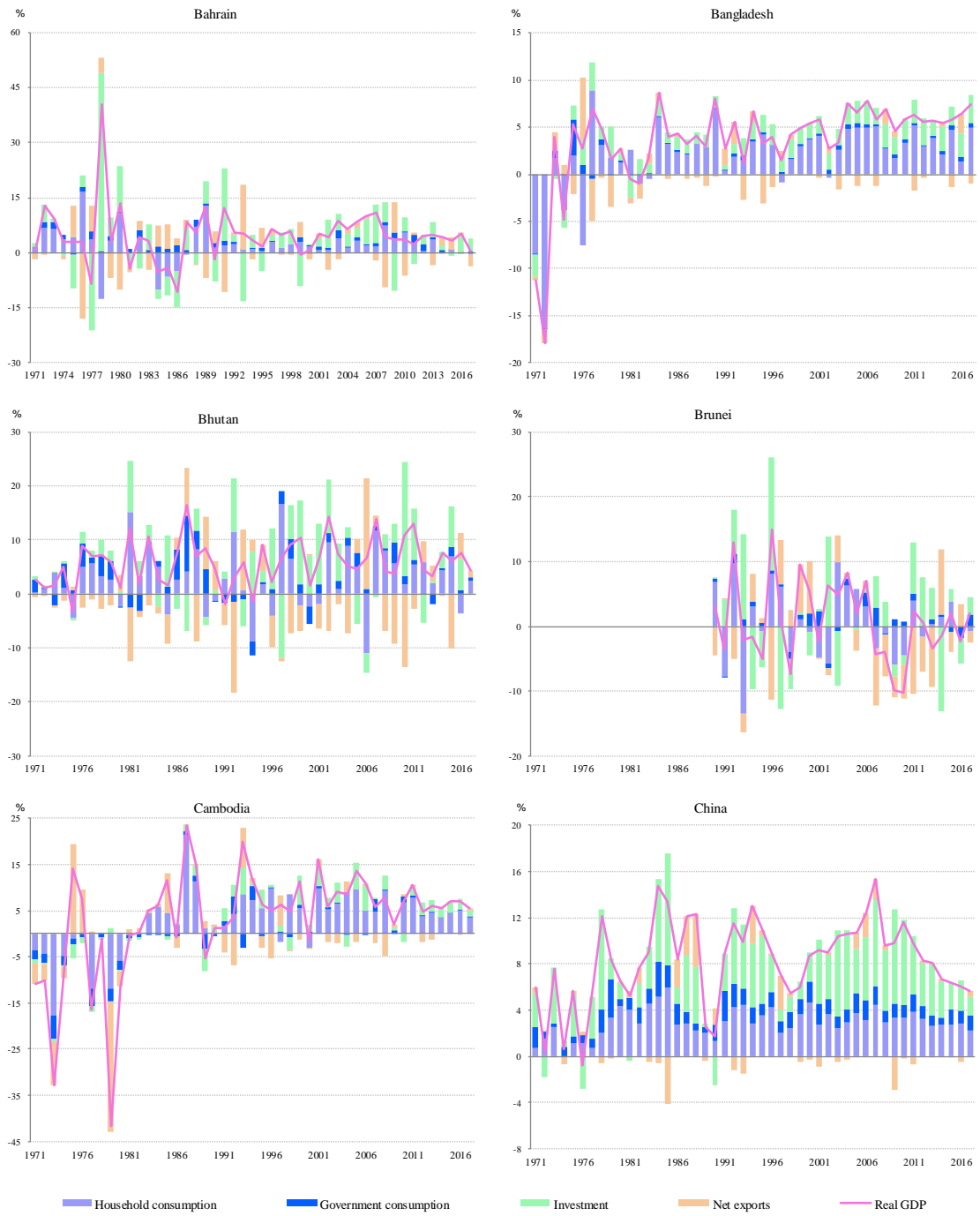
Sources: Official national accounts in each country, including author adjustments.
 Note: The starting periods are 1993 for Cambodia and 2000 for Nepal and Mongolia.



Appendix Figure 20: Impacts of Global Financial Crisis and Recoveries
 —Annual growth rate of constant-price GDP and contributions of final demands in 2007–2012
 Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 21: Impacts of Asian Financial Crisis
 —Annual growth rate of constant-price GDP and contributions of final demands in 1997–1998
 Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 22: Final Demand Contributions to Economic Growth (Year-over-Year)

—Annual growth rate of constant-price GDP and contributions of final demands in 1970–2017

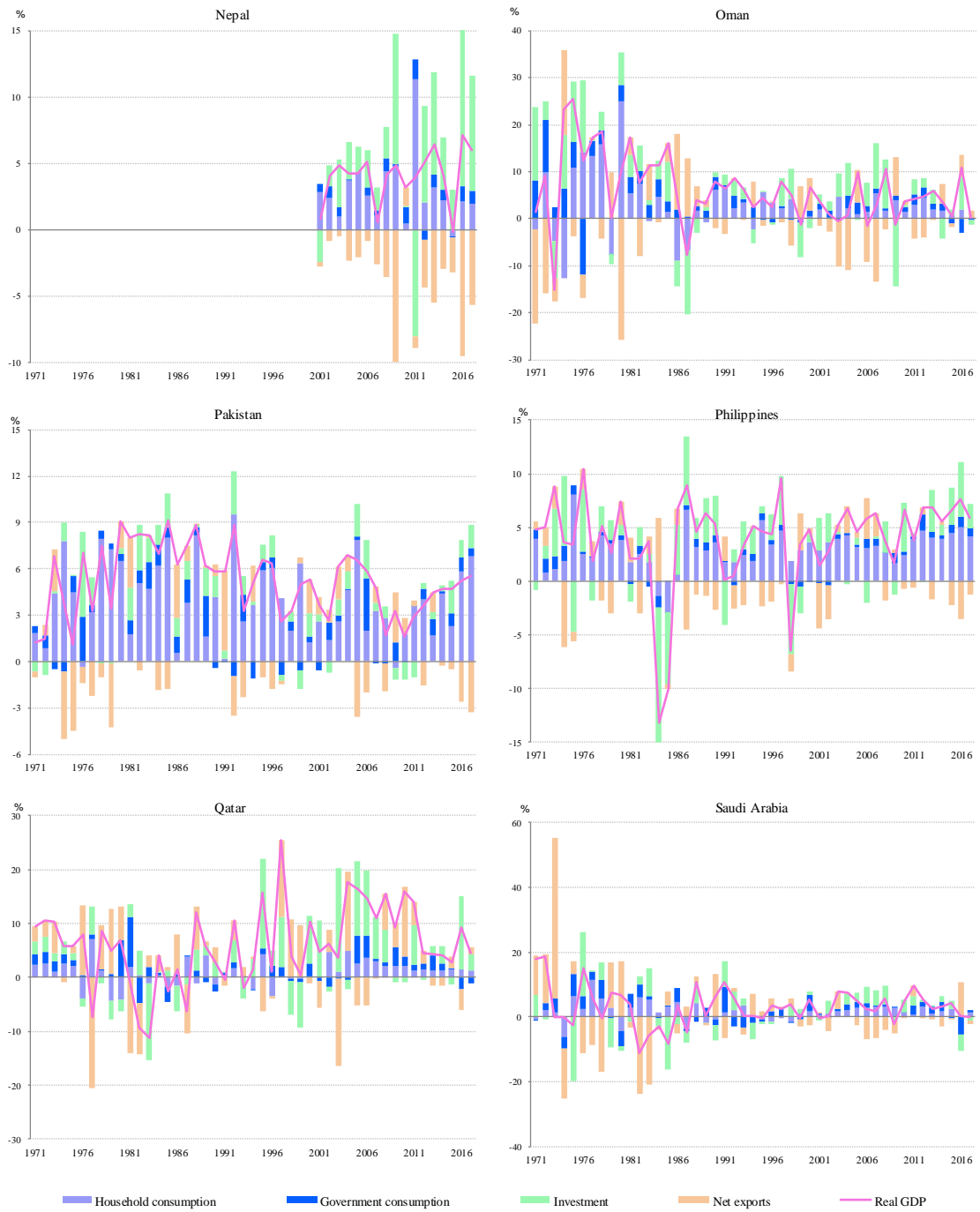
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 22: Final Demand Contributions to Economic Growth (Year-over-Year) (continued)



Appendix Figure 22: Final Demand Contributions to Economic Growth (Year-over-Year) (continued)



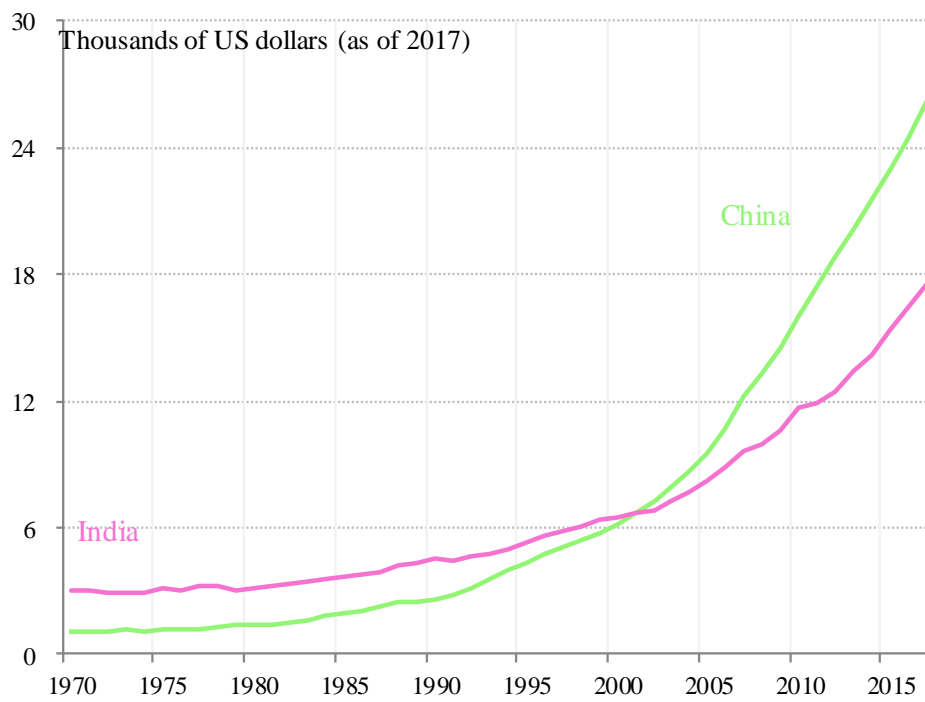
Appendix Figure 22: Final Demand Contributions to Economic Growth (Year-over-Year) (continued)



Appendix Figure 22: Final Demand Contributions to Economic Growth (Year-over-Year) (continued)



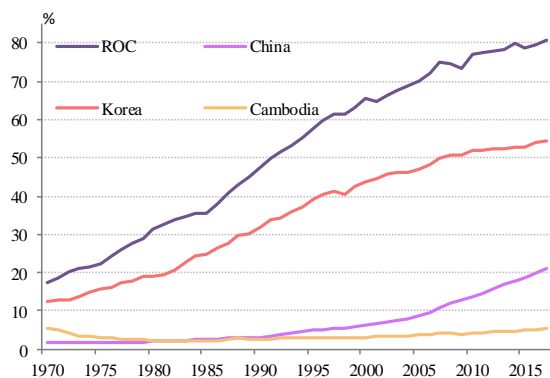
Appendix Figure 22: Final Demand Contributions to Economic Growth (Year-over-Year) (continued)



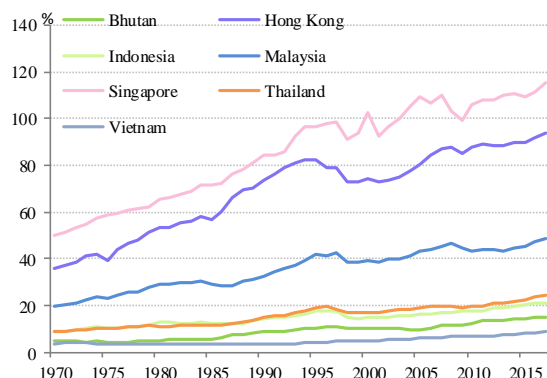
Appendix Figure 23: Labor Productivity of China and India

—GDP at constant basic prices per worker in 1970–2017, using 2011 PPP, reference year 2017

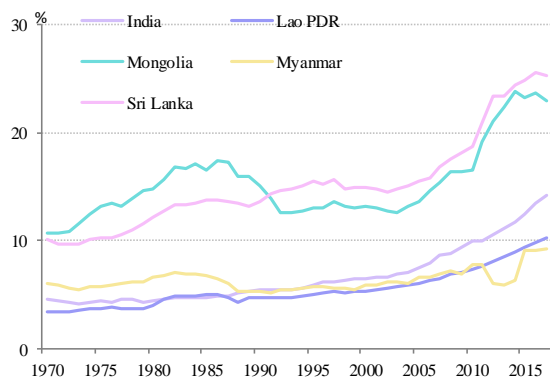
Source: APO Productivity Database 2019.



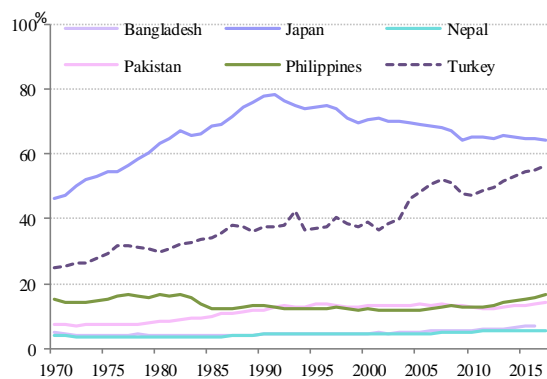
Appendix Figure 24.1: Group-A1 (catch-up \geq 3%)



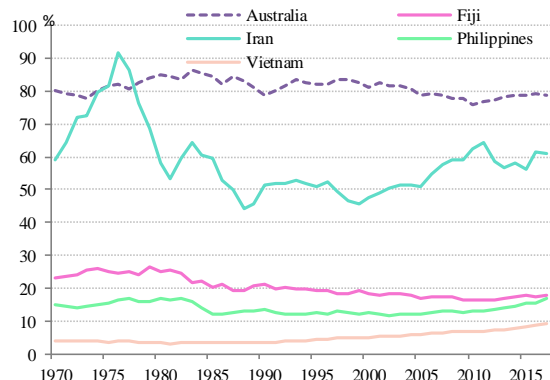
Appendix Figure 24.2: Group-A2 (2% \leq catch-up<3%)



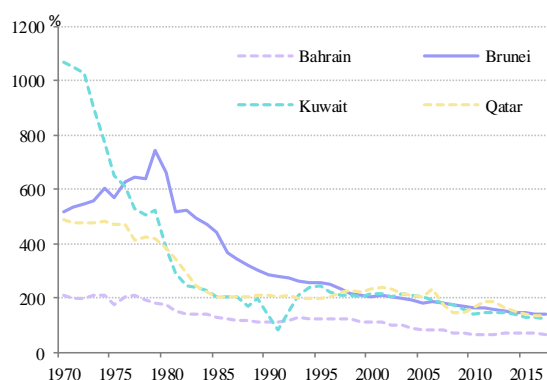
Appendix Figure 24.3: Group-A3 (1% \leq catch-up<2%)



Appendix Figure 24.4: Group-A4 (0% \leq catch-up<1%)



Appendix Figure 24.5: Group-A5 (-1% \leq catch-up<0%)



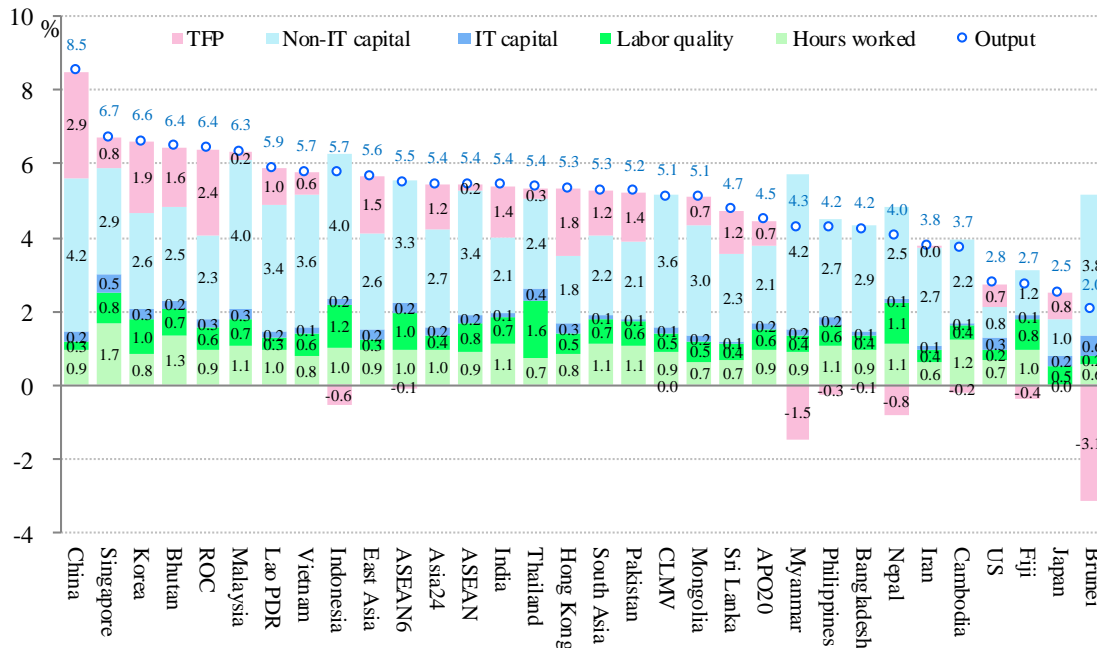
Appendix Figure 24.6: Group-A6 (catch-up<-1%)

Appendix Figure 24: Labor Productivity Level Relative to the US

—Index of GDP at constant basic prices per worker in 1970–2017, using 2011 PPP

Source: APO Productivity Database 2019.

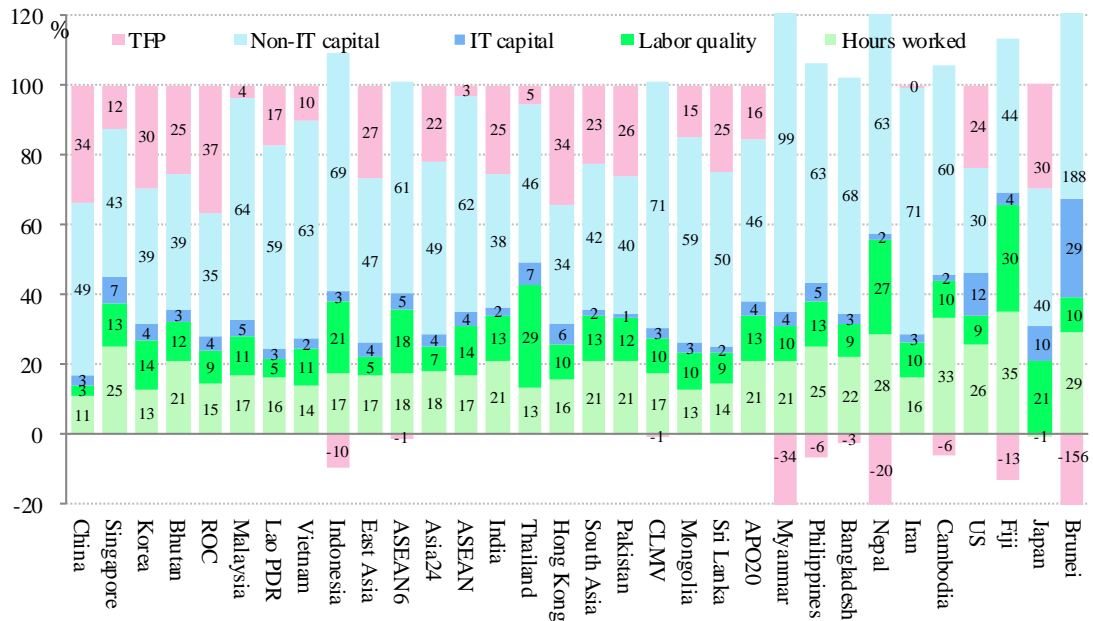
Note: Countries are grouped based on Appendix Table 1. The catch-up is defined as average annual rate of catch-up to the US during 1970–2017.



Appendix Figure 25: Sources of Economic Growth in the Long Run

—Average annual growth rate of constant-price GDP and contributions of labor, capital, and TFP in 1970–2017

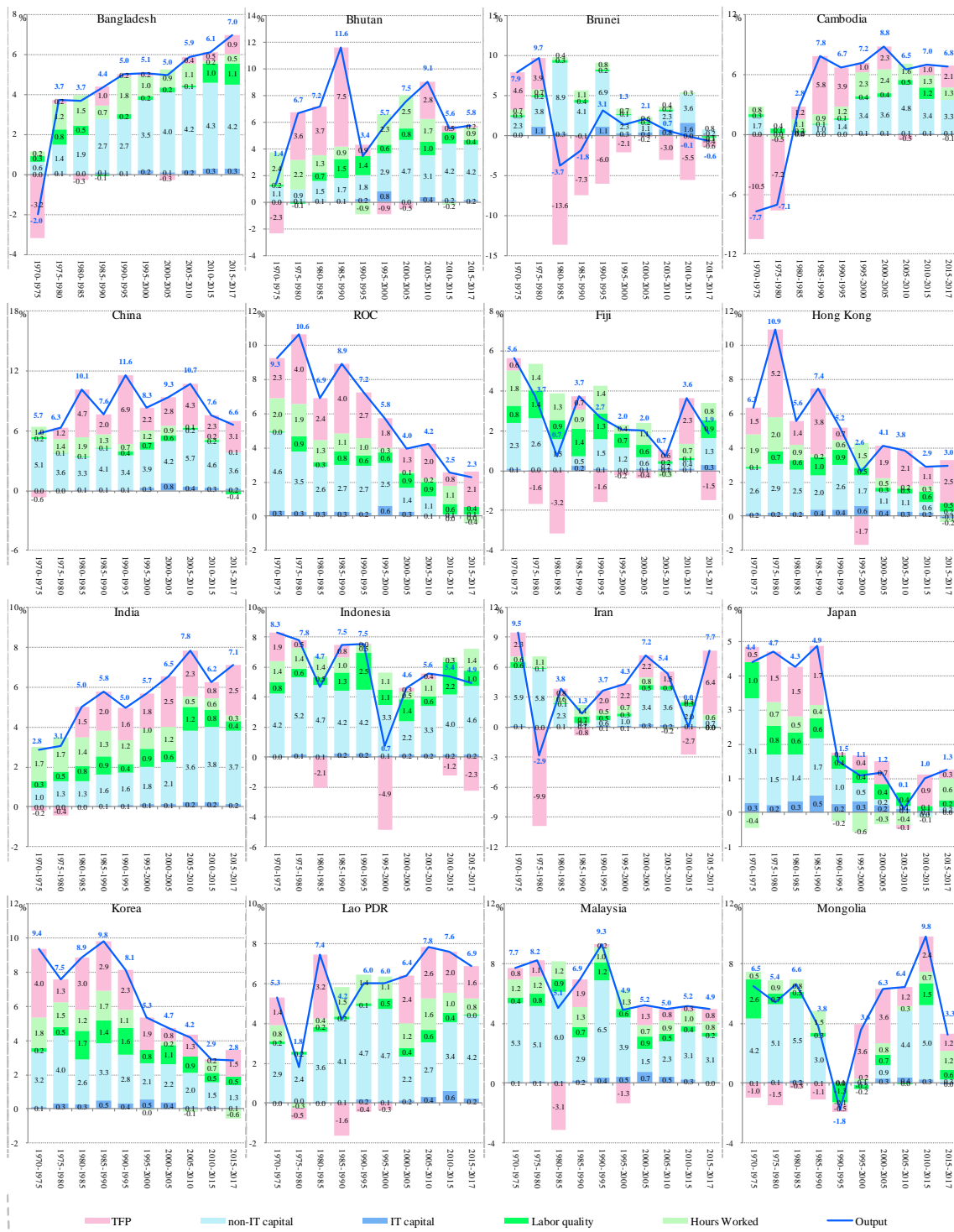
Source: APO Productivity Database 2019.



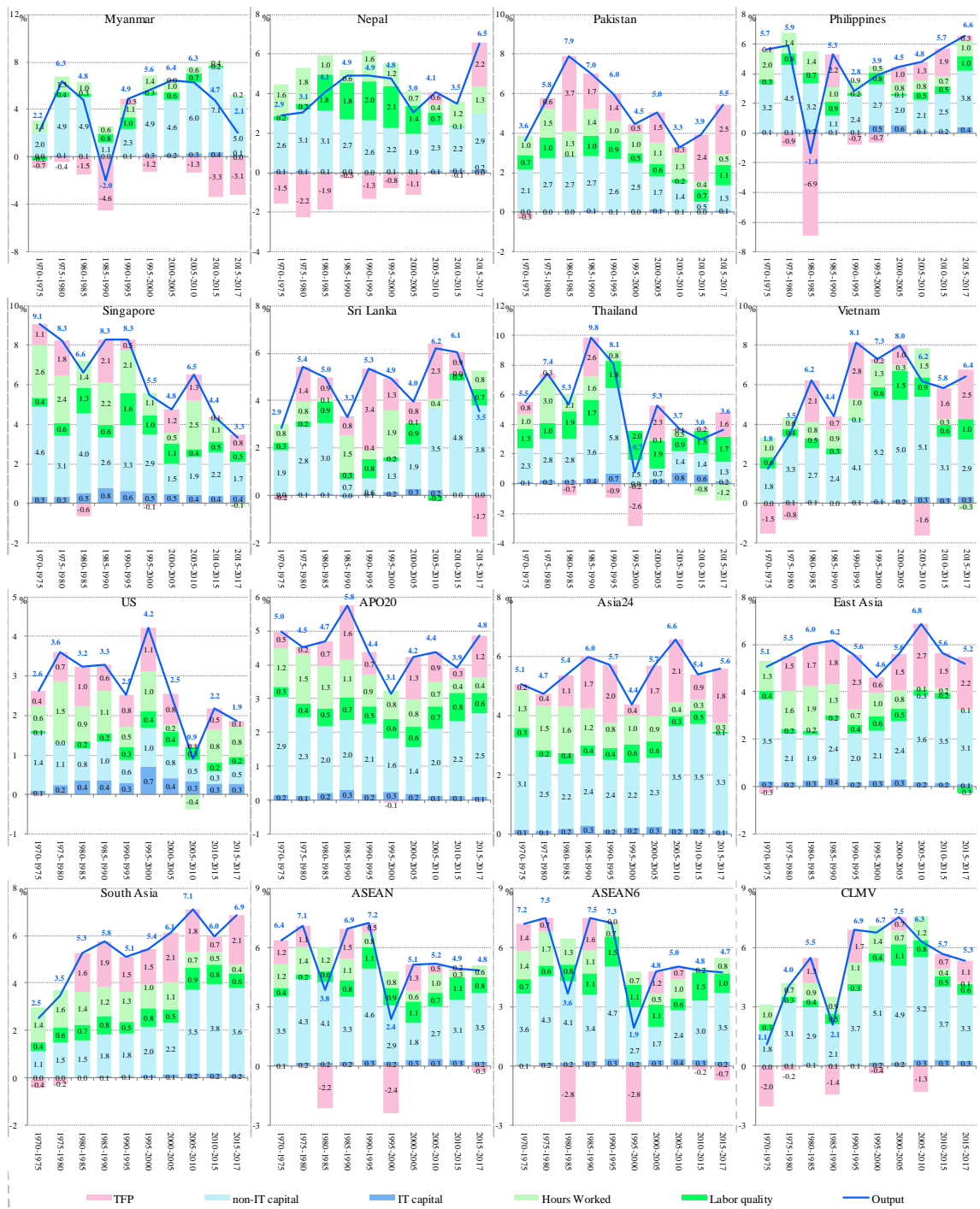
Appendix Figure 26: Contribution Shares of Economic Growth in the Long Run

—Average contribution shares of labor, capital, and TFP in 1970–2017

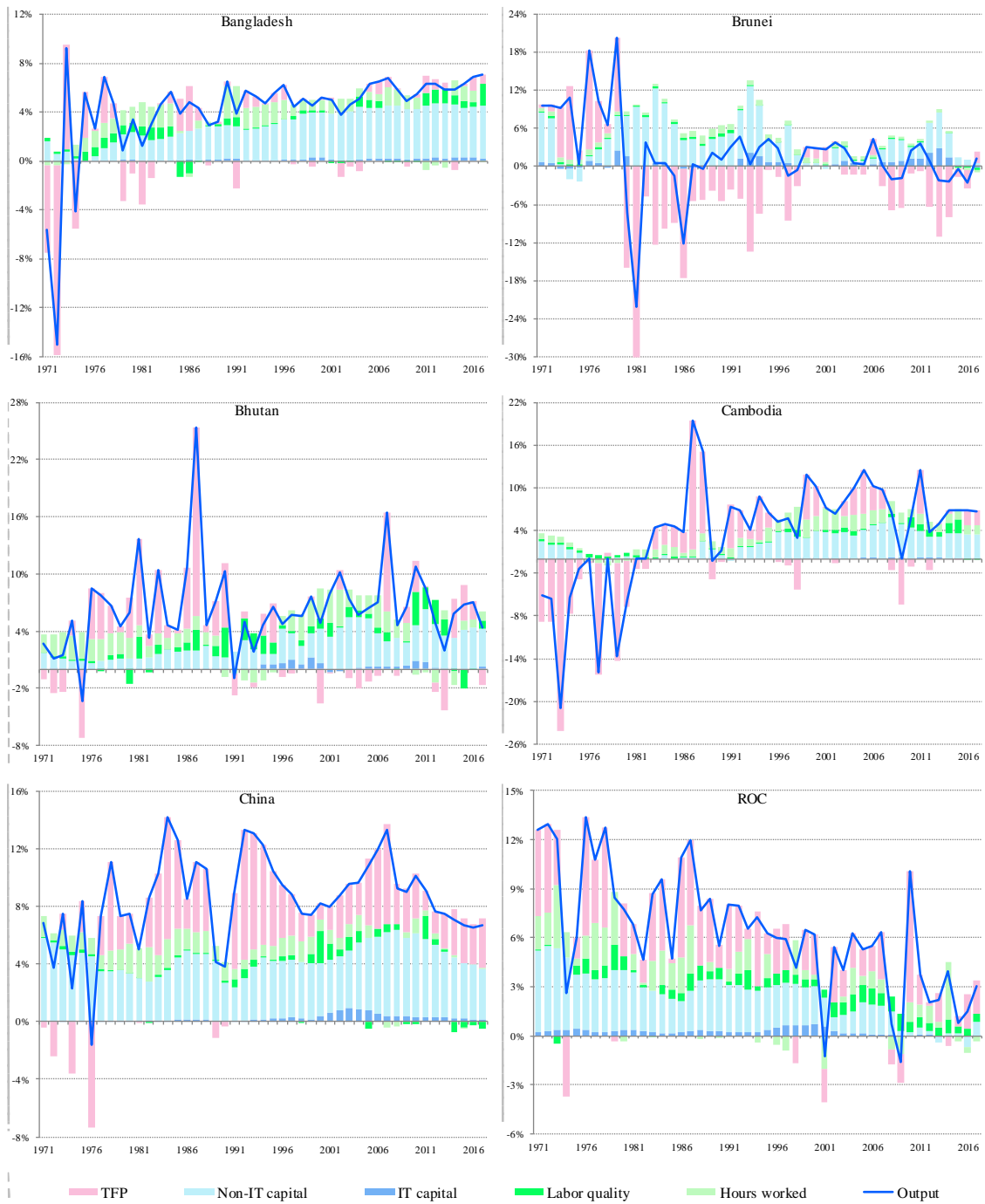
Source: APO Productivity Database 2019.



Appendix Figure 27: Growth Accounting Decomposition by Country and Region
 —Average Annual growth rate of constant-price GDP and contributions of labor, capital, and TFP in 1970–2017
 Source: APO Productivity Database 2019.



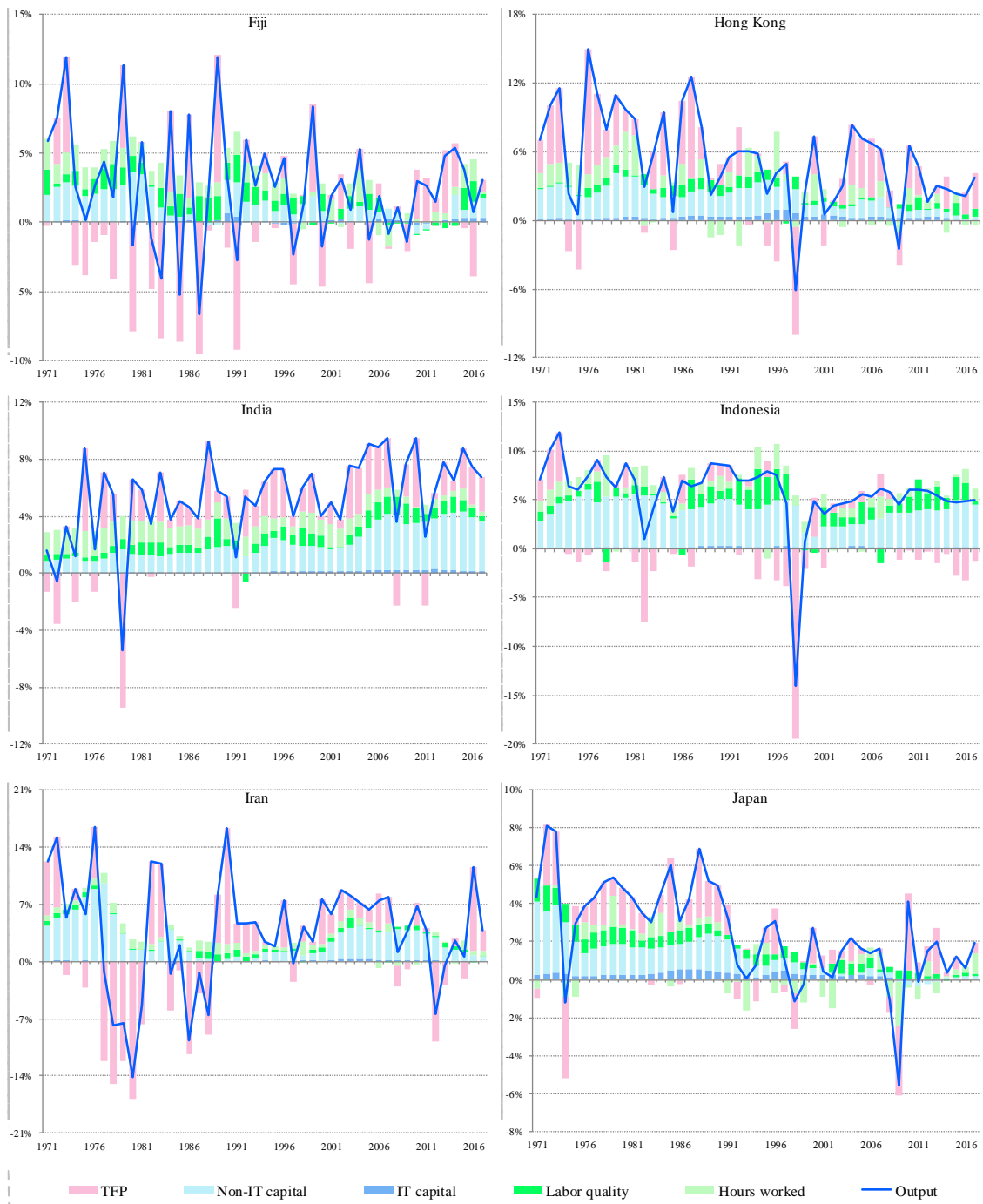
Appendix Figure 27: Growth Accounting Decomposition by Country and Region (continued)



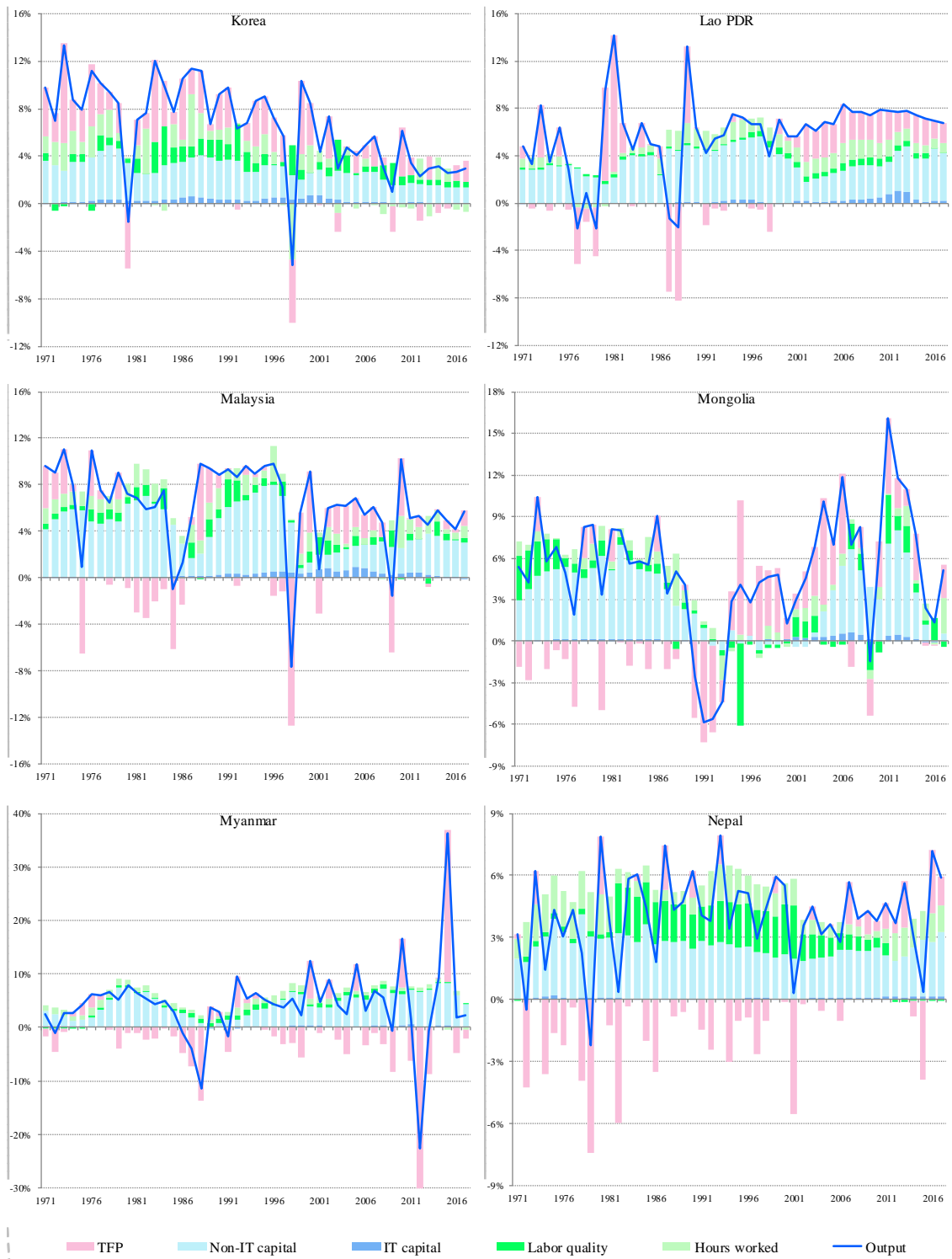
Appendix Figure 28: Growth Accounting Decomposition by Country and Region (Year-over-Year)

—Annual growth rate of constant-price GDP and contributions of labor, capital, and TFP in 1970–2017

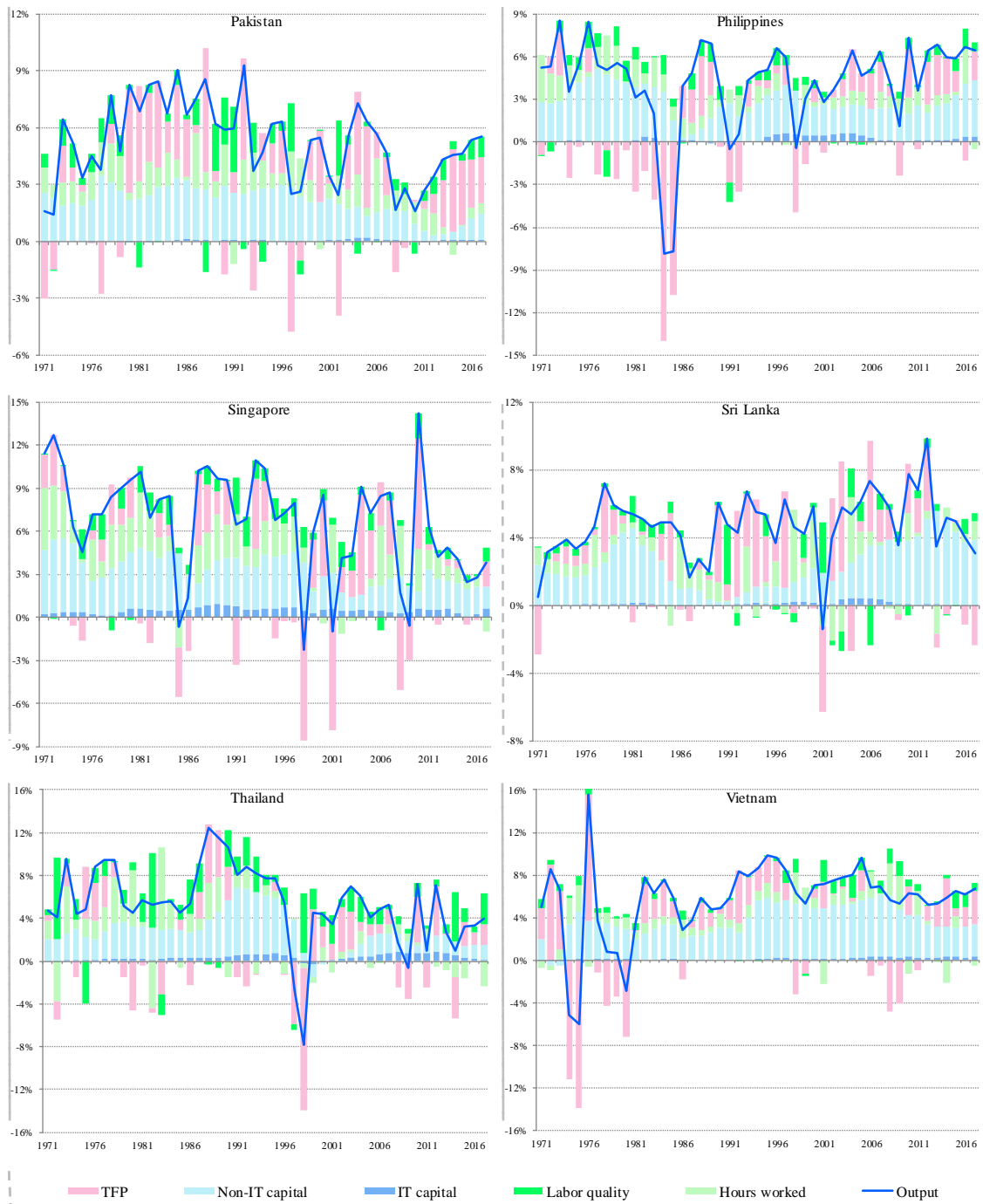
Source: APO Productivity Database 2019.



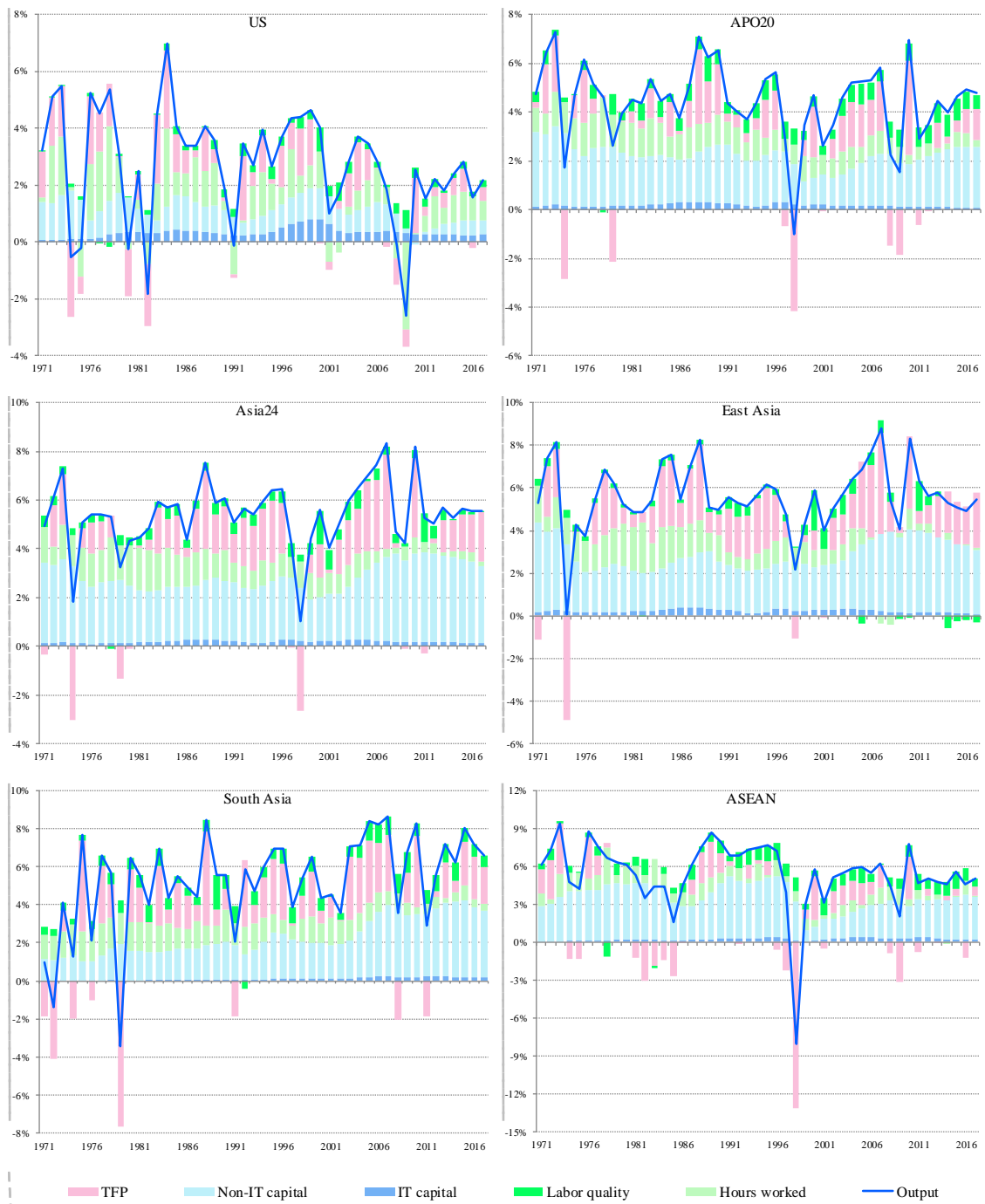
Appendix Figure 28: Growth Accounting Decomposition by Country and Region (Year-over-Year) (continued)



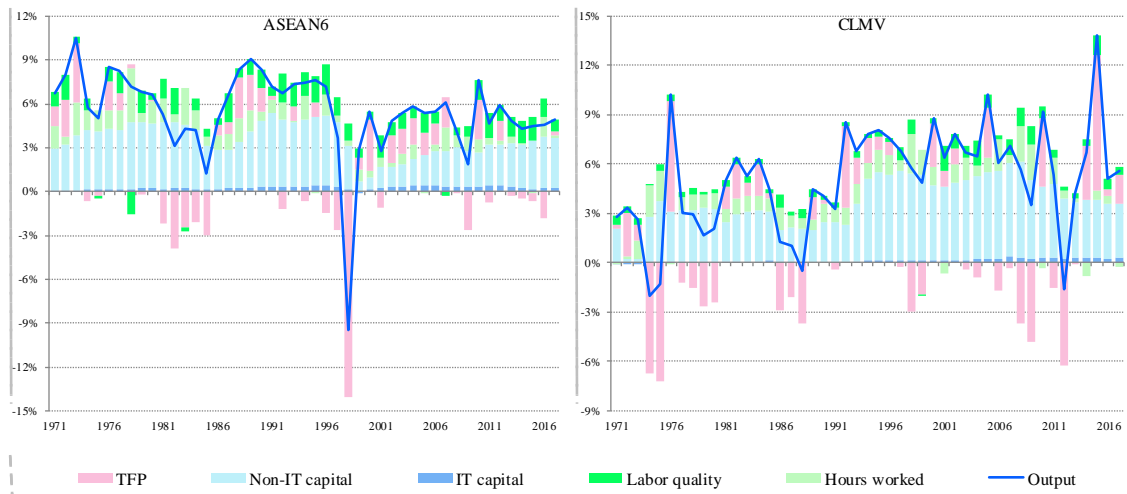
Appendix Figure 28: Growth Accounting Decomposition by Country and Region (Year-over-Year) (continued)



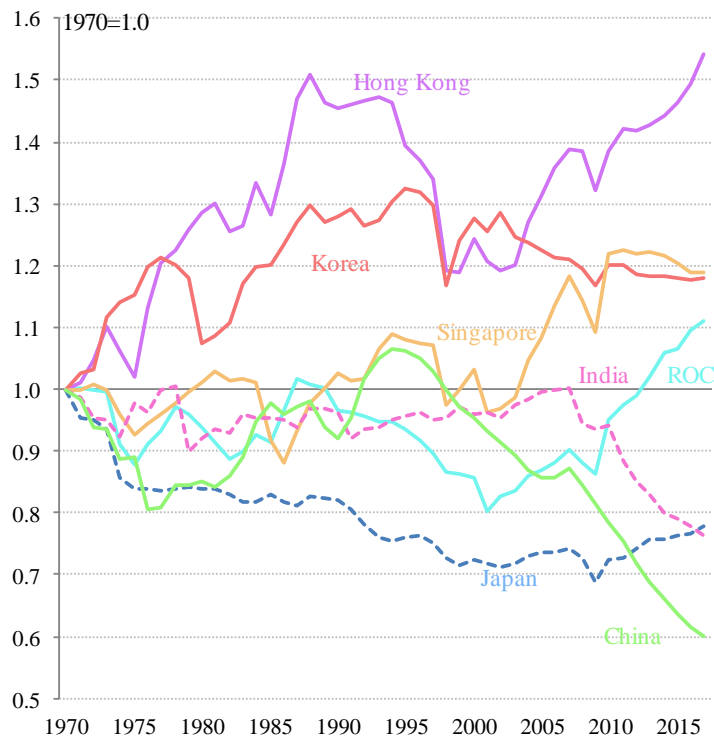
Appendix Figure 28: Growth Accounting Decomposition by Country and Region (Year-over-Year) (continued)



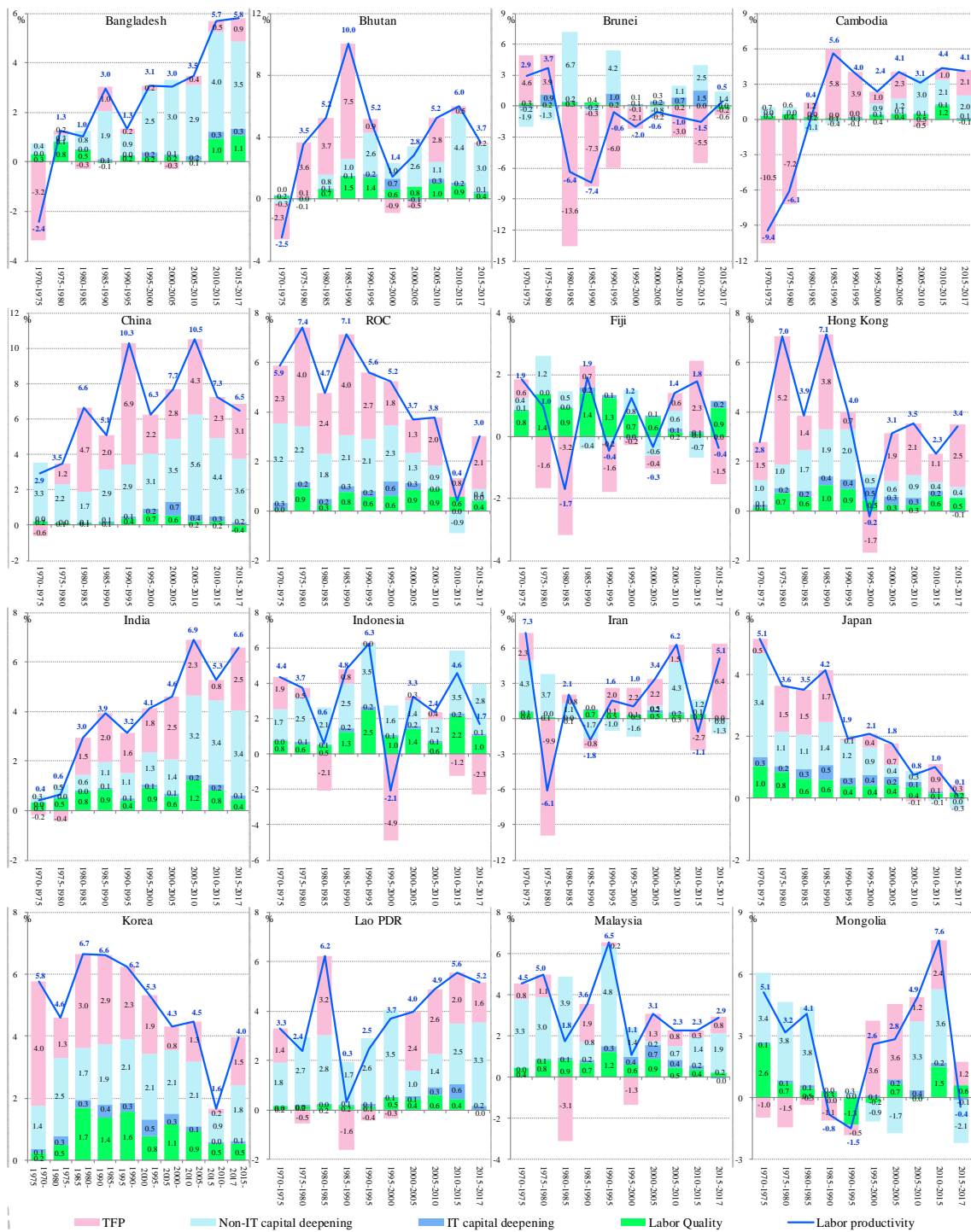
Appendix Figure 28: Growth Accounting Decomposition by Country and Region (Year-over-Year) (continued)



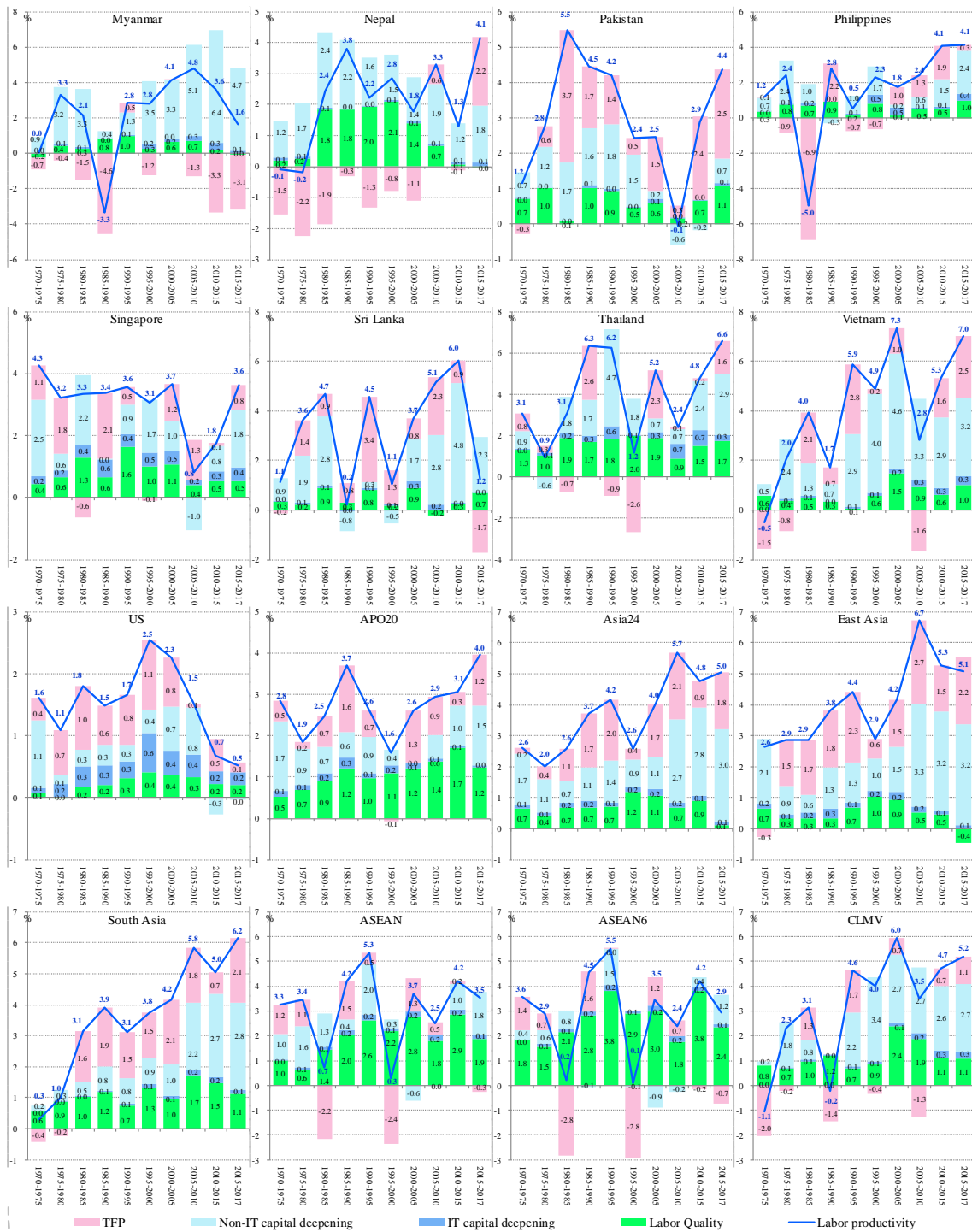
Appendix Figure 28: Growth Accounting Decomposition by Country and Region (Year-over-Year) (continued)



Appendix Figure 29: Capital Productivity of Japan, China, India and the Asian Tigers
 —Index of constant-price GDP per capita input in 1970–2017
 Source: APO Productivity Database 2019.



Appendix Figure 30: Decomposition of Labor Productivity Growth by Country and Region
 —Average annual growth rate of constant-price GDP per hour worked and contributions in 1970–2017
 Source: APO Productivity Database 2019.



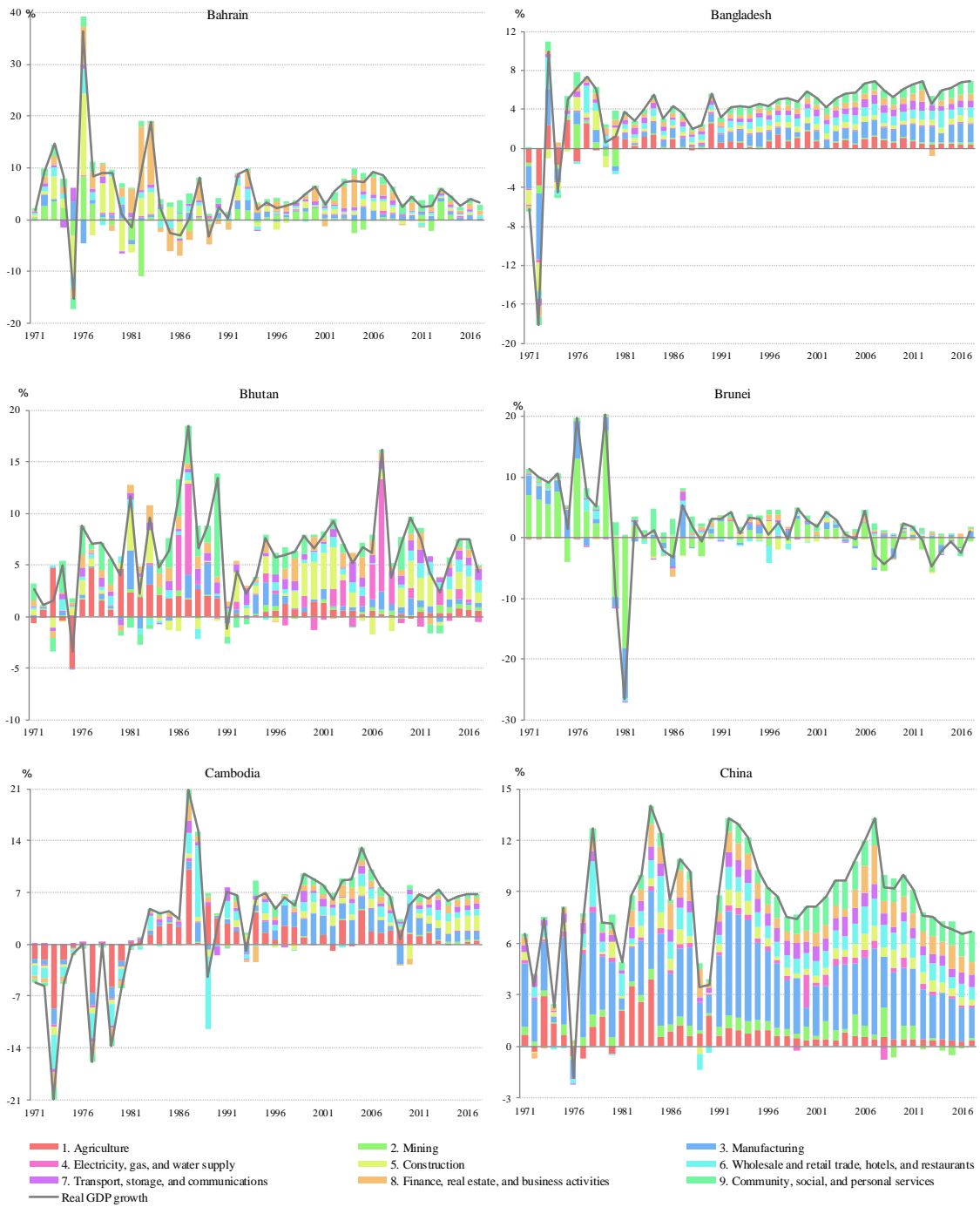
Appendix Figure 30: Decomposition of Labor Productivity Growth by Country and Region (continued)



Appendix Figure 31: Industry Origins of Asian Economic Growth

—Contributions of industry growth in constant-price GDP for the whole Asia (Asia30) in 2000–2017, using 2011 PPP

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



Appendix Figure 32: Industry Origins of Economic Growth (Year-over-Year)

—Annual growth rate of constant-price GDP and industry contributions in 1970–2017

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



Appendix Figure 32: Industry Origins of Economic Growth (Year-over-Year) (continued)



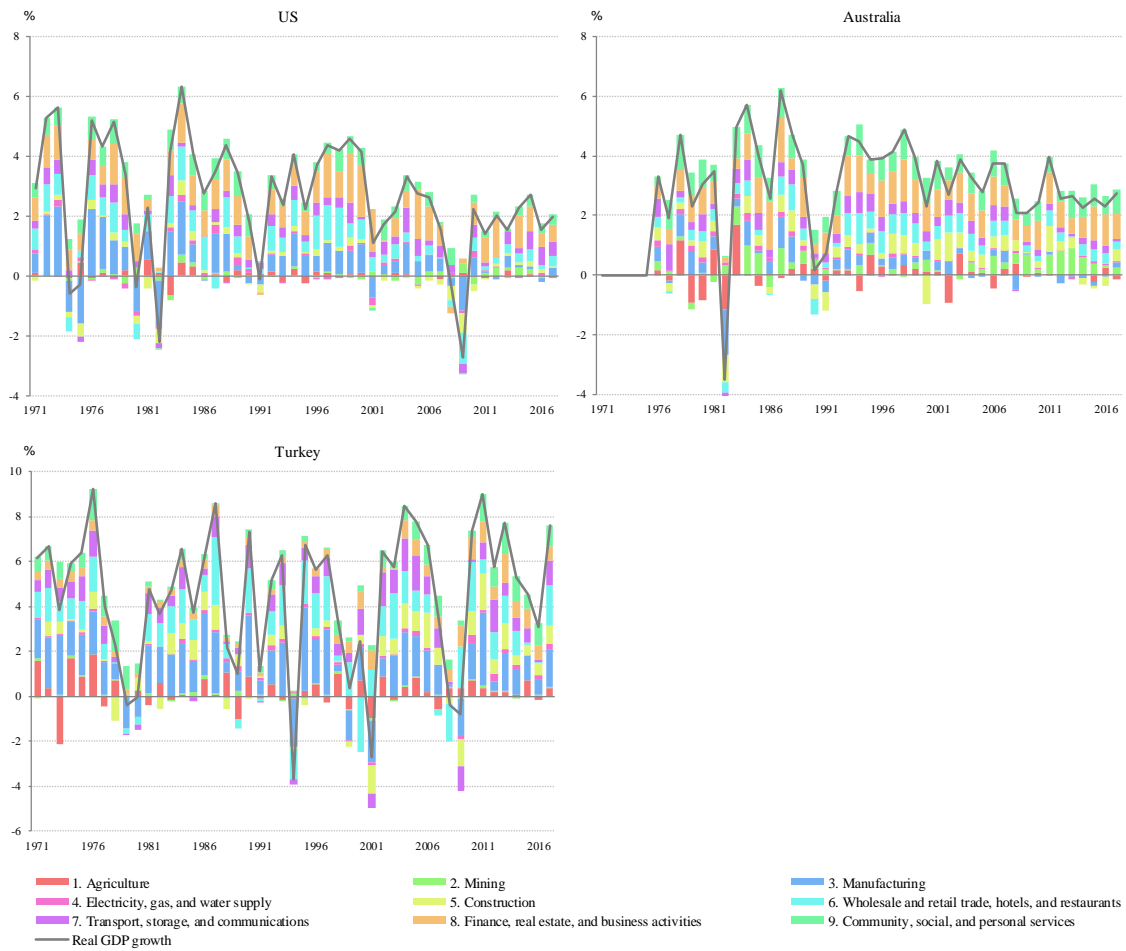
Appendix Figure 32: Industry Origins of Economic Growth (Year-over-Year) (continued)



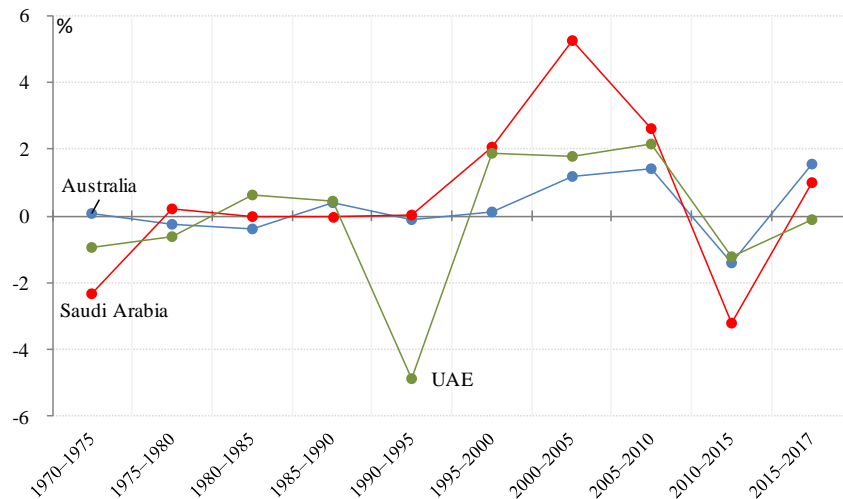
Appendix Figure 32: Industry Origins of Economic Growth (Year-over-Year) (continued)



Appendix Figure 32: Industry Origins of Economic Growth (Year-over-Year) (continued)



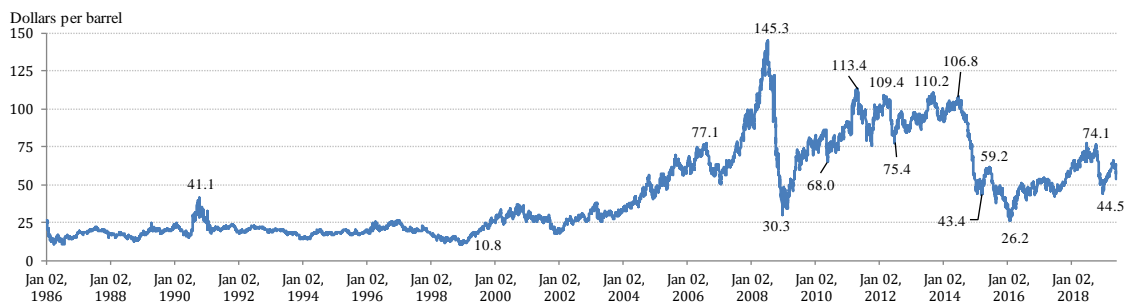
Appendix Figure 32: Industry Origins of Economic Growth (Year-over-Year) (continued)



Appendix Figure 33: Trading Gain Effect of Australia, Saudi Arabia, and UAE

—Average annual contribution to real income growth in 1970–2017

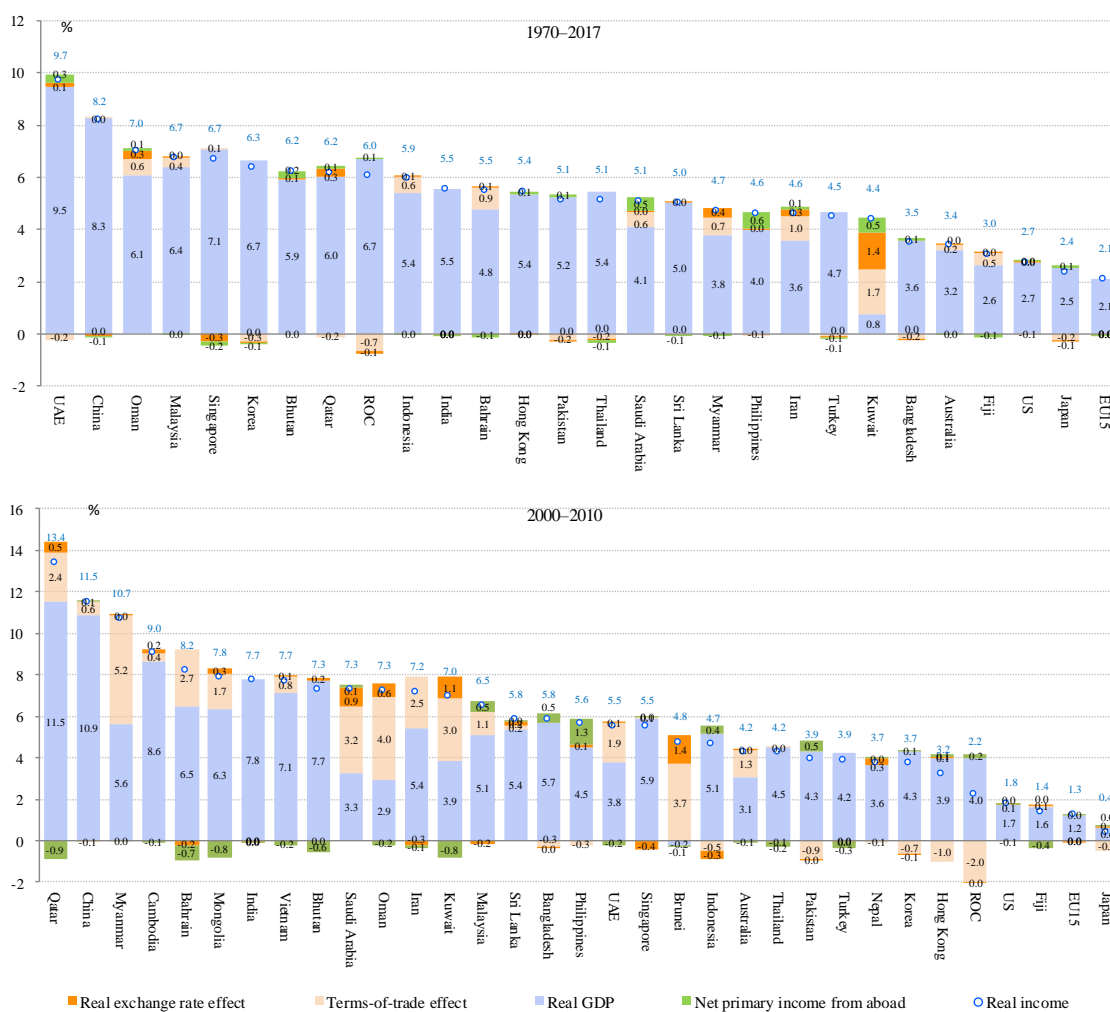
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 34: Crude Oil Price

—Dollars per barrel of West Texas intermediate crude oil (WTI) in 1986 January–2019 May

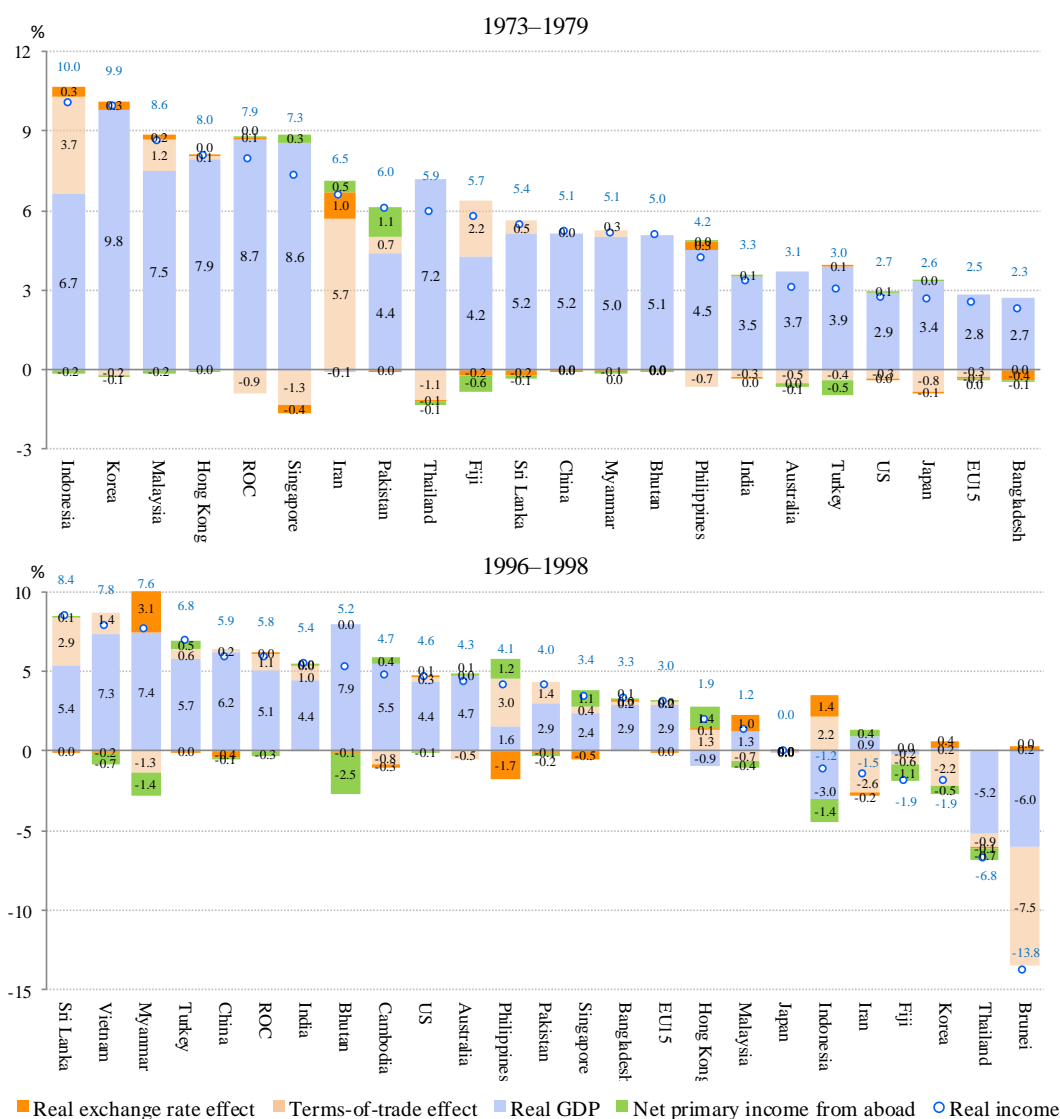
Source: US Energy Information Administration, WTI spot prices FOB (Cushing, Oklahoma).



Appendix Figure 35: Decomposition of Real Income Growth

—Average annual growth rate of real income and contributions in 1970–2017 and 2000–2010

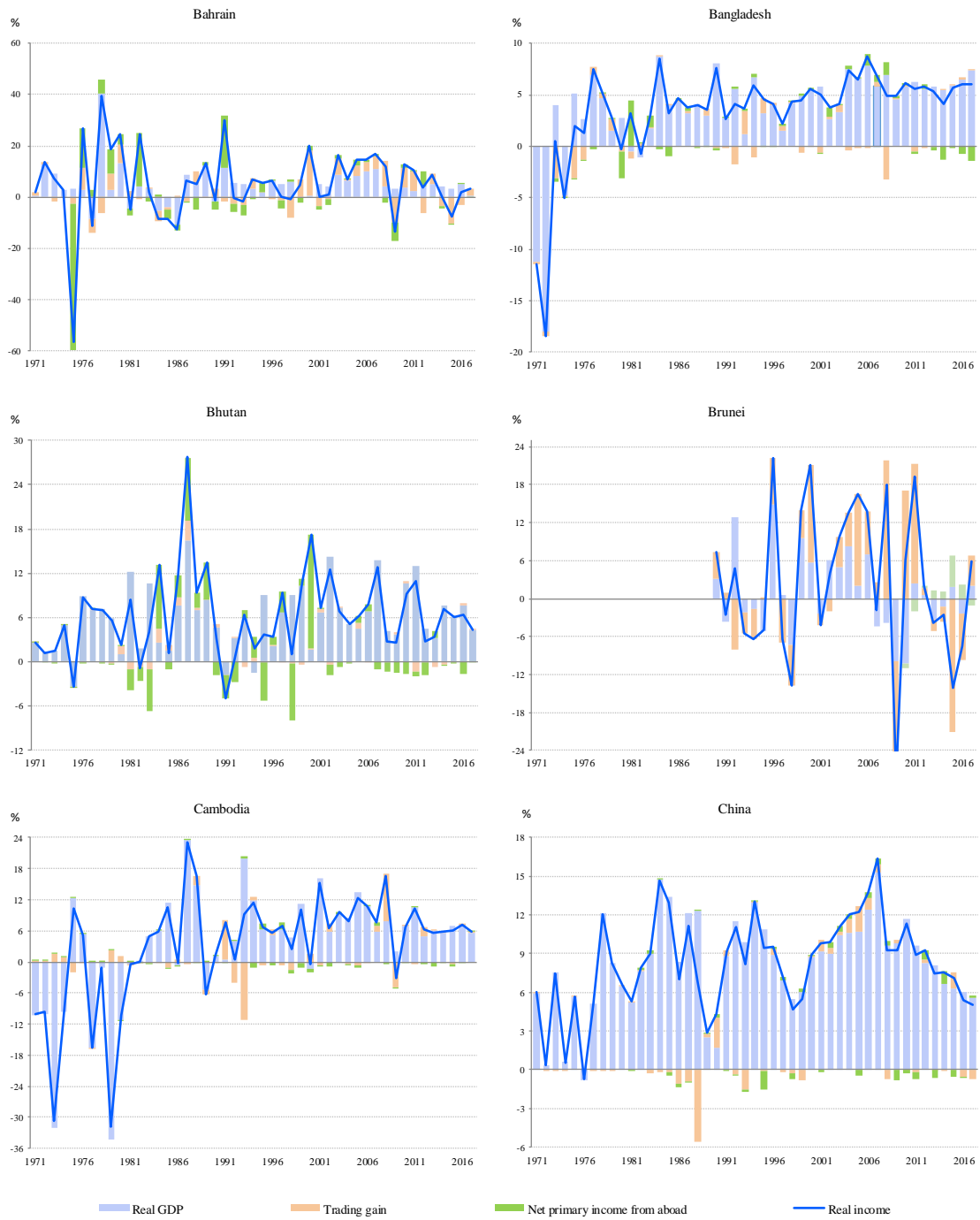
Sources: Official national accounts in each country, including author adjustments.



Appendix Figure 36: Decomposition of Real Income Growth in the Periods of Economic Crises

—Average annual growth rate of real income and contributions in 1973–1979 and 1996–1998

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

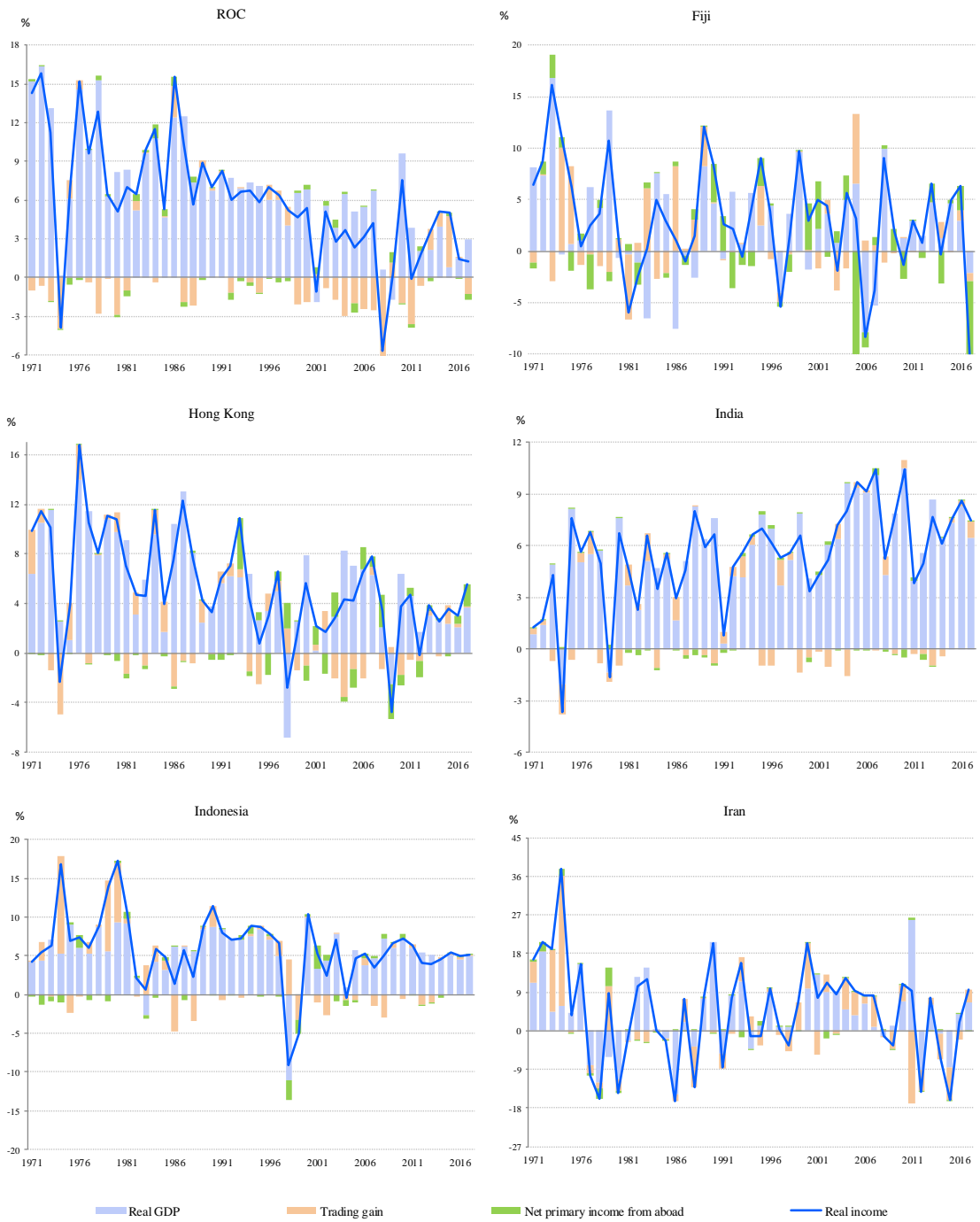


Appendix Figure 37: Sources of Real Income Growth (Year-over-Year)

—Annual growth rate of real income and contributions in 1970–2017

Unit: Percentage.

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



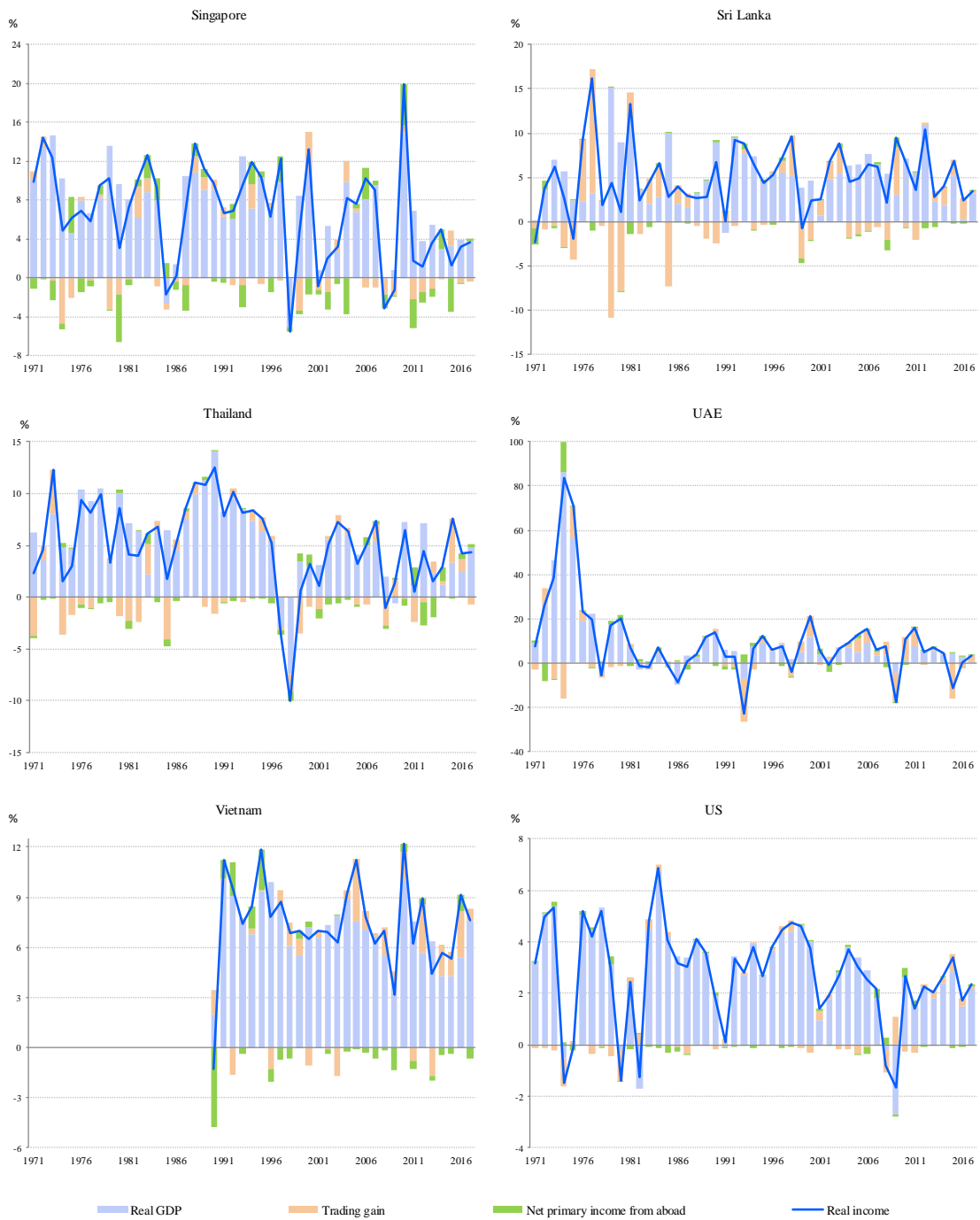
Appendix Figure 37: Sources of Real Income Growth (Year-over-Year) (continued)



Appendix Figure 37: Sources of Real Income Growth (Year-over-Year) (continued)



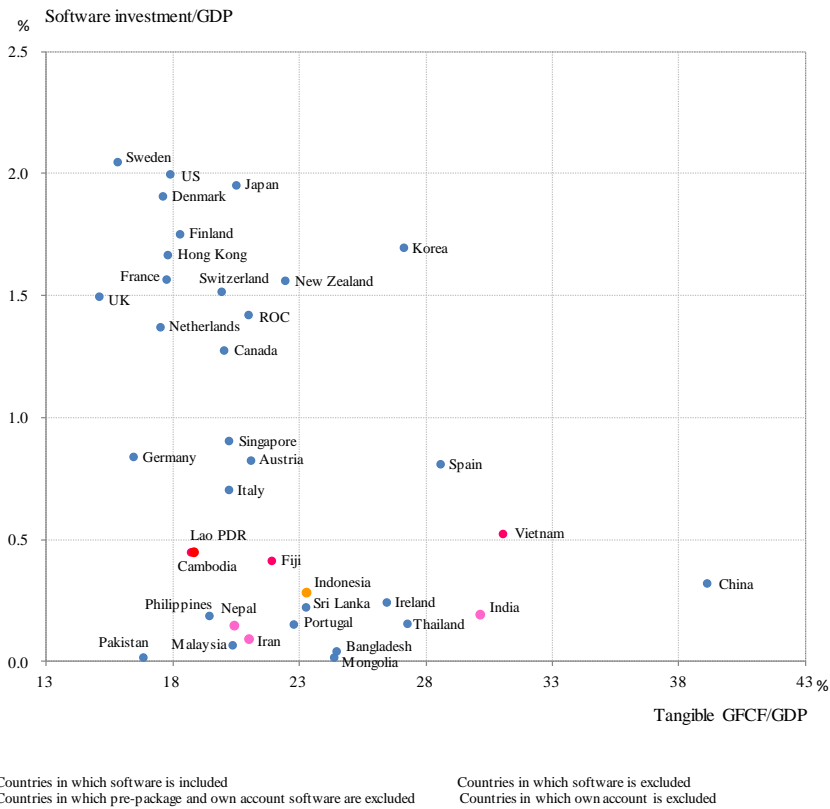
Appendix Figure 37: Sources of Real Income Growth (Year-over-Year) (continued)



Appendix Figure 37: Sources of Real Income Growth (Year-over-Year) (continued)

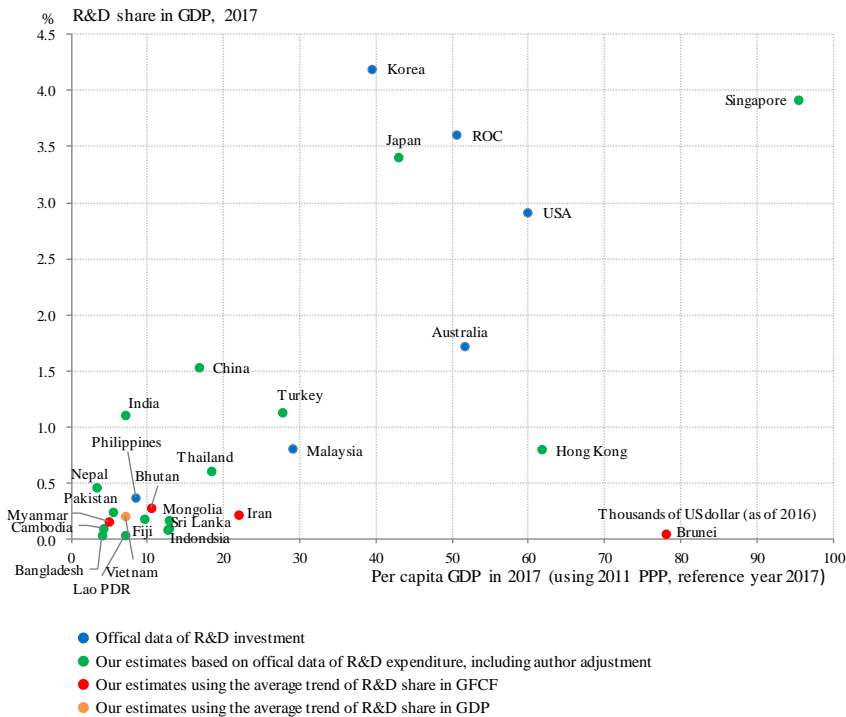


Appendix Figure 37: Sources of Real Income Growth (Year-over-Year) (continued)



Appendix Figure 38: Software Investment Ratio and GFCF Ratio to GDP

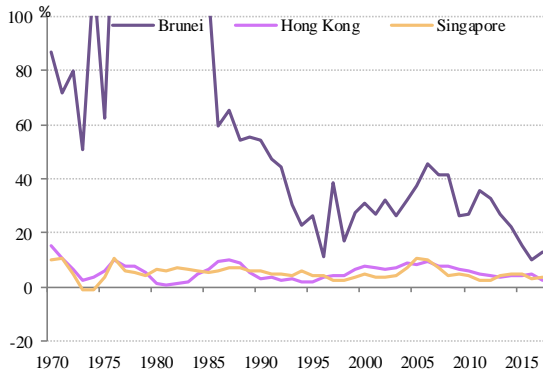
—Share of software and aggregate GFCF current purchaser's prices in GDP current market prices in 2005
Sources: OECD Productivity Database, including author adjustments.



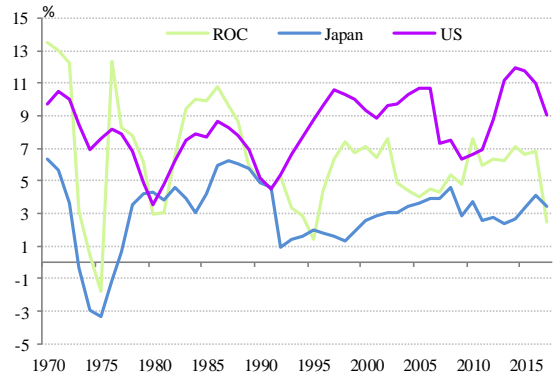
Appendix Figure 39: R&D Share in GDP

—Share of R&D investment in GDP at current prices in 2017

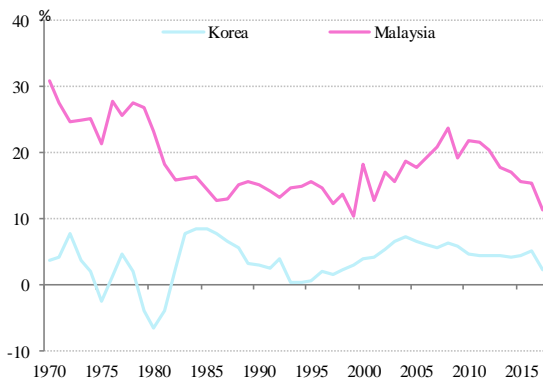
Sources: Official national accounts, including author adjustments; Surveys on R&D in each country; World Bank (2018).



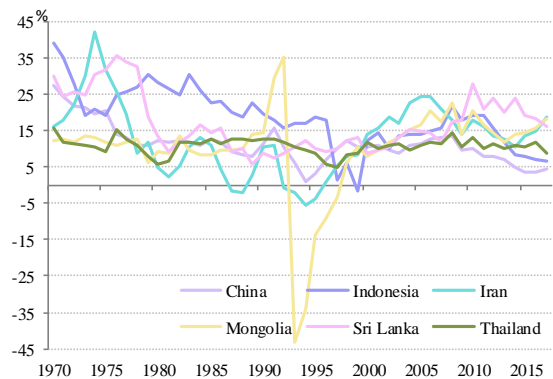
Appendix Figure 40.1: Group-D1 (100% ≤ ...)



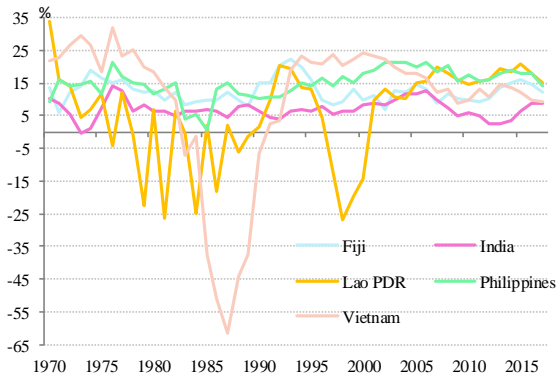
Appendix Figure 40.2: Group-D2 (70% ≤ ... < 100%) and the US



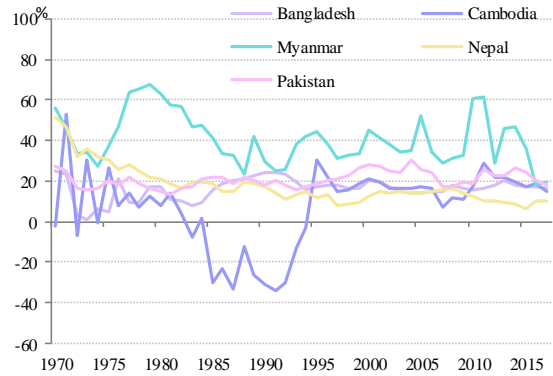
Appendix Figure 40.3: Group-D3 (40% ≤ ... < 70%)



Appendix Figure 40.4: Group-D4 (20% ≤ ... < 40%)



Appendix Figure 40.5: Group-D5 (10% ≤ ... < 20%)



Appendix Figure 40.6: Group-D6 (< 10%)

Appendix Figure 40: Ex-Post Real Rate of Return in Asia

—Nominal rate of return in 1970–2017

Source: APO Productivity Database 2019.

Note: Countries are grouped according to the levels of per-capita income in 2017, relative to the US, defined in Appendix Table 2.

Table 3: Per-Worker Labor Productivity Level

—GDP at constant basic prices per worker, using 2011 PPP, reference year 2017

1970		1980		1990		2000		2010		2017	
	(%)		(%)		(%)		(%)		(%)		(%)
Iran	39.2	Singapore	47.0	Singapore	70.1	Singapore	103.2	Singapore	124.7	Singapore	142.3
Singapore	33.2	Japan	45.2	Japan	64.5	Hong Kong	75.1	Hong Kong	103.5	Hong Kong	116.0
Japan	30.7	Iran	41.6	Hong Kong	60.8	Japan	71.1	ROC	90.6	ROC	99.7
Hong Kong	23.8	Hong Kong	38.1	Iran	42.6	ROC	65.9	Japan	76.9	Japan	79.7
Fiji	15.4	ROC	22.5	ROC	39.3	Iran	47.9	Iran	73.3	Iran	75.5
Malaysia	12.8	Malaysia	20.7	Malaysia	27.0	Korea	44.1	Korea	61.0	Korea	67.3
ROC	11.5	Fiji	18.0	Korea	26.3	Malaysia	39.6	Malaysia	51.3	Malaysia	60.0
Philippines	9.9	Korea	13.6	Fiji	17.5	Fiji	18.6	Thailand	23.5	Sri Lanka	31.2
Korea	8.1	Philippines	12.0	Mongolia	12.5	Thailand	17.1	Sri Lanka	21.9	Thailand	30.3
Mongolia	7.0	Mongolia	10.6	Thailand	12.2	Sri Lanka	15.1	Indonesia	20.4	Mongolia	28.3
Sri Lanka	6.7	Indonesia	9.3	Indonesia	11.6	Indonesia	14.7	Mongolia	19.5	China	26.2
Thailand	5.9	Sri Lanka	8.7	Sri Lanka	11.3	Pakistan	13.6	Fiji	19.2	Indonesia	26.0
Indonesia	5.8	Thailand	8.0	Philippines	11.0	Mongolia	13.2	China	16.0	Fiji	22.0
Pakistan	5.0	Pakistan	6.0	Pakistan	9.8	Philippines	12.5	Philippines	15.2	Philippines	20.6
Myanmar	4.0	Myanmar	4.7	Bhutan	7.3	Bhutan	10.2	Pakistan	14.9	Bhutan	18.8
Cambodia	3.5	Bhutan	3.4	India	4.5	India	6.5	Bhutan	14.6	India	17.5
Bangladesh	3.2	India	3.2	Myanmar	4.4	China	6.2	India	11.7	Pakistan	17.3
Bhutan	3.2	Bangladesh	3.1	Lao PDR	3.9	Myanmar	5.9	Myanmar	9.2	Lao PDR	12.7
India	3.0	Lao PDR	2.9	Nepal	3.6	Lao PDR	5.4	Lao PDR	8.6	Myanmar	11.5
Nepal	2.6	Nepal	2.5	Bangladesh	3.6	Vietnam	5.0	Vietnam	8.0	Vietnam	11.1
Vietnam	2.5	Vietnam	2.3	Vietnam	2.9	Bangladesh	4.7	Bangladesh	6.6	Bangladesh	9.3
Lao PDR	2.2	Cambodia	1.6	China	2.6	Nepal	4.7	Nepal	6.0	Nepal	7.0
China	1.0	China	1.4	Cambodia	2.2	Cambodia	3.2	Cambodia	4.7	Cambodia	6.6
Bahrain	139.5	Bahrain	126.4	Bahrain	93.8	Bahrain	111.6	Bahrain	77.4	Bahrain	81.9
Kuwait	706.4	Kuwait	276.8	Kuwait	113.2	Kuwait	218.5	Kuwait	162.9	Kuwait	153.0
Oman	128.7	Oman	175.5	Oman	187.7	Oman	162.4	Oman	112.4	Oman	83.9
Qatar	321.9	Qatar	273.5	Qatar	176.2	Qatar	236.1	Qatar	195.8	Qatar	168.6
Saudi Arabia	261.6	Saudi Arabia	263.1	Saudi Arabia	150.6	Saudi Arabia	171.8	Saudi Arabia	155.3	Saudi Arabia	144.6
UAE	102.8	UAE	378.9	UAE	235.4	UAE	203.1	UAE	150.9	UAE	186.5
Brunei	341.8	Brunei	473.5	Brunei	236.8	Brunei	207.5	Brunei	192.0	Brunei	177.3
(region)		(region)		(region)		(region)		(region)		(region)	
APO20	8.1	APO20	10.2	APO20	13.7	APO20	16.9	APO20	22.2	APO20	27.5
Asia24	5.0	Asia24	6.3	Asia24	8.5	Asia24	12.3	Asia24	20.2	Asia24	28.1
Asia30	5.6	Asia30	7.3	Asia30	9.3	Asia30	13.2	Asia30	21.5	Asia30	29.5
East Asia	5.2	East Asia	6.8	East Asia	9.4	East Asia	14.1	East Asia	24.9	East Asia	35.7
South Asia	3.4	South Asia	3.6	South Asia	5.1	South Asia	7.3	South Asia	12.1	South Asia	17.5
ASEAN	6.2	ASEAN	8.7	ASEAN	10.7	ASEAN	14.4	ASEAN	19.5	ASEAN	25.0
ASEAN6	7.5	ASEAN6	11.0	ASEAN6	13.5	ASEAN6	18.0	ASEAN6	24.1	ASEAN6	30.6
CLMV	3.2	CLMV	3.1	CLMV	3.4	CLMV	5.3	CLMV	8.4	CLMV	11.3
GCC	289.5	GCC	264.5	GCC	153.3	GCC	176.2	GCC	147.5	GCC	142.1
(reference)		(reference)		(reference)		(reference)		(reference)		(reference)	
US	66.1	US	71.5	US	82.8	US	100.7	US	117.7	US	123.6
EU15	42.2	EU15	54.5	EU15	65.2	EU15	76.8	EU15	81.7	EU15	85.4
EU28	41.0	EU28	51.0	EU28	61.0	EU28	68.7	EU28	75.2	EU28	79.6
Australia	52.8	Australia	60.6	Australia	65.1	Australia	81.5	Australia	89.3	Australia	97.4
Turkey	16.5	Turkey	21.4	Turkey	31.2	Turkey	39.4	Turkey	55.8	Turkey	69.9

Unit: Thousands of US dollars (as of 2017).

Source: APO Productivity Database 2019.

Table 4: Energy Productivity Level

—GDP at constant basic prices per energy consumption, using 2011 PPP, reference year 2017

1980			1990			2000			2010			2016		
		(%)			(%)			(%)			(%)			(%)
Hong Kong	29.3	100.0	Hong Kong	31.3	100.0	Singapore	26.0	100.0	Hong Kong	43.7	100.0	Hong Kong	46.5	100.0
Singapore	24.3	82.8	Singapore	21.7	69.4	Hong Kong	25.6	98.5	Singapore	24.6	56.2	Singapore	26.4	56.8
Iran	15.1	51.6	Japan	13.8	44.1	Sri Lanka	14.4	55.5	Philippines	23.1	52.8	Sri Lanka	25.4	54.6
Malaysia	14.2	48.5	Malaysia	13.3	42.6	Philippines	14.4	55.3	Sri Lanka	20.1	45.9	Philippines	24.6	53.0
Philippines	12.4	42.2	Thailand	12.9	41.2	Bangladesh	14.2	54.6	Bangladesh	16.2	37.1	Bangladesh	18.7	40.3
Thailand	11.5	39.3	Philippines	12.5	39.9	Japan	13.7	52.6	Indonesia	15.4	35.3	Indonesia	18.4	39.6
Bangladesh	11.2	38.1	Sri Lanka	12.0	38.3	ROC	13.4	51.3	Japan	15.4	35.2	Japan	17.3	37.3
Japan	10.9	37.1	Bangladesh	11.9	38.2	Malaysia	12.6	48.6	Malaysia	14.7	33.7	ROC	16.0	34.5
Sri Lanka	9.8	33.5	ROC	11.6	36.9	Thailand	11.4	44.0	ROC	14.4	32.8	Malaysia	15.1	32.5
Indonesia	9.6	32.8	Indonesia	11.0	35.1	Indonesia	11.0	42.4	India	11.6	26.4	India	14.4	31.0
ROC	8.3	28.4	Iran	9.9	31.6	Pakistan	10.1	39.0	Pakistan	11.2	25.6	Pakistan	12.4	26.6
Pakistan	6.5	22.2	Pakistan	8.5	27.1	India	8.7	33.4	Thailand	10.7	24.4	Thailand	11.2	24.0
Korea	6.2	21.1	Korea	7.6	24.3	Iran	8.5	32.7	Iran	9.6	21.9	Mongolia	10.0	21.6
India	5.4	18.3	India	6.6	21.1	Vietnam	7.7	29.7	Korea	9.5	21.8	Korea	10.0	21.5
Vietnam	4.0	13.7	Vietnam	5.6	17.8	Korea	7.6	29.2	Cambodia	8.4	19.2	China	9.7	20.8
Nepal	3.6	12.4	Nepal	4.5	14.4	Mongolia	7.3	28.0	Vietnam	8.2	18.7	Cambodia	9.2	19.7
China	1.4	4.8	Mongolia	3.5	11.2	Cambodia	6.0	23.1	Mongolia	7.5	17.2	Iran	9.0	19.3
			China	2.5	8.1	China	5.7	22.0	China	7.5	17.1	Vietnam	8.6	18.6
						Nepal	5.2	20.2	Nepal	6.0	13.6	Nepal	6.1	13.1
(region)			(region)			(region)			(region)			(region)		
APO20	9.2	31.5	APO20	10.7	34.4	APO20	11.2	43.2	APO20	13.2	30.1	APO20	14.8	31.9
Asia24	5.9	20.2	Asia24	7.4	23.8	Asia24	9.4	36.2	Asia24	10.8	24.8	Asia24	12.8	27.5
Asia30	6.8	23.1	Asia30	7.8	25.1	Asia30	9.7	37.4	Asia30	10.9	24.9	Asia30	12.8	27.5
East Asia	4.9	16.7	East Asia	6.6	21.2	East Asia	8.9	34.2	East Asia	9.9	22.6	East Asia	11.9	25.6
South Asia	6.0	20.6	South Asia	7.4	23.7	South Asia	9.5	36.7	South Asia	12.3	28.1	South Asia	15.0	32.3
ASEAN	10.5	35.9	ASEAN	11.7	37.3	ASEAN	12.0	46.0	ASEAN	14.5	33.3	ASEAN	16.0	34.5
ASEAN6	11.7	39.9	ASEAN6	12.5	39.9	ASEAN6	12.5	48.2	ASEAN6	15.4	35.2	ASEAN6	17.2	37.1
CLMV	5.5	18.8	CLMV	6.8	21.7	CLMV	8.6	33.2	CLMV	10.4	23.9	CLMV	10.9	23.4
GCC	32.4	110.5	GCC	17.3	55.2	GCC	15.8	60.7	GCC	12.1	27.7	GCC	13.3	28.6
(reference)			(reference)			(reference)			(reference)			(reference)		
US	5.4	18.5	US	7.6	24.3	US	8.9	34.3	US	10.8	24.8	US	12.2	26.4
EU15	9.3	31.7	EU15	11.4	36.5	EU15	12.9	49.6	EU15	14.5	33.1	EU15	16.6	35.7
						EU28	13.0	49.9	EU28	14.9	34.1	EU28	16.1	34.7
Australia	8.1	27.8	Australia	9.0	28.9	Australia	10.4	40.1	Australia	12.9	29.4	Australia	14.3	30.7
Turkey	13.6	46.4	Turkey	14.7	47.1	Turkey	14.7	56.5	Turkey	16.1	36.7	Turkey	18.7	40.3

Unit: Thousands of US dollars per toe (tonne of oil equivalent) (as of 2017).

Sources: Official national accounts in each country, including author adjustments; IEA, *Energy Balances of OECD Countries 2018*; IEA, *Energy Balances of Non-OECD Countries 2018*; APO Productivity Database 2019.

Table 6: Industry Origins of Economic Growth

–Average annual growth rates (contributions) of industry GDP at constant prices in 2010–2017

	1. Agriculture	2. Mining	3. Manufacturing	4. Electricity, gas, and water supply	5. Construction	6. Wholesale and retail trade, hotels, and	7. Transport, storage, and communications	8. Finance, real estate, and business activities	9. Community, social, and personal	Total economy
Bahrain	2.6	1.8	3.6	4.2	2.7	2.6	4.9	2.7	7.1	3.7
Bangladesh	3.1	7.5	9.4	8.4	7.8	7.3	6.6	4.8	5.2	6.2
Bhutan	3.0	13.7	4.2	1.0	9.1	13.5	8.6	5.3	1.7	5.8
Brunei	2.1	-3.4	1.3	3.6	4.8	1.4	0.5	2.1	0.8	-1.4
Cambodia	1.8	18.8	8.5	7.8	15.6	6.7	7.2	9.6	5.5	6.6
China	4.0	-0.8	8.2	5.6	7.8	8.2	8.5	7.1	8.4	7.4
ROC	-1.1	-4.3	4.0	1.6	-0.2	2.3	3.3	2.6	1.1	2.4
Fiji	3.8	-4.4	1.0	5.0	6.1	2.5	5.0	2.9	2.6	2.9
Hong Kong	-1.9	-1.9	-0.3	-0.4	7.7	2.5	3.7	2.8	3.7	3.0
India	3.3	4.8	7.2	6.3	4.6	8.0	6.9	9.4	6.7	6.6
Indonesia	3.9	1.2	4.7	4.8	6.5	5.1	8.4	6.8	5.2	5.1
Iran	2.7	-0.2	2.1	6.3	-5.6	2.4	4.9	4.1	2.0	1.2
Japan	-2.2	-4.0	1.4	-3.9	3.1	1.0	0.6	1.4	0.7	0.9
Korea	0.1	0.4	3.4	2.4	2.6	2.7	3.1	2.8	2.5	2.9
Kuwait	2.2	2.1	4.4	10.1	-3.3	1.0	2.2	0.3	4.7	3.3
Lao PDR	3.1	3.8	6.9	16.1	15.1	7.3	8.4	7.3	5.0	6.7
Malaysia	2.1	1.3	4.8	6.6	9.2	6.4	7.1	4.8	6.0	5.0
Mongolia	9.6	8.3	7.1	4.9	-0.3	8.0	8.3	8.9	1.5	7.5
Myanmar	1.7	-1.3	9.2	9.5	9.6	3.9	5.4	33.2	10.2	4.5
Nepal	2.7	5.8	3.2	4.1	4.5	5.4	5.7	4.1	5.9	4.0
Oman	7.6	1.6	1.5	9.1	8.2	5.4	5.6	5.2	5.9	4.3
Pakistan	2.1	2.3	4.0	6.7	4.3	3.7	4.1	4.0	7.1	3.8
Philippines	1.6	3.8	6.9	4.5	7.2	6.2	5.7	7.5	5.6	5.9
Qatar	8.8	1.9	5.1	11.4	16.9	5.7	5.6	9.0	7.3	5.8
Saudi Arabia	2.1	3.0	5.1	3.7	3.7	3.9	5.8	4.5	3.5	4.3
Singapore	-0.7		2.9	1.6	2.9	4.4	4.3	5.4	3.1	4.3
Sri Lanka	2.4	9.2	3.2	6.0	9.9	5.2	6.2	8.7	4.3	5.7
Thailand	0.7	0.6	1.5	3.4	3.0	4.7	5.2	6.4	2.9	3.0
UAE	2.2	3.4	4.7	7.8	0.3	4.9	3.3	6.0	6.3	4.8
Vietnam	2.8	0.7	10.1	10.0	6.3	7.9	6.6	5.1	6.9	5.8
(region)										
APO20	2.8	1.2	4.2	3.9	4.4	5.0	4.9	5.5	3.3	4.0
Asia24	3.3	0.5	6.4	4.8	6.0	6.1	6.4	6.1	5.4	5.5
Asia30	3.3	1.4	6.4	4.8	5.9	6.0	6.4	6.0	5.3	5.4
East Asia	3.7	-0.7	6.8	4.1	6.6	5.8	6.4	5.2	5.3	5.7
South Asia	3.1	4.7	6.9	6.4	4.9	7.5	6.5	8.9	6.5	6.3
ASEAN	2.7	1.4	4.4	5.5	6.5	5.5	6.8	6.3	4.9	4.8
ASEAN6	2.8	1.0	4.0	4.5	6.3	5.3	6.9	6.4	4.6	4.7
CLMV	2.4	0.7	9.7	10.5	8.2	7.1	6.3	5.6	7.2	5.5
GCC	2.5	2.7	4.8	6.4	4.4	4.2	4.7	4.8	4.5	4.4
(reference)										
US	2.0	4.7	0.9	0.4	1.9	2.3	4.4	2.3	0.9	1.9
Australia	-0.2	6.2	2.7	0.7	2.3	2.8	2.5	3.2	2.7	2.7
Turkey	2.8	3.4	5.8	6.9	9.5	5.5	6.5	5.2	5.8	5.9

Unit: Percentage.

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

A.1 Industry Classification

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. The concordances between the industry classification used in the Databook and the ISIC Rev.3 and Rev.4 are shown in Table 7 and Table 8, respectively.

Table 7: Industry Classification – Concordance with ISIC Rev.3

ISIC Rev. 3 Section	Division	Databook	
		1st	2nd
A - Agriculture, hunting, and forestry	01 Agriculture, hunting, and related service activities	1	
	02 Forestry, logging, and related service activities	1	
B - Fishing	05 Fishing, operation of fish hatcheries, and fish farms; service activities incidental to fishing	1	
C - Mining and quarrying	10 Mining of coal and lignite; extraction of peat	2	
	11 Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying	2	
	12 Mining of uranium and thorium ores	2	
	13 Mining of metal ores	2	
	14 Other mining and quarrying	2	
D - Manufacturing	15 Manufacture of food products and beverages	3	3.1
	16 Manufacture of tobacco products	3	3.1
	17 Manufacture of textiles	3	3.2
	18 Manufacture of wearing apparel; dressing and dyeing of fur	3	3.2
	19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness, and footwear	3	3.2
	20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	3	3.3
	21 Manufacture of paper and paper products	3	3.4
	22 Publishing, printing, and reproduction of recorded media	3	3.4
	23 Manufacture of coke, refined petroleum products, and nuclear fuel	3	3.5
	24 Manufacture of chemicals and chemical products	3	3.5
	25 Manufacture of rubber and plastics products	3	3.5
	26 Manufacture of other non-metallic mineral products	3	3.6
	27 Manufacture of basic metals	3	3.7
	28 Manufacture of fabricated metal products, except machinery and equipment	3	3.8
	29 Manufacture of machinery and equipment n.e.c.	3	3.8
	30 Manufacture of office, accounting, and computing machinery	3	3.8
	31 Manufacture of electrical machinery and apparatus n.e.c.	3	3.8
32 Manufacture of radio, television, and communication equipment and apparatus	3	3.8	
33 Manufacture of medical, precision, and optical instruments, watches, and clocks	3	3.8	
34 Manufacture of motor vehicles, trailers, and semi-trailers	3	3.8	
35 Manufacture of other transport equipment	3	3.8	
36 Manufacture of furniture; manufacturing n.e.c.	3	3.9	
37 Recycling	3	3.9	
E - Electricity, gas, and water supply	40 Electricity, gas, steam, and hot water supply	4	
	41 Collection, purification, and distribution of water	4	
F - Construction	45 Construction	5	
G - Wholesale and retail trade; repair of motor vehicles, motorcycles, and personal and household goods	50 Sale, maintenance, and repair of motor vehicles and motorcycles; retail sale of automotive fuel	6	
	51 Wholesale trade and commission trade, except of motor vehicles and motorcycles	6	
H - Hotels and restaurants	52 Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	6	
	55 Hotels and restaurants	6	
I - Transport, storage, and communications	60 Land transport; transport via pipelines	7	
	61 Water transport	7	
	62 Air transport	7	
	63 Supporting and auxiliary transport activities; activities of travel agencies	7	
	64 Post and telecommunications	7	
J - Financial intermediation	65 Financial intermediation, except insurance and pension funding	8	
	66 Insurance and pension funding, except compulsory social security	8	
	67 Activities auxiliary to financial intermediation	8	
K - Real estate, renting, and business activities	70 Real estate activities	8	
	71 Renting of machinery and equipment without operator and of personal and household goods	8	
	72 Computer and related activities	8	
	73 Research and development	8	
	74 Other business activities	8	
L - Public administration and defence; compulsory social security	75 Public administration and defence; compulsory social security	9	
M - Education	80 Education	9	
N - Health and social work	85 Health and social work	9	
O - Other community, social, and personal service activities	90 Sewage and refuse disposal, sanitation, and similar activities	9	
	91 Activities of membership organizations n.e.c.	9	
	92 Recreational, cultural, and sporting activities	9	
	93 Other service activities	9	
P - Private households with employed persons	95 Private households with employed persons	9	
Q - Extra-territorial organizations and bodies	99 Extra-territorial organizations and bodies	9	

Note: "n.e.c." represents "not elsewhere classified."

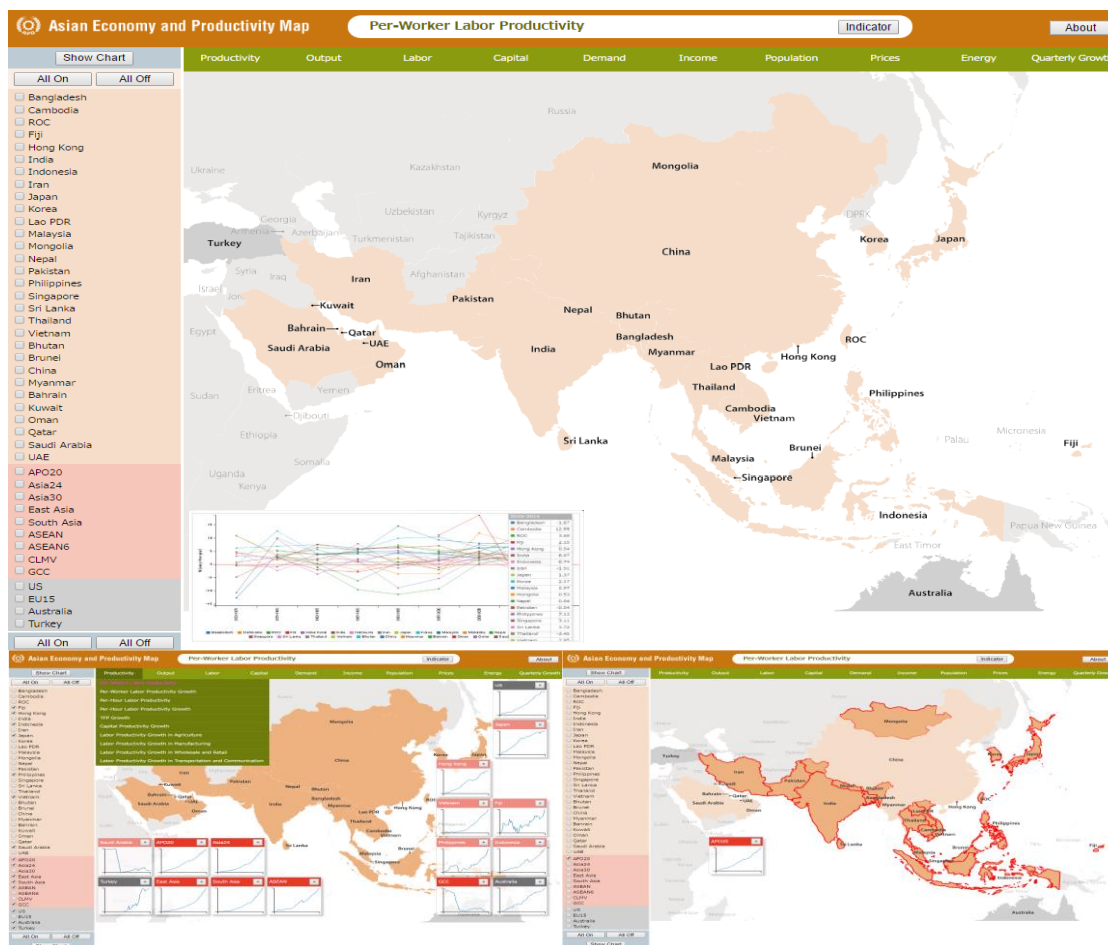
Table 8: Industry Classification – Concordance with ISIC Rev.4

ISIC Rev. 4	Division	Databook	
		1st	2nd
Section	Division	(a)	(b)
A - Agriculture, forestry, and fishing	1 Crop and animal production, hunting, and related service activities	1	1
	2 Forestry and logging	1	1
	3 Fishing and aquaculture	1	1
B - Mining and quarrying	5 Mining of coal and lignite	2	2
	6 Extraction of crude petroleum and natural gas	2	2
	7 Mining of metal ores	2	2
	8 Other mining and quarrying	2	2
	9 Mining support service activities	2	2
C - Manufacturing	10 Manufacture of food products	3	3 3.1
	11 Manufacture of beverages	3	3.1
	12 Manufacture of tobacco products	3	3.1
	13 Manufacture of textiles	3	3.2
	14 Manufacture of wearing apparel	3	3.2
	15 Manufacture of leather and related products	3	3.2
	16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	3	3.3
	17 Manufacture of paper and paper products	3	3.4
	18 Printing and reproduction of recorded media	3	3.4
	19 Manufacture of coke and refined petroleum products	3	3.5
	20 Manufacture of chemicals and chemical products	3	3.5
	21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	3	3.5
	22 Manufacture of rubber and plastics products	3	3.5
	23 Manufacture of other non-metallic mineral products	3	3.6
	24 Manufacture of basic metals	3	3.7
	25 Manufacture of fabricated metal products, except machinery and equipment	3	3.8
	26 Manufacture of computer, electronic and optical products	3	3.8
	27 Manufacture of electrical equipment	3	3.8
	28 Manufacture of machinery and equipment n.e.c.	3	3.8
	29 Manufacture of motor vehicles, trailers and semi-trailers	3	3.8
30 Manufacture of other transport equipment	3	3.8	
31 Manufacture of furniture	3	3.8	
32 Other manufacturing	3	3.9	
33 Repair and installation of machinery and equipment	3	3.9	
D - Electricity, gas, steam, and air conditioning supply	35 Electricity, gas, steam, and air conditioning supply	4	4
E - Water supply; sewerage, waste management, and remediation activities	36 Water collection, treatment, and supply	4	4
	37 Sewerage	9	9
	38 Waste collection, treatment, and disposal activities; materials recovery	9	9
	39 Remediation activities and other waste management services	9	9
F - Construction	41 Construction of buildings	5	5
	42 Civil engineering	5	5
	43 Specialized construction activities	5	5
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	45 Wholesale and retail trade and repair of motor vehicles and motorcycles	6	6
	46 Wholesale trade, except of motor vehicles and motorcycles	6	6
	47 Retail trade, except of motor vehicles and motorcycles	6	6
H - Transportation and storage	49 Land transport and transport via pipelines	7	7
	50 Water transport	7	7
	51 Air transport	7	7
	52 Warehousing and support activities for transportation	7	7
	53 Postal and courier activities	7	7
I - Accommodation and food service activities	55 Accommodation	6	6
	56 Food and beverage service activities	6	6
J - Information and communication	58 Publishing activities	7	3
	59 Motion picture, video, and television programme production, sound recording and music publishing activities	9	9
	60 Programming and broadcasting activities	9	9
	61 Telecommunications	7	7
	62 Computer programming, consultancy, and related activities	8	8
	63 Information service activities	8	8
K - Financial and insurance activities	64 Financial service activities, except insurance and pension funding	8	8
	65 Insurance, reinsurance, and pension funding, except compulsory social security	8	8
	66 Activities auxiliary to financial service and insurance activities	8	8
L - Real estate activities	68 Real estate activities	8	8
M - Professional, scientific, and technical activities	69 Legal and accounting activities	8	8
	70 Activities of head offices; management consultancy activities	8	8
	71 Architectural and engineering activities; technical testing and analysis	8	8
	72 Scientific research and development	8	8
	73 Advertising and market research	8	8
	74 Other professional, scientific, and technical activities	8	8
	75 Veterinary activities	9	9
N - Administrative and support service activities	77 Rental and leasing activities	9	9
	78 Employment activities	9	9
	79 Travel agency, tour operator, reservation service, and related activities	9	9
	80 Security and investigation activities	9	9
	81 Services to buildings and landscape activities	9	9
	82 Office administrative, office support, and other business support activities	9	9
	84 Public administration and defence; compulsory social security	9	9
P - Education	85 Education	9	9
Q - Human health and social work activities	86 Human health activities	9	9
	87 Residential care activities	9	9
	88 Social work activities without accommodation	9	9
R - Arts, entertainment, and recreation	90 Creative, arts, and entertainment activities	9	9
	91 Libraries, archives, museums, and other cultural activities	9	9
	92 Gambling and betting activities	9	9
	93 Sports activities and amusement and recreation activities	9	9
S - Other service activities	94 Activities of membership organizations	9	9
	95 Repair of computers and personal and household goods	6	6
	96 Other personal service activities	9	9
T - Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	97 Activities of households as employers of domestic personnel	9	9
	98 Undifferentiated goods- and services-producing activities of private households for own use	9	9
U - Activities of extraterritorial organizations and bodies	99 Activities of extraterritorial organizations and bodies	9	9

Note: The concordance (b) is used if the division-level data is available. The concordance (a) is used if only the section-level data is available.

A.2 Data Publication and Visualization

The productivity data used in this Databook is based on the APO Productivity Database 2019, which provides the annual productivity accounts covering Asian countries for the period 1970–2017. The data set is available at the APO website (www.apo-tokyo.org). Timely analysis of the current economic situation is beyond the scope of the Databook. In the meantime, for an insight into the current economic growth, one must rely on quarterly national accounts (QNA) from each country. Although they are timelier, the QNA are often less precise and subject to frequent revisions as more reliable data become available in their normal estimation cycle. With this trade-off between timeliness and data quality in mind, the APO recognizes the complementary benefits of collating and presenting a country’s QNA alongside its database of annual data. As result, this project developed the Asian Economy and Productivity Map (AEPM) by expanding its scope on data visualization in September 2016. Shown in Appendix Figure 41, the AEPM provides an instinctive understanding of recent economic growth, as well as the long-term productivity performances described in the Databook. This is also available at the APO website.



Appendix Figure 41: Visualization in Asian Economy and Productivity Map

Source: Asian Economy and Productivity Map, June 2019.