6

Catch-up and Learning in Taiwan

The Role of Industrial Policy

Wan-wen Chu

6.1 Introduction

Taiwan’s post-war economic performance has been extraordinary. Its real PPP per capita income was only US$916 in 1950,¹ less than one-tenth that of the United States. By 2008, Taiwan’s real per capita income had increased 22.8-fold, and by 2017 it had reached 84 per cent of the United States’ and was ranked nineteenth in the world in terms of PPP per capita GDP.²

When the Japanese colonialists withdrew from Taiwan following their country’s defeat in 1945, Taiwan was still a typical colonial economy, mainly exporting sugar and rice to the protected Japanese market. Industrialization under colonialism was limited; it supported Japanese military activities, and the plants were mostly owned and managed by the Japanese.³ At the end of 1949, the Nationalist regime in mainland China was defeated by the Communists and had to retreat to Taiwan. Fortunately, Taiwan was able to embark on a path of sustained industrialization, rapidly reducing its reliance on primary exports. The share of rice and sugar in Taiwan’s exports declined from 74 per cent in 1952, to 47 per cent in 1960, and a mere 3.2 per cent in 1970,⁴ indicating the fruits of industrialization in the first twenty post-war years.

Taiwan managed to sustain the rapid pace of development throughout the post-war decades, and has grown from a low-income to a high-income economy. Its GDP and per capita GNP grew at an average annual rate of 9.2 and 6.3 per cent respectively in the first thirty post-war years, 1951–80, and 5.7 and 4.9 per cent from 1981 to 2016 (see Tables 6.1 and 6.2). It faced various challenges along the way, but facilitated by suitable and adaptive industrial policies, it managed to adapt to the new environment and transform itself at every turn. For example, its

¹ This is from Maddison (2010). The unit was 1990s International Geary-Khamis dollars.
² According to the IMF World Economic Outlook (July 2018), Taiwan’s PPP per-capita GDP was US$50,293, about 84 per cent of the United States’ (US$59,501), in 2017. http://www.imf.org/external/datamapper/PPPPC@WEO/OEMDC/ADVEC/WEOWORLD.
³ For discussion of the Japanese colonial period, see Ho (1978) and Cumings (1984).
The high-tech industry has become the major manufacturer of ICT (information and communications technology) products in the world in the last two decades.⁵

This chapter will examine how and why Taiwan developed its economy successfully in the post-war era. It will first discuss conditions at the beginning of the

Table 6.1 Major economic indicators (I), 1951–2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Average annual growth rates of Export CPI</th>
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</tbody>
</table>

Note: *Figures were deflated by indexes with 2011 as the base. **Figures before 1969 were deflated by indexes with 1986 as the base; those afterwards were by indexes with 2011 as the base. ***Figures for 1995 and before exclude quarrying.


The high-tech industry has become the major manufacturer of ICT (information and communications technology) products in the world in the last two decades.⁵

This chapter will examine how and why Taiwan developed its economy successfully in the post-war era. It will first discuss conditions at the beginning of the

Table 6.2 Major economic indicators (II), 1952–2016

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP per capita (US$)</th>
<th>Gross fixed capital formation as % of GDP</th>
<th>Exports as % of GDP</th>
<th>Trade balance (US$ million)</th>
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⁵ See Amsden and Chu (2003).
post-war era, and then review the various stages of development in chronological order, from import-substitution industrialization in the 1950s, through export promotion and upgrading in the 1960s and 1970s, to entry into the high-tech sector from the 1980s, and to liberalization and globalization subsequently.

6.2 Factors Favourable to Development

The Nationalist government that took over Taiwan in 1945 after fifty years of colonial rule encountered difficulties because state and society did not understand each other. Though Taiwan’s economy had been badly affected by the war, however, there were some factors that were favourable to economic development in the early post-war period. The Japanese colonialists had built modern infrastructure and laid the foundations for subsequent modernization. US military and economic aid provided crucial political support and much needed resources to stabilize the economy and the regime. But it was up to the Nationalist government to build up the infrastructure to make post-war growth possible. This confirms the structuralist theory of development which argues that it is necessary for the state to play an active role to substitute for the deficient market mechanism in a latecomer country.

Stabilizing the economy made implementing industrial policy feasible after 1949. In the post-war years on the mainland, the Nationalist government had mishandled the economy, causing hyperinflation, which contributed greatly to its defeat. The political leaders learned the hard way that it was crucial to maintain macroeconomic stability. A key factor in Taiwan’s early success in promoting industrialization were the many highly motivated officials with experience in economic planning on the mainland who built up the bureaucratic organization required for effective industrial policy. The government appointed the National Resource Commission (NRC) to help restore major industrial production (especially Taiwan Sugar and Taiwan Power). A new set of institutions and policies to promote industrialization effectively emerged.

Moreover, Taiwan was fortunate in having the scope to practise industrial policy during the early post-war period. Japan’s economic forces, with their superior productivity, had to leave Taiwan after the defeat of 1945. However, US political and military aid stemming from Cold War considerations enabled the Nationalists to intervene in the economy to promote development. Associated US economic aid provided crucial foreign exchange to support the currency, reduce the fiscal deficit, and stabilize prices and the economy. The aid agency also

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⁶ This section draws much from Chu (2017).
⁷ Facing the imminent threat of Japanese military invasion, the Nationalist government set up the National Resource Commission in 1935 to build up military supply and related industrial production. NRC was responsible for basic wartime industrial production, and continued to train relevant personnel in preparation for post-war industrial recovery and construction. See Chu (2017: 172–98).
coordinated with the local economic bureaucracy so that the right to allocate US aid became an industrial policy tool. Nevertheless, US aid played a positive role in Taiwan’s development only because the local government used it in the right way. Where this was not the case, as often occurred elsewhere in the developing world, US aid did not necessarily produce favourable results.

What was the private business sector like at that time? During the colonial period, exporting sugar and rice to the Japanese market had brought steady growth to the local economy, but colonial policy had limited industrialization to a Japanese enclave. Some local businessmen accumulated wealth by participating in trade. After the war, from 1945 to 1949, small plants emerged producing light industrial consumer goods. After 1949, land reforms implemented by the government discouraged the elite from living on agricultural rent. Locals who had been discouraged from engaging in modern industries during the colonial era found the new investment environment enticing, and their behaviour was strongly influenced by industrial policy. Sensing the government’s resolve to promote industrialization, the private sector responded by learning about and investing in modern industrial production.

6.3 Economic Recovery and Import Substitution in the 1950s

Taiwan’s post-war industrialization was undoubtedly very much a state-led development, with the Nationalist government having almost all the essential policy tools at its disposal and using them to promote economic development resolutely.⁸

Nevertheless, they faced formidable odds of political uncertainty, large-scale immigration from the mainland, persistent fiscal and balance of payment deficits, and chronic shortages of foreign exchange and material resources.⁹

The government needed large amounts of material resources to restore economic stability, relying first on gold reserves and then on US aid to shore up the currency. From 1950 to 1965, economic aid amounted to about US$1.5 billion, which was almost equal to the total balance of payment deficit.¹⁰

In a series of land reforms, the Nationalists implemented the ‘Land to the Tiller’ programme in 1953. The compensation given to landlords partly consisted of shares in the four industrial state-owned enterprises (SOEs). To ensure the lasting success of the land reform, the government paid careful attention to the agriculture sector, assuring farmers an adequate supply of necessary inputs for production. In

⁸ For discussions of major policies, see Amsden (1979), Ho (1978), Wade (1990), Gold (1981), and Chu (2017).
⁹ This section draws on Chu (2017: 198–220).
¹⁰ Chao (1985: 8).
addition, the newly emerged industrial sector provided opportunities for the elite who had to leave the rural sector. The rise in agricultural productivity and output helped to secure an ample food supply for the enlarged population and to keep industrial wage levels low. It also contributed to an improvement in income distribution.

Moreover, to successfully industrialize, the government needed to extract surplus from a very productive agricultural sector. The fact that the agricultural sector had made significant gains in productivity, and the land reform had redistributed income in the tenants’ favour, made the sector better able to bear the heavy fiscal burden. The former tenants’ newly acquired land could be turned into capitalized assets in the modernization process. In a way, the success of the land reform started a virtuous cycle.

In addition to its pursuit of economic recovery, in the 1950s the government promoted import-substitution industrialization due to severe foreign exchange constraints. During 1951–3, it kick-started the main target industry, cotton textiles, by bearing most of the risks and responsibilities itself. A few other industries, including utilities, fertilizer, and some consumer essentials, were also targeted and enjoyed prioritized allocation of resources.

Instead of expanding the SOE sectors, the Nationalists promoted private enterprise. Though most of the non-agricultural US aid went to support the large SOEs, especially utilities and transportation, a significant part of it was used to promote new manufacturing industries, mostly in the private sector. Here the government acted as entrepreneur, drafting the investment plans from scratch and handling them all the way up to handover to the would-be private industrialists. The share of private enterprise in manufacturing output, therefore, increased from 41 per cent in 1952 to 70 per cent in 1966.¹¹

Despite retreating to Taiwan, Chiang Kai-shek intended eventually to ‘recover’ the mainland. Paradoxically this provided the strong political will necessary to support post-war developmental projects. The economic bureaucracy enjoyed great autonomy in promoting industrialization under authoritarian rule, and the pathway to industrialization has continued to the present day. Section 6.4 will discuss subsequent changes in policy.


The scale of the domestic market was obviously too small to realize economies of scale in industry and to sustain growth. For example, the cotton textile industry reached self-sufficiency within just two years and began to accumulate excess capacity. However, the foreign exchange regime was designed to facilitate import

¹¹ CEPD, *Taiwan Statistical Data Book*, various years.
substitution, and had overvalued exchange rates and a complicated set of multiple exchange rates. To help lessen the foreign exchange constraint and encourage firms to export,¹² the government had to design schemes, such as ‘getting the prices wrong’.¹³

With hindsight, the switch to an export-promotion policy regime seemed a logical next step for a government eager to find ways to sustain growth and push industrialization. However, due to fear of unforeseen risk and resistance from vested interests, the Foreign Exchange Reform was implemented in 1958 only after a prolonged round of heated debate among the economic bureaucrats and the ruling elite. In a two-stage process the multiple exchange rates were converted to a unitary rate, the currency was devalued significantly, and various export promotion programmes were adopted.

Furthermore, to promote overall economic development, the government enacted the 19-Point Programme for Economic and Financial Reform and the important Statute for Encouraging Investment in 1960. The latter remained in effect till 1990 when it was replaced by the Statute for Promoting Industrial Upgrading. It put in place the framework to reduce investment barriers and to provide tax breaks for investors. The policy regime switch was not as drastic as it seemed, however, because the extent of trade liberalization was rather limited, and the domestic market remained to a great extent protected. Nonetheless, exports began to grow very rapidly, led by the textile industry: Taiwan’s cotton textile products began to be subject to import restraints in the US market as early as 1962. This occurred long before apparel exports began to take off in the late 1960s, showing the beneficial effects of import substitution.¹⁴

6.5 Industrial Upgrading

The policy switch did not imply, however, that the government would cease to promote industrialization. As light industry was beginning to grow in the 1950s a secondary import-substitution programme was introduced to set up the upstream production to supply inputs to the exporting downstream industries, though with time limits, and price and quality conditions.¹⁵ A man-made fibre manufacturing plant was established with government help in the mid-1950s. The automobile industry made a start in 1956. Plans for the steel and petrochemical industries also

¹² This section draws on Lin (1973: Chs 4 to 6) and Chu (2017: 273–300).
¹³ Amsden (1989) coined the phrase ‘getting the prices wrong’ in her seminal work on South Korea’s post-war economic development. The term means that the latecomer state has to provide subsidies to the disadvantaged latecomer firms so as to alter the prevailing market prices to induce the latecomer firms to embark on the learning process.
¹⁴ Chu (2008).
¹⁵ Chu (2001). This is similar to the Korean case as described in Amsden (1989).
began to be discussed in the 1950s. Due to difficulties in obtaining technology and capital, the first naphtha cracking plant did not begin operation until 1968, and the first integrated steel mill began construction only in the early 1970s. Both were undertaken by SOEs, socializing investment risks deemed unsupportable by the private sector at the time. All these were part of the plan to promote industrial deepening.

In the 1970s, the level of US support, which had been crucial for the survival of the Nationalist government on Taiwan, began to lessen. US–PRC relations started to thaw, though diplomatic relations were not established until January 1979. This created a legitimacy crisis for the Nationalist regime, while around the same time the first oil crisis of 1973 brought an economic crisis. In response, between 1974 and 1979 the government introduced the ‘Ten Construction Projects’: six major infrastructure projects, one nuclear power plant, and three industrial projects—the integrated steel mill, and expansion of petrochemical plants and shipyards. These helped to stimulate the economy in the short term, and to build up infrastructure and sustain and deepen industrialization in the long term.

6.6 Entry into High Tech

Once plans for heavy industry were in place in the early 1970s, the government began to plan for the next growth industry: electronics. Adopting a different policy approach this time, the government set up the National Science Council and public research laboratories such as the Industrial Technology Research Institute (ITRI). The first integrated circuit (IC) project was started in 1976. Subsequent spin-offs from ITRI, principally the United Microelectronics Corporation in 1980 and Taiwan Semiconductor Manufacturing Company in 1987, now comprise the majority of Taiwan’s IC industry.

This policy environment also supported local production of key information technology (IT) components, and with successful industrial upgrading, Taiwan has in recent years become one of the world’s largest producers of IT products, semiconductors, liquid-crystal-display units, and man-made fibres. In 2016 Taiwan’s ICT products continued to occupy a substantial share of the world market in, for example, notebook computers (83 per cent), motherboards (84 per cent), tablets (38 per cent), servers (36 per cent)\(^\text{16}\), IC foundry (71 per cent) and IC design (19 per cent)\(^\text{17}\). Taiwan’s industrial prowess is largely unseen, however, because its leading firms are mostly subcontractors for firms in advanced countries.

Amsden and Chu (2003) have studied how Taiwan upgraded and entered the high-tech sector. The strategy of Taiwanese firms has been to play second mover


or act as subcontractor. Lacking frontier technology, firms enter when the product becomes mature, and earn profits based on efficient and low-cost manufacturing and timely delivery. They have to absorb the technology and expand production quickly. These firms mostly relied on locally trained engineers, as well as some returnees from abroad. While support of the education system, accumulated manufacturing experience, and local production networks provided the necessary conditions for the emergence of these firms, it was also the government’s industrial policy that helped to set up the right environment and the crucial institutions, and assisted the advancement of the industry along the way. As a result, the main players in Taiwan’s IT industry are large nationally owned firms, not foreign capital. Domestically, the share of the IT and electronics sector in total manufacturing value added rose from around 18 per cent in 1990 to 54 per cent in 2017 (Table 6.3).\(^\text{18}\) Meanwhile, an increasing proportion of offshore production shifted to China, reaching 92 per cent in 2016.\(^\text{19}\) This gave Taiwanese firms access to an abundant supply of cheap and efficient labour, allowing them to greatly expand their scale of operations. Despite this trend, total employment in the electronics sector has not declined over the last two decades.

Most of the successful second movers in Taiwan have not pursued R&D-intensive and own-brand strategies to catch up. Second movers expand through accumulated organizational capabilities based on subcontracting manufacturing, which implies path dependence.\(^\text{20}\) Thus, the strategy of choice for most has been upgrading subcontracting, cross-industry subcontracting, and then own-brand manufacturing, in that order. Industrial policy has been a crucial structural factor affecting a firm’s strategic choices. South Korea has produced successful global brands, supported by the state’s national champion policy and long-term commitment to the chaebol, the Korean conglomerates. China has also adopted a highly ambitious national champion strategy. The fact that the government in Taiwan has never adopted a national champion strategy helps to partly explain the evolutionary path of Taiwan’s second movers, and attests to the importance of industrial policy.

### 6.7 Liberalization and Globalization

With the exception of the high-tech industry, overall industrial policy until 1986 was export promotion, accompanied by secondary import substitution and protection of the domestic market. Most of the banks were publicly owned. The government had successfully maintained macroeconomic stability by keeping the budget mostly in balance and the inflation rate low. Foreign exchange was under

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Source: MOEA, Yearbook of Industrial Production Statistics by Taiwan Area, ROC, various years.
control, the exchange rate remained stable and undervalued, and the domestic market was protected.

However, a great and unavoidable transformation of the Taiwanese economy began in 1986. Though the government tried to guide the process, its hands were forced, and instead of adopting forward-looking policies, it simply made necessary adjustments.

Trade surplus and exchange reserves began to accumulate rapidly from 1980. The protection of the domestic market left increasingly wealthy domestic consumers ever more unsatisfied. The sustained trade imbalance between the United States and East Asia eventually led in 1985 to the signing of the Plaza Accord, which forced the New Taiwan Dollar to appreciate from 1986. Its value had risen 40 per cent against the US dollar by 1989. Under US pressure, the government relaxed foreign exchange controls and began to reduce tariff rates, remove non-tariff trade barriers, and phase out the tariff rebate programme. Substantial asset bubbles began to appear in the local stock and housing markets. Wages began to rise significantly, and industry’s share in GDP started to decline (see Table 6.2).

Meanwhile, the government also began to liberalize the internal economic environment. With the lifting of martial law in mid-1987 by President Chiang Ching-Kuo,²¹ the government began to open up (to both foreign and local firms) domestic markets in some of which the number of operating licences had previously been limited and more or less frozen since the early post-war period. The most important of these newly liberalized markets were modern services, such as banking, telecommunications, transportation, and mass retailing. Significantly, at the same time, the government began to improve the cross-Strait relationship by allowing citizens to visit relatives on the Mainland for the first time since 1949. Privatization of state-owned enterprises began two years later. Thus, democratization, liberalization, and globalization went hand in hand within a short period of time. It should be stressed that this was a process of managed liberalization, even though the extent of its success is debatable.

In hindsight, the government probably should have implemented these reforms earlier in a more forward-looking way. The change from a developmental state model, in which growth was given priority, to one in which political, social, and economic goals had to be renegotiated and realigned, proved difficult.

The pace of globalization has been swift in Taiwan since the late 1980s. The flow of inward and outward foreign direct investment (FDI) has increased significantly. Inward FDI now mostly flows into the modern service sectors, as entry restrictions continue to lessen. By the time Taiwan entered the WTO in 2002, the domestic market had already become quite open. Outward FDI mostly took place from the late 1980s onward, beginning with the move of labour-intensive

²¹ He was the son of Chiang Kai-shek, the Generalissimo who had led the Nationalists from 1920s until his death in 1975.
production, first to the ASEAN countries and later to China. In the last few years, high-tech industry has also begun to move mass production lines to China, with firms under intense pressure to upgrade their operations again. Taiwan’s outward FDI has become increasingly concentrated on China. The situation in the export trade is similar.²²

In sum, though Taiwan’s economy has become increasingly globalized, its external relations have been dominated by the cross-Strait relationship.

6.8 Recent Slowdown and Prospects

Taiwan’s economy has performed relatively well since embarking on its transformation in the late 1980s. Industry has continued to grow, and unemployment has remained at a moderate level. Although labour-intensive production has moved offshore, electronics has become Taiwan’s pillar industry, continuing to upgrade and expand, and maintaining its global competitiveness. Integration with the Chinese economy has provided growth momentum and has helped the second movers expand in scale.

As Taiwan’s economy approaches maturity, however, economic growth has been slowing down in the last two decades. At the height of post-war growth, in the 1960s and 1970s, overall annual growth averaged nearly 10 per cent, but from 2001 to 2016 growth averaged only 3.3 per cent, and investment growth has fallen to 0.8 per cent this century (see Table 6.1).

There remain serious challenges. Overall growth is overly reliant on the old export-promotion regime. There are several probable reasons for the recent lack of investment growth: the flow across the Strait remains one way; the growth of domestic consumption lags behind overall growth; and the dominant industry, electronics, has encountered greater competitive pressures. Although economic integration with China continues to grow, political debate persists in hindering rational policy planning. At the same time, globalization has brought an unprecedented increase in the degree of economic inequality. The new rules of political competition have not been conducive to addressing these challenges.

These conflicts remain unresolved, and society is yet to face up to the crucial question of how to fit China into Taiwan’s economic future. Only if future political developments promote more productive dialogue within Taiwan and across the Strait will Taiwan be able to formulate a new economic vision for its future development.

²² CEPD, *Taiwan Statistical Data Book, 2017*, 226–7. In 2016, the share of exports heading to Hong Kong and China amounted to 40.1 per cent of Taiwan’s total exports, while that to the United States was 12 per cent.
Taiwan still relies very much on its industrial sector to maintain growth and global competitiveness. Industrial production has been the driving force from the beginning of the post-war period. The share of agricultural production in GDP decreased from 38 per cent in 1953 to below 10 per cent after 1978, while manufacturing’s share increased from 12.9 per cent in 1952 to 29 per cent in 1970, reached a peak at 39.4 per cent in 1986, and had fallen to 30 per cent by 2016. The share of services remained stable, around 48 per cent, in the first thirty post-war years, and then steadily rose to 63 per cent by 2016 (Table 6.2). The shifting pattern of GDP composition among the primary, secondary, and tertiary sectors in Taiwan closely resembles that of more advanced countries, of course, indicating the steady advance of Taiwan’s economy. The changes in employment composition are similar to those of GDP. The total number of employees in the manufacturing sector has remained around 2.4 million during the last two decades. Several industry trends are observable in Taiwan. Its exports mainly consisted of labour-intensive products in the earlier post-war period and technology- and capital-intensive products in the later period. Taiwan’s exports came mainly from small and medium enterprises (SMEs) in the earlier period and from large-scale firms in the later period. During both periods, subcontracting has been the dominant business model. At present, the leading industrial enterprises in Taiwan are high-tech subcontractors and medium-tech upstream input producers. Very few large-scale firms have their own brands, and Taiwan’s few global brands are mostly owned by non-major firms.²³

Part of the reason why Taiwan has been able to maintain healthy growth over the last sixty years is that its industry has been very adaptive, with new growth industries emerging as its comparative advantage has shifted. In the early post-war period, the leading sector was the textile and apparel industry. At its peak in the early 1970s, it contributed over 23 per cent of manufacturing value added. Since then its share has continued to decline, reaching a mere 1.8 per cent in 2017.

The changes in each sector’s share in total manufacturing value added during 1971–2000 and 2001–17 are shown in Table 6.3. In the former period, the declines in textiles and plastics were offset by increases in chemicals, basic metals, and electronics. The more traditional industries gradually moved their operations overseas. In the latter period, however, almost all sectors except electronics experienced decreases in their shares of total manufacturing value added. The share of the electronics sector rose steeply from 26.9 per cent in 2000 to 54.2 per cent in 2017, and the share of the top three industries now accounts for 68.7 per cent.

²³ Chu (2009).
6.10 The Role of Small Firms in Taiwan’s Development

It is often argued that small firms played a key role in Taiwan’s development, unlike the case of Korea. For example, Feenstra and Hamilton (2006) believe Taiwan’s post-war development was a case of bottom-up industrialization. They argue that after the war, SOEs took over Japanese firms and remained dominant till the early 1970s. Only then did Taiwan’s economy set off on a trajectory of genuine development. The dynamic export sector, dominated by small firms, created demand for intermediate goods, and that allowed large firms to grow and transform themselves. Thus, they argue, it was small firms that began to lead the entire economy starting from the late 1960s.

Chu (2017), however, finds an alternative explanation. After the war, the SOEs which took over Japanese firms did not expand much beyond their domain. Private enterprises, fostered by the government’s industrial policy, took advantage of the Japanese departure and immediately began to grow rapidly. SOE share in industrial production began to decline in the early 1950s, falling below 50 per cent in 1958, when the government changed its policy from import substitution to export promotion. It also began to push import substitution of upstream input production right at the beginning of the export promotion stage. Entrepreneurial small firms, eager to engage in exports, were helped by changes in industrial policy that made exports profitable, granted subsidized export loans, and promoted import substitution of intermediate inputs. In short, Taiwan’s trajectory of genuine development started early, from the 1950s, and was not characterized by sudden emergence as postulated in Feenstra and Hamilton (2006). Moreover, the government played a key role in changing the environment and leading development.

Amsden and Chu (2003) present a pointed and well-documented case, disputing Feenstra and Hamilton’s (2006: 210) argument that ‘the small firm tail of Taiwan’s economic organization wags the entire economy’. Amsden and Chu (2003: 67–76) find that it was large firms that played the leading role in recent industrial upgrading. They show that although small firms in Taiwan increased their share of employment both in total manufacturing and in the electronics sector from 1986 to 1996, their share of value added remained at a much lower level. In the important electronics industry, the disparity between employment and value added was even greater. The relative efficiency (valued added per worker) of large firms in this industry increased during this period, while that of small firms declined, reflecting their deficiency in skills and investment. Amsden and Chu (2003) show that although the numerous small firms constituted a dense production network in most of Taiwan’s industries, they provided mainly passive low-tech components to the leading firms at arm’s length. Leading firms, however, cooperated with ITRI to transfer key technology from foreign suppliers.
Chu’s (2015) updated data on value added and efficiency by firm size of Taiwan’s manufacturing and electronics industry shows that the small firms’ share of value added dropped to only 9 per cent in 2011 in the electronics industry, while their relative efficiency has been declining since 2001.

In her first study of Taiwan’s machine tool industry, Amsden (1977) found that small firms in a latecomer country, unlike advanced countries, tend to lack skills, investment, and frontier technology. Hence they cannot be the agent of industrial upgrading.

6.11 Comparison with South Korea

The overall development pattern in the post-war period has been extremely similar in Taiwan and South Korea. However, there has been a distinct difference in policy on big business and national champions.²⁴ In Taiwan, establishing national champions has never been a priority. The Nationalist government has prioritized stability over growth, and shied away from pursuing a high-risk national champion strategy. Through its control over the banks, the state has kept the debt–equity ratio relatively low throughout the half century of post-war growth. Lacking firm long-term commitment from the state, most of Taiwan’s leading firms found the branding strategy too risky to pursue. The state’s pursuit of industrial deepening from the 1970s was comparable to Korea’s Heavy and Chemical Industrialization Plan, but Taiwan’s private firms were unwilling to undertake the projects.²⁵ It was therefore state-owned enterprises rather than chaebol that undertook industrial deepening. Institutional arrangements in Taiwan differ from those of South Korea, because of their different strategies for big business and national champions.

There are two possible reasons for the Nationalist government’s pursuit of this strategy. The Nationalists’ top priority was economic stability, probably because they believed that the failure of their economic policies, which caused hyperinflation and widespread discontent, contributed greatly to their defeat by the Chinese Communists in 1949. It may also have to do with their particular kind of nationalist vision. In the early post-war period, they still believed they could realize their grand plan to modernize China after retaking the mainland, and thus planned Taiwan to be a model province. In this context a risky national champion strategy might jeopardize its economic stability.

²⁵ In these projects, the state solicited but failed to obtain participation from private firms. Thus, for example, China Steel, an SOE, undertook the integrated steel project, while semi-public firms, United Microelectronics and TSMC, were set up with mainly state funds to undertake the electronics projects. See Chu (2001).
In South Korea, when the Park regime began to promote economic development in the 1960s, it clearly designated chaebol as the agents of industrialization and used various policy tools to help them. It was understood between the state and chaebol that Japan was the model to be emulated and chaebol should strive to be national champions with prominent positions in the global market. This type of policy regime, especially long-term subsidized loans to the chaebol, helped to finance fast chaebol growth and industrial deepening, but also led to an extremely high debt-equity ratio that came to characterize all large Korean firms before the 1997 Asian financial crisis. Though some chaebol, such as Samsung and LG, finally managed to become global brand-name companies, this high-risk national development strategy undoubtedly brought high volatility to the firms, the industries, and the overall economy. Of the top thirty chaebol before 1997, half have either gone bankrupt or have undergone reorganization.²⁶

The state’s policy on big business has significant implications for the scope remaining for small firms. Unlike the Korean government, the Nationalists did not privatize the large Japanese firms but kept them as SOEs. They also ensured a favourable policy environment for small firms by facilitating export production, granting subsidized export loans, and so on. By indirect facilitation, restraining the SOEs and not promoting big business, therefore, the Nationalist government allowed some room for small firms to grow.

### 6.12 Policy Lessons

At each stage of Taiwan’s post-war development the government sought to improve the policy environment for all sectors, but with limited resources it was only able to actively promote certain targeted industries, such as textiles, chemicals, and electronics. These industries played the role of growth engine, pulling related sectors to grow together. The pattern of industrial development in advanced countries has been used as a road map. In addition, products ranked by import value can indicate potential targets for import substitution at various stages of development. Fortunately, some of the choices, though not all, have borne fruit.

Moreover, industrial policy had to adapt to the changing environment. Different policy measures were required to promote different target industries. For example, SOEs were tasked with setting up the first petrochemical and integrated steel plants. However, the government changed tactics when promoting

²⁶ For discussion of industrialization in the earlier period, see Amsden (1989). Woo (1991) discusses the importance of the state’s financial leverage in the Korean model. For more recent upheaval, see Shin and Chang (2003).
electronics. It set up public research labs, such as ITRI, to assist with the introduction and development of technology. It established science parks to promote industrial clusters. It helped to set up a venture capital industry to promote IC-related industries in the 1980s. It also made ITRI spin-offs semi-private firms, not SOEs, so that they would have more autonomy in management.

Throughout Taiwan’s industrialization, economic officials sought to maintain economic stability and remove obstacles to industrial investment. When growth began to slow under the import-substitution regime, the policy was switched to promotion of exports and upstream inputs. The foreign exchange system was reformed into a single exchange rate regime. Time limits and performance requirements are considered the key difference between the protection regimes in East Asia and Latin America, and relevant legislation continued to be revised to improve the investment environment. Various agencies were set up to help enterprises raise productivity.

In the early period, economic development also brought about some beneficial social results, which in turn were helpful to subsequent development. Land reform contributed to social and income equality. Labour-intensive export production provided ample jobs for young people leaving the agricultural sector. Industrial districts were quite widely dispersed until recently when the electronics boom concentrated new jobs in the north of the island. Implementation of industrial policy relied partly on SOEs, leaving room for SMEs, unlike the case in South Korea.

Education policy emphasized mass education in the early period, vocational education in the later period, and higher education only recently. In the earlier period, education policy served economic development well by supplying a large number of good-quality unskilled and semi-skilled workers, and an ample supply of competent engineers. The higher education system has been greatly expanded since the 1990s. Education reform and further liberalization plans have been the subjects of heated debate in recent years.

Health policy focused on public health in the early period, emphasizing control of the spread of communicable diseases and implementation of a birth control programme. The health programme has expanded alongside economic progress through the years. A universal health care plan came into effect in 1998, and remains the major social welfare programme in Taiwan today.

In recent years, however, democratization, liberalization, and globalization have posed challenges to Taiwan’s original development model, in which growth was given priority. Industry faces increasing global competitive pressure to continue to upgrade. Political, social, and economic goals have to be renegotiated and realigned in the new environment. It remains to be seen how successfully Taiwan will transform itself in the future. As always, economic policies will have to adapt to the changing environment.
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