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From Commodity Booms to Economic Miracles:
Why Southeast Asian Industry Lagged Behind

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Abstract

Except for the Philippines between 1896 and 1939, Southeast Asia was never part of the century-long East Asian industrial catching up until after World War II. Before the 1950s, Southeast Asian manufacturing hardly grew at all: while commodity export processing did grow fast, import-competing manufacturing and manufacturing for local consumption did not. Singapore and Thailand started recording catching up growth rates on the western leaders only from the 1950s onwards, and Indonesia and Malaysia joined the club only after 1973. Even then, Southeast Asia did not record catching up growth rates on Japan or Taiwan until after 1973 and 1990, respectively. The only Southeast Asian country that appeared to have joined the fast industrial growth club before World War II – the Philippines -- had its industrial growth collapse after the ISI years. What explains this dismal industrial performance before the 1960s? Why did Southeast Asia become a rapid export-led manufacturing growth success story after the 1960s while it did not in Latin America, the Middle East, or South Asia? In seeking answers, we distinguish four periods: de-industrialization and commodity export growth before 1913; a modest diversification into manufacturing during WWI and the interwar years; the development of consumer goods production under import substitution policies between the 1940s and the 1960s; and finally the high speed export-led industrialization since. We show how factor endowments, demography, schooling, second-best institutions, foreign markets, and, especially, good luck mattered.

Key words: Manufacturing growth, Southeast Asia, history
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I. Introduction

Three Southeast Asian nations -- Indonesia, Malaysia, and Thailand -- emerged unexpectedly in the 1960s and 1970s as fast growing manufacturing countries. While starting from very low manufacturing output per capita levels, they became successful in promoting export-led labor-intensive manufacturing. Their manufacturing growth rates closely matched that of Japan, South Korea, and Taiwan for more than two decades, and their performance attracted extensive foreign direct investment.[1] This sudden growth "miracle" took place in the context of political instability and ethnic tensions, after more than two decades of modest success with post-independence import substitution industrialization (ISI) strategies. During the 1950s, these countries experienced low per capita GDP growth due to the combination of rapid population growth and a slowdown in the expansion of agriculture and mining, two sectors which had until then been the main engines of growth. Led by manufacturing, growth accelerated from the 1960s onwards: the share of manufacturing[2] in GDP rose in Thailand and Malaysia from about 10 percent in the late 1950s to more than 20 percent in the late 1970s. In Indonesia, the upward trend started only in the 1970s but afterwards followed the same trajectory (Figure 1). These achievements were acknowledged by the World Bank in its *East Asian Economic Miracle* report (World Bank 1993) as almost matching South Korean and Taiwanese export-led industrial success a bit earlier.[3]

[Figure 1 about here]

Neither the emergence of Mainland China as an industrial power in the 1990s, and thus a competitor,[4] nor the Asian financial crisis of 1997, had an impact on the long-term trajectory of these industrial-emerging Southeast Asian nations. By the early 2000s, the share of manufacturing in Thailand's GDP had reached around 35 percent, well above South Korea, and

[1] Singapore was the industrial pioneer in Southeast Asia in the 1950s and 1960s. But since it was essentially linked to British Malaya before independence, since it benefited from its position as a service hub for the entire region, since it was a city-state, and since it was of such small size, it is excluded from our analysis.
[2] Manufacturing is defined here as including UN Statistical Office ISIC divisions 15 to 37.
[3] Japanese manufacturing development in the late 19th and early 20th century relied to a large extent on import substitution and domestic demand. Thus, it continued to play an important role in the post-war period even under export-led growth. See Chapter X by Perkins and Tang in this volume.
[4] See Chapter 11 in this volume on China by Brandt, Ma, and Rawski.

remained at that level for a decade, while it peaked above 30 percent in Malaysia and Indonesia, before declining to 25 percent. In contrast, Turkey's manufacturing share had followed a trajectory almost identical to that of Malaysia until the late 1990s, after which it declined steadily to below 20 percent in the mid-2000s.[5]

The view that Southeast Asian countries shared common growth fundamentals gained more credibility when Cambodia and Vietnam joined the export-led manufacturing boom in the 1990s, and when even Myanmar joined the club in the 2000s. The only Southeast Asian nation to miss the "miracle" was the Philippines. While it posted impressive manufacturing growth rates from the early 20th century to the 1960s, it stagnated thereafter. Still, the share of Philippine manufacturing in GDP reached about 25 percent by the 1960s.

Before the 1960s, Southeast Asian manufacturing had exhibited a dual structure: on the one hand, small cottage industry workshops using native labor-intensive technologies, on the other hand, a few medium or large scale enterprises mostly involved in processing rice, sugar, tin, oil, and other commodities. These commodity-processing firms used imported capital-intensive technology and were owned and operated mostly by Chinese immigrants, Indian immigrants, or Westerners. Manufacturing accounted for a small share of employment, typically below 10 percent (including the cottage industries).

Although it did not show signs of rapid industrial growth before World War II, Southeast Asia did experience impressive GDP per capita growth, close to 1 percent per annum between 1870 and 1940. GDP grew at about the same rate between 1940 and 1970 as before 1940, but since population growth accelerated, GDP per capita stagnated or declined (Maddison 2003). The share of manufacturing in GDP remained constant until the 1960s, from which it follows that manufacturing output growth barely exceeded population growth. Table 1 reports annual real industrial output growth 1870-2007 for three world leaders – Germany, United Kingdom, and the United States, the two Asian giants – China and India, and three East Asian late 20th century economic miracles -- Japan, Korea (South Korea after 1945), and Taiwan. The industrial history is broken up into two pre-World War I episodes (1870-1896, 1896-1913), the World War I years (1913-1920), the two interwar decades (1920-1938), the ISI years following World War II (1950-1973), and the two periods up to the present (1973-1990, 1990-2007). During this long century, Japan, South Korea, and Taiwan recorded catching up growth rates on the western

[5] See Chapter 8 in this volume on the Middle East by Karokoc, Pamuk, and Panza.

leaders, and they were the fastest catching up rates in the periphery. Between 1896 and 1990, the unweighted average of their growth rates exceeded that of the world leaders by: 2.7 percent 1896-1913, 7.1 percent 1913-1920, 4.2 percent 1920-1938 – all long before any postwar growth miracles. The figures were 7.1 percent 1950-1973 and 7.3 percent 1973-1990.

Except for the Philippines between 1896 and 1939, Southeast Asia was never part of this East Asian industrial catching up until after World War II. Before the 1950s, most industrial sectors in Southeast Asia hardly grew at all. For example, only 7.1 percent of the Malayan labor force was employed in manufacturing in 1921, declining to 6.9 percent in 1931, and rising only modestly to 9.8 per cent in 1947 (Huff 2002: 1082). Singapore and Thailand started recording catching up growth rates on the western leaders only from the 1950s onwards, and Indonesia and Malaysia joined the club only after 1973.[6] Even then, Southeast Asia did not record catching up growth rates on Japan or Taiwan until after 1973 and 1990, respectively, and never on South Korea. The only Southeast Asian country that appeared to have joined the fast industrial growth club before World War II – the Philippines[7] -- had its industrial growth collapse after the ISI years (de Dios and Williamson 2015).

[Table 1 about here]

What explains this dismal industrial performance in Southeast Asia before the 1960s? Why did Southeast Asia become a success story of rapid export-led manufacturing growth after the 1960s while it did not in Latin America, North Africa, the Middle East, South Asia, or Sub-Saharan Africa? To answer these two questions, we focus on Indonesia (Netherlands East Indies until 1947), Malaysia (Malaya, Sabah, Sarawak, and Straits Settlements before 1957[8]), Myanmar (Burma until 1989), the Philippines, Thailand (Siam until 1939), and Vietnam (part of French Indochina before 1949). We distinguish four periods: de-industrialization and commodity export growth before 1913; a modest diversification into manufacturing during WWI and the interwar years; the development of consumer goods production under import substitution policies between the 1940s and the 1960s; and finally high speed export-led industrialization up to the 1990s, helped greatly by FDI but primarily driven by improvements in education and the

[6] Between 1913 and 1934, industry's share in GDP rose in the Philippines from 16.1 to 23.8 percent (Hooley 2005: Table A.1), while it rose only marginally in Indonesia and Thailand (Booth and Deng 2014: Table 3); manufacturing accounted for around 25 percent of GDP in the Philippines in the early 1960s, while the share was around 8 percent in Indonesia, Malaysia, and Myanmar, and 13 percent in Thailand. See Figure 1.

[8] The Federation of Malaya was established in 1948 to unify British Malaya except Singapore under British colonial rule, and the British colonies of Sabah (then North Borneo), Sarawak, and Straits Settlements (less Singapore), and became independent in 1957. Singapore joined Malaya in 1963, to form Malaysia, and then left in 1965.

demographic dividend that made young, literate labor abundant, particularly through the rapid rise of female labor force participation. To gauge the magnitude of the Southeast Asian industrial lag, we compare the region with Japan and Korea, the major success stories in Asia before China's emergence.[9]

II. Southeast Asia in the first global century: de-industrialization and commodity processing

The idea that the Third World suffered de-industrialization during the 19th century has a long pedigree.[10] However, quantitative evidence on the level of industrial activity in the 19th century Third World is scant, and Southeast Asia is no exception. Most de-industrialization assessments rely on very sparse employment and output data. Manufacturing output is relatively easy to estimate for commodity processing, as these activities followed closely commodity exports. In Southeast Asia, they included rice milling in Bangkok, Rangoon, and Saigon, the three major hubs of the rice-exporting deltas of the Chao Phraya, Irrawaddy, and Mekong rivers, sugar milling in Java and the Philippines, and tin processing in Malaysia (joined by rubber processing in the early 20th century). These manufacturing activities were undertaken mostly in enterprises owned by foreigners (Chinese immigrants, along with Indian immigrants in Burma, and Westerners) and they used imported capital goods such as milling and processing machinery powered by steam engines. This equipment was imported mostly from Britain, Germany, and France, and they were operated by Western engineers, Chinese and Indian (in Burma) skilled workers, and local unskilled workers (including Chinese and Indian immigrants).

We do not have enough information to provide a quantitative assessment of the collapse of domestic textile production in the late 19th century as a consequence of the flood of cheap British and Indian cotton yarn, and cheap Japanese and Chinese silk yarn. But qualitative evidence offers little doubt that a collapse in domestic yarn production took place all across Southeast Asia. However, much of Southeast Asian imported (factory-made) yarn was processed into fabrics and dyed by local artisans.[11] Thus, the decline of the indigenous textile industries

[9] China is not included in the comparison given the paucity of data available for the pre-WWII period.
[10] Williamson (2011: Chapters 5 and 6).
[11] This is well documented for Java (Boomggaard 1991; van der Kraan 1991), central and northern Vietnam (Gourou 1936: 460, 527; IGMI 1943: 51), and the Philippines (Legarda 1999).

was partly offset by the specialization of cottage industry in products enjoying "home preference".

Price data are much more plentiful, and, as a consequence, the terms of trade can be used as a proxy for the de-industrialization forces facing Southeast Asia up to the early 20th century: as manufactured import prices fell – driven by productivity growth by the industrial leaders, domestic production collapsed, and commodity export sectors expanded – driven by booming commodity prices pushed upwards by European demand. Such evidence suggests that while de-industrialization occurred everywhere in the poor periphery, it was much more dramatic in Southeast Asia than elsewhere (Williamson 2011: Chapter 3). The long commodity price boom turned around after World War I, something that should have favored re-industrialization, except, as we shall see below, that skill scarcity, strong Japanese and Chinese competition, and adverse colonial fiscal, monetary, and commercial policies, all served to mute its impact. While these forces were shared everywhere in the poor periphery, they were more dramatic in Southeast Asia and Sub-Saharan Africa (Frankema, Williamson, and Wolter 2015) than elsewhere. To make matters worse for local manufacturing, labor was relatively expensive in this resource-abundant frontier region.

Figure 2 plots the net barter terms of trade[12] (1900=100) from 1782 to 1913 for Indonesia, Malaya[13], the Philippines, Siam, and Southeast Asia as a whole. While the Philippines and Siam underwent a spectacular price boom up to the 1860s, Indonesia's boom was more than twice as steep and much longer, peaking in 1896. Not only was it the biggest terms of trade boom in Southeast Asia, it was also the biggest in the poor periphery. Since the Indonesian population was so large compared with the rest of the region, its trend dominates the Southeast Asian average.

[Figure 2 about here]

Did the biggest terms of trade boom produce the biggest de-industrialization of import-competing manufacturing? The answer is definitely yes. In Java, textile manufacturing was about 15 percent of GDP in the 1820s (van Zanden 2002), a figure which suggests that

[12] A country's net barter terms of trade is simply the ratio of its average export price to its average import price, where the averages are weighted by the relative importance of the traded goods in total exports or total imports.

[13] Malaya 1882-1913 is plotted in Figure 2, but it starts much too late to be included in the analysis reported below. Since doing the analysis, Professor Huff has shared with us new terms of trade data for Malaya 1872-1939 (May 6 2015). To give some sense of timing and magnitudes, peaks and troughs are: 1872 100, 1878 46.6, 1888 111.6, 1896 49, 1911 141.7, 1925 93.3, 1931 33.5, and 1939 69.3.

manufacturing may have been as much as a fifth of total GDP at that time. By the early 1850s, it had fallen by half, to 6-7 percent of GDP. The share of the home textile market supplied by Indonesian producers dropped from about 82 to 38 percent from 1822 to 1870, before falling still further to about 11 percent in 1913 (Williamson 2011: Table 5.3). This evidence confirms dramatic de-industrialization in Indonesia up to World War I.

Indonesia was not alone in suffering de-industrialization, since it happened everywhere in Southeast Asia. By the late 1890s, Burma's "textile industry had suffered a serious decline and it was finally … destroyed by the 1920s" and "weaving …, spinning, iron and metal making, pottery … and paper making" had declined in Siam (Resnick 1970: 57 and 60). Like Indonesia, the Philippines started the 19th century with a well-developed textile industry. Indeed, by 1818 local cloth accounted for 8 percent of Manila's exports:

> "The province of Iloilo … developed valuable *piña*, dyed in bright and varied colours. This was woven chiefly with pineapple fibre, but might also contain cotton, silk and *abacá*. The industry sucked in migrants from far and wide … selling as far afield as Europe and the Americas" (Clarence-Smith 2005: 8).

By 1847, almost 60 percent of Philippine imports were textiles, and they increased nine-fold over the half-century that followed (Legarda 1999: 149-50). By the 1880s, "native textiles were in a sad state" (Legarda 1999: 155). Spanish authorities did not use tariffs to fend off the flood of European manufactures. Indeed, the Philippine tariff system was thoroughly liberalized in the late 1860s (Legarda 1999: 198 and 205), as it was in Indonesia (Booth 1998: 215-16). In short, it does indeed appear that Southeast Asia underwent the biggest terms of trade boom, the biggest Dutch disease, and thus the biggest de-industrialization in the global periphery.

[Figure 2 about here]

Although commodity export prices (and thus terms of trade) boomed up to World War I, Southeast Asia was subjected to great terms of trade volatility and thus investment uncertainty in all sectors including manufacturing. Table 2 documents that terms of trade volatility between 1865 and 1913 was 2.7 times greater than that of the three industrial leaders, and 1.5 times the leaders even in the turbulent interwar decades. The four Southeast Asia countries which had the most commodity price volatility included Burma and Thailand (both major rice exporters). Malaya did not have a long enough time series to be included in Table 2, but its two key exports,

rubber and tin, had great price volatility and thus so did its economy.[14] The same applies to Vietnam, with rice accounting for about 70 percent of total exports from the late 19th century to 1945. [15] The role of commodity price volatility in suppressing incentives in import-competing industries has been well-established by economists (Acemoglu *et al.* 2003; Hnatkovska and Loayza 2005; Fatás and Mihov 2006; Loayza *et al.* 2007; Poelhekke and van der Ploeg 2009) and economic historians (Huff 2002; Williamson 2011, 2012), so there is no reason to doubt its role in Southeast Asia.

[Table 2 about here]

An additional factor explaining the decline of Southeast Asian manufacturing in the late 19th and early 20th century is related to expensive labor relative to competitors such as Japan. Most of Southeast Asia was land abundant and labor-scarce, as evidenced by the very low population density there compared with Northeast Asia (Table 3). The only exceptions were Java (in Indonesia), the Red River delta (in northern Vietnam), and the western part of Luzon (in the Philippines), but even these areas were close to extensive agricultural margins. In addition to high land/labor ratios, Southeast Asia enjoyed high labor productivity in agriculture by Asian standards (van der Eng 2003). As urban and rural labor markets were well integrated throughout Southeast Asia, this resulted in high wages in urban cottage industries and commodity processing manufacturing. The massive inflow of Chinese and Indian workers was not sufficient to induce a convergence of labor costs within the region and between it and the labor-abundant sources of its immigrants since the land frontier remained wide open until at least the 1920s in the midlands and highlands surrounding high density areas of Java, the Red River delta, or central Luzon, and until the 1960s in the rest of Southeast Asia. Until the 1890s, nominal daily wages of unskilled workers, measured in grams of silver, were higher in Bangkok, Jakarta, Penang, Rangoon, Singapore and Surabaya than in Tokyo (Bassino and van der Eng 2013). Since the skill premium was much lower in Japan than in Southeast Asia, Japanese skilled labor remained cheaper than in most Southeast Asia cities until at least the 1910s. Under these circumstances, the most profitable manufacturing activities were involved in commodity processing, in particular milling

[14] By the late 1920s, rubber and tin accounted for 68.6 percent of total Malayan merchandise exports (Huff 2002: 1077). New terms of trade data for Malaya confirms huge price volatility there from 1870 to 1913. See footnote 14.
[15] Brenier (1914) and Annuaire Statistique de l'Indochine (various years).

and mining, but certainly not in labor-intensive manufacturing. Southeast Asia simply had no comparative advantage in labor-intensive manufacturing prior to the interwar years..[16]

[Table 3 about here]

III Slow industrial growth in Southeast Asia in the interwar years

After World War I, commodity prices collapsed, the terms of trade fell with it (Table 1), and the relative price of import-competing manufactures rose in domestic Southeast Asian markets. Between 1913 and 1932, the terms of trade for Indonesia and the Philippines fell by 40.6 and 76 percent, respectively, and they had not recovered by 1949 (still 22.9 and 34.7 percent below 1913). The rice exporters Burma and Thailand suffered more modest declines from 1913 to 1932 (Burma down 12.6 percent, and Thailand down 27 percent), and both had surpassed 1913 levels by 1949 and the subsequent run-up to the Korean War peak. Malayan rubber prices fell by 86 percent from 1910/19 to 1930/39, and its terms of trade fell by 51.1 percent (see footnote 14). But in spite of the rise in the relative price of import-competing manufactures, Southeast Asian manufacturing did not expand by much.

Industrial growth in interwar Southeast Asia was slow due to the combined effects of colonial exchange rate appreciation policy, skill scarcity, expensive unskilled labor, and Japanese and Chinese competition. Nevertheless, some diversification and deepening of modern manufacturing *did* occur during the interwar decades.[17] And in some cases, modest pro-industrial colonial policy did help pave the way for the postwar "miracles".

First, it is important to keep in mind the role of commodity price volatility when searching for causes of lagging industrial development. Pre-World War II Southeast Asian economies were exposed to enormous world price shocks. The volatility of commodity prices already reported for the pre-1913 years was even greater between 1913 and 1940 (Table 4). For example; the international demand for rice from Burma, Indochina, and Siam, and sugar from Java,[18] declined sharply in the 1930s. Their export bundles were dominated by just one or two

[16] The same was true of Sub-Saharan Africa. See Chapter 7 on Africa in this volume by Austin, Frankema, and Jerven.

[17] For instance, in the case of Vietnam in the mid-1920s, the production of cement, glass, paper, matches in relatively large scale industrial plant employing several hundreds workers, along with the production of electric porcelain insulators, explosive, paint, and various basic chemical products in industrial plants employing more than one hundred workers (GGI 1928).

[18] Philippine sugar exporters had access to a protected US market.

commodities (Table 5), reflecting their specialization, so that the price behavior of one commodity was not offset by the behavior of others. In addition, exports were a very large share of GDP. Between 1901 and 1938, that share (in percent) was 30-48 in Burma, 28-34 in the Philippines, 18-25 in Vietnam, and 12-26 in Indonesia (Table 6). Since so much of rural household output was not marketed, the export share in marketed value added might have been double these figures.

[Tables 4, 5, and 6 about here]

Second, it is important to keep in mind that there were three kinds of manufacturing in the commodity exporting economy – import competing, commodity processing, and local non-tradable. Commodity price booms suppressed import-competing industrial growth (the relative price of manufactures fell). Commodity price busts (the relative price of manufactures rose) improved the profitability of import-competitive manufacturing, but they hurt commodity processing -- since export demand was falling, and they hurt local production of non-tradables -- since local demand shrank during the bust. Total manufacturing in the interwar years was dominated by the latter two, so manufacturing was hurt by commodity price busts. In contrast with resource-poor China, Northeast Asia and much of the European periphery, any analysis of Southeast Asia (and Sub-Saharan Africa) must focus on the mix between those three manufacturing activities.

Third, the secular decline in Southeast Asia's net barter terms of trade between the World Wars should, other things constant, have stimulated import competing activities. But, as we shall see, other things were not constant.

Dutch disease models are common in the development and growth literature, and they have been used to inform the "resource curse" debate as to whether an abundant resource endowment implies poor growth prospects.[19] But that debate is not about manufacturing but rather about income per capita growth, and the latter was not slow in Southeast Asia over the first three quarters of the 20th century. Indeed, three of the five regions where GDP can be documented – Malaya, the Philippines, and Singapore – had jumped over the Kuznets modern economic growth hurdle -- namely per capita income growth of 1 percent or higher during a sustained period -- for the quarter century 1913-1938. The GDP per capita growth rates were 2.4 percent for Indonesia and 3.5 percent for the Philippines 1902-1913 (Maddison 2010). For the

[19] It is somewhat of an irony that the term Dutch disease applies best to the Dutch East Indies.

six decades 1913-1973, four Southeast Asian nations had jumped over the Kuznets hurdle. So, with the exception of Burma, the "curse" certainly wasn't manifested by poor GDP per capita growth in pre-World War II Southeast Asia. Rather, it was manifested by slow or even non-existent industrial growth (Table 1).

To account for this poor industrial performance, it is conventional to start with colonial policy. Britain was opposed to industrial development in their colonies on ideological free trade grounds. The French may have been a little less so, but neither wanted to lose their colonial markets for their exports. America forged free trade arrangements with the Philippines during the interwar years. So, protection of domestic manufacturing was excluded there. Colonial tariffs were raised a bit in the 1930s to shore up collapsing colonial revenues, but this certainly didn't constitute an industrial development policy, except late in the decade. Nor were subsidies used to help import competing industries, no doubt partly because they would have been a drag on net colonial revenues. Colonial policy also muted any anti-Dutch disease forces. The Dutch disease model we find most helpful is one applied by Gregg Huff to pre-World War II Malaya (Huff 2002). Although Huff draws extensively on the larger Dutch disease literature -- led by Max Corden and Peter Neary (1982) and Cordon (1984) -- he adds three colonial dimensions that make the de-industrialization forces powerful even during commodity price busts: credit scarcity, shrinking domestic markets, and the absence of currency depreciation since colonial commitments to sterling exchange and gold standards made the latter impossible. On credit scarcity and shrinking domestic markets, Huff has this to say about Malaya during commodity price busts:

> "[A]lthough would-be industrialists benefited from a favorable [relative manufacture's price] and so more attractive cost-price structure, a downward shock to credit supply and accompanying shrinkage in the size of the Malayan market effectively worked against any shift to manufacturing (Huff 2002: 1093)."

On the inability of colonial economies to depreciate their currencies during a commodity price bust, Anne Booth (1998: 231-3) offers the best Southeast Asia example, namely that Indonesia's real exchange rate *appreciated* during most of the pre-World War II years. French Indochina offers another example. Colonial authorities took into account the importance of China as the main market for Indochinese rice, and therefore kept the *piaster* on a silver standard but shifted their monetary policy to adopt a French franc peg in 1930. The decision was ill advised since the

franc became a gold exchange standard currency, the Indochinese rice exporters underwent a loss of competitiveness due to the appreciated *piaster*. The story of fixed colonial exchange rates was pretty much the same elsewhere in Southeast Asia (Booth 2003: 439-56; Huff 2003). One can only imagine how much these colonial policies suppressed industrial growth in Southeast Asia given modern econometric studies of developing country performance since the 1950s (Rodrik 2007; Macmillan and Rodrik 2011). Thus, one of the reasons that Southeast Asia had to wait so long to start its industrial catch up on the leaders was to first gain control of their exchange rate and their tariffs.

Colonial attitudes towards local industry began to change during the 1930s, especially in Indonesia and Indochina. With the collapse of commodity prices, diversification into industry became the catchword (Shepherd 1941). Indeed, in the face of the flood of Japanese manufactures in to Southeast Asian markets (the Japanese share of Indonesian textile imports rose from 26 to 75 percent between 1928 and 1933: van der Eng 2013: 9), colonial authorities raised tariffs. They did so in part because of the decline in commodity export revenues, but they also set quotas. Both quotas and tariffs may have been used more to defend these markets for imperial manufactures (Booth 2015: 46), but they also protected domestic industry. Indeed, the "colonial government abandoned the principle that Indonesia's tariff served only fiscal purposes" also because the flood of Japanese textiles was destroying a new local weaving industry. These new policies "gave the colonial government unprecedented powers to steer industrial development in Indonesia [up to] 1939" (van der Eng 2013: 10 and 11). With postwar independence, Indonesia and other parts of Southeast Asia were able to exploit this experience.

The cost of labor in Southeast Asia offers an additional explanation for the slow development of its import-competing industries. As we pointed out above, Southeast Asian nominal unskilled wages were higher than Japan up to the 1920s (Bassino and van der Eng 2013), and they were much higher than China and India throughout the interwar years. In addition, due to skill shortages in Southeast Asian cities, nominal skilled wages were equal to or greater there than those of Tokyo throughout the interwar years,[20] and far above those of Bombay and Shanghai. It is not surprising, therefore, that most the foreign direct investment received by Southeast Asia in the 1920s and 1930s concentrated on the plantation and mining

[20] The skill premium was even higher in resource abundant and land scarce Sub-Saharan Africa during the same period (Frankema and van Waijenburg 2012: Table 1).

sectors (Lindblad 2002), and that local manufactures had difficulty competing with Japanese imports, especially in the 1930s after the depreciation of the *yen*.

In spite of these difficulties, the interwar period did witness a gradual transformation of Southeast Asian manufacturing including the diffusion of modern technology to the traditional sector. The literature on industrial development and industrialization in emerging nations typically focuses on modern industry, that is, on large-scale, capital- and energy-intensive factories producing consumption importables – like textiles – and capital goods importables – like machinery, even though small labor-intensive operations that used little or no inanimate power remained dominant for a number of decades. The emerging and large-scale factories using modern technologies did not immediately destroy the small-scale workshop using traditional technologies, that is, they co-existed during the transition so that dualism characterized early industrial development. Only at more advanced stages did large-scale, capital-intensive, and energy-intensive technology become ubiquitous. Understanding that transition is important to understanding industrial development more generally, and especially in Southeast Asia.

How the industrial output mix is measured matters in understanding the transition. In the interwar and immediate post-World War II years of anti-global policies and closed economies, distinguishing between capital and consumption goods production mattered in accumulation and growth debates (Domar 1957; Bronfenbrenner 1960). For the 1913-1950 years, and as we pointed out above, the distinction that matters for Southeast Asia and other commodity exporters is between commodity-processing, import-competing, and non-tradable domestic manufacturing. This tri-part distinction matters since they often or even typically offset each other, yielding little net industrial growth. Since Southeast Asia specialized in the export of commodities until the post-World War II era, their industrial growth was based largely on commodity processing. To repeat the argument above, commodity price booms triggered commodity-processing (and the production of the capital goods that did the processing) while the country suffered de-industrialization in the manufacture of importables like textiles. Unless they had some natural protection[21] or could build tariff barriers, import-competing manufactures collapsed. Some

[21] A large share of manufacturing activity in early stages of industrialization are those which are protected from foreign competition by distance, high weight-to-value ratios, consumer preferences, and perishability.

protective barriers did emerge in the 1930s, but most of Southeast Asia had to wait until postwar political independence to decide how high those barriers would be.[22]

Interwar industry mix and industrial dualism in Southeast Asia is best documented for the region's fastest industrial grower, the Philippines. There were four key exports reported in the 1918 Philippine Census: coconut oil and copra accounted for 27 percent of all exports, manila hemp for 43 percent, sugar for 12 percent, and tobacco products for 10 percent.[23] While the Philippines was a net rice importer for most years, that commodity needed to be cleaned and then sent to the rice mills. In 1918, these commodity export processing industries accounted for 73.4 percent of "modern" industrial output, that is, industrial output excluding household or cottage industry. Furthermore, between 1903 and 1918, these commodity export processing industries grew three times as fast as the rest of manufacturing.[24]

Philippine sugar mills were 51 percent steam or water power driven by 1918, and thus offer a good illustration of technology dualism in the transition to modern industrial growth. The cottage industry – or what the Philippine Manufacturing Census called the "household industry" or HH in what follows – offers another good illustration of dualism in transition to modern industrial growth: 55.5 percent of total manufacturing output in 1918 came from HH. While this HH share may seem big, it was smaller than China where in 1933 it accounted for three-quarters of total manufacturing value added.[25] Furthermore, the role of HH production varied considerably across industries. Many labor-intensive activities had been forced by foreign competition to retreat to isolated rural HHs: in 1918, 92 percent of total textile output was produced by HHs; and 46 percent of the hats. Many industries had converted to factory organization (tobacco, corn milling, furniture, tanning, footwear, vegetable oils, rice mills, soap, sugar mills, brick and tile, abaca processing, pasta making, fish salting), and could report only trivial HH shares in total production. Some industries remained in dualism: HHs accounted for

[22] Even earlier in the 1920s, there was a change in colonial policy that began to favor agricultural productivity growth, education, and health, led by the "progressive" US policies in the Philippines and the pro-growth attitudes of Japan towards their new colonies Korea and Taiwan. See Landes (1998: 437), Booth (2012: 3-7) and Booth and Deng (2014).

[23] These four items needed processing before export: copra was dried and then pressed for the oil; sugar cane was processed at the mill; manila hemp was converted to rope, rugs, wall coverings and other products in factories; and tobacco was dried, cut, and made in to cigars and cigarettes. All of these were then packed for shipment.

[24] The import-competing growth estimates have an upward bias since so many were under-reported or unreported in either 1903 or 1918. The under-reported or unreported import-competing industries were: textiles, spinning, bags and sacks, iron agricultural implements, hats, and umbrellas.

[25] Chapter 11 in this volume by Brandt, Ma, and Rawski.

55.9 percent of copra drying, 53.9 percent of textile dying, and 70.7 percent of pottery production. All of these HH shares were much smaller in the 1939 Manufacturing Census. Although information on individual firms does not enable a precise quantitative assessment, one can speculate that where HH shares were high, capital intensity was low, and the labor-intensive technology in use was well-suited to the local factor prices.

Industrial dualism can also be observed in other Southeast Asian countries. For example, the share of power looms in total looms had risen in Indonesia from nothing to 18 percent in 1940-41 (van der Eng 2013: Table 1, 28), but it was still small. To take another example, shipbuilding had both traditional workshops and modern shipyards for repairing steamers in the main Southeast Asian ports of Jakarta, Surabaya, Haiphong, Saigon, Singapore and others. Although they recorded lower manufacturing growth rates than did the Philippines, most Southeast Asian countries experienced some diversification of industrial activities. In the export hub of Saigon, rice milling was a relatively capital-intensive industry in 1926-1927 using steam-driven machines (GGI 1928), but it was small scale and powered by hand or animals in rural areas. In northern Vietnam, manufacturing activities using capital-intensive and steam-driven technologies (using cheap local coal) included cement, glass, brewing, tobacco processing, printing, and paper mills, while others producing for the local market were cottage industries using hand-driven technologies.

Although it was more modest, the same industrial diversification and emerging dualism was apparent in Burma, at least as measured by the number of factories (Hlaing 1965: Table 8, 32). Since it was factories and not cottage industry being reported by these official statistics, one can plausibly assume that fast factory growth rates meant a rising “modern” share of industry, and rise it did. Between 1899 and 1940, the number of factories grew by 5.2 percent per annum. And the industry mix diversified as well, although modestly. The share of factories that processed export commodities (rice and saw mills, cotton ginning, petroleum refining, metal smelting) was huge in 1899, 94.2 percent. But that share fell to 86.7 percent in 1940, domestic non-tradable producers (vegetable oil and flour mills, cement, printing) rising from 4.3 to 9.6 percent, and import competing manufacturers (spinning, weaving, knit ware, rubber goods) from 1.4 to 3.8 percent.

In short, while there were some pro-industrial forces at work in Southeast Asia during the interwar, they were modest at best: the industrial share in GDP (including mining,

manufacturing, construction, and utilities) only rose from 16.1 to 17.6 percent in Indonesia, and from 17.1 to 17.3 percent in Thailand (Booth and Deng 2014; Table 3, 43).

IV. Transition: Human capital accumulation and ISI from the late 1930s to the late 1960s

In the 1930s, Southeast Asia experienced a steady rise in public investment in education and some early attempts to promote ISI. Both were amplified during World War II and in the two postwar decades. Although these policies did not have a big immediate impact on industrial production, they paved the way for "miracle" manufacturing growth after the 1960s.

Economists think that primary schooling is a critical ingredient of labor-intensive manufacturing in early stages of modern industrial growth, and that secondary schooling helps move countries up the industrial ladder to more skill-intensive activities. A large macro-econometric literature on modern East Asia certainly supports that view (Jones *et al.* 1993; World Bank 1993; Radelet *et al.* 2001; Lee and Hong 2010).[26] Each of these studies finds that schooling is a central contributor to economy-wide per capita income and labor productivity growth after controlling for capital accumulation, good government, openness and other variables. A recent study of Southeast Asia covering the four decades between 1970 and 2010 finds, once again, that schooling has been an important determinant of GDP per worker growth (Phung, Coxhead, and Lian 2015). Our strong prior is that it has been an even more important determinant of *manufacturing* output per worker growth since the latter is certainly more schooling-intensive than agriculture and traditional services.[27]

This literature motivates the question: If schooling has mattered to Southeast Asian industrial growth since 1970, what was the source of that favorable schooling endowment? Available evidence suggests that much of Southeast Asia under foreign rule was severely disadvantaged by colonial policy before the 1940s (Sopheak and Clayton 2007; Chaudhary 2009). Table 7 reports that -- with the exception of American colonial policy in the Philippines (Gomez and Pedro 1993)[28] – primary enrollment rates in schools controlled by colonial

[26] The literature is extensive, but see also Bils and Klenow (2000), Glewwe and Kremer (2006), and Manuelli and Seshandri (2014).

[27] Oddly enough, there is no study, to our knowledge, of the econometric determinants of manufacturing labor productivity growth in Southeast Asia.

[28] It should be noted, however, that enrollment rates were not insignificant in late 19th century Philippines. In 1866, the number of children attending primary school was 542 per 10000 inhabitants, implying an enrollment rate of

administrations were very low in Southeast Asia in the 1920s. Again excluding the Philippines, primary enrollment rates in Southeast Asia at that time were everywhere less than a sixth of Japan (Table 7). This was especially true of French colonial primary school enrollment rates[29] (Indochina 2.8), but also Dutch colonial rates (Indonesia 7.0), and British colonial rates (Burma and Malaya 9.6). Enrollment rates were low even in in Korea (6.3) and Taiwan (11.8). But they rose very steeply to 1935-40 as a result of Japanese colonial policy (38.7 in Korea and 87.3 in Taiwan).

Perhaps influenced by both American and Japanese pro-schooling colonial policies, primary school enrollment rates rose dramatically everywhere in colonial Southeast Asia up to World War II. Indeed, there was even impressive convergence on Asia's industrial leader, Japan (Table 7). Between 1910 and 1940, primary school enrollment rates rose from 1.7 to 17.9 percent of Japan in Indochina, from 6.3 to 22 in Indonesia, from 12.7 to 40.7 in Malaya, from 48 to 74 in the Philippines, and from 9.8 to 86.9 in Thailand. While it takes some time for the schooling rates of children to convert an adult industrial labor force from illiterate to literate, the process was certainly well underway in the interwar years. What about the industrial growth leader in Southeast Asia? The primary school enrollment rate in the Philippines was 44.8 in 1935-40, at a time when Japan was 60.5, so that the Philippines was already 74 percent of the Asian schooling leader. But the Philippines was not alone: late 1930s primary school enrollment rates were even higher in Thailand (Table 7: 52.6), having risen steeply from 1920.[30]

Enrollment rates could be misleading if official statistics do not record the number of children attending informal schools supported by private initiative (e.g. religious institutions) or by village authorities.[31] Similar to Meijii Japan, Buddhist temple schools in Thailand and

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about 5 or 6, and the ratio of girl to boy students was a surprisingly high 0.72 (Census of the Philippine Islands 1903, volume 2: 591). The same source reports that 20.2 percent of the population above 10 was able to read and write (*ibid*.: 81-2). The American pro-school colonial policy could to some extent be viewed as a continuation of Spanish colonial policy.

[29] Share of school-aged children enrolled.

[30] Using age heaping as a numeracy index, Crayen and Baten (2010) find that late 19th and early 20th century Southeast Asian levels were not too far below those of Northwestern Europe, North America, and Northeast Asia, and well above those of South Asia.. However, differences in numeracy across Southeast Asia do not correlate well with school enrollment in the early 20th century.

[31] The return of an official survey on illiteracy undertaken in 1938 in two districts of central Vietnam, regarded by the authorities as representative, indicate that the percentage of boys between 10 and 20 able to read Romanized Vietnamese was 55 in one district and 22 in the other (22 and 18 percent were able to read French); while the percent of girls able to read Romanized Vietnamese was 60 and 28. The percentages were lower at higher ages, for

Cambodia were reformed in the early 20th century to offer a more comprehensive curriculum (Sopheak and Clayton 2007). But it was only with the establishment of public schools that most Thai girls gained access to primary education. In all Southeast Asian cities, Chinese communities established privately funded primary schools for boys and girls. The fact that pro-school policies emerged in the interwar as part of the core political program of the only Southeast Asian country that had remained independent, Thailand, says something about the lack of such policies in most of colonial Southeast Asia until the 1930s. Primary schools played a major role in the nation-building agenda of all post-colonial Southeast Asian countries after 1945.[32]

With a lag of a couple of decades behind primary school enrollment rates, secondary school enrollment rates rose steeply in Southeast Asia after 1940. By 1970 and the start of modern "miracle" growth, secondary school enrollment rates were 53 percent of Japan in Malaysia and almost 48 percent in the Philippines (Table 8). By 1960, there is enough demographic and schooling data to say something about the average years of schooling of adults aged 25-64 (a stock), not just the enrollment rates of children (a flow). That there was a revolutionary increase in Third World schooling after 1900 is well documented (Easterlin 1981; Lindert 2008). That the revolution really took off in the periphery between 1960 and 1980 is also well documented (Schultz 1987; Williamson 1993: 147-52). Table 8 documents just how dramatic it was in Southeast Asia. Taking the Asian industrial leader, Japan, as our standard, between 1960 and 2010 average years of schooling of adults 25-64 rose from 15.7 to 39.3 percent of Japan in Burma, from 13.4 to 59.7 in Indonesia, from 23.8 to 71.3 in Malaysia, from 43.5 to 76.1 in the Philippines, and from 25.8 to 64.6 in Thailand.

[Table 8 about here]

By the end of the 1960s, most of Southeast Asia was well endowed with educated labor ready for other forces to trigger an industrial "miracle". To the extent that schooling is a prime mover of modern industrial growth, Southeast Asia was under equipped for it before World War II. But school enrollment rates were on the rise during the interwar decades, and took off in the post-World War II era up to 1970. The Southeast Asian schooling constraint was loosened in the

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both men and women, but around 30 percent of men aged 51 to 60 were able to read Vietnamese in Chinese characters (Trinh 1995: 36-7).

[32] Thailand offers a postwar puzzle, since enrollment rates fell from 1935-40 to 1960-61, but they rose everywhere else in Southeast Asia. True, the rise in the Philippines was modest, but it was already at a relatively high level.

1920s and 1930s, and broken after 1950. However, the growth of schooling was not sufficient by itself to promote rapid manufacturing development.

ISI became explicit policy in Southeast Asia only in the 1950s, but it had two precedents. The first occurred in the interwar as Chinese entrepreneurs established workshops in Southeast Asia using imported Chinese technology, Chinese skilled workers, and native unskilled labor for producing goods such as affordable chinaware or fireworks that were directly competing with imports from China. As we have seen, manufacturing received some stimulus by the switch to a less anti-industrial colonial policy in the 1930s. The second precedent occurred during WWII when, during Japanese occupation, Southeast Asia improvised a response to the disappearance of European and North American manufactured imports, and to the inability or unwillingness of Japan to fill the gap. Indeed, it was Japanese imperial policy to make Southeast Asia self-sufficient (Huff: 2013). Although these policies were introduced as an emergency response to exceptional conditions, they certainly paved the way for the more formal post-independence policies introduced under postwar ISI.

ISI has been viewed as a response to the newly-independent governments' desire to jump start modern industrial growth.[33] But in Southeast Asia, it had another stimulant, the secular decline of commodity processing. Given the absence of adequate manufacturing data before the late 1950s, the decline cannot be measured directly, but it can be inferred by using export data. Figure 3 shows the volume of some of the main commodities exported between 1930 and 1970 relative to total population (kg per capita). Rice exports from Myanmar, Thailand, and Vietnam, as well as coffee and sugar exports from Indonesia, reached peaks in the interwar years. Since so much of Southeast Asian manufacturing was based on commodity processing, manufacturing faltered thereafter. Even with an expanding well-educated and cheap workforce, Southeast Asian manufacturing found it impossible to compete with Japanese manufacturers of textile and other consumer goods without protective barriers in the 1950s and 1960s.[34] ISI under tariff protection seemed to be the only option to enhance the profitability of domestic manufacturing in Southeast Asia. The ISI strategy had some success, at least in the short run: cotton yarn output per capita grew briskly between 1950 and 1970, as did electricity output per capita.

[33] One of the most comprehensive discussions on ISI in this volume can be found in Chapter 14 on India.
[34] The fact that, under Bretton-Woods regime, the Yen-US$ exchange rate was fixed at Yen-depreciated level helped the Japanese producers retaining a strong price competitiveness until the 1960s in some sectors, in addition to non-price competitiveness resulting from the increasing sophistication of their production process.

[Figure 3 about here]

V. Economic miracles: Cheap schooled labor, technological transfer, and trade liberalization

Southeast Asian per capita incomes diverged dramatically from the 1960s to the 1990s as a result of the successful industrial drive of Indonesia, Malaysia, Singapore and Thailand (ASEAN 4) versus the disappointing performances of the Philippines and the stagnation of war-torn Cambodia, Laos, Myanmar, and Vietnam. The successes were celebrated as the Southeast Asian part of the Asian economic miracle when the World Bank (1993) compared the ASEAN 4 with South Korea and Taiwan, highlighting the importance of export-led industrial growth. However, the World Bank overlooked the divergence in per capita incomes across the region, illustrated best by Thailand (the biggest winner), and the Philippines (one of the biggest losers). In 1960, per capita GDP in Malaysia and the Philippines was 50 percent higher than in Indonesia and Thailand (Maddison 2010). By 1990, Thailand had a per capita GDP twice as high as the Philippines, and the income gap between Malaysia and Indonesia increased from 50 to 100 percent.[35]

In confronting the causes of this uneven performance, we first consider shares of manufactured goods to total exports and then the stock of foreign direct investment (FDI) relative to GDP. Figure 4 shows that Malaysia and Thailand followed the same upward trend in their shares of manufactured goods in total exports between the 1960s and the 1990s, both catching up with Singapore. Of course, these trends also imply a dramatic decline in commodity export dependence. And the relatively low percentages until the 1970s are consistent with a gradual transition from slow ISI to fast export-led industrialization reported in the previous section. Indonesia underwent a comparable trend but with a lag of almost 20 years, largely due to the Dutch disease impact of its oil boom, and thus stagnation in its share of manufactured goods in total exports at very low levels until the late 1980s. Vietnam was later still, but its delayed trend was just as dramatic.

[Figure 4 about here]

[35] Within-country regional inequality also increased in Southeast Asia, as manufacturing was concentrated in urban areas where agglomeration economies could be exploited. See Chua *et al.* (2003: Table 2).

In order to exploit modern manufacturing technologies, market size is, of course, crucial. Southeast Asian domestic markets were very small in the interwar years, and they could not compete with cheap Japanese consumer goods even in their own markets, let alone in world markets. Small domestic market size placed Southeast Asia with a disadvantage until the late ISI years. We use GDP as our proxy for domestic market size (Maddison 2010). No doubt it might be a better proxy if GDP were interacted with urbanization – since most of the demand for local manufactures was generated by urban incomes – but it serves adequately enough to indicate the disadvantage. The proxy confirms that, with the exception of Indonesia, every Southeast Asian country had tiny domestic markets, much smaller than Japan, Brazil, Russia, and other countries which were pre-World War II catching up leaders in their regions. In 1929, domestic markets in Burma, Malaya, the Philippines, and Thailand ranged between about 6 to 14 percent of Japan's domestic market. The market size of China, India, and Japan were 11 to 24 times larger than the average of the four Southeast Asian countries just listed, Russia was 20 times larger, and Brazil was more than three times larger. Indonesia was bigger and suffered a smaller scale disadvantage, but its domestic market was still only an eighth of the Russian domestic market. Given small domestic markets at the start, going open would have had a bigger impact on small Southeast Asian nations than on large emerging industrial nations, like Brazil or India.

Since every Southeast Asian country benefited from Japanese, US and, to a lesser extent, European market access, the delayed expansion of manufacturing in Indonesia and the poor performance of the Philippines calls for alternative explanations. Indonesia presented unattractive features, in particular some of the most extreme forms of crony capitalism, and a chronic waste of financial resources due to over-investment in poorly managed State owned enterprises during the oil booms (Robison 1992). But the deregulation of investment barriers in the 1980s resulted in a rapid rise in the share manufacturing in GPD.[36] Analysts have certainly offered many explanations of the poor Philippine performance. One paper has described its experience as a "perfect storm" of economic disasters, including: political instability, overlong protection, corruption, immigrant-remittance-induced Dutch disease, and the rejection of all things Japanese, including their FDI (de Dios and Williamson 2015). Indeed, all of these forces resulted in only a trickle of foreign capital into the Philippines.

[36] This evolution can be compared with India resulting from deregulation policy in the 1980s discussed in Chapter 14 in this volume, by Gupta and Roy.

These capital inflows were mostly FDI since international portfolio investment only became a significant source of financing for local investors in the 1990s (with the exception of Singapore). The stock of inward FDI accounted for a small and only slightly increasing percentage of GDP in Indonesia, the Philippines and Thailand up to the late 1990s (Figure 5). Singapore and Malaysia had the highest FDI stock to GDP ratios before the 1990s. Although there are no sector breakdowns available, it seems likely that the high levels for Singapore were partly due to previous investments in finance and other services there. The high levels for Malaysia were mostly due to mining. We stress FDI since economists long ago reached the conclusion that this form of foreign investment is a carrier of technology, organizational efficiency, and managerial skills. This conclusion is confirmed by a recent econometric study of the region:

> "[T]he East Asian FDI boom continues to benefit [Southeast Asia] … These benefits originated from having export-oriented industries with improved labor skills and technological transfers, productivity growth and economic efficiency [following] the massive investment inflows from Northeast Asian economies (Phung, Coxhead, and Lian 2015: 80)."

Needless to say, the larger the gap between best practice technology in rich countries and traditional technology in poor countries, the better the chance that FDI will trigger a manufacturing miracle. Productivity growth in Southeast Asian manufacturing resulted from the combined effects of human capital investment and technology imported through FDI. Indeed, some time ago Alwyn Young argued that

> "once one accounts for the dramatic rise in factor inputs, one arrives at estimated total factor productivity growth rates that are closely approximated by the historical performance of many of the OECD and Latin American economies (Young 1995: 644)."

[Figure 5 about here]

Another possible explanation for the heterogeneity of Southeast Asian industrial performance might be demography. Developing countries going through the middle stage of their demographic transitions have increasing shares of young working age populations (Bloom and Williamson 1998). This so-called demographic dividend played a major role in the development of East Asia (Krugman 1994; Bloom and Williamson 1998), and we argued above that it also hastened the schooling revolution that helped carry the miracles. However, its

contribution in Southeast Asia has been more limited (Williamson 2013) and it cannot account for the region's uneven industrial performance.[37]

We are persuaded that one of the most powerful explanations of the uneven Southeast Asian industrial performance lies with differences in access to modern technology imported through FDI. Southeast Asia received only modest volumes of FDI until the 1980s.[38] However, these early inflows had an important impact on the development of manufacturing using labor-intensive technology compatible with Southeast Asian endowments, that is cheap human capital. Japanese FDI played a much bigger role than did US and European FDI since the Japanese manufacturing technology of the 1950s and 1960s was less capital intensive. It was also becoming obsolete in Japan just when it was appropriate for Southeast Asia. It was characterized by low capital requirements, high primary and secondary schooling requirements, and was well suited for high female workforce participation.

Compared with South Korea, Southeast Asia was initially a second-best option for Japanese manufacturing firms[39] but these countries became increasingly attractive as their comparatively cheaper work force became almost as well equipped with primary schooling as in East Asia.

The flow of Japanese manufacturing FDI into Southeast Asia can be documented with company level data reported in the annual Toyo Keizai survey. Figure 6 indicates the total number of manufacturing subsidiaries established by decade. Thailand and Malaysia appear as the major recipients of Japanese manufacturing FDI suggesting that these flows played an important role in contributing to their fast manufacturing growth. By contrast, the small number of Philippine subsidiaries indicates that it did not benefit much from Japanese technology transfer through FDI.

[Figure 8 about here]

[37] Between 1965 and 1990, working age population grew faster than total population in Southeast Asia, although the difference was much lower than in East Asia; this resulted in higher investment in human capital, saving, and female labor force participation than in South Asia and the rest of the developing world (Bloom and Williamson 1997).

[38] Due to their concentration in manufacturing, Japanese FDI flows had a major effect on ASEAN manufactures exports (Urata 1993). Manufacturing accounted for 45 percent of total Japanese FDI to ASEAN in the period 1951-1989, compared to 35 percent for the total for South Korea, Taiwan and Hong Kong, and only 27 percent for the world as a whole (Urata 1993: Ttable 10.1, 280).

[39] Perhaps mainly for political reasons, South Korea remained almost entirely closed to Japanese FDI up to the late 1990s, and the same remark applies to China until the 1980s. The economies of Taiwan, Hong Kong and Singapore were too small to absorb the huge flows of outward Japanese FDI resulting from the rise in labor cost in Japan and the strategy of Japanese manufacturers to expand their activity overseas, particularly in lower income countries. Southeast Asia benefitted as a result

Available case studies illustrate a winning strategy based on the creation of joint ventures between local trading companies providing marketing know-how and foreign investors bringing modern (but labor-intensive) technology and organizational skills. In the case of Japanese FDI in Thailand, two of the most successful joint ventures of the early 1960s were that linking Siam Motors with Nissan starting with an assembly plant in Bangkok in 1962, and the joint venture linking the Sukree Group with Shikibo Spinning and Nomura Trading companies, starting with cotton spinning and weaving in 1963, and moving rapidly to synthetic yarns in 1968 (Suehiro 1992: 55-6). In addition to textile products, automobiles and motorcycles, the list of production activities of these early Japanese subsidiaries also includes chemicals (cosmetics, plastics, rubber products, ink and paint), and electric consumer durables (fans, radios and TV sets). This suggests that the ISI experience with consumption goods production was an important precursor of subsequent export processing as it nurtured a generation of local entrepreneurs that gradually became accustomed to manage joint ventures with foreign partners, with a wide range of new manufacturing technologies. Furthermore, Southeast Asia had to leapfrog to comparatively capital-intensive export processing (chemicals, electric machinery, and transportation machinery) because Japanese manufacturers had previously located their most labor-intensive processing in Taiwan and Hong Kong, such as the assembly of toys, cheap watches, and low quality garments.

The first wave of FDI took advantage of local markets behind tariff and non-tariff barriers in Malaysia and Thailand. As these countries liberalized in the 1970s and 1980s, FDI rose substantially (Figure 5). Indonesia was an important exception since it received comparatively little FDI but nevertheless it experienced productivity gains and rising competitiveness in manufacturing (Amiti and Konings 2007).

VI. Conclusion:
Factor endowments, second-best institutions, foreign markets, and good luck

Resource-abundant and skill-scarce Southeast Asia has been a latecomer to modern manufacturing development. As long as nominal wages of skilled and unskilled workers were lower in resource-scarce and labor-abundant Japan or Korea, Southeast Asian manufacturing was limited to commodity export processing and some modest success with ISI-induced domestic manufacturing of consumer goods. The fundamental secular force at work seems to have been

the evolution of this resource-abundant, labor-scarce, and skill-scarce region into a labor-abundant and skill-abundant region. But it also appears that Southeast Asia benefited from an extraordinary window of opportunity from the 1960s to early 1980s when China was entirely closed to foreign investment and unwilling to consider any kind of economic integration with the rest of Asia or the world. Indonesia, Malaysia, and Thailand were lucky that China was stubbornly engaged in an autarkic policy during these decades. Between the 1960s and the 1990s, rapid industrial growth occurred in much of Southeast Asia in spite of inadequate economic institutions. It is telling that when the World Bank 1993 *Economic Miracle* report assessed Japanese, Korean, and Taiwanese success, it highlighted the importance of sound institutional environments. Yet, abundant examples of corruption and crony capitalism could be found then even in the best Southeast Asian performers, like Thailand and Malaysia (Suehiro 1992: 50), let alone the Philippines (de Dios and Williamson 2015). Southeast Asia did not undergo its industrialization drive because it had virtuous institutions but because public and private agents managed to play by some "rules of the game" that can be described as second-best institutions (Rodrik *et al.* 2004; Rodrik 2008). An oil boom and some dysfunctional aspects of the Indonesian economy (Robison 1992) were sufficient to delay the expansion of manufacturing there but not to prevent it, perhaps because other countries considered as potential targets for FDI had even worse institutions.

The fact that Vietnam joined the Southeast Asian manufacturing growth club in the 1990s, with Cambodia and Myanmar following in the 2000s, and all with labor costs lower than China and with comparable second-best institutions, suggests that the region retains a comparative advantage vis-à-vis Latin America, North Africa, the Middle East, Southern Asia, and Sub-Saharan Africa. These advantages were complemented by the gradual liberalization of trade policies, abundant and relatively cheap human capital, small gender gaps in education, high rates of labor force participation, and a willingness to participate in win-win regional cooperation. All of these factors were amplified by the ability to exploit FDI and the technology transfers it always carries.

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Table 1. Industrial Output Growth 1870-2007: Southeast Asia and the Rest (% per annum) [40]

	1870-1896	1896-1913	1913-1920	1920-1938	1950-1973	1973-1990	1990-2007
World Leaders							
Germany	3.1	3.6	0.4	1.6	6.8	1.3	1.2
United Kingdom	1.9	1.5	-0.6	3.0	4.3	0.1	0.8
United States	4.6	4.9	4.5	1.2	4.4	1.9	4.2
Average	**3.2**	**3.3**	**1.4**	**1.9**	**5.2**	**1.1**	**2.1**
Asian Giants							
China	7.8	7.8	9.4	5.3	9.2	8.3	9.8
India	0.9	2.6	-4.3	3.4	6.9	5.1	6.5
Average	**4.4**	**5.2**	**2.6**	**4.4**	**8.1**	**6.7**	**8.2**
East Asian 3							
Japan	3.3	5.0	6.5	6.7	12.4	4.1	1.0
Korea		8.0	9.3	7.1	13.6	11.7	7.4
Taiwan		5.1	9.8	4.4	11.6	8.7	4.9
Average	**3.3**	**6.0**	**8.5**	**6.1**	**12.5**	**8.2**	**4.4**
Southeast Asia							
Cambodia							15.9
Indonesia	1.3	1.3	1.0	2.7	3.4	12.8	5.1
Lao PDR							8.5
Malaysia						8.5	7.1
Burma		0.1	3.5	2.6	3.2	3.0	12.0
Philippines		6.3	10.1	3.4	7.0	1.8	3.3
Singapore					16.2	6.9	6.1
Siam	0.9	2.3	1.6	2.3	11.2	8.1	5.9
Vietnam					7.6	1.9	10.7
Average	**0.8**	**2.5**	**4.1**	**2.8**	**8.1**	**5.4**	**8.3**

Source: Bénétrix, O'Rourke, and Williamson (2014: Table A.1).

[40] The very high growth rate observed for China between 1870 and 1920 could mostly reflect the evolution of the modern sector, as it is likely that the underlying series do not entirely cover the large traditional cottage industry sector. The same remark may apply to Korea and Taiwan between 1896 and 1938. In the Philippines, the growth rate of the period 1896-1913 could be due to some extent to a change of coverage of the cottage industry in the transition from the Spanish to the US colonial administration. Still, such measurement problems existed for all periphery countries with which Southeast Asia could be compared.

Table 2. Terms of Trade Volatility in Southeast Asia 1865-1939

	1860s-1900s	Relatives	1910s-1930s	Relatives	1860s-1930s	Relatives
Southeast Asia	**8.091**	**2.744**	**10.985**	**1.503**	**9.538**	***1.859***
Burma	6.945	**2.356**	13.463	**1.841**	10.204	***1.989***
Indonesia	9.558	**3.242**	6.904	**0.944**	8.231	***1.604***
Philippines	7.823	**2.654**	10.004	**1.368**	8.914	***1.738***
Thailand	8.036	**2.726**	13.569	**1.856**	10.803	***2.106***
Three Colonizers	***2.948***	**1.000**	***7.311***	**1.000**	***5.130***	***1.000***
France	4.038	**1.370**	6.728	**0.920**	5.383	***1.049***
Germany	2.089	**0.709**	7.380	**1.009**	4.735	***0.923***
United Kingdom	2.716	**0.921**	7.825	**1.070**	5.271	***1.027***

Source: Data underlying Blattman *et al.* (2007).
Note: Volatility is measured by the Hodrick-Prescott filter with a smoothing parameter=300.
The regional averages are unweighted.

Table 3. Population density in Southeast Asia, Japan, and Korea

	1820	1870	1913	1950	1970	2000
Indonesia	9	17	27	43	61	107
Malaysia	1	2	9	20	33	66
Myanmar	5	6	18	29	40	65
Philippines	7	17	31	70	129	271
Thailand	9	11	17	39	72	120
Vietnam	20	32	59	77	129	240
Japan	82	91	137	222	276	335
Korea	63	65	71	138	211	311

Sources: World Bank for land area (http://data.worldbank.org/indicator/AG.LND.TOTL.K2); Maddison (2010, *Historical Statistics of the World Economy: 1-2008 AD*) for population.
Notes: population data for Myanmar unadjusted for changes in territory (lower Burma only up to 1890, including upper Burma thereafter).

Table 4. Terms of Trade Bust, 1913-1949 (1900=100)

	Burma	Indonesia	Philippines	Thailand
1913	100.0	100.0	100.0	100.0
1918	137.9	103.9	90.0	134.1
1929	113.2	72.5	54.7	105.1
1932	87.4	59.4	34.0	73.0
1939	99.5	70.9	39.8	89.4
1949	164.2	77.1	65.3	175.9

Source: Data underlying the series in Blattman *et al.* (2007).

Table 5. Export Concentration in Asia around 1900

Country	Two Major Export Commodities	Percent of Total Exports
Burma	Rice, oil products	92
Indonesia	Sugar, coffee	60
Philippines	Hemp, sugar	89
Siam	Rice	100
Vietnam	Rice	68
Southeast Asia		***82***
Ceylon	Tea, coffee	100
India	Rice, jute	35
South Asia		***68***
China	Silk, tea	78
Japan	Silk, cotton goods	79
East Asia		***79***

Source: All based on data underlying Blattman et al. (2007), except Vietnam proxied using share of rice in total export of French Indochina, based on data reported in Brenier (1914).
Note: All regional averages are unweighted.

Table 6. Share of Exports in GDP (%) 1901-1938

	Indonesia	Thailand	Philippines	Vietnam	Burma
1901	12		28	19	30
1916	22	17	32	18	35
1926	26	22		25	36
1938	17	25	34	22	48

Sources and Notes: Booth (2003: Table 2, p. 431). Thailand 1916=1913, 1926=1929; Philippines 1901=1902, 1916=1918.

Table 7. Mean Primary Schooling Enrollment Rates in Southeast Asia, 1880-1960

	1880	1890	1900	1910	1920	1930	1935-40	1950/52	1960/61
Burma	9.4	8.5	11.5	11.8	10.3	13.4	13.3		
Indochina			0.5	1.0	2.8	6.9	10.8		
Indonesia	1.0	2.0	2.5	3.7	7.0	12.2	13.3		38.1
Japan	30.3	34.5	49.3	59.2	60.3	60.9	60.5	61.5	58.4
Korea				1.1	3.8	10.8	23.4		58.2
Malaysia				7.5	8.9	19.4	24.6		69.2
Philippines			19.3	28.4	35.8	32.4	44.8	70.6	53.8
Taiwan			2.0	3.1	19.5	26.1	52.8		83.0

Thailand		0.5		5.8	7.1	24.1	52.6	39.3	36.4
Japan = 100									
Burma	31.0	24.6	23.3	19.9	17.1	22.0	22.0		
Indochina			1.0	1.7	4.6	11.3	17.9		
Indonesia	3.3	5.8	5.1	6.3	11.6	20.0	22.0		65.2
Korea				1.9	6.3	17.7	38.7		99.6
Malaysia				12.7	14.8	31.9	40.7		118.5
Philippines				48.0	59.4	53.2	74.0	114.8	92.1
Taiwan				5.2	32.3	42.9	87.3		142.1
Thailand				9.8	11.8	39.6	86.9	63.9	62.4

Source: Aaron Benarot and Phyllis Riddle, "The Expansion of Primary Education, 1870-1940:

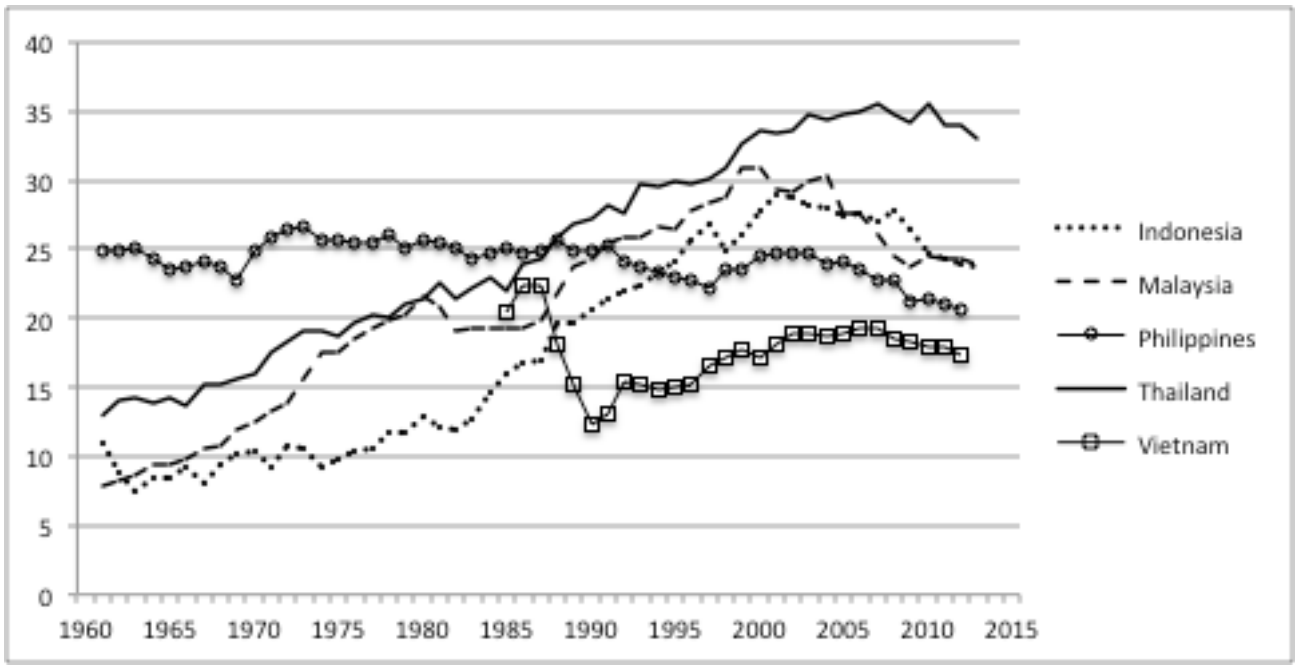
Trends and Issues," *Sociology of Education* 61 (July 1988): Appendix, 205-6; and Brian R. Mitchell, *International Historical Statistics: Africa, Asia, and Oceana 1750-1988* (New York: Stockton, 1995), primary school enrollment (000) from pp. 958-967, and children ages 5-14 (000) from pp. 23-27.

Table 8. Average Years of Schooling Aged 25-64 1960-2010

	Years of Schooling			**Japan = 100**		
	1960	**1970**	**2010**	**1960**	**1970**	**2010**
Korea	3.552	5.710	13.324	41.3	58.1	101.1
Japan	8.598	9.829	13.181	100.0	100.0	100.0
Burma	1.349	1.118	5.182	15.7	11.4	39.3
Indonesia	1.148	2.367	7.864	13.4	24.1	59.7
Malaysia	2.043	3.126	9.400	23.8	31.8	71.3
Philippines	3.744	4.727	10.030	43.5	48.1	76.1
Thailand	2.219	2.731	8.516	25.8	27.8	64.6

Source: Data underlying Daniel Cohen and Marcelo Soto, "Growth and human capital: good data, good results," *Journal of Economic Growth* (2007) 12: 51-76 in electronic appendix cls-database.

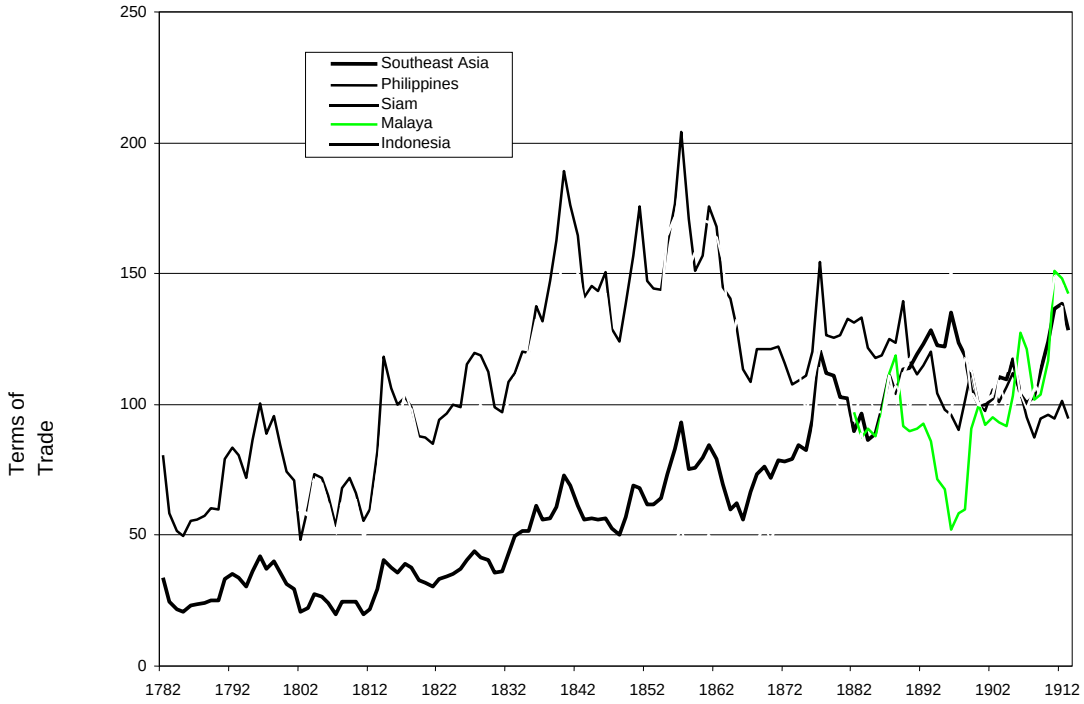
Figure 1. Share of Southeast Asia Manufacturing in GDP 1960-2023



Source: World Bank (World Development Indicators Website, accessed 9 May 2015)

Note: Manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3.

Figure 2. Net terms of trade 1782-1913



Source: Williamson (2011: Figure 3.9).

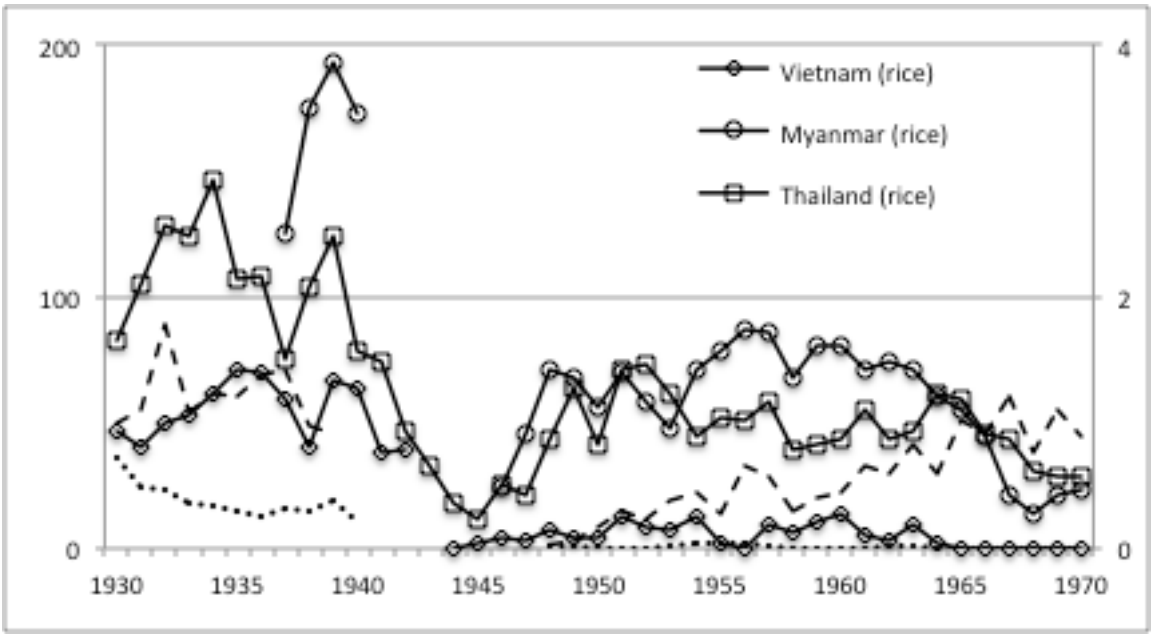


Figure 3. Export of main agricultural product (kg per capita) between 1930 and 1970

Sources: Mitchell (1995) for export volumes; Maddison (2010) for population, except Vietnam 1930-1949 form Banens (2000).

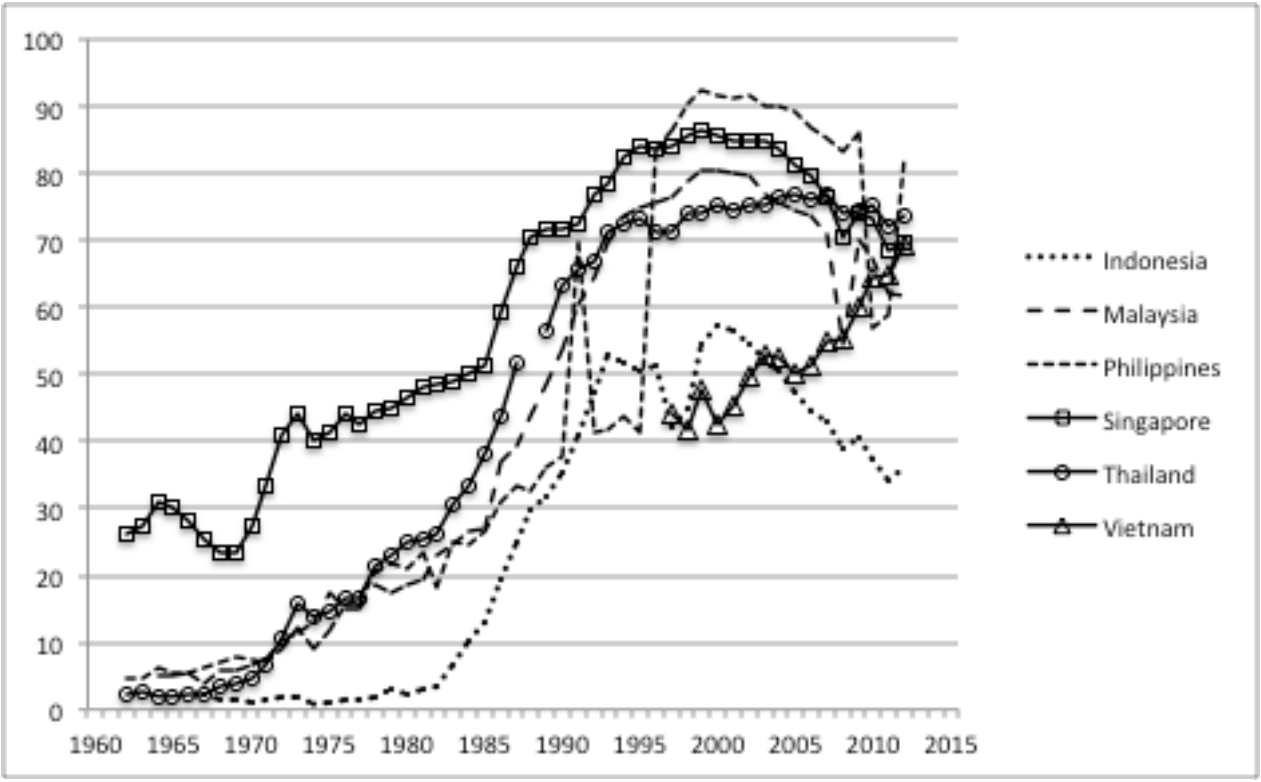


Figure 4. Manufactured goods as % of merchandise exports

Source: World Bank (World Development Indicators Website, accessed 9 May 2015)

Note: Manufactures comprise commodities in SITC sections 5 (chemicals), 6 (basic manufactures), 7 (machinery and transport equipment), and 8 (miscellaneous manufactured goods), excluding division 68 (non-ferrous metals).

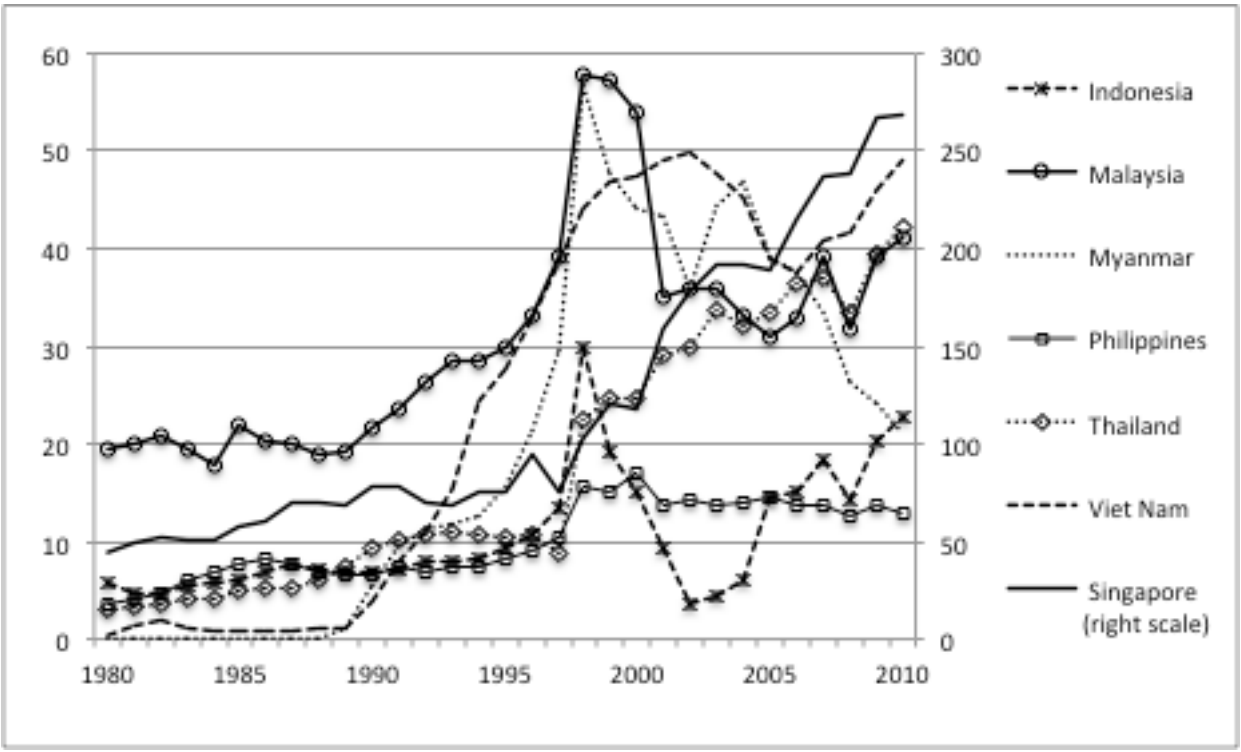


Figure 5. Inward foreign investment stock as percentage of GDP

Source: UNCTAD (http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx).

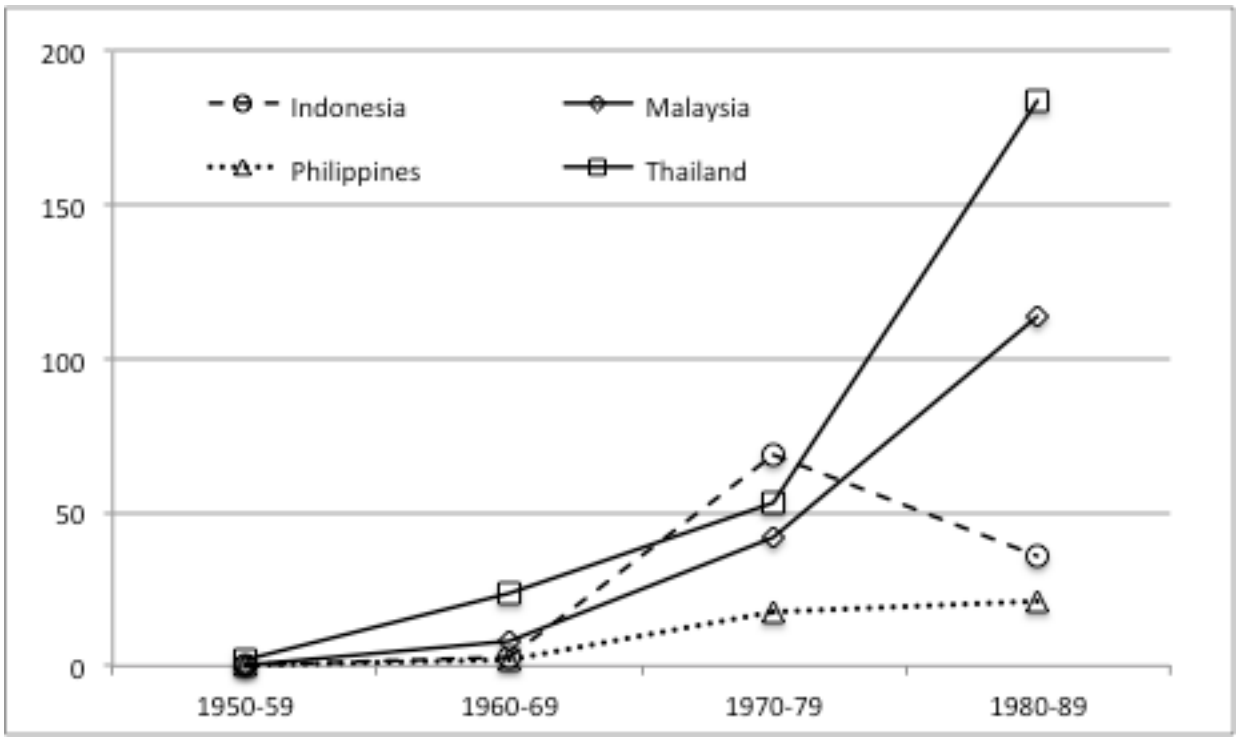


Figure 6. Number of Japanese manufacturing subsidiaries established by decade

Source: compiled from individual data reported in Toyo Keizai (2006), CD-ROM version.