
Introduction

The term “globalization” reigns supreme as a description of recent economic transformation—and it carries many meanings. In a technical sense, it is usually associated with an increasing proportion of national income devoted to international trade, hosting or providing larger amounts of foreign direct investment (FDI), and being the recipient or, less frequently, the source of portfolio investment. At the same time, globalization carries less precise, yet nevertheless important, connotations related to loss of national control, sovereignty, or identity in the organization of economic and cultural life.

In the policy realm, the orthodox terms of engagement for the process of globalization have been enshrined in the “Washington consensus,” a shorthand for a set of policies including secure property rights, fiscal discipline, sectorally neutral tax and expenditure policies, financial liberalization, unified and competitive exchange rates, openness to foreign trade and investment, privatization, and deregulation, as described by Williamson (1990). Since then, however, disappointing results in Latin America, lackluster performance in the transitional economies, and the Asian financial crisis of the late 1990s have all contributed to a crisis of faith in these policy prescriptions, in Washington and elsewhere. One response has been to augment the consensus with “second-generation” reforms such as strengthening prudential supervision of financial markets or competition policy.

Another impulse has been to reconsider the more statist policies that had been marginalized. As former Treasury Secretary Paul H. O’Neill toured Africa with pop star and development economics enthusiast Bono, Ugandan President Yoweri Museveni, who is deservedly known for his com-

mitment to improving economic policy, raised a question “that both African and American officials are just starting to talk about: what brand of capitalism should Africa pursue as it wades into global competition. . . . Africans sometimes look more to Asia than to the United States in thinking about how to advance their development plans. The model for development in much of Asia has included heavy government involvement in nurturing industries and companies that could become globally competitive and stimulate job growth.”¹ In this regard, Japan, Korea, and Taiwan are promoted as the poster nations that have derived great benefits from increasing integration with the international economy without surrendering national autonomy in the economic or cultural spheres—in effect beating the West at its own game. As one commentator put it, “The East Asian tigers . . . were free to do their own thing, and did so, combining trade reliance with unorthodox policies—export subsidies, domestic-content requirements, import-export linkages, patent and copyright infringements, restrictions on capital flows (including direct foreign investment), directed credit and so on—that are largely precluded from today’s rules” (Rodrik 2001, 28). The mechanisms partly foreclosing these policy options include the World Trade Organization (WTO) and “the ubiquitous role of the World Bank and IMF [which] make it harder for governments dependent on these institutions to depart from the orthodoxy” (Rodrik 1999, 8).

This encapsulates the fundamental questions addressed in this monograph: Was industrial policy defined as choosing individual manufacturing sectors to foster indeed a major source of growth in these three economies? If so, can it be replicated elsewhere under current institutional arrangements—and if so, is it worth replicating, or would developing countries today be better off embracing the suitably refined orthodoxy? Much of the dominant view was based on the perceptions, circa 1990, of the policies that had led to rapid growth in a few Asian countries. Although many developing countries had experienced some spurts of growth between 1950 and 1973, often in conjunction with the end of colonial status, the period after 1973 was generally dismal. Sub-Saharan Africa, with the exception of Botswana, experienced a significant decline in per capita income. The 1980s saw no growth in per capita income in Latin America, partly as a result of extensive borrowing to pay for more expensive oil during the 1970s and the consequent default on sovereign debt in the early 1980s that led to contractionary policies. Although by 1990 China had undergone a significant acceleration of growth, much of

1. Robert W. Stevenson, *New York Times*, June 2, 2002. The allure of intensive government guidance was apparently not diminished by the disastrous experiments in neighboring Tanzania and many other African countries.

it had been due to the liberalization of the agricultural sector and the impact of foreign direct investment that had been enticed into special economic zones.² The focus on the smaller Asian economies and Japan as potential models for growth was partly an outcome of a sometimes desperate search for a coherent formula for growth.

The Washington consensus crystallized an emerging understanding among both academics and policymakers of the factors underlying Asian successes. Some important aspects of Asian policy were disregarded, particularly the considerable intervention that had occurred in product and factor markets and the political stability—initially authoritarian, then progressively more democratic—in Korea and Taiwan. The emphasis was on the role of what were thought to be relatively unhindered market forces. Empirical analysis of countries that had earlier attempted to intervene extensively had shown that it would be very difficult for governments to successfully intervene in a continuous fashion. This skepticism reflected a huge empirical literature documenting the ubiquitous failure of the strategy of import-substituting industrialization (ISI) that had been pursued by many countries, including early attempts in Korea and Taiwan.³ To draw an analogy from finance, an investment bank, a brokerage house, or an actively traded mutual fund might be able to identify one winning sector or set of companies for a few years, but over long periods such efforts rarely improve on the performance of a passively managed index fund. Likewise, the Washington consensus reflected doubt that a government could systematically intervene in a manner that accelerated growth, even though it might make the occasional lucky pick.

It is important to underline that in this volume we attempt to evaluate one part of the overall economic growth strategy of Japan, Korea, and Taiwan, namely, the effects of their attempts to discriminate among various industrial sectors. As will be seen, we are skeptical that this was the major key in their success. We do not question that all three countries were committed to sustained economic development and pursued this goal in many ways, from investing in infrastructure to improving the education system—perhaps skewing it toward a general favoring of the industrial sector. These instances of intensive devotion to economic development often produced what might be called generic infrastructure, for example, roads that could be used to ship any product, not just those of a specific sector. Similarly, the education received by chemical engineers enabled them to enter any of a large number of sectors, ranging from food processing to industrial chemicals. The effort in these directions may indeed

2. Small rural (“township and village”) industrial enterprises also played a significant role.

3. For comprehensive surveys of major studies see Balassa et al. (1982), Bhagwati (1978), Krueger (1978), and Little, Scitovsky, and Scott (1970).

have been greater in these nations, but they are not synonymous with the favoring, say, of heavy chemicals over the canning of jams and jellies. This latter aim requires narrowly targeted, sector-specific policies. Chemical engineers could have supervised the production of either jams or sulfuric acid, and either product could have been shipped along the same roads and through the same ports.

More generally, Japan, Korea, and Taiwan pursued policies similar to those of many newly independent countries after World War II. Compared with most, however, they had much better macroeconomic policies (World Bank 1993). In addition, although all three countries protected their domestic markets, they also relied more intensively than other developing countries on exports, an emphasis that required exporting firms to improve their productivity and product quality in order to compete in international markets. Efforts to improve the competitiveness of exported products inevitably affected the productivity of output destined for the protected domestic market as well—firms did not establish separate production facilities for exports and domestic production. Moreover, many of the numerous interventions to encourage exports were designed to offset some of the protection, including rebates for the higher price of protected intermediate inputs employed in the production of exports.⁴ Many have argued that this aspect of the system was unnecessarily cumbersome and that the same result—neutrality of incentives between production for the domestic market and for export—could have been achieved by low uniform protection combined with a subsidy on value added in exports.⁵

The three Asian nations intervened fairly heavily for varying lengths of time, as did all other developing countries with the exception of Hong Kong. Thus we are afforded the opportunity to observe perhaps 100 experiments involving systematic government intervention in developing countries, or more, given that many countries halted such intervention only to resume it during difficult periods. After half a century, three nations may have succeeded by using extensive selective intervention—four if Singapore is included, though its reliance on FDI requires a different analysis.

If a country were nevertheless to insist today on pursuing selective industrial policy (defined in detail below), it would have to identify those unique aspects of it in Japan, Korea, and Taiwan that may have led to suc-

4. In addition to rebates on intermediates, lower interest on loans that financed export production were used, as were export targets.

5. In fact, there may have been some slightly positive net incentive given to exports, as the package of special incentives slightly more than offset the protection of intermediates used in the exporting sectors (Westphal and Kim 1982).

cess. Since almost every policy pursued by those countries was adopted at some point in one or more ISI countries, it would be necessary to identify the combination of policies that led to success.⁶ Even if that could be done, it would still be necessary to avoid the long-run costs that have revealed themselves in the past decade, particularly in Korea and Japan, which are discussed in chapter 3. While the odds of achieving successful development through detailed interventions are much better than those of winning the lottery, they are not particularly favorable.

Before delving into industrial policy itself, we should take note of the danger of a “post hoc, ergo propter hoc” fallacy with respect to Japan, Korea, and Taiwan. They have all intervened, Japan and Korea very intensively, and they are among the few developing countries to have become relatively rich. It is thus tempting to conclude that industrial policy was a key to their growth. But as many analyses have noted, these countries also differed in a number of fundamental determinants of per capita growth, including investment relative to GDP, public and private education expenditures, stable real exchange rates, low inflation (relative to other developing countries), and initial endowments.⁷ Their investment rates, for example, were 30 percent or more for much of the post-1965 period, roughly twice the typical investment rate in less-developed countries (LDCs). While high investment does not guarantee rapid growth—the former Soviet Union comes to mind—it is unlikely that a country can achieve 9 percent GDP growth year after year without it.

An alternative view of these Asian success stories is that they are largely the result of getting macroeconomic policies right: responsible government monetary and fiscal policy, low inflation, and maintaining the correct real exchange rate were key to their success, as was the con-

6. Most observers agree that a distinguishing characteristic of Asian industrial policy was its use of export performance to monitor the success of individual firms. Growth in exports was a demonstration of quality and price competitiveness, although at any given moment this competitiveness may itself have stemmed from extensive subsidies, including those provided by consumers in the protected domestic markets. Insofar as subsidies were not growing over time as a percentage of the f.o.b. price of exports, subsidies could not account for the growth of exports. There were other differences with respect to the ISI countries as well.

7. Some would argue that an important dimension of their success may have been undervalued exchange rates, particularly for Japan and Taiwan. Insofar as such undervaluation led to continuing export surpluses, they imply that domestic saving (private and public) exceeded domestic investment. But this pattern would normally be attributed to macroeconomic policy rather than sectorally selective policy.

On a related point, these countries experienced less real exchange rate volatility than other major developing countries; lower levels of uncertainty about relative rates of return across alternative activities in turn reduced the riskiness of investment, which contributed to growth. Again, the maintenance of stable real exchange rates is really an issue of macroeconomic policy rather than industrial policy.

siderable investment in the education system.⁸ Growth was propelled largely by physical and human capital accumulation and the growth rate of total factor productivity (TFP), while not spectacular, was high by LDC standards.

It is difficult to sustain the synthesis of these views—namely, that the industrial policies were the source of superior macroeconomic performance. Some argue that policy in the Asian countries has had a “pro-producer” bias and that this may have contributed to their growth performance by increasing incentives to save, providing their firms with a ready supply of low-cost capital.⁹ This argument is seldom if ever formalized, however, and while it has some superficial plausibility, it is hard to reconcile with the life cycle hypothesis and with research on Japanese saving behavior, which, for example, has not uncovered links between industrial policy and national saving.¹⁰ That said, an interesting paper by Yano (2001) demonstrates that in a dynamic two-country model, a lax competition policy with respect to the nontraded sector of a large trade-surplus economy can act as a “beggar-thy-neighbor” policy, shifting real income to itself from its trade-deficit partner. Some fraction of this income may find its way into either government or private saving. Some of the more general issues associated with the interaction of micro- and macro-economic policies are discussed in chapter 3.

The disagreement between those who believe in the efficacy of industrial policy and those who maintain that economic fundamentals were critical is, at one level, unbridgeable, as it would require agreement on the evolution of sectors and productivity in the absence of industrial policy. Nevertheless, the considerable body of evidence available from attempts to empirically assess the impact of industrial policy brackets most of the plausible counterfactual scenarios. The neoclassical view that success was the result of getting the fundamentals right may be correct, but it must deal with the abundant evidence that the Asians were indeed interventionist (Komiya, Okuno, and Suzumura 1984; Pack and Westphal 1986; Wade 1990; World Bank 1993). For the revisionist view, the issue is whether the documented use of industrial policy can be shown to have

8. The second-generation reforms that have been widely urged since the onset of the financial crisis in 1997, such as better prudential bank regulation, more transparent corporate governance, and more vigorous competition policy, were clearly not part of the institutional structure of these nations, although some interventions, such as regulation of the capital market, had impacts that to a limited extent led to some desirable results, such as limiting risk taking by borrowers (Stiglitz 1993).

9. A largely closed capital account up through the mid-1980s facilitated the maintenance of a pool of captive saving, although this is not absolutely necessary if there is home bias in portfolio allocations.

10. See Balassa and Noland (1988, chapter 4) and Horioka and Watanabe (1997) on this point.

been a *quantitatively* significant contributor to welfare. Thus the contribution of industrial policy can be understood as its impact on the level and productivity of physical and human investment. If a country would have achieved a growth rate of 9.7 percent a year from conventional policies that encouraged the accumulation of physical and human capital and from TFP growth, and instead realized 10 percent as a result of its industrial policy, the latter, while not cumulatively unimportant, is a relatively small part of the growth story. If the growth rate would have been 7 percent in the absence of selective industrial policy because of lower factor accumulation and TFP growth, the benefits are clear.¹¹ Our reading of the extensive evidence we present in chapter 2 is that the interpretation in which selective industrial policy is seen to have accelerated growth only slightly, at best, is the most persuasive one.

Despite the important macroeconomic dimensions in which Japan, Korea, and Taiwan differed from other developing countries, some analysts suggest that the Washington consensus may have been wrong and that sufficiently competent governments could identify profitable sectors, channel resources to them, and accelerate growth rates. If this is indeed the case, some of the pillars of the Washington consensus are undermined. Sectorally neutral tax and expenditure policies may be wrong, financial institutions should perhaps be encouraged to lend to targeted sectors rather than aim for sectoral neutrality, and tariff protection to allow firms to move down their average cost curves may be justified. Such intervention is viewed sympathetically in many poorer countries where the program embedded in the Washington consensus, sometimes derided as “neoliberalism” or “the Anglo-American model,” is viewed with deep suspicion as part of an attempt to institute “neocolonial” policies or worse. Often the suspicion is expressed in terms of doubts about “globalization,” interpreted as an emphasis on growing international trade in goods and services: opponents are convinced that local firms can neither compete with efficient imports or export to other countries without a sustained period of government fostering of the industrial sector. Thus it is important to understand the role of industrial policy in Asia, to obtain some indication of its success or failure, and, if it is found to have been successful, to identify both the economic and political components that contributed to its success.

As noted earlier, this skepticism finds support in an extensive literature on the widespread failure of ISI policies in many countries. The World Bank’s *East Asian Miracle* volume (World Bank 1993) confirmed the emerging evidence that considerable intervention had occurred in Japan, Korea,

11. This implies that the 35 percent national saving rates and the passion for education reflected improved profit and wage opportunities that were generated by industrial policy or the lower risk attached to a given prospective rate of return. We discuss this in chapter 4.

and Taiwan—they were hardly the conventional *laissez-faire* economies imagined by some. On the other hand, it was difficult to document a significant *quantitative* contribution of these policies after taking account of the fundamentals, such as high investment rates. Partly catalyzed by publication of *The East Asian Miracle*, an enormous amount of empirical research on the effect of selective industrial policy has since been conducted. This literature has generated a considerable amount of new data and provided many new tests of the impact of industrial policy.

Our purpose in this volume is to provide a road map for policymakers in contemporary developing countries on the potential costs and benefits of industrial policy by incorporating this new evidence into a coherent framework. We do not attempt to sort out doctrinal disputes. Our point of departure is to assume that the broad facts of intervention are correct even though some of the interpretations have recently been disputed.¹² We do not start from the position that industrial policy cannot work. On the contrary, one of us coauthored a paper that interprets early Korean industrial development as partly the result of clever industrial policy (Pack and Westphal 1986). While this seemed a possible explanation of the earliest Korean successes, the evidence from later periods is decidedly less favorable for intervention, raising the question of how policymakers would know when to phase out a previously successful policy—an issue not unfamiliar to investors who rode the stock market bubble of the late 1990s. Thus the evidence of the limited or perverse effects of industrial policy in the past quarter century is important. Once such policies had been implemented, governments found them hard to adjust, let alone to abandon.

This volume does not address any of the influential journalistic approaches, which we view as untestable. For example, in the pessimistic atmosphere that characterized the United States in the 1980s, a large number of books (e.g., Vogel 1979; Magaziner and Reich 1982; Prestowitz 1988) were published that argued that “Japan Inc.” was a reflection of the attempt of an entire nation to excel economically and that Japan had devised new approaches to economic success that the United States (in particular) ignored at its own risk. As in many paeans to the emergence of a new, unbeatable form of social organization,¹³ these volumes and many others focused on a small segment of the national economy, namely,

12. For example, Wade (1990) presented a highly detailed account of extensive intervention in Taiwan but did not include an evaluation of its impact in terms of productivity growth or allocative efficiency. In an exhaustive reexamination of the evidence from Taiwan, Smith (2000) questioned the accuracy of Wade’s depiction of the government’s fostering new sectors with emerging comparative advantage; she provides careful tests of their economic effects, casting doubt on the growth effect of the policies. On Korea, see Yoo (1990, 1994).

13. Panegyrics to the superiority of the US model of the 1990s and the “new economy” have disturbing parallels to this literature.

Japan's success in a limited range of manufactured exports.¹⁴ The extent of market penetration in the United States was emphasized, but the welfare consequences in Japan were ignored. No discussion was given of the fact that purchasing power parity estimates of GDP per capita showed that Japan was still much poorer than the United States despite a quarter century of investment to GDP rates twice as high as in the United States and the implied lower level of consumption in Japan. And despite the frequent use of anecdotes about just-in-time delivery, social cohesion, and the brilliance of the Ministry of International Trade and Industry (MITI) and the Ministry of Finance in correctly assessing dynamic comparative advantage, other revealing facts were missing. In particular, there was no evaluation of the welfare of Japanese consumers and producers in sectors other than large-scale manufacturing (Balassa and Noland 1988). The exceptionally long work hours, by Organization for Economic Cooperation and Development (OECD) standards, and the absence of lifetime employment in the small-scale sector that supplied components to the large exporters was ignored, as were the \$25 cantaloupes, the tiny apartments of the upper middle class, and the extraordinarily long commuting times in Tokyo due to inadequate infrastructure that made Los Angeles and New York seem commuter friendly. Needless to say, after 13 years of unprecedented stagnation for a developed economy, Japan Inc. is now viewed more skeptically.

Protectionists in the United States who examine the impact of protection on the welfare of relatively small numbers of American workers (and shareholders) make a similar error when they ignore the consumer surplus accruing to 280 million consumers. The justifiable concern about displaced American workers (and the need for improved government aid to them) led to a disregard of the fact that many of the same workers purchased Japanese TV sets and cars that had lower prices and were of higher quality than American-made ones while their peers in Japan paid much higher prices for the same products. The workers of the world were united but not quite in the way Marx envisioned.

Another dubious proposition is articulated by those who argue that Japan (or Korea or Taiwan) would not have succeeded in any sector without intervention in *all* sectors. Hence it is necessary to examine Japan's aggregate growth rather than parse the impact of industrial policy sector by sector, as do all of the studies we discuss in chapter 2. Implicit in this argument is that there were extensive externalities flowing in unpredictable directions and that a simultaneous promotion policy was necessary in large numbers of sectors. Of course, it is not quite clear what externalities were derived by electronics firms from the protected small-scale Japanese

14. Contemporaneous Japanese accounts were much less sanguine. See Komiya, Okuno, and Suzumura (1984).

rice sector that produced rice selling at six times the world price, nor the externalities flowing from Toshiba to inefficient Japanese construction firms that could not match competitive international bids for domestic construction projects. The oft-heard argument that one must take a “holistic” approach and look at the entire economy rather than the impact of industrial policy on individual sectors is irrefutable. But the burden on those who hold such views is to demonstrate that externalities existed and were large.

Similarly, some analysts suggest that Japan and Korea generated “deep” industrial structures—that is, they produce most types of industrial goods—and take this as a positive benefit of industrial policy.¹⁵ However, India also achieved a thick industrial structure, but one that was extraordinarily inefficient and resulted in much lower per capita income than would have resulted from more attention to efficiency and less to encouraging all sectors. Hong Kong, with a much less deep industrial structure, is considerably richer than India. Not incidentally, Hong Kong also has a higher per capita income than Japan and Korea. All of this suggests that the efficiency of the industrial path chosen and its general equilibrium consequences on welfare are the critical issue rather than industrial depth. Consumers cannot eat industrial “depth” for breakfast but do value increases in their real standard of living.

Definition

We define selective intervention or industrial policy briefly as an effort by a government to alter the sectoral structure of production toward sectors it believes offer greater prospects for accelerated growth than would be generated by a typical process of industrial evolution according to static comparative advantage. Used without more specificity, all developing countries, excluding perhaps Hong Kong, have used and continue to use industrial policy.¹⁶ Credit directed at specific sectors with below-market interest rates for long-term and working capital, sectorally differentiated profits taxes, subsidized electricity rates, research and development subsidies, control of the entry and exit of firms, export targets, and highly differentiated tariffs and nontariff barriers are all forms of industrial policy. Japan, Korea, and Taiwan used most or all of these instruments as well as others for varying lengths of time and at different intensities. Given their

15. In technical terms they are arguing that the input-output tables will generally have few empty cells and that the individual coefficients are larger than they would have been absent government efforts.

16. Contrary to some popular impressions, Hong Kong engaged in some efforts to improve the prospects of the industrial sector. In particular, it tried to keep food and housing prices low to avoid increases in the nominal wage.

rapid growth in per capita income, it is understandably tempting to conclude that the industrial policy played a decisive role in their success.

Initiation and Maintenance of Industrialization

In analyzing the impact of industrial policy, it is important to distinguish between the initiation of industrialization and its continuance once a higher level of growth had been achieved. The former is of interest to many of the least-developed countries, particularly in sub-Saharan Africa, and the latter to countries that have implemented many basic economic reforms but whose growth rate has responded slowly, for example, Chile. The recovery in Japan between 1945 and the Korean War was probably accelerated by the government's efforts to restore prewar levels of capacity and productivity in sectors such as autos, aluminum refining, steel, textiles, and shipbuilding (Mutoh 1988; Tanaka 1988; Yamawaki 1988; Yamazawa 1988; Yonezawa 1988). In some ways this was the easier part of postwar growth in Japan, as the knowledge on which the prewar structure was based had not been destroyed. Protection of sectors that encouraged investment in them, the direct allocation of foreign exchange to acquire critical equipment and technology licenses, and investment coordination almost surely served a positive role, although this proposition is not easily tested given the lacunae in the data for this period. One interpretation of the impact of these policies is that they compressed the time it would otherwise have taken to restore prewar industrial output levels, but given high investment and the largely intact stock of human capital, this would inevitably have occurred anyway. When one considers the Japanese or foreign image of Japan Inc. popular in the 1970s and 1980s, the issue is not the contribution of industrial policy to the immediate postwar recovery in basic industry but the role of government in fostering the entry of firms into new sectors such as televisions and electronics and whether such policies were the source of the rapid growth in living standards between the Korean War and 1990 (Johnson 1982). Most of the scholarly literature that we review has a skeptical evaluation of this view.

Similarly in Korea and Taiwan, government may have played some positive role in the initiation of industrial development from around 1960 to 1970 in largely labor-intensive sectors, although the relative contributions of industrial policy and of fundamentals has not been demonstrated quantitatively. Little (1994) emphasizes that Korean and Taiwanese industrial growth in their first years of rapid development was concentrated in sectors such as clothing, textiles, and sporting goods, labor-intensive sectors in which their relatively large supplies of low-wage, fairly productive labor conferred a comparative advantage. Once macroeconomic reforms in the 1960s provided a relatively stable environment,

the expansion of exports in these sectors was not surprising, in Little's view, given that a similar phenomenon had occurred in Hong Kong despite the absence of government policy. These efforts were complemented by measures undertaken by the governments to facilitate growth, and several efforts have been made to understand the potential contribution of these policies (Pack and Westphal 1986; World Bank 1993). Given the patchiness of the data for this early period, the relative impact of government policy and of the improved general economic environment resulting from reforms is impossible to establish quantitatively. Nations such as Uganda that are anxious to jump-start their development process cannot seek guidance in the experience of these countries alone. But the enormous literature from other nations does show, rather definitively, that government policies that favor individual sectors generally have not been successful.

By the early 1970s Korea and Taiwan had both achieved considerable growth in per capita income largely on the basis of labor-intensive industries, and, as in Japan, efforts were then made to move into more capital- and technology-intensive sectors, which is the issue of interest for semi-industrialized nations. It is this period for which considerable evidence is available and on which we concentrate in chapter 2. Nevertheless, the distinction between these emphases should not be drawn too sharply. For example, many of the sectors that were encouraged in Taiwan in the 1980s were labor intensive (Pack 1992a; Smith 2000). A low-income country that is trying to initiate industrialization has several options from which to choose. Assuming (perhaps heroically) that it can raise its investment and education levels and maintain a good macroeconomic policy,¹⁷ its options include the following:

1. Follow a *laissez-faire* policy with no detailed intervention—roughly the policy of Hong Kong, in which local firms become important sub-contractors within international supply networks. Although the conventional wisdom is that Hong Kong's skill base was very high as a result of the immigration of Shanghai industrialists in 1949, it is not obvious that the modern industrial skills they possessed were particularly great. Small clothing factories in the economically backward China of the 1930s were unlikely to be the repository of internationally competitive management competence. Rather the small firms on which Hong Kong's industrial success was built were chosen to be

17. This does not imply these are the only prerequisites. This is used as a shorthand for many basics, including the now-hackneyed but nevertheless important tasks of a well-regulated financial system, the provision of widespread education, the construction of social overhead capital, a workable judicial system, and so on. Obviously, a country as poor as Uganda cannot do all of these at once. Certainly Japan, Korea, and Taiwan did not achieve all of them instantaneously.

come part of international supply networks because of the stable government and good macroeconomic environment.¹⁸ The continuing search by wholesalers and retailers in the OECD countries for low-cost international suppliers offers a poor country considerable opportunity provided it can emulate Hong Kong's policy environment.¹⁹

2. Actively seek foreign direct investment. Singapore, which was similar to Korea in endowments (discussed in chapter 4) took an entirely different route to augmenting local skills by actively recruiting multinational corporations and by building infrastructure ranging from ports to airports to telecommunications systems in order to make location there attractive. Like Hong Kong, Singapore fostered a successful industrial sector and has achieved a higher per capita income than Japan and Korea. While skeptics argue that Singapore's success is fragile, as footloose multinational corporations can relocate to still less expensive countries, the infrastructure and educational stock are not easy to replicate, and the formula has worked for 40 years.
3. Follow a detailed industrial policy of the type pursued by Japan, Korea, and Taiwan, the focus of this study. One broad rationale for this approach is the need to encourage purportedly missing entrepreneurship; the other is to correct market failures.

Before moving to a detailed discussion of market failures that may require the government to implement corrective policies, it is useful to analyze explicitly the question of the need to encourage entrepreneurship. Much of the rationale for industrial policy has been based on this perceived requirement, but the discussion has largely ignored the huge literature on the rationality of small farmers and households in developing countries that has become, to a large extent, synonymous with development economics in the past two decades.²⁰ The question of entrepreneurship has a long history in economics, and much of the discussion has amounted to a catalogue of characteristics—the conditions necessary for

18. For a detailed discussion of the recent expansion of international supply networks and the incorporation into them of many heretofore marginal countries, see Sturgeon and Lester (2002). Hong Kong was one of the early beneficiaries of this development, but the new data suggest that this is an ongoing phenomenon of considerable importance to many nonindustrialized nations.

19. Morawetz (1982) has shown that maintaining a place in this international system is not easy. Colombia was producing clothing for American retailers long before the Asian countries were, but its position was undermined by, among other things, a poor real exchange rate policy.

20. See, for example, the last two volumes of the *Handbook of Development Economics*, edited by Behrman and Srinivasan (1994), and recent textbooks in development economics, such as Ray (1998), in which more than half of the volume is devoted to these issues.

its emergence.²¹ In the “modernization” literature of the 1950s and 1960s, much was made of the need to instill entrepreneurship into societies in which it was alleged to be missing; efforts were undertaken to measure the personality traits of entrepreneurs who would then become the protégés of aid programs, foundations, or nongovernmental organizations that would convert them into local Henry Fords (McClelland 1961; Inkeles and Smith 1974).

This early literature *assumed* that the critical bottleneck to development was the absence of attitudes of calculation, risk taking, and the Schumpeterian ability to perceive and exploit profitable opportunities. Largely ignored was the research of Theodore Schultz (1964) and others who argued that small farmers were extraordinary in their rational calculation, a contribution cited by the Nobel Prize committee honoring Schultz in 1979. Two decades of intensive empirical effort have confirmed that households and farmers with limited education have made quite rational choices, in one case approximating the optimal solution found by economists using dynamic programming models executed on a supercomputer (Rosenzweig and Wolpin 1993). Households routinely deal with risk, for example, by having children choose spouses from families in a region in which weather patterns have a limited correlation with their own. Peasant farmers change their planting patterns as relative prices of crops change (and implicitly take account of the standard deviation of these prices over time). Managers of township and village small industrial enterprises responded with alacrity to the opportunities in post-1977 China despite three decades without rewards or incentives, finding new product niches and appropriate production methods.

It might be argued that these demonstrated abilities are not those necessary in large-scale industry, but advocates of industrial policy appear to be unaware of these results and hence have not engaged them. But even if we assume that the relevance of these skills for large-scale industrial firms is limited—as should be argued by proponents of industrial policy—is a policy directed to fostering large individual firms the only choice for a very poor country? Is the model of the Korean chaebol or the members of the Japanese keiretsu the only path? Or is it possible to envision an industrial trajectory such as that followed initially in Hong Kong and to a lesser extent in Taiwan, to say nothing of the rural Chinese township and village enterprises, that initially relies on small-scale firms that gradually become larger and more efficient?²² Moreover, even the usual characteri-

21. Perhaps the richest and most insightful discussion is that of Leff (1979).

22. For a formal model of the implications of such growth for the aggregate economy, see Nelson and Pack (1999). It can also be correctly argued that such a small-scale strategy requires centralized technical support, as was provided in Taiwan (Dahlman and Sananikone 1997). This is much closer to the first best imperative of targeting specific market failure rather than providing broad support such as tariffs and quantitative restrictions.

zation of the Korean model is open to question, as it had experienced some industrialization under the Japanese occupation, although the eventual geographic distribution of managers between North and South is not clear. None of this is to argue that it is inconceivable that entrepreneurship needed fostering. Rather it is to indicate that invoking the need to encourage missing entrepreneurship as a defense of industrial policy (and its earlier incarnation in import-substituting industrialization) rests on an assumption that is belied by almost all modern development economics.

Thus, even focusing on the three Asian nations that have succeeded, the model pursued by the Asians is hardly the only option for very poor countries attempting to initiate growth, and the other two options need to be considered as serious alternatives. A nation attempting to derive lessons from them should worry about the replicability of their experience. A large number of conditions must be present, including significant government competence and an overriding interest by the government in economic success measured in growth in income per capita, rather than the enrichment of specific groups at the expense of the society. The interest of more advanced developing countries, such as Chile, looking to the Asian experience is not their ability to export wigs, baseball gloves, or shirts—important products in the initial growth of manufacturing—but their later transition into more complex sectors. Much of the evidence we examine in this monograph considers the three Asian countries' success in developing more sophisticated industries in the period after higher growth began; thus, for these more advanced nations, the evidence for the late 1970s and 1980s is of great relevance.

There are two issues to be addressed: the impact of industrial policy on the initiation of growth, and its effect after the initial stage. In fact, these issues are not easily separable. As alluded to earlier, if industrial policy is pursued intensively in the initial phase, altering its substance, course, or pace may quickly become politically difficult. Moreover, as we discuss in chapter 3, some economic damage may be done if one of the instruments of industrial policy is the suppression of the banking sector that is used as a passive conduit of funds to chosen sectors and firms. In principle, we would like to answer the following questions. During each period of growth, initial and follow-on, was industrial policy *the* source of growth, or was it a mild accelerant, improving the growth rate slightly given the high growth of capital, education, and gains in total factor productivity (TFP) realized from borrowing technology from abroad? Second, are any of the problems that have been encountered in Japan since 1990 and in Korea since 1997 partly the legacy of one aspect or another of industrial policy?

The Case for Selective Industrial Policy

For selective government intervention or industrial policy to be welfare improving, policymakers must identify market failures that would pro-

vide the scope for welfare-enhancing interventions, design and implement the appropriate interventions, and correct or terminate the applied policy as changing circumstances warrant.²³ To use a construction metaphor, to build an addition to a house there must be room for the extension, a feasible blueprint must be drawn up, and the right tools must be used correctly to get the job done. In technical terms, economists have identified numerous circumstances in which market failures could provide scope for welfare-enhancing industrial policy. These include:

1. Real external economies. These provide benefits to firms that generate improvements in their productivity (or a reduction in their costs) as a result of the activities of other firms. In a familiar example, assume that Microsoft develops new software and that other firms informally learn some of the details of the development process (through after-hours conversations at the local Starbucks) and are thus able to avoid blind alleys. Competitors such as Symantec may be able to produce a new software program more quickly. This reduction in development time will lead to greater profitability for Symantec and perhaps to lower consumer prices. Such knowledge spillovers may occur from informal exchanges in both professional and social contexts. In the case of goods that enter international trade, real externalities improve the welfare of the entire nation only if they allow goods to be produced at less than the imported c.i.f. price.²⁴ Thus if the new software package produced by Symantec is already available at a lower price from SAP, a German software producer, no benefit is realized by the United States as a whole.
2. External economies that arise as the size of a competitive industry increases, permitting a falling long-run supply curve. For example, machine tool manufacturers typically obtain specialized inputs from foundries. The machine tool firms benefit from a specialist foundry that can operate a large piece of equipment for three full shifts as it pools orders from a large number of machine tool manufacturers. If the industry is not sufficiently large to support a specialist, each ma-

23. We use the terms welfare-enhancing and growth-accelerating interchangeably in this discussion. Most of the theoretical models are explicitly static, hence the normative results are expressed in terms of welfare enhancement, not growth acceleration. While it is possible that industrial policy could generate a one-step increase in welfare that would not lead to an acceleration in the secular growth rate, we believe that focusing solely on explicitly dynamic models would be too limiting in this context.

24. This is not sufficient to justify intervention, however. A socially successful intervention depends on whether the present discounted value (PDV) of future producer surplus exceeds the PDV of the social cost of subsidies.

chine tool firm will have to invest in its own foundry, operating it for a small fraction of 168 hours per week, thus raising production costs substantially. The gains in productivity in a competitive sector in which individual firms exhibit constant or increasing costs are attributable to “economies of scope” in the use of specialized equipment and greater specialization of individual labor skills, in this case, in the foundry. Encouragement of many firms to enter the machine tool sector could generate economies of scope.²⁵

3. Pecuniary economies that may occur in some industries in which large-scale economies exist and only one firm can be established in each sector, for example, a steel mill in a relatively small economy. If a steel manufacturer perceives only a domestic market, it will construct a larger plant only if a potential purchaser, such as in the auto sector, also establishes a large plant that generates extensive demand. The market failure is that at a given point in time, current prices may not convey the information about prospective expansion that is relevant to attaining a lower cost of production through larger plant size (Scitovsky 1954; Chenery 1959). This generates an argument for coordination of planned investment as delineated by Murphy, Shleifer, and Vishny (1989), who formalize Rosenstein-Rodan’s (1943) idea of the “big push.” There are multiple equilibria because of pecuniary externalities generated by imperfect competition and large fixed costs. Murphy et al. argue that industrial policy that “encourages industrialization in many sectors simultaneously can substantially boost income and welfare even when investment in any one sector appears impossible” (p. 1024). Such arguments critically depend on the costs of importing some of the inputs or difficulties in exporting the resulting output (Pack and Westphal 1986). Growth of the size of the economy will eventually preclude the need for policies to obtain the productivity gains from economies either of scope or of scale. Government encouragement of individual sectors and coordination of these sectors could potentially yield greater productivity, providing that international trade options could not be exploited.
4. Externalities that may be conferred on other firms in an industry by the first entrant. These include the demonstration that the sector is physically and economically feasible (Pack and Westphal 1986; Rob 1991) and the diffusion of information about technology and market-

25. This is usually classified as a pecuniary external economy, as the machine tool firms benefit from a lower price in specialist foundries. In contrast, in the preceding paragraph, Symantec does not purchase a cheaper or improved input from Microsoft. The increase in profitability is not mediated through the price system.

ing conditions to other domestic firms that are considering establishing production.²⁶

5. Results of research by one firm that benefit other firms. Xerox's demonstration of the feasibility of a dry photocopying process led many other firms to seek methods of dry copying that did not infringe Xerox's patent. The incomplete appropriability of the results of R&D may provide a strong argument for governments' encouragement of research. Without such efforts, too little R&D may take place.
6. Externalities that could arise from the interaction of suppliers and buyers on the design or method of production of a product leading to a better or cheaper good than is available internationally. Thus a local machine producer may be capable of designing equipment that is responsive to local humidity, temperature, or variation in input quality. The cost saving to textile producers might justify the establishment of a loom manufacturer that was not as efficient as foreign competitors. In this case, the source of the externality is the nontradability of some types of inputs or knowledge—otherwise the improved method or product could be obtained from international suppliers.
7. Finally, firms that anticipate learning-by-doing reduce their costs, and eventually become competitive. In principle, they could self-finance this process or raise funds from friends and family if their capital needs are limited and resort to bank finance if large amounts are required. However, if bankers take a myopic view, require large amounts of collateral that new firms do not have, or are excessively risk averse, some subsidy might be appropriate.

In all of these cases, industrial policy can be directly welfare enhancing by improving the competitiveness of domestic industry, leading to both higher national and world output.²⁷ There are additional cases in which

26. Okuno-Fujiwara (1988) provides a formal example of this phenomenon in the form of a model of the interdependence of two industries. One industry, which produces an intermediate product, is assumed to be oligopolistic because of underlying scale economies and engages in Cournot competition. The other industry, which produces a final product from an intermediate product, is perfectly competitive. In this situation there may be multiple equilibria with one equilibrium Pareto-superior to the others. Industrial policy has a positive role in the form of preplay communication to generate a superior coordinated equilibrium. For the intervention to convey some purely *national* welfare enhancement, there has to be some nontraded aspect of the externality. Otherwise, foreigners have access to the same low-cost inputs, and the pattern of production in the downstream industry is indeterminate without additional assumptions.

27. As is well known from the Bhagwati-Ramaswamy (1963) contributions, the optimal strategy is to address the source of the externality, for example, by providing R&D subsidies rather than by less targeted policies such as tariffs.

industrial policy can be welfare enhancing or growth promoting through the capture of rents or terms of trade effects associated with international trade.²⁸ In these cases, national industrial policies have a zero-sum element at the global level and hence could be thought of as containing a strategic or predatory element.

Similarly, the endogenous trade and growth literature that links the cross-national pattern of international trade specialization to differential cross-national growth rates provides numerous theoretical possibilities for growth-enhancing industrial policy at the national level, for example, through R&D or output subsidization schemes that could accelerate new product development, innovation, and growth (Grossman and Helpman 1991).²⁹ (Of course, these results are assumption-specific: if in reality the subsidized R&D-intensive sectors are characterized by low levels of TFP relative to world best practice, the policy could be welfare reducing at both the national and global levels.) The point is simply that the theoretical possibility exists—we have room to build that addition to the house; whether the blueprint makes sense or the contractor can build it is another issue.

In this discussion we have established the theoretical possibility of welfare- or growth-enhancing industrial policies. However, it is beyond the scope of this monograph to comprehensively map the advisable policy interventions to the specific market failures or strategic opportunities identified in the literature. Nevertheless, we think it worthwhile to point out a few general caveats for the successful implementation of industrial policy. First, the appropriate policy response may be highly case specific. For example, in the well-known Brander-Spencer model, the optimal intervention changes from an export subsidy to an export tax, if price competition rather than quantity competition is assumed.³⁰ In the case of the international trade models, multiple policy tools may be necessary to pursue do-

28. Early formalizations of arguments along these lines are provided by Spencer and Brander (1983) and Itoh and Kiyono (1987). Helpman and Krugman (1989) offer a synthesis of the subsequent literature on strategic trade policy. Kang (2000a,b) shows that the degree of intellectual property rights protection can have a strategic effect similar to export subsidization in the earlier literature. For a skeptical view of the relevance of strategic trade theory for developing countries, see Corden (1991).

29. It might at first seem surprising that the normative results of these models to a large extent turn on conventional differences in factor usage across industries. Consequently they do not appear to yield robust policy inferences. Empirical work has focused on modeling international spillovers arising from research and development activities (e.g., Coe and Helpman 1995; Coe, Helpman, and Hoffmaister 1997) rather than on the implications of industrial policy.

30. Similarly, the presence of increasing returns to scale decreases the likelihood that the optimal policy is a subsidy, since a subsidy may encourage the entry of additional firms into the market and reduce efficiency by reducing plant size or output. See Helpman and Krugman (1989) for more such examples.

mestic and international goals in concert if the good in question is not purely importable or exportable—almost surely the case in the real world.

Second, with the exception of some policies that might be accomplished through pure informational or coordination effects, industrial policies require scarce resources. It is not sufficient, for example, to show that in a partial equilibrium sense a particular production or export subsidy might be potentially growth enhancing if the necessary resources are mobilized at the expense of even more worthy sectors (Dixit and Grossman 1986).³¹ In other words, while adding an additional bedroom to a house may increase its resale value, adding another bathroom may increase it even more. This, of course, suggests a more general informational problem, namely, that even if policymakers identify the possibility of a growth-accelerating intervention and the appropriate policy package, they still have to calibrate the appropriate magnitude of, say, a tax or subsidy; after all, it is as possible to intervene too much as too little.

Third, in the case of globally zero-sum strategic policies, policymakers must consider the possibility of retaliation. As a general proposition, one would expect that the possibility of retaliation would reduce the likelihood of growth-accelerating industrial policies, and indeed, retaliation may make both parties worse off relative to their initial positions.³² The basic lesson from the strategic trade literature is that the possibility of retaliation further complicates the problem of identifying optimal policies.³³

Finally, in the cases discussed thus far, intervention may be effective if the government itself does not suffer from deficiencies leading to government failure. One of the notable lacunae in the industrial policy literature is the general absence of discussion of political economy factors, in particular the possibility of rent-seeking behavior by self-interested firms and policymakers and the concomitant degradation of policy. A good blueprint is of little use if your contractor is a crook. One of the important aspects of Asian industrial policies was the relative lack of corruption, as we discuss in succeeding chapters.

31. Almost all of the literature advocating industrial policy not only ignores the immediate opportunity cost of funding a preferred sector but also the deadweight loss often imposed on other sectors, for example, by taxes that are used to pay for subsidies.

32. However, as demonstrated by Johnson (1953–54), the possibility of retaliation does not eliminate the possibility that the introduction of a tariff by a large country would necessarily be welfare reducing even allowing for retaliation.

33. For example, in the Brander-Spencer model with retaliation, the previously optimal export subsidy policy is welfare reducing, and the optimal policy is a coordinated export tax by both national governments.