WIDER Working Paper 2018/120

Industrial development in Asia

Trends in industrialization and industrial policy experiences of developing Asia

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September 2018

United Nations University World Institute for Development Economics Research

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Abstract: Industrial transformation of Asia arguably constitutes the most surprising and dramatic change in the global economy in the last fifty years. This paper provides an outline of some of the most important trends of this development and analyses selected national industrial policies that promoted structural transformation in developing Asia during the period. In the first part, we describe crucial dimensions of industrialization in the region—its extent, its historical trajectory, and the resulting industrial upgrading. In the second part, we use four case studies—of the Republic of Korea, Malaysia, China, and India—to describe some of the strategies which Asian economies used in order to induce industrial development. We argue that more successful cases did not try to implement a golden policy template but rather pragmatically adopted their policies to overcome specific bottlenecks and meet strategic objectives.

Keywords: industrialization, industrial policy, structural transformation, development, case studies, developing Asia
JEL classification: L16, L52, O14, O25

Acknowledgements: We thank Deepak Nayyar and the reviewers for their invaluable suggestions throughout the preparation of this paper. Earlier versions were presented in seminar at Central Institute for Economic Management (CIEM) in Hanoi, Vietnam. We also thank Rob Vos, Robert Wade, Kaushik Basu, Frances Stewart, Finn Tarp, Tony Addison, and other seminar participants for their insightful comments and suggestions.

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This study has been prepared within the UNU-WIDER project on 'Asian Transformations: An Inquiry into the Development of Nations'.

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ISSN 1798-7237 ISBN 978-92-9256-562-6 https://doi.org/10.35188/UNU-WIDER/2018/562-6

Typescript prepared by Lesley Ellen.

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland, Sweden, and the United Kingdom as well as earmarked contributions for specific projects from a variety of donors.

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1 Introduction

Fifty years ago, in the freshly published *Asian Drama*, Gunnar Myrdal was cautious if not outright sceptical about the industrialization prospects of the Asian economies in the upcoming decades, pointing to the many institutional, social, political, and economic barriers they faced. In this light, it is fitting to call the industrialization successes in a number of Asian economies in the last five decades 'development miracles'. From today's vantage point of view, the phenomenal growth of China or the industrial prowess of the East Asian 'tigers' may appear as a natural, or even inevitable, outcome of the region's culture or other uniquely favourable initial conditions. Yet this had not been so when South Korea (henceforth Korea), fresh from the destructions of the Korean War (1950–53), was denounced as a 'bottomless pit' in an internal memo of the United States Agency for International Development (Chang 2007). Taiwan faced the threat of military intervention from China, which itself was often politically isolated by the Western powers, and its gross domestic product (GDP) per capita was barely half that of India. None of these, or other 'developing' Asian economies in South or Southeast Asia, had any significant industrial capacity at the time.

It was a tall order to achieve this success. The developing economies of Asia[1] had aspirations of seemingly Icarian heights: to close, in a single generation, the huge gap in industrial development that separated them from their old colonial masters. This feat was to be achieved against the tides of rapid population growth and persistent trade deficits without the benefits provided to the earlier industrializers by colonial possessions.

Even though not all odds were stacked against them, we cannot explain the industrialization achievements of the more successful developing Asian economies with some structural factors.[2] Likewise, it is just as inadequate to credit structural barriers and conditions as the only causes of relatively less successful industrialization of other Asian economies. To understand the differences in the structural transformation[3] of different Asian countries (as well as the differences between the Asian and other developing countries), one needs to look at the differences in their choices of overall development strategy and industrial policy.

In Section 2, we provide a bird's-eye view of Asia's industrial transformation in the last five decades. We explore: (i) the progress of industrialization, measured by value added (henceforth VA) indicators; (ii) the changes in employment patterns and manufacturing VA (henceforth MVA) indicators; and (iii) industrial upgrading, with the use of export indicators. In Section 3, drawing on insights from Myrdal's work, we discuss the role played by industrial policy in industrialization, outline experiences of four notable cases—Korea, Malaysia, China, and India—and discuss some of the general factors behind a successful industrial policy.

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[1] The 'developing Asia' category excludes Japan and Israel, as well as the Asian part of the USSR due to a lack of reliable data for the period. The 'developing economies' are defined following the definition by UNCTAD (2017).

[2] For a rebuttal of the 'cultural' arguments, see Chang (2007: chapter 9) and Chang (2011a), which also discusses 'institutional' arguments. For a rebuttal of explanations involving other types of initial conditions (e.g. natural resources, human resources, infrastructure, geo-political factors), see Chang (2006: chapter 4).

[3] Structural transformation is defined in this paper as the series of economic and social changes resulting from changes in the production structure. These involve notably transition in employment towards manufacturing and modern industries, new organization of production, technological upgrading, and related changes in social conditions such as urbanization. There is a voluminous literature on this topic, for instance Rosenstein-Rodan (1943) or Kaldor (1967). For discussion of industrial transformation in Asia, see ADB (2013).

2 Asian industrial development in numbers

2.1 The extent of industrialization in developing Asia

In the last five decades, the manufacturing sector in Asia has become the largest in the world, which happened in tandem with other important developments, including the continent's increasing share in global trade and rapid urbanization. All Asian regions have industrialized faster than the global average during that period, but most startlingly the 'developing' East Asian region, while being marginal in terms of industrial development in 1970, became the world's largest 'core' industrial region by 2015.

These changes were by no means predestined. Asia of the 1960s was a continent of subsistent farming with a few 'enclaves' of modern industry. In 1970, the developing Asian economies produced around 32.98 per cent of their VA in agriculture, compared to the world average of 9.46 per cent,[4] while the share of their manufacturing VA (henceforth MVA) in GDP was lower than that of Africa (10.57 per cent vs 12.89 per cent). MVA constituted less than a third of Asia's total industrial VA (henceforth IVA), typically for extractive-industries-dominated post-colonial economies (see Table 1; also see UNCTAD (2017) for data on Africa). In 1970, developing Asia accounted for only 4.15 per cent of the world's MVA, despite holding over half the world's population (Table 1).

Table 1: Comparing developing Asia in 1970 and 2015

Indicator		Value in 1970	Value in 2015	% increase $\left(\frac{Value\ in\ 2015}{Value\ in\ 1970} - 100\%\right)$
Average GDP per capita (constant 2005 US$)	Developing Asia	501	3,272	553%
	World	4,283	8,178	91%
Total IVA (constant 2005 US$)	Developing Asia	400,769	5,615,672	1,301%
	World	5,361,309	16,453,140	207%
Total MVA in constant 2005 US$	Developing Asia	109,433	3,567,380	3,160%
	World	2,634,860	10,174,996	286%
Developing Asia's share of global total	IVA	7.48%	34.13%	356%
	MVA	4.15%	35.06%	745%
Developing Asia's share of global GDP		6.2%	22.7%	264%
Developing Asia's share of global exports		8.42%	35.87%[a]	326%
Developing Asia's inward FDI flows as a % of global total[b]		7.1%	29.2%	310%
Share of urban population	Developing Asia	20.7%	46.7%	126%
	World	36.7%	53.8%	47%
Population in millions	Developing Asia	1,971	4,173	112%
	World	3,683	7,350	100%

Notes: a. For 2016. b. Asia's foreign direct investment (FDI) flows numbers are 1970–74 and 2010–15 averages.

Sources: Authors' calculations based on data from UNCTADstat (UNCTAD 2017) and WDI Database Archives (World Bank 2017).

In the five decades that followed, Asia experienced rapid industrialization, outpacing every other continent by a big margin. From 1970 to 2015, while the world's MVA grew by 286 per cent, Asia's grew by a staggering 3,160 per cent. The bulk of this came from developing Asia, which expanded its share in global MVA from 4.15 per cent to 35.06 per cent, pulling ahead of both Europe and

[4] Compared to 22.26 per cent for Africa or 11.25 per cent for 'developing' Latin America (UNCTAD 2017).

the Americas (26.35 per cent and 25.81 per cent respectively).[5] In doing so, it also became the only 'developing' continent whose share in global MVA outgrew its share in IVA (35.06 per cent to 34.13 per cent, with 1.80 per cent to 3.02 per cent for Africa, and 5.01 per cent to 6.42 per cent for developing Americas (UNCTAD 2017)). This means a transition away from dependence on extractive industries to manufacturing as the engine of development.

Most of the expansion in Asia's share of global MVA was concentrated in developing East Asia. From 1970 to 2015, the region expanded its share in global MVA from a mere 1.60 per cent to 25.30 per cent. Although other Asian regions have also expanded their global share of MVA their increases were much less dramatic by comparison. In South Asia it grew from 0.97 per cent to 3.83 per cent, in South-Eastern Asia from 0.75 per cent to 3.56 per cent, and for Western Asia from 0.88 per cent to 2.37 per cent.

The importance of these facts cannot be over-emphasized. In less than five decades, developing East Asia has gone from having a globally marginal manufacturing base to eclipsing the industrial capacity of other Asian regions and rising above the world average in per capita terms. It has also pulled ahead of the old industrial centres of the world economy—Europe and the Americas in terms of total MVA. In other words, East Asia has emerged as the largest industrial 'core' region in the world. In contrast, Southeast Asia is at best half-way towards that goal, and South Asia is just beyond the starting line.

In 1970 there was nothing in East Asia's 'initial conditions' that would have allowed us to predict such a dramatic industrial expansion in the subsequent fifty years. Their comparative advantages were in products using cheap labour. Given the low levels of GDP per capita, there was also little potential to generate capital from savings. A sharp ideological divide, military tensions, and low share in international exports at that time made the region uninviting for foreign investors. Heavy state involvement in the economies in the region (and not just in centrally planned China) was seen by many as being inimical to the growth of domestic private capital. By any conventional economic standards the region in 1970 was destined to stay at a low level of development for the foreseeable future.

Table 2 shows the industrialization trends in the selected Asian countries. Between 1950 and 2005, agriculture's share of output in all Asian countries fell by more than it did in Africa, despite the fact that in the 1950s and the 1960s Asia was the most 'agricultural' continent (measured by agriculture's share in total output). Furthermore, Asia is the only continent in which the share of manufacturing in GDP increased continuously between 1950 and 2005. Thus, in 2005, the share of non-manufacturing industry in GDP in Asia was similar to that of the OECD (both 11 per cent), whereas those in Latin America and Africa were much higher (19 per cent and 18 per cent respectively), suggesting the dominance of extractive industries.

[5] In this period, Asia was the only continent which saw its share of global IVA and MVA significantly increase—IVA from 18.8 per cent to 43.5 per cent and MVA from 16.6 per cent to 46.1 per cent. For Europe and the Americas, these both decreased—the Americas' IVA share fell from 35.8 per cent to 27.2 per cent and its MVA share from 34.5 per cent to 24.8 per cent, while Europe's IVA share fell from 40.7 per cent to 24.5 per cent and its MVA share from 46.2 per cent to 26.4 per cent. For Africa and Oceania, they stagnated. Africa's IVA share stayed at around 3.0 per cent, while its MVA share rose from 1.6 per cent to 1.8 per cent. Oceania's IVA share went from 1.7 per cent to 1.8 per cent, while its MVA share fell from 2.0 per cent to 0.9 per cent. These figures are authors' calculations based on UNCTADstat (UNCTAD 2017), except for the estimate for China's MVA figures in 1970, which is taken from the World Bank's World Development Indicators (and recalculated in 2005 prices).

Table 2: Structure of production in selected Asian countries, 1950–2005 (gross value added in main sectors of the economy as per cent of GDP at current prices)

	1950				*1980*				*2005*				*Per capita GDP 1970–2015*		
	agr	ind	mf	sv	agr	ind	mf	sv	agr	ind	mf	sv	1970	2015	growth
South Korea	47	13	9	41	16	37	24	47	3	40	28	56	1,869	25,280	6,0%
Taiwan	34	22	15	45	8	46	36	46	2	26	22	72	1,862	22,481	5,7%
Turkey	49	16	11	35	27	20	17	54	11	27	22	63	3,124	8,943	2,4%
Malaysia	40	19	11	41	23	41	22	36	8	50	30	42	1,201	7,622	4,2%
China	51	21	14	29	30	49	40	21	13	48	34	40	150	4,187	7,7%
Thailand	48	15	12	37	23	29	22	48	10	44	35	46	616	3,853	4,2%
Sri Lanka	46	12	4	42	28	30	18	43	17	27	15	56	477	2,470	3,7%
Indonesia	58	9	7	33	24	42	13	34	13	47	28	40	349	2,043	4,0%
Philippines	42	17	8	41	25	39	26	36	14	32	23	54	826	1,734	1,7%
India	55	14	10	31	36	25	17	40	18	28	16	54	259	1,279	3,6%
Pakistan	61	7	7	32	30	25	16	46	21	27	19	51	371	904	2,0%
Bangladesh	61	7	7	32	32	21	14	48	20	27	17	53	271	653	2,0%
											World		4,283	8,178	1.4%
Averages:															
Asia	49	14	10	36	25	33	22	42	13	35	24	52			
Latin America	22	28	16	50	10	40	24	50	7	37	18	56			
Africa	44	19	9	36	25	32	14	43	26	30	12	45			
Developing countries	41	19	11	40	21	35	20	44	16	34	18	51			
16 OECD countries	15	42	31	43	4	36	24	59	2	28	17	70			

Notes: a. Agr—agriculture, ind—industry, mf—manufacturing, sv—services. b. earliest year for which data are available: 1950, except for Taiwan and Thailand, 1951; Japan and China, 1952; South Korea, 1953; Malaysia, 1955. c. Bangladesh 1950–59, same data as Pakistan. d. the countries are arranged by their 2015 per capita incomes.

Sources: Adapted from Szirmai (2009) and authors' calculations based on data for GDP per capita at constant 2005 US$ are from UNCTADstat (UNCTAD 2017).

All in all, at the continental, the regional, and the country levels, the Asian experience shows that the most rapid per capita growth is associated with the highest degree of industrialization. This is both consistent with the historical record of currently rich countries (Chang 2002; Szirmai 2009) and with the arguments that manufacturing serves as an engine of growth for the rest of the economy, which we discuss in the next section.

2.2 The trajectory of industrialization among the Asian economies

The main impact of industrialization on economic development comes, in the classical formulation, from the transfer of labour from sectors with low and slowly growing productivity to the industrial (and especially manufacturing) sector, as discussed by Myrdal (1968: chapter 24). Most notably, this was formulated as Nicholas Kaldor's (1966) first growth law, positing that GDP growth is positively correlated with manufacturing growth, owing to such transfer. This is supported by two other propositions—second and third laws—which state, in turn, that the productivity of the manufacturing sector is positively related to manufacturing output growth (due to static scale economies and learning-by-doing) and that the productivities of other sectors are positively related

to the size of the manufacturing sector (due to technological spill-overs).[6] This would suggest that the richest and the fastest-growing economies will be the ones with the largest manufacturing sectors.

In this section, we look at how far and how fast different Asian economies have increased their manufacturing employment (see Table 3) and manufacturing value added (see Figure 1). We find that the experience of the major Asian economies is in line with Kaldor's prediction; the currently richest major Asian economies (Japan and the first-tier Newly Industrialized Countries - NICs[7]) are the ones that have increased their manufacturing employment share relative to total employment and population the most. We find that the key to their success lies in the ability to sustain the growth of manufacturing production.

In Table 3, we see that the peak of per capita employment in manufacturing is an accurate predictor of income levels of that country in line with Kaldor's first proposition. This applies to Japan and the first-tier NICs, but also to the richest second-tier NIC, Malaysia.

Relatively rapid rates of employment and output growth in the manufacturing sector were significant in the rise of the currently industrialized East Asian countries to their 'peak' industrializations. This is consistent with Myrdal's (1968: Appendix 2) assertion that, in order to achieve sustained economic growth, a country needs to overcome the 'threshold' of initial institutional and economic inertia (more on this in Section 3). However, contrarily to Myrdal's assertion, simply achieving such rates of growth does not seem to be a sufficient, not to speak of being necessary, condition for successful industrialization. For instance, Indonesia and Malaysia have achieved similar, or higher, rates of employment and output growth than those of some East Asian 'tigers', but Indonesia has not been able to sustain its manufacturing employment growth and Malaysia's industrial dynamism started to wane at levels of per capita income and of MVA significantly short of those of the East Asian 'tigers'. China, in contrast, has been able to reach a high (and still growing) level of employment in manufacturing, despite having a significantly lower growth rate of employment in manufacturing than most of the countries in the sample. This suggests that it is not the high rates of growth in manufacturing employment or output per se but the ability to sustain them that matters.

[6] Other classic formulations were put forward by Myrdal (1957), Hirschman (1958), Chenery (1960), Gerschenkron (1962), and Kuznets (1966) among others.

[7] In the article we mention first-tier NICs—South Korea, Taiwan, Singapore, and Hong Kong—and second-tier NICs—Malaysia, Indonesia, and Thailand.

Table 3: Peaks in manufacturing employment share in total employment and in total population in selected Asian economies (employment, population, and MVA growth prior to and after reaching the manufacturing employment 'peak' relative to total population)

	Data entries	***'Peak' in mf share in total employment***		***'Peak' in mf empl as a proportion of total population***		***Pre-peak growth rates** (regards the 'population' peak)*			***Post-peak growth rates** (regards the 'population' peak)*		
		year	*%*	*year*	*per 1,000*	*empl*	*pop*	*MVA*	*empl*	*pop*	*MVA*
Japan	1953–2012	1969	24.5	1969	135.2	4.6	1.1	13.0	-1.2	0.5	2.6
Singapore	1970–2011	1981	30.4	1982	142.8	8.0	1.6	9.5	1.4	2.5	6.3
Hong Kong	1974–2011	1976	45.3	1981	197.3	6.1	2.8	12.5	-6.4	1.1	0.4
South Korea	1963–2010	1988	28.1	1991	116.4	7.8	1.6	14.6	-0.8	0.7	6.7
Taiwan	1963–2012	1987	33.7	1987	144.1	7.4	2.1	13.8	0.2	0.7	3.1
Malaysia	1975–2011	1997	24.9	1997	100.5	7.4	2.5	10.5	0.2	2.0	3.7
China	1952–2011	2010	19.2	2010	107.3	4.5	1.5	14.4	n/a	n/a	n/a
Thailand	1960–2011	2007	15.1	2007	84.5	5.1	1.9	8.9	n/a	n/a	n/a
Indonesia	1971–2012	1994	13.5	1994	62.5	6.1	2.2	12.1	1.2	1.4	3.3
Philippines	1971–2012	1971	12.0	1975	40.6	n/a	n/a	n/a	1.6	2.3	3.1
India	1960–2010	2002	12.5	2003	49.7	2.8	2.1	5.5	-0.2	1.5	8.7
US	1950–2010	1953	25.6	1953	106.0	n/a	n/a	n/a	-0.7	1.3	2.8

Notes: a. mf—manufacturing, empl—employment, pop—population. b. Underlined numbers indicate that the 'peak' is within the last 5 years of the period covered, and therefore that it could go higher. Double-underlined numbers indicate that the 'peak' is within the first 5 years of the period covered and therefore that it might have been higher before. The growth rates prior to 'underlined' peaks, as well as after 'double-underlined' peaks, are omitted (marked n/a), either due to lack of data or because they may be reflecting short-term fluctuations rather than longer-term trends in growth. c. The MVA growth rates and the employment growth rates are calculated for the same years, except for Japan (whose post-peak MVA growth rate is for 1969–2011) due to data availability. d. Countries are ranked according to their per capita GDP in 2015 from the richest to the poorest (UNCADstat 2017 database), except for the US, which serves as a reference.

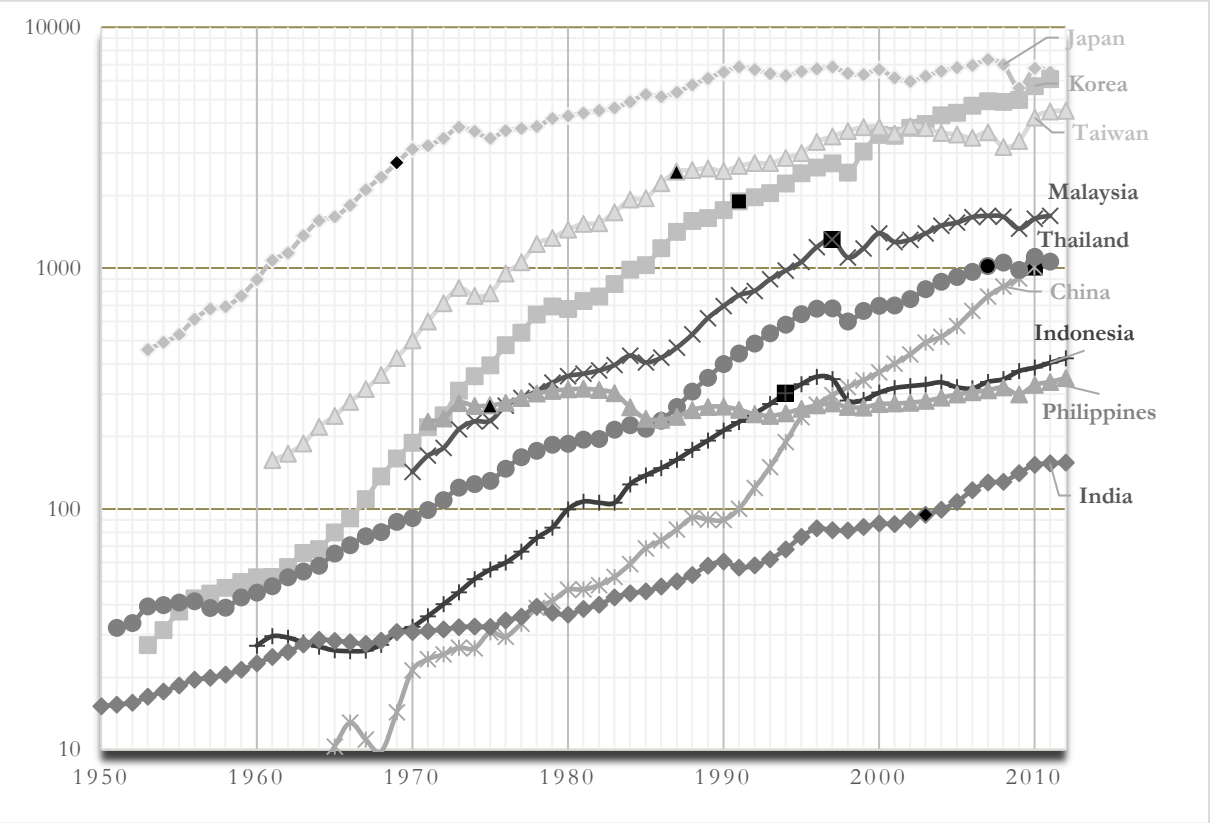
Sources: Authors' calculations based on employment and MVA at constant 2005 national prices data from GGDC 10-Sector Database, Timmer et al. (2015); population data from UN DESA Population Division (2017) database.

Interestingly, the countries that have had lower 'peak' employment shares have had weaker manufacturing productivity growth performance afterwards (3.5 per cent or lower with the exception of India) than the richer (Japan and first-tier NICs) countries (3.8 per cent and higher, with the exception of Taiwan). In theory, this can be partially attributed, as in the second Kaldor's law, to the smaller dynamic scale economies and fewer intra-industry linkages.

Particularly notable is the fact that, in the industrialized East Asian countries, manufacturing output has expanded through continued productivity growth, even while manufacturing employment in

absolute terms has declined.[8] However, as seen earlier (Table 2), in the South and the Southeast Asian economies, manufacturing employment has been growing in absolute terms even after the 'peak' in terms of the employment share (except for India recently), suggesting that their manufacturing employment growth cannot keep up with the growth in workforce. At the same time, their manufacturing sector is still not large enough to drive overall development through its productivity growth.[9] We can notice these different patterns of loss of industrialization dynamism in Figure 1.

Figure 1: Per capita MVA in selected East Asian economies (in constant 2005 US$)



Notes: a. **The black point** indicates the year in which economy had its manufacturing employment 'peak' as a percentage of population. b. Graph done in logarithmic scale to illustrate growth rates. c. Original data is in national currencies at constant 2005 prices—converted to 2005 US$ prices using *Treasury Reporting Rates of Exchange as of December 31, 2005*.

Sources: Authors' calculations from MVA at 2005 national prices data from Timmer et al. (2015), population data from UN DESA Population Division (2017) and exchange rates of national currencies to US$ from US Department of Treasury, Bureau of the Fiscal Service (2005).

Figure 1 visually presents some of the previous points. First, it shows that at the heart of the industrialization success of Japan and first-tier NICs was their ability to sustain the rapid expansion of manufacturing output for long, well beyond their manufacturing employment peak (marked by

[8] This is also due to shedding sunset industries, which are often more labour intensive.

[9] It is not to say that sustaining employment growth in manufacturing is desirable under any conditions. If employment in the protected manufacturing sector is expanded without raising its competitiveness, the result may be larger loss of employment if such a sector is exposed to international competition, as it will have little ability to withstand it. This can create higher unemployment in the longer run, which would be difficult to absorb quickly.

the black point on the trend line).[10] Second, it shows that, in the case of Southeast Asia (especially Malaysia and Indonesia), the loss of industrial dynamism happened around the time of the employment peak. Beyond it, their industrial growth performance weakens and is increasingly disrupted by contractions.

Most Asian economies in the figure (China and India are the exceptions) experienced a slowdown and even a decline in the growth of MVA following the Asian financial crisis of 1997, despite being at very different levels of MVA per capita.[11] Beyond the 'dip' due to the crisis, the affected countries have experienced a lasting loss of industrial dynamism. The likely cause of this deterioration is the change in economic policies and institutions towards the neoliberal direction, introduced in the aftermath of the 1997 crisis (see Shin and Chang 2005).

One of the main effects of the policy changes after the crisis was on the rate of investment. For both the Southeast and the East Asian regions, gross fixed capital formation (GFCF) as a proportion of GDP fell significantly between 1991 and 1995 and 2001 and 2005 and stayed close to that level in the next decade with the exception of Indonesia (Appendix Table A2). It fell by the equivalent of about 6 per cent of GDP for Japan, 7 per cent for Korea and Indonesia, almost 8 per cent for Singapore, and over 16 per cent for Malaysia and Thailand. It remained at that level, except in Malaysia, Thailand, and Hong Kong, where it bounced back a little bit. This decline takes the GFCF/GDP ratio of most of those countries below the world average, around 20 per cent, for the first time since the 1970s. The only major Asian economies with a GFCF/GDP ratio over 30 per cent in that period were Korea, China, and Viet Nam.

Interestingly, with this decline, most of those countries have converged to the GFCF/GDP levels of the slower industrializers, like the South Asian economies and the Philippines. This suggests that the inability to sustain the growth in the share of manufacturing in total employment among the Southeast Asian countries after 1997, on the one hand, and the South Asian countries and the Philippines in the earlier period, on the other hand, have similar origins—that is, investments were inadequate to generate manufacturing employment growth faster than the growth of the workforce.

The experiences of China and Viet Nam give even more weight to this reasoning. From 2000 to 2010 (and for China in 2010 to 2015 as well), both countries maintained the highest (alongside Korea) rates of GFCF as a proportion of GDP in the region (Viet Nam around 30 per cent, China around 40 per cent—see Appendix Table A2), which coincided with them being the only two major economies of the region that experienced growth 'miracles' during the period. In the same period, they significantly improved their MVA per capita level relative to other economies of the region, with China approaching the Malaysian level and Viet Nam nearing the Indonesian level.

2.3 Upgrading and diversification of industrial production

Continued upgrading of industrial production is essential for sustaining both industrialization and growth in the standards of living. Industrialization creates demands for a variety of complex machinery and intermediate goods. In an open economy, this can be—and often should be—met by imports, which require foreign exchanges. The rising standards of living lead to an increase in the demand for imported consumer goods and thus for foreign exchanges. The challenge is then

[10] Hong Kong is the exception. It began to rapidly financialize in the 1980s and especially in the 1990s to provide financial services for the gradually liberalizing Chinese economy.

[11] Japan at around US$6,800, Japan and Taiwan at around US$3,800, Malaysia at US$1,300, and Indonesia at US$350 per capita.

to sustain industrialization in the face of rising demands for foreign exchanges (due to increased needs for imports) and of falling abilities to earn them (due to higher wages).

Initially, developing countries earn the necessary foreign exchanges by expanding the exports of existing primary commodities or basic manufactures. However, these will prove insufficient. First, as wages grow, the competitiveness of these goods will deteriorate, as they tend to be more labour-intensive. At the same time, the possibilities for cutting costs become more limited, as these 'basic' goods benefit less from the scale economies than complex ones and have less room for cutting costs through capital investments. Second, the demands for technologically complex goods grow faster than those for primary commodities, structurally constraining their export growths (see Palma 2005).

Thus, the more viable strategy for alleviating the balance of payments (BoP) constraints lies in the diversification of production structure. 'Horizontal' diversification, entailing the expansion of other primary commodities or basic manufacturing goods increases the economy's foreign exchange earnings, while also 'hedging' it against price fluctuations of specific goods. More important, however, is 'vertical' diversification, especially that which involves 'upgrading' towards more technology-intensive industries. It alleviates BoP pressure by making the export basket more 'demand-dynamic', thereby generating more foreign exchanges than it would otherwise. Some studies indicate that the quicker this process occurs, the better the growth outcomes are (e.g. Felipe et al. 2012; also see discussion in Chang and Lin 2009).

In Table 4, we can see the change in the leading export items for major Asian economies. We see that the currently industrialized economies have upgraded the most—with high- and medium-technology goods dominating exports. This is especially surprising in the case of Singapore or Korea, which had been exporters of low-tech and resource-based manufactures in 1965. At the same time, no country which has upgraded only moderately has experienced significant industrialization success.

Furthermore, the experiences of China and Viet Nam support the idea that countries which upgrade aggressively at relative low-income levels subsequently experience faster rates of economic growth. These countries moved from primary commodity dependence in 1965 to the dominance of mostly high-tech products in 2016. Countries like the Philippines, Malaysia, and Thailand have an even higher concentration of export share in electronic products. However, they, including Malaysia, still significantly depend on primary commodities.

Perhaps unsurprisingly, countries which have not industrialized or grown as rapidly have generally witnessed fewer changes in their exports baskets. Pakistan, for instance, upgraded from plant fibre to garments and from jute to cotton, but is still a largely agro-products exporter. India and Indonesia have largely upgraded from agro-products to mined commodities and natural-resource-based manufactures—into diamonds and jewellery (India) and coal and petroleum (Indonesia)—but have not gone beyond that.

Table 4: Technology intensity of top five exports in selected countries in 1965 and 2016 (SITC4 classification)

Country	**1965**	**2016**
Japan	Ships and Boats (7932) 7.0%	Cars (7810) 15%
	Fabrics, Woven, of Man-made Fabrics (6530) 3.7%	**Unclassified Transactions (9310) 6.2%**
	Finished Cotton Fabrics (6522) 3.6%	Vehicle Parts and Accessories (7849) 5.4%
	Universals, Plates and Sheets, of Iron or Steel (6740) 3.1%	Machinery for Specialized Industries (7284) 4.0%
	Motorcycles (7851) 2.0%	Electronic Microcircuits (7764) 3.0%
Singapore	Natural Rubber (2320) 34%	Electronic Microcircuits (7764) 24%
	Petroleum Products, Refined (3340) 9.7%	**Unclassified Transactions (9310) 5.9%**
	Fuel Oils (3344) 5.9%	Machinery for Specialized Industries (7284) 2.3%
	Light Oils (3341) 3.4%	Aircraft Parts and Accessories (7929) 2.2%
	Gas Oils (3343) 2.9%	TV and Radio Transmitters (7643) 2.0%
Republic of Korea	Veneers, Plywood, Improved Wood and Other Wood, Worked, Nes (6340) 9.1%	Electronic Microcircuits (7764) 11%
	Universal Plates of Iron or Steel (6741) 7.4%	Cars (7810) 8.2%
	Men's and Boys' Outwear, Textile Fabrics Not Knitted or Crocheted (8420) 5.7%	Ships and Boats (7932) 5.5%
	Unbleached Cotton Woven Fabrics (6521) 5.1%	Vehicle Parts and Accessories (7849) 4.8%
	Miscellaneous Non-Ferrous Ores (2879) 4.8%	Telecom Parts and Accessories (7649) 4.7%
Malaysia	Natural Rubber (2320) 40%	Electronic Microcircuits (7764) 14%
	Unwrought Tin and Alloys (6871) 17%	Palm Oil (4242) 5.4%
	Non-Coniferous Sawlogs (2472) 7.4%	Liquified Petroleum Gases (3413) 4.3%
	Iron Ore and Concentrates (2810) 5.2%	Diods, Transistors and Photocells (7763) 3.8%
	Non-Coniferous Worked Wood (2483) 3.4%	Crude Petroleum (3330) 3.4%
China	Finished Cotton Fabrics (6522) 5.3%	TV and Radio Transmitters (7643) 5.8%
	Soy Beans (2222) 5.0%	Personal Computers (7522) 4.1%
	Milled Rice (0422) 4.7%	Telecom Parts and Accessories (7649) 3.1%
	Miscellaneous Animal Origin Materials (2919) 4.2%	Electronic Microcircuits (7764) 2.7%
	Unbleached Cotton Woven Fabrics (6521) 3.4%	Footwear (8510) 2.3%
Thailand*	Milled Rice (0422) 30%	Computer Peripherals (7525) 5.4%
	Natural Rubber (2320) 14%	Cars (7810) 4.7%
	Tin (2876) 7.0%	Trucks and Vans (7821) 4.1%
	Maize (0440) 6.9%	Electronic Microcircuits (7764) 3.4%
	Jute (2640) 6.0%	Vehicle Parts and Accessories (7849) 3.3%
Indonesia	Crude Petroleum (3330) 26%	Palm Oil (4242) 10%
	Natural Rubber (2320) 21%	Coal (3222) 8.6%
	Tin (2876) 6.3%	Crude Petroleum (3330) 3.5%
	Coffee (0711) 6.1%	Footwear (8510) 3.2%
	Fuel Oils (3344) 5.0%	Liquified Petroleum Gases (3413) 3.1%
Philippines	Non-Coniferous Sawlogs (2472) 20%	Electronic Microcircuits (7764) 25%
	Copra (2231) 20%	Computer Peripherals (7525) 8.2%
	Refined Sugars (0612) 14%	Carpentry Wood (6353) 5.2%
	Coconut Oil (4243) 7.7%	Diodes, Transistors and Photocells (7763) 4.3%
	Copper Ores (2871) 6.1%	Electric Wire (7731) 4.1%
India	Tea (0741) 14%	Diamonds (6672) 10%
	Jute Woven Fabrics (6545) 13%	Precious Jewellery (8973) 5.5%
	Iron Ore and Concentrates (2810) 7.4%	Medicaments (5417) 5.2%
	Textile Bags (6581) 5.6%	Cars (7810) 2.8%
	Oilcake (0813) 4.7%	Milled Rice (0422) 2.3%
Viet Nam*	Natural Rubber (2320) 42%	TV and Radio Triansmitters (7643) 16%
	Coal, Lignite and Peat (3220) 17%	Footwear (8510) 7.6%
	Pig and Cast Iron (6712) 3.9%	Telecom Parts and Accessories (7649) 3.5%
	Green Groundnuts (2221) 3.8%	Personal Computers (7522) 2.7%
	Tea (0741) 3.4%	Electronic Microcircuits (7764) 2.6%
Pakistan	Jute (2640) 35%	Linens (6584) 12%
	Raw Cotton (2631) 12%	Milled Rice (0422) 8.2%
	Textile Bags (6581) 10%	Finished Cotton Fabrics (6522) 6.8%
	Jute Woven Fabrics (6545) 6.3%	Cotton Yarn (6513) 6.1%
	Cotton Yarn (6513) 4.9%	Miscellaneous Textile Articles (6589) 5.2%
Bangladesh	Jute (2640) 53%	Cotton Undergarments (8462) 23%
	Jute Woven Fabrics (6546) 21%	Men's Pants (8423) 17%
	Textile Bags (6581) 12%	Knitted Underwear (8451) 11%
	Crustaceans and Molluscs (0360) 3.0%	Miscellaneous Feminine Outerwear (8439) 7.1%
	Finished Leather (6118)	Men's Shirts (8441) 7.0%

Notes: a. Products coloured by technology intensiveness. High-tech manufactures, medium-tech manufactures, low-tech manufactures, natural resource-based manufactures, primary commodities. Based on Lall (2000) classification. b. Countries marked with * use data for 2015—latest available. Bangladesh uses data for 1972 and 2011—first and last entries available. c. Countries ordered from richest to poorest (2015 per capita GDP UNCTADstat 2017 data).

Sources: Authors' construction, Observatory of Economic Complexity (OEC) software, Simoes and Hidalgo (2011).

Table 5 confirms these observations at a more aggregated level. The table looks at the shares of four main groups of export goods—agricultural goods, both primary and processed (Agr), minerals and oil (M&O), textile and garments (GTF), and hi-tech products like electronics and machinery (M&E).[12]

Table 5: Merchandise export shares of selected commodity groups in selected Asian economies 1965–2016 (SITC2 classification, see note a. for commodity groups)

Year	1965				1985				2000				2016			
Commodity group	Agr	M&O	GTF	M&E	Agr	M&O	GTF	M&E	Agr	M&O	GTF	M&E	Agr	M&O	GTF	M&E
Korea	20	12	33	3	4	1	31	28	2	1	10	57	<1	2	3	61
Malaysia	49	11	1	1	23	27	4	19	4	7	3	69	9	11	2	49
China	45	3	23	3	15	21	33	7	3	2	27	45	2	1	17	52
Thailand*	76	3	<1	<1	56	6	16	10	16	4	11	47	13	6	4	50
Indonesia	49	31	2	<1	12	67	3	<1	10	25	15	20	21	27	12	15
Philippines	52	10	4	<1	30	12	14	22	3	2	11	75	6	5	7	61
India	54	13	18	2	30	24	23	7	15	22	29	10	14	21	17	17
Viet Nam*	66	20	<1	<1	86	7	2	<1	22	28	34	7	13	4	27	39
Pakistan	68	<1	23	1	39	<1	46	2	13	<1	76	3	20	2	64	3
Bangladesh*	84	<1	15	<1	56	<1	37	<1	12	<1	84	<1	7	<1	89	<1

Notes: a. Commodity groups based on SITC2 groups as in OEC software: **Agr**—cereals and vegetable oils, cotton, rice, soy beans and others, fish and seafood, fruit, leather, meat and eggs, misc agriculture, tropical treecrops and flowers; **M&O**—oil, coal, mining, precious stones; **GTF**—garments, textiles and fabrics, **M&E**—machinery and electronics. b. Countries marked with * have data for other years included—Bangladesh has 1972 instead of 1965 and 2011 instead of 2016; Thailand and Viet Nam have 2015 instead of 2016. c. The shares are calculated with the exclusion of 'not classified' group. The only exception is 1965 Viet Nam data, which includes Coal, Lignite and Peat (SITC4 code 3220) into group B, since it constitutes a very significant portion of exports in that year (17 per cent). d. Countries are ordered from the richest to the poorest based on their 2015 per capita GDP, as reported in UNCTAD (2017).

Sources: Authors' calculation with use of OEC software, Simoes and Hidalgo (2011).

All the economies in Table 5 have seen a very significant decrease in the share of agricultural commodities, both primary and processed (Agr). Excluding Korea (where it was only 20 per cent), these constituted 45–84 per cent of merchandise exports in 1965, but only 2–21 per cent in 2016. This decline was accompanied initially by an increase in exports of garments and textiles (GTF) and, in some countries, mined commodities (M&O). In the case of the four richest countries in the table, as well as the Philippines and more recently Viet Nam, another change was taking place after that initial shift, which was a marked expansion of electronics and machinery (M&E) exports. In these countries, these constituted <1–3 per cent of merchandise exports in 1965 but 39–61 per cent in 2016.

[12] See note a. to Table 4 for the breakdown of each group. The commodities included in each group are not all goods of a similar nature (for instance, group Agr could also include processed foods and group M&E could also include aircraft). However, we did not include all OEC-SITC2 commodity groups, partly due to the limits of the OEC software, partly because some SITC2 groups encompass a much more diverse range of goods, and partly because some groups had only marginal shares of exports across all selected economies.

Despite large variations within the trend, we can see that those countries that were growing faster (see Table 2 for their respective growth rates) were those which experienced the most dramatic transformation in their export baskets and went through the changes described above most rapidly. This could be seen most clearly in the cases of Korea, Malaysia, China, Thailand, and more recently Viet Nam, which all have seen a drastic transition from dominant group Agr to M&O, GTF, and then M&E. There are exceptions to this, such as the Philippines, which did not manage a similarly high overall growth rate, or Thailand, which moved directly from agricultural commodities and products to machinery and electronics without much expansion in groups M&O and GTF. However, Table 2 shows that no countries which did not significantly expand their group M&E exports have managed successful industrialization.

As we have seen in this part of the paper, the Asian development experience of the past five decades has been defined by remarkable degrees of industrialization and the resulting structural transformation. In the next section, we will examine how the industrial policy approaches adopted by Asian economies during that period have been crucial in that process.

3 Industrial policy in Asia

3.1 The purpose of industrial policy in the framework of circular and cumulative causation

To understand the role of industrial policy for industrial development, let us start by considering Myrdal's conceptualization of the development process as that of circular and cumulative causation. It means that a number of positive (or negative) impacts of changing socioeconomic conditions reinforce the process in the direction of the initial change. Thus understood, the process of industrial development is underpinned by a number of economic objectives whose achievements contribute to the achievement of others,[13] notably:

- sustaining a high investment rate and maximizing their development impacts;
- expansion of manufacturing employment;
- expanding the scales of production to reap scale economies;
- vertical diversification into higher-technology sectors;
- expanding and deepening inter-sectoral linkages;
- acquisition of cutting-edge technologies and the development of research and development (R&D) capabilities by domestic producers;
- acquisition of organizational, managerial, and technical capabilities by domestic producers;
- increasing international market share.

In theory, success in meeting these objectives drives industrialization. In practice, however, the 'virtuous spiral' of cumulative causation rarely happens automatically. This is especially true for developing countries that lack potent domestic industrial enterprises. According to Myrdal (1968), this is due to various institutional factors, attitudes, scarcity of certain economic inputs, and political demobilization, which create strong inertia—all of which require a powerful impulse to be overcome, especially through state intervention. State intervention becomes even more necessary

[13] As described by Myrdal, industrial development is also strongly related and dependent on institutional and social factors, the discussion of which goes beyond the scope of this paper. For discussion of these aspects in relation to Asia, see for instance Khan (forthcoming, 2018) and Evans and Heller (forthcoming, 2018).

if military objectives or ideological aspiration requires acceleration of the pace of structural transformation or if there are counterforces or shocks pushing the economy in the opposite direction.

Given all these, Myrdal points out that the core purposes of development planning are: (i) to cause such a 'virtuous spiral' to arise; (ii) to introduce (where missing) and strengthen the forces of cumulative causation that drive it; (iii) to preserve it in the face of bottlenecks, counterforces, or shocks; and (iv) to use newly arising opportunities to propel it further. Correspondingly, the purpose of industrial policy is to guide industrial development in the same manner, using a broad range of policies (for examples see Chang 2011b).[14]

In the following section, drawing on Myrdal's insights, we will provide overviews of industrial policy in four major Asian economies—in Korea, Malaysia, China, and India—and discuss how and why it has contributed (or not) to industrialization in those countries.[15]

3.2 Selected case studies of industrial policy in Asian countries

Republic of Korea

The 'classic' Korean industrial policy started in the 1960s, motivated by revanchism against Japan and by the military threat from its communist neighbours. It was heavily influenced by the industrial planning ideologies of Japan, the USSR, and China, despite the widely advertised allegiance to the 'free world' by its new military government. It was structured by the (indicative) five-year plans of the Economic Planning Board (EPB), with detailed sectoral plans provided by the Ministry of Commerce and Industry (Chang 1994).

The Korean government provided a range of strong incentives to expand into hi-tech sectors at a relatively low level of development—the Heavy and Chemical Industrialization programme was launched in 1973 when the country's per capita income was just over 5 per cent of the US level. First, the government protected 'infant' industries from international competition through trade restrictions; quantitative restrictions were prevalent until the 1980s and the average manufacturing tariff was 30–40 per cent until the 1970s (Chang 2005). Second, the government rationed foreign exchanges, giving priority to importers of capital goods and intermediate inputs. Third, subsidies, including export subsidies, were provided conditional on improving the export performance or developing R&D capabilities and retracted whenever the recipient failed to perform. Fourth, foreign direct investment (FDI) was heavily regulated to promote capability acquisition by domestic firms. FDI was banned in many industries and majority ownership was not allowed outside the Export Processing Zones (EPZs), while investors were put under various performance requirements regarding local contents and technology transfer. Fifth, where the private sector was unwilling to invest in sectors deemed strategic, the government set up state-owned enterprises (SOEs)—the most notable example being POSCO (set up in 1968 and privatized in 2001), which is now the fourth largest steel-maker in the world.

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[14] The need for coordination and for the management of a range of interlinked economic and non-economic processes is one of the reasons why it is difficult, if not outright misleading, to try to define industrial policy in terms of the tools. Such attempts usually yield excessively long lists. We argue that it is better to define it in terms of its goals (that is, industrial development) and in terms of its modus operandi (that is, selective—and sequential—development of various industrial sectors).

[15] Within the scope of this paper, we focus on overviewing most standard selective industrial policies. The papers which explore the role of other policies to the success of industrial development, including macroeconomic and exchange rate policies are by Bhaduri (forthcoming, 2018) or Mundle (forthcoming, 2018).

In implementing industrial policy, the government promoted the chaebols, the large and highly diversified conglomerates. This policy allowed the concentration of scarce capital and managerial resources while ensuring scale economies and long investment horizons. While promoting fierce competition among the chaebols through innovation, the Korean government also regulated their investments and pricing in order to reduce inefficiencies resulting from 'excessive competition'.[16] It also set up deliberation councils to coordinate private investment goals with national targets.

Moderated in the late 1980s and the early 1990s, Korea's 'classic' industrial policy approach was largely dismantled in 1993, when the EPB was abolished and five-year plans terminated. Soon after that, industrial policy was even more diluted by liberalization following the Asian financial crisis of 1997, resulting in the loss of industrial dynamism. By that time, however, Korea had already become a rich industrialized economy.

Malaysia

In its initial phase (1957–69), Malaysia's industrial policy was aimed at expanding domestic manufacturing employment and alleviating BoP pressures through import-substitution. This was realized by direct and indirect government financing of factory construction in industrial zones. However, there was little to no strategic targeting aimed at things like vertical diversification, technological upgrading, or scale economies in production. There was little pressure for infant industries to 'mature' (Jomo et al. 1997).

The approach changed in the 1970s to an export-oriented one. While there were attempts to expand comparative-advantage-conforming export industries, like palm oil and petroleum, great efforts were made to enter hi-tech sectors (especially electronics) by attracting multinational companies (MNCs) into free-trade zones. Export-oriented local firms were also given lucrative tax incentives (including deductions on R&D and training), although there was no policy to expand local supply linkages (Jomo et al. 1997).

These efforts were combined with the New Economic Policy, aimed at ethnic redistribution. Instead of supporting the most able industrialists (mostly Chinese), the government set up SOEs and subsequently privatized them to Bumiputera owners (the country's majority ethnic group). These enterprises were supported by the industrial licensing system, which handicapped Chinese-owned businesses.

Malaysia's industrial policy took a brief turn towards prioritizing the expansion of domestic productive capabilities with the introduction of the heavy industrialization policy in 1980–85, which targeted sectors like cement, steel, and automobiles. This effort was mostly abandoned in 1985–86 due to the poor performance of the targeted industries.

Even after the 1986 liberalization, however, industrial policy continued. The Industrial Development Agency used a variety of tax incentives and investment subsidies to deepen local supplier linkages and technological transfer (Lall 1995). Although less 'heavy-handed' than before 1986, the government continued to support selected sectors, identified in the industrial master plans, launched for 1986–95, 1995–2006, and 2006–20, on the bases of growth and technological potentials. Support to these industries was largely provided through 'horizontal' industrial policy

[16] It was understood to be a situation in which a large number of firms competed in one sector, leading to a waste of resources due to things like unnecessary scrapping of sector-specific capital goods due to more frequent bankruptcies, duplication of R&D, and the lack of technology sharing. On the concept of 'excessive competition', see Chang (1994) and Amsden and Singh (1994).

measures (e.g. subsidies for R&D, physical investment, worker training), but some trade protection (heavier for more processed products) was also used. Export tariffs on some strategic industrial inputs, such as crude palm oil (which provided targeted support to the oleo-chemical industry reliant on it), were maintained. Investment licensing was continued, favouring capital-intensive investments through rules regarding the minimum investment per worker. Investment incentives were actually extended rather than reduced, after 1986. For example, the pioneer status, which allowed, among other things, exemption from corporate income tax for five (extendable to ten) years for firms entering new industries was granted to 12–17 per cent of investments in 1983–85 but to 24–28 per cent of investments in 2001–03 (Gustafsson 2007). Although yielding limited success in the expansion of domestic productive capabilities, these policies helped the vertical and horizontal diversifications of the Malaysian economy.

China

Initially, China was a Soviet-style administrative-command economy with industrialization efforts geared primarily towards developing the capital goods sector through direct state ownership of enterprises and through state control over the supply, distribution, and pricing of industrial production (Ellman 2014). After the 1978 reform, this evolved towards an activist strategic industrial policy in the context of the market system, private property, and production for profit.

During 1978–2004, China's industrial policy was strongly shaped by two motives—the increased pressure, both international and internal, for economic liberalization and the need to transform the planned economic system into an internationalized market economy (Heilmann and Shih 2013). By the end of that period, China became one of the most open among the world's major economies—the share of its exports and imports reached 71 per cent of GDP in 2005 (second only to Germany) and its average tariff was reduced to 40.6 per cent in 1992 and 4.9 per cent in 2005 (Dahlman 2009).

However, liberalization was done gradually and selectively. China rejected the 'shock therapy' and used a range of policies to develop domestic productive capabilities while protecting and restructuring domestic industries. One such strategy was the targeted use of FDI in EPZs. The Chinese government attracted FDI into specific sectors with the use of tax incentives, while extracting (formal and informal) concessions from the MNCs regarding local sourcing, joint ventures, technology transfer, and workforce training.[17] The government actively encouraged domestic enterprises—through direct control of SOEs, various subsidies, or direct negotiation with the management—to use EPZs' exposure to actively integrate domestic producers into the international market. For example, enterprises present in EPZs were encouraged to expand their supplier networks to include a larger number of domestic firms into the supply chain of EPZs-based MNCs. They were also integrating into international supply chains, learning organizational capabilities, or upskilling of technical staff. At the same time, the large network of EPZs enabled the country rapidly to expand manufacturing employment and its foreign exchange earnings, which were then used for importing more advanced technologies (machines or technology licences).

Over the course of liberalization, China has continued to promote infant industries. This has been done through a significant degree of state ownership (roughly 30 per cent of Chinese firms in 2013 were state-owned), the use of subsidized credit through state-owned banks, an extensive system of public procurement, various trade barriers for non-EPZ areas, and public investments (Dahlman 2009). It has tried to develop large-scale domestic firms by encouraging and facilitating mergers in

[17] Dahlman et al. (2007) give the example of Motorola, which agreed to conduct a training programme for the managers of 1,000 large Chinese SOEs.

an effort to create 'national champions' (Nolan 2001). The most comprehensive support was provided to sectors deemed important for national security, technological advancement, and the secure supply of strategic inputs (especially coal, electricity, telecommunications, and aircraft) (Chang et al. 2013).

Following the success of initial restructuring and the build-up of domestic production capabilities, China's strategy turned towards the development of native R&D capacity, the expansion of domestic linkages, and vertical diversification. These were the main goals of the sectoral industrial policies and national indicative planning programmes which followed the establishment of the National Development and Reform Commission in 2003–04. The number of national industrial policy programmes annually adopted rose from nil in 2003 to 15 in 2011.

Three such programmes deserve special mention. The first, the 2006 Medium and Long Term Programme of Science and Technology, provided funding for sixteen megaprojects in hi-tech sectors, such as pharmaceuticals, semiconductors, large commercial aircraft, and military industries (Chen and Naughton 2016). The second programme, Strategic Emerging Industries launched in 2010, aimed to develop twenty industries in seven broad categories, building on the aforementioned megaprojects. These industries accounted for 8 per cent of Chinese GDP by 2015 and 15 per cent by 2020 (Cheng and Naughton 2016). Lastly, in 2015, the Made in China 2025 initiative was launched, geared towards upgrading Chinese industries and achieving domestic contents of core components and materials of 40 per cent by 2020 and 70 per cent by 2025. It prioritizes high-tech sectors like aerospace, robotics, IT, energy, and pharmaceuticals (Wübbeke et al. 2016).

India

India's industrial policy of the early post-colonial period aimed to achieve economic independence through industrialization (Felipe et al. 2013). Its occupation of industrial 'commanding heights' allowed the Indian government to directly control investment (Singh 2008). Its development vision was implemented through the five-year plans of the Planning Commission, whose primary emphasis was on the development of capital goods industries, to enable indigenous industrialization. These and other key industries were to be state-owned. The private industrial sector was allowed but was to fully conform to the five-year plans through the so-called 'licence raj' system, which controlled all the key aspects of the business (scale and location of investments, minimum and maximum outputs, and imports).

Focused on achieving a high degree of self-reliance, India put little emphasis on competing in international markets and pursued an aggressive import-substitution (IS) policy, supported by high tariffs (the average weighted tariff was 83 per cent in 1990) and comprehensive import controls. FDI was highly restricted, especially following the 1973 Foreign Exchange Regulation Act. Such a degree of protection from international competition, when coupled with price controls, ensured significant margins to industrial enterprises, but there was no East-Asian-style government compulsion to improve performances. Some industrial policy measures during the IS period were successful. For example, the Indian government promoted the generic pharmaceutical industry by 'freeing' product patents through the 1970 Patent Act, setting up the Council of Scientific and Industrial Research labs, and introducing restrictions on MNCs (Chaudhuri 2013).

However, in many cases, industrial policy was constrained by ideological considerations. For example, in the electronics hardware industry, the policy favoured native innovation, even when it would have been much more effective to first acquire more advanced technologies through foreign

licensing and then build on them, as did the East Asian countries.[18] As another example, the Indian government restricted the scale of investment of large firms in order to protect small-scale enterprises, which were favoured for ideological reasons, rather than ensuring scale economies of factories set up, as was done in East Asia.

Most of these policies were later liberalized. In the 1980s, restrictions on imports of capital goods and on production capacity were relaxed, and targeted FDI became more widely used (Rodrik and Subramanian 2004; Kohli 2006; Nayyar 2006). A more dramatic shift came with the 1991 reform. The investment licensing system and state monopoly were abolished in almost all industries. FDI was allowed in the majority of sectors (at first up to 49 per cent and later up to 100 per cent of ownership). Industrial location policy and the Monopoly and Restrictive Trade Practices Act were abolished (Kohli 2006; Felipe et al. 2013). Trade was gradually liberalized—the average weighted tariff fell from 83 per cent in 1990 to 14.5 per cent in 2005.

More recently, the pendulum has swung back to an extent, with more activist national industrial policy plans. The first major such plan was the 2011 National Manufacturing Policy, which aimed to increase MVA in GDP from 16 per cent to 25 per cent by 2022, with the use of the so-called national investment and manufacturing zones, tax exemptions (e.g. exempting suppliers to Special Economic Zones from indirect taxes), and other incentives (e.g. covering the costs of filing for international patents) (Warwick 2013). Another was the 2014 Make in India initiative, aimed at attracting MNCs to set up production and design facilities through measures like further sectoral de-licensing, the building of industrial corridors, and the facilitation of greater government–business cooperation (especially through the Investor Facilitation Centre and the Invest India initiative).

3.3 Evaluating industrial policy experience in Asia—what can be learnt?

The choice of policies

Although the use of industrial policy in the post-Second World War period has enabled the majority of Asian economies to achieve sustained GDP per capita growth, it has yielded dramatically better outcomes in some countries.

It is clear that neoliberal policies—based on the principles of privatization, liberalization, and stabilization—have commonly brought about a decline in industrial dynamism. It is also clear that central planning has proven very ineffective in most areas. However, beyond that, there is no policy that has worked—or not worked—everywhere. Infant industry protection worked very well in Taiwan but failed in Pakistan. Export-orientation and FDI-friendly policies have helped Malaysia, but less so the Philippines. Regulation of domestic investment promoted rapid industrialization in Korea but hindered it in India. Moreover, some countries have been able to sustain good growth performance despite significantly changing their policies over time, while others have produced uneven results across time despite a consistent industrial strategy.

The point here is *not* that you can use any policies to succeed, but rather that the same policy tools can be used poorly or even misused. In other words, the difference between success and failure stems not only from *which* policies were used but *for what purpose* and *how* they were used. More specifically, the policy approaches of poorer performers have often neglected or abandoned the

[18] However, some of the investments made in establishing elite engineering institutes and domestic hi-tech hubs (most notably in Bangalore) later created the basis for the success of Indian ITC industries (Balakrishnan 2006).

objectives crucial to industrial catch-up, whereas successful countries have been willing to use any means at their disposal to pursue them.

Let us consider this in relation to some of the objectives listed at the beginning of Section 3. For example, to achieve economies of scale in production, the Chinese government facilitated the mergers of smaller enterprises to create 'national champions', while the Korean state used industrial licensing to encourage the establishment of large-scale factories. In India, in contrast, the same tools were often used to protect small-scale enterprises, with serious negative implications for industrial efficiency and dynamism. As another example, subsidized credits in Korea were rationed in a way that maximized the developmental benefits of the resulting investments. In Malaysia, their rationing was largely guided by ethnic considerations, often restricting the growth of more capable (Chinese-owned) firms. As yet another example, Korea, Taiwan, and India all restricted FDIs and put conditions on them, but the East Asian economies did so to maximize the development of domestic productive capabilities, while India did the same to minimize the involvement of foreign capital.

In short, what distinguishes the less successful performers is less the policy tools used than the neglect of the objectives crucial for achieving industrial catch-up, such as the achievement of scale economies and the development of domestic productive capabilities.

Pragmatism and adaptability

Common to the success stories of industrialization in East Asia was the degree of pragmatism characterizing their policies. They were willing to adopt any tools or approaches deemed beneficial for industrial catch-up, even when they went against their overall ideological position.

In all the successful industrializers, industrial policy was built neither on blind trust in markets nor on its full substitution by state control. For example, the Korean state severely regulated many markets, but this was done to ensure scale economies (investment licensing) or to prevent 'wasteful competition' (price controls, government-sanctioned recession cartels). While protecting national firms from international market forces through infant industry protection and subsidies, it exposed them to international market forces by pushing them to start exporting early. As another example, despite its initial ideological opposition to capitalism, China liberalized its economy through the dual-track pricing system, which provided (temporary) protection to SOEs from market forces, while allowing them to sell for profit and learn to compete in the market.

We can see the same kind of pragmatism in the choice of concrete policy tools. For example, despite the very aggressive general stance they took against FDI, Korea and Taiwan were flexible enough to actively court MNCs in industries like garments, shoes, stuffed toys, and electronics assembly, in the early days of industrialization, recognizing their abilities to generate the extra foreign exchanges needed for industrial upgrading. Singapore very much relied on FDI, but was selective, rather than 'even-handed', in choosing which firms in which sectors to host. China has relied far more heavily on FDI and imposed far fewer *formal* conditions on MNCs regarding ownership and performance requirements (e.g. local sourcing, export) than Korea or Taiwan have, but has fully exploited its strong bargaining position (coming from large domestic markets, good quality infrastructure, and workers with good skills) to impose many *informal* conditions regarding technology transfer, local sourcing, worker training, and so on.

As another example, the Korean government had a clear preference for domestically owned private sector enterprises, but willingly set up SOEs when necessary (see the case of POSCO referred to earlier), nationalized private sector firms in trouble (although usually privatized them again when they were nursed back to health), and granted 100 per cent foreign ownership to MNCs in the

EPZs. The Singapore government may have used free-trade policy and welcomed MNCs, but it heavily uses SOEs (they produce around one-fifth of GDP—one of the highest such ratios outside the oil economies) and owns 90 per cent of the land (and aggressively exploits the position for industrial policy purposes).

Furthermore, the more successful East Asian economies were willing to quickly and/or significantly adapt their policies to changing internal and external conditions. Korea, despite its huge success in labour-intensive manufacturing industries (textiles, garments, shoes, wigs, and stuffed toys) in the 1960s, started developing heavy and chemical industries in the early 1970s, when the wage costs showed a sign of rising, even though the country was able to remain competitive in most of those industries (except wigs) well into the 1980s. Had it not taken early action to develop a new generation of export industries (e.g. shipbuilding, automobiles, electronics), Korean industrialization may have fizzled out by the 1980s. The most dramatic example of adaptability is China's liberalization. At the turn of the 1990s, the Chinese economy was unable to compete in the international capitalist trading system. However, after rejecting the then prevalent neoliberal 'shock therapy' in favour of a gradualist approach to industrial policy reform, not only did its economy avoid the traumatic collapse and then the prolonged slump experienced by the USSR and its satellites, but it has become one of the most successful industrializers in recent history.

Enabling conditions

The question as to why some countries have more effective industrial policy regimes has been discussed broadly in the literature on the so-called developmental state (see Evans 1995; Leftwich 1995; Woo-Cumings 1999, among others). Two broad factors are worth mentioning here.

First, it has been frequently emphasized that the existential threat that the East Asian countries faced from their communist neighbours forced their leaders to prioritize industrial catch-up and enabled them to impose 'harsh' but necessary policies for rapid industrialization, such as suppression of wage demands, repression of consumption, low welfare spending, and restrictions on civil liberties. The logic driving such thinking is perhaps best captured by the quote of Sun Yat-sen that 'the nation without foreign foes and outside dangers will always be ruined' (Wade 1990). In Myrdal's terms, existential threats contributed to the changes in the attitudes of both the (political and economic) elites and the population at large, thereby enabling the institutional changes and policy reforms necessary for economic development.

The importance of existential threat, however, should not be overstated, as there is no inevitable relationship between external threat and successful industrialization. The existential threat posed to each other by Pakistan and India has not led to the emergence of developmental states, while the Korean state itself was not 'developmental' in the 1950s, despite having the same (or an even more serious) existential threat as that of the 1960s. These examples show that human agencies (both of the elites and people) are critical in determining the effect of external threats on industrialization. Moreover, independently of external threats, nationalism—often expressed in the form of revanchism against the Japanese—was a key motive in countries like Korea and (later) China (see Duara forthcoming, 2018, on the role of nationalism on development in Asia).

Second, the more successful Asian countries have exhibited higher state capacity. Two aspects are important here. One is the technical capacity—namely, the ability of the policy-makers to design and implement the context-sensitive and technically demanding policies described above. The other is the political capacity to maintain what Evans (1995) calls the 'embedded autonomy'—namely, the ability of the policy-makers to resist the pressure of sectional interests in formulating

and implementing industrial policy while being attentive to the needs of different economic actors.[19]

However, it should be noted that high state capacity in East Asia was developed *alongside* success in industrialization, rather than prior to it, as is often believed. A good case in point is Korea, which until the late 1960s was sending its bureaucrats for extra training to the Philippines and Pakistan. It is also not as if China's rapid industrialization since the 1980s was preceded by a vast upgrading of the country's administrative apparatus. It has only been over a period of a couple of decades that these countries have been able to transform their corrupt and incompetent bureaucracies into some of the most efficient state machinery (see Chang 1994 for the Korean and the Taiwanese cases).

4 Conclusion

In the five decades following the publication of Myrdal's *Asian Drama*, developing Asia has witnessed a remarkable structural transformation. Its experience has conformed to the two tenets of early development economics—the belief in industrialization as the key motor force behind economic development and the view that an active industrial policy is instrumental for guiding industrial development.

Each of the Asian growth miracles has been underpinned by comprehensive industrialization. At the same time, while all Asian regions—and almost all Asian economies—have industrialized faster than the world average, there are staggering differences between their performances.

The most successful cases, apart from Hong Kong, have been based on activist industrial policy of one kind or another. Even though these countries have seen significant policy liberalization since the 1990s, they still have more active industrial policies than their counterparts elsewhere. Moreover, the fastest-growing major economy since the 1990s—China—has had one of the most comprehensive industrial policies in the region, and indeed in the world.

Although the activist industrial policy has been a common feature among more successful industrializers, what set them apart has been a striking degree of pragmatism in the pursuit of developmental objectives. Their choice of policies, rather than being dictated by dogmas, often strayed from the ideological preferences. Instead, these economies were willing to change policies whenever they were proving to be insufficient or to adapt them to changes in domestic and international conditions.

These observations remain just as relevant for the decades ahead. Those sceptical of the continued relevance of industrial policy point to the changes in the global production landscape (especially the dominance of 'global value chains' controlled by MNCs from rich countries) and the narrowing of the policy space under the World Trade Organization (WTO) and various bilateral and regional trade and investment agreements (Pack and Saggi 2006; Warwick 2013). Yet the rejection of industrial policy on such bases amounts to interpreting it as another dogmatic policy template.

Even though it is true that a narrower policy space makes some of the old tools of industrial policy (e.g. export subsidies, local content requirements for FDI) unavailable, many of them can still be

[19] Interestingly the concept of 'embedded autonomy' defines the opposite situation to what was described by Myrdal (1968) as a 'soft state'. He describes it as a situation where the state is not able to enact or enforce its policies against the interests of social groups.

used. A number of industrial policy measures are not related to trade and are therefore beyond the WTO's jurisdiction (e.g. targeted subsidies for investment or skills development, promotion of strategic M&A), while many of the trade-related measures are still allowed (e.g. tariffs, R&D subsidies, technology transfer requirements for FDI) (for further discussions, see Chang et al. 2016: chapter 5). In these circumstances, the pragmatism in policy design and its adaptability—that have marked the performance of successful Asian policy-makers—remain just as important in future years.

The increased importance of global value chains does make it more difficult for developing economies to compete against MNCs in final goods markets. However, global value chains also create opportunities for those countries to specialize in intermediate goods. Rather than making industrial policy obsolete, this creates new roles for it. More policy measures will be needed to help firms develop capabilities in quality control, abilities to coordinate R&D with buyer firms, and workers' skills (as intermediate goods tend to be more skill-intensive than final goods), among others. Once again, successful industrial catch-up in the face of these and other challenges will require an ability to skilfully adapt a country's industrial policy.

These considerations are present to a varying degree in the cases of new activist industrial policy initiatives unveiled in countries of the region such as China or India. Although their effectiveness remains to be seen, the upcoming challenges of this century, including the need to face the environmental crisis, require perhaps an unforeseen degree of adaptability in guiding structural change, and policy-making going beyond established dogmas.

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Appendix tables

Table A1: 'Developing' Asia regional MVA and population shares

'Developing' Asia region	Global share of	1970 (%)	MVA/population shares ratio 1970		2015 (%)	MVA/population shares ratio 2015
Eastern Asia*	MVA	1.60	0.067		25.30	1.251
	Population	23.74			20.22	
Southern Asia	MVA	0.97	0.048		3.83	0.154
	Population	20.14			24.80	
South-Eastern Asia	MVA	0.75	0.098		3.56	0.413
	Population	7.64			8.62	
Western* Asia	MVA	0.88	0.461		2.37	0.752
	Population	1.91			3.15	

Note: a. Regions marked with * exclude economies classified in database as developed—Japan for Eastern Asia and Israel for Western Asia.

Sources: Authors' calculations using MVA and population figures for regions taken from UNCTADstat (UNCTAD 2017) database and World Bank (2017) used to calculate Chinese 1970 MVA estimate.

Table A2: Gross fixed capital formation as % of GDP

	1961–1965	1966–1970	1971–1975	1976–1980	1981–1985	1986–1990	1991–1995	1996-2000	2001–2005	2006–2010	2011–2015	1961–2015
China	18.1	20.3	25.7	29.1	29.5	29.2	32.8	33.0	38.1	41.7	44.9	31.1
Singapore	16.8	24.0	36.1	35.6	44.2	32.3	33.9	36.2	26.2	26.3	26.6	30.7
Japan	32.1	33.9	35.9	32.4	29.8	31.1	30.9	28.6	24.9	23.3	23.0	29.6
Korea, Rep.	13.2	24.2	24.8	31.4	29.8	32.3	37.7	33.3	30.9	30.9	29.5	28.9
Viet Nam*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26.3	29.7	33.0	24.6	28.1
Malaysia	19.1	18.2	25.2	25.9	33.3	26.9	39.1	31.9	22.9	21.9	25.2	26.3
Thailand	15.9	21.5	22.9	25.5	27.8	31.8	40.3	28.1	24.0	25.2	25.5	26.2
Hong Kong SAR, China	30.7	19.5	22.5	26.6	26.2	24.5	28.0	29.4	22.7	21.2	23.8	25.0
World	22.5	23.1	25.2	25.6	24.3	24.3	23.5	23.5	23.4	24.0	23.4	23.9
India	15.5	15.2	16.2	18.7	21.1	24.2	24.4	25.3	28.6	34.4	31.7	23.2
Indonesia	25.6	9.3	17.9	20.6	22.6	26.1	27.5	24.7	20.9	27.8	32.3	23.2
Sri Lanka	14.5	16.1	13.9	21.1	27.3	22.6	24.7	25.7	21.6	24.5	27.8	21.8
Philippines	18.4	19.6	19.5	25.9	24.9	18.9	22.1	22.8	20.5	19.8	20.3	21.2
Pakistan	19.2	15.3	12.9	17.5	16.8	17.1	18.1	15.7	15.7	16.5	13.3	16.2
East Asia and Pacific	23.8	25.7	29.0	29.7	29.1	29.4	31.4	30.0	29.8	31.0	32.1	29.2
OECD members	23.9	24.6	25.4	25.0	23.8	24.1	22.6	22.9	22.3	21.9	20.7	23.4
South Asia	15.8	15.3	15.8	18.6	20.6	22.9	23.4	24.2	26.9	31.8	29.5	22.2
Latin America and Caribbean	n/a	n/a	21.0	22.8	19.6	19.9	18.9	19.1	18.2	20.1	20.6	20.0

Notes: a. Countries ordered from highest to lowest average GFCF as % of GDP in the 1961–2015 period (last column). b. Vietnamese full period average is for 1994–2015 only, since earlier data is not available.

Source: Authors' calculations based on UNCTAD (2017) database.