Industrial Policy: Can We Go Beyond an Unproductive Confrontation?

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This paper attempts to go beyond what the author sees as an unproductive confrontation between the proponents and the opponents of industrial policy and to take the debate on industrial policy forward. After discussing some issues related to conceptualizing and assessing industrial policy, the paper discusses most (although not all) of the key issues emerging from the industrial policy debate. They include the wisdom or otherwise of targeting, the feasibility of the state "beating the market," political economy questions, bureaucratic capabilities, performance measurement (especially export targets), the importance of export-related industrial policy, and the implications of changing global policy environment.

Few topics in development economics, and indeed in economics as a whole, have caused more heated controversy than industrial policy. Not just its effectiveness and generalizability, but also its definition and very existence have been debated. Its opponents have declared its nonexistence, irrelevance, ineffectiveness, and demise many times, but it refuses to go away. For this to be the case, there has to be something more than the irrepressible human tendency to search for a magic solution for their problems.

This paper aims to go beyond what I see as an unproductive confrontation between the proponents and the opponents of industrial policy and to explore how we can take the debate forward. I cannot claim to be impartial in this endeavor, as I have been a party to this debate. I will, however, do my best to find common ground and extract some theoretical and policy lessons from both sides of the debate.

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The Industrial Policy Debate: Conceptual Issues and Neglected Facts

Before discussing what I think are the main lessons from the industrial policy debate, I briefly review the debate itself. While I cannot avoid pronouncing judgments on at least some of the arguments advanced during the debate, the main purpose of the review is *not* to declare scores. It is to highlight some conceptual issues and neglected facts that help us to see the debate from what I hope to be a broader, but more pragmatic, point of view.

Literally interpreted, industrial policy should mean policy that affects industry, in the same way in which agricultural policy means policy that affects agriculture and monetary policy means policy that affects monetary variables. And indeed, many commentators on industrial policy on both sides of the argument follow this definition (see Chang 1994, 58–61, for some examples).

However, when we talk about "industrial policy," the majority of us do not mean any policy that affects industry, but a very particular type of policy that affects industries. This type of policy is commonly known as selective industrial policy or targeting—namely, a policy that deliberately favors particular industries over others, against market signals, usually (but not necessarily) to enhance efficiency and promote productivity growth.

Industrial policy in this sense is usually associated with the development experiences of Japan and other East Asian economies (the Republic of Korea, Taiwan, China, and Singapore) in the post–World War II period. As I explain below, however, industrial policy, even in this narrow sense, has been practiced well beyond such time and place. Even so, let me start with the debate on post–World War II East Asian industrial policy, as this is what has framed our current thinking on industrial policy.

The modern debate on industrial policy started in the late 1970s, with the rise of Japan. Although the practice of (selective) industrial policy had been noticed among the scholars of postwar French economic policy in the 1960s, it was seen as a part of the broader exercise of "indicative planning" (Shonfield 1965; Cohen 1977). With the debate on Japan, industrial policy was brought to center stage, not least because Japan was the first country that used the term "industrial policy" (*sangyo seisaku*) to mean selective industrial policy. By the late 1980s, it came to be widely accepted that strong industrial policy was also practiced in Korea; Taiwan, China; and (in a very different way) Singapore; which had until then been thought to be free trade, free market economies.

In the early days of the debate on industrial policy in East Asia, some denied its very existence. Some of this denial was out of sheer unwillingness to recognize any fact that goes against one's deep-held beliefs. For example, free trade economist Bela Balassa argued, as late as 1988, that the role of the state in Korea "apart from the promotion of shipbuilding and steel . . . has been to create a modern infrastructure, to provide a stable incentive system, and to ensure that government bureaucracy will help rather than hinder exports" (Balassa 1988, S286). However, more often it was based on an honest misunderstanding of the ways in which industrial policy worked in these countries. For example, Trezise (1983) argued that Japan did not have much industrial policy on the "objective" ground that its industrial subsidies

and government loans as a proportion of GDP were below the Organisation for Economic Co-operation and Development (OECD) average.

However, subsequent debate revealed that industrial policy in East Asia involved a lot more than handing out subsidies and providing trade protectionism (tariffs, import bans, quotas, and domestic regulations at least partially intended to curb imports). Industrial policy measures in East Asia included (a) coordination of complementary investments (the so-called Big Push); (b) coordination of competing investments through the regulation of entry, "investment cartels," and (in declining industries) negotiated capacity cuts; (c) policies to ensure scale economies (for example, licensing conditional on scale of production, emphasis on the infant industries starting to export early on, and state-mediated mergers and acquisitions); (d) regulation of technology imports (for example, screening for overly obsolete technologies and caps on technology licensing royalties); (e) regulation of foreign direct investment (for example, entry and ownership restrictions, local contents requirements, technology transfer requirements, and export requirements); (f) mandatory worker training for firms above a certain size, in order to resolve the problem of underinvestment in the training of skilled workers due to the possibility of poaching; (g) the state's role in providing venture capital and incubating high-tech firms; (h) export promotion (export subsidies, export loan guarantees, and marketing help from the state trading agency); and (i) government allocation of foreign exchanges, with top priority going to capital goods imports (especially for export industries) and the bottom priority going to luxury consumption goods imports.

The debate on the existence and the definition of industrial policy in East Asia alone has suggested two important points that are important to bear in mind when assessing industrial policy in general.

First, the extent of industrial policy cannot be identified purely in terms of quantifiable measures, especially those that involve financial transfers. As can be seen from the above list, many industrial policy measures do not involve any financial transfer, possibly except in the most roundabout general-equilibrium sense. By looking only at quantifiable indicators, we significantly underestimate the extent and the depth of industrial policy, both at the sectoral level and at the economy-wide level.

Second, we cannot assess the impact of a country's industrial policy solely on the basis of the performance (however measured) of the "targeted" sectors (World Bank 1993 and Lee 1996 are the two most frequently cited examples along this line). Looking at sectors separately leaves us to ignore the impacts of "super-sectoral" industrial policy measures that address issues such as complementarities, linkages, and externalities among sectors.[1]

Of course, as the critics of industrial policy rightly point out, the mere coexistence of industrial policy, however widespread, and rapid industrial economic development in East Asia does not prove that the former has caused the latter. As they point out, it is possible that these countries could have grown even faster, had they not used industrial policy (Pack and Saggi 2006).

This is logically possible, but if that were the case, these countries must have had some country-specific "countervailing forces" that were so powerful that they canceled out all the harmful effects of market-distorting industrial policy and still

generated the highest growth rates in human history (6–7 percent annual growth rate in per capita income over four decades). I find this highly implausible. Are these skeptics seriously suggesting that, without industrial policy, these powerful countervailing forces would have made the East Asian countries grow at 9, 10, or even 12 percent, when no country in history has ever grown faster than 7 percent for an extended period, with industrial policy or not?

No convincing story as to what these countervailing forces are has been offered. Culture (leading to a high savings rate, strict work ethic, and high-quality bureaucracy), the legacy of Japanese colonialism (leading to exceptionally high literacy and a broad industrial base), and cold war politics (leading to exceptionally high foreign aid and special access to the U.S. market) are frequently cited, but none of them even passes the minimum factual tests (Chang 2007, ch. 9, on culture; Chang 2006 on Japanese colonialism and the cold war).[2]

Of course, as Pack and Saggi (2006, 268) point out, it is impossible to prove that East Asia could have done better or worse without industrial policy, as "the relevant counterfactuals are not available." However, not all counterfactuals are equally plausible, and the counterfactual supposed by the critics of industrial policy is highly implausible. This nudges us toward the conclusion that industrial policy worked in East Asia.

Moreover, contrary to what many of its critics believe, industrial policy success was not confined to late-twentieth-century East Asia. There is quite a lot of evidence outside late-twentieth-century East Asia that further strengthens (but once again cannot "prove") the case for industrial policy. There are three such sets of evidence.

First of all, if we broaden our spatial horizon, we realize that successful industrial policy experiences in the late twentieth century are not confined to East Asia. I have already mentioned the French industrial policy, but quite a few other European economies, such as Finland, Norway, and Austria, also pursued (selective) industrial policy, often with even greater success than France, during this period (Katzenstein 1985). Certain local governments in Italy (Emilia-Romagna) and Germany (Baden-Württemberg) also pursued effective industrial policy, promoting particular "industrial districts" through directed credits (from local banks, often owned by the local government), support for research and development (R&D), and export marketing help (Piore and Sabel 1984). All these countries had high growth rates between the 1950s and the 1980s, although this is not to say that industrial policy was solely responsible for their growth.[3]

While championing the free market ideology during this period (although not before that), the U.S. government also ran a huge (if somewhat wasteful) industrial policy program under the guise of R&D support for defense and public health. Between the 1950s and the 1980s, the U.S. federal government financed anywhere between 47 and 65 percent of national R&D spending, compared with around 20 percent in Japan and Korea and less than 40 percent in several European countries, such as Belgium, Finland, Germany, and Sweden (Mowery and Rosenberg 1993, 41, table 2.3 for the United States; OECD data for the other countries).[4] Many of the industries where the United States still has a technological edge would

not have developed, or even emerged at all, without public funding of R&D. These include aircraft, computers, microchips, the Internet, and genetic engineering.

Second, going back in time, there are even more stories of industrial policy success. Contrary to the popular myth, in the nineteenth and the early twentieth centuries, all of today's rich countries, except for the Netherlands and (before World War I) Switzerland, practiced significant degrees of protectionism for substantial periods of time (see table 1; see Bairoch 1993 and Chang 2002 for further details). Although these tariffs were not as systematically calibrated as those used in the late twentieth century in East Asia (and other countries), they were definitely parts of (selective) industrial policy insofar as they were deliberately different across sectors. In addition

TABLE 1. Average Tariff Rates on Manufactured Products for Select Developed Countries in Their Early Stages of Development, 1820–1950

(weighted average, % of value[a])

Country	1820[b]	1875[b]	1913	1925	1931	1950
Austria[c]	R	15–20	18	16	24	18
Belgium[d]	6–8	9–10	9	15	14	11
Canada	5	15	—	23	28	17
Denmark	25–35	15–20	14	10	—	3
France	R (20)[e]	12–15	20	21	30	18
Germany[f]	8–12	4–6	13	20	21	26
Italy	—	8–10	18	22	46	25
Japan[g]	R	5	30	—	—	—
Netherlands[d]	6–8	3–5	4	6	—	11
Russia	R	15–20	84	R	R	R
Spain	R	15–20	41	41	63	—
Sweden	R	3–5	20	16	21	9
Switzerland	8–12	4–6	9	14	19	—
United Kingdom	45–55	0	0	5	—	23
United States	35–45	40–50	44	37	48	14

Source: Chang 2002, 17, table 2.1, largely based on Bairoch 1993, 40, table 3.3, except for Canada, which is from Taylor 1948, 102–08, 398.

Notes: R = numerous and important restrictions existed, making average tariff rates not meaningful. — = not available.

a. World Bank (1991, 97, box table 5.2) provides a similar table, partly drawing on Bairoch 1993. However, the World Bank figures, although in most cases very similar to Bairoch's, are *unweighted* averages, which are obviously less preferable to the *weighted* average figures that Bairoch provides.

b. These are very approximate rates and give a range of average rates, not extremes.

c. Austria-Hungary before 1925.

d. In 1820, Belgium was united with the Netherlands.

e. According to the estimate by Nye (1991), the average tariff rate, measured by customs revenue as a percentage of net import values, in France during 1821–25 was 20.3 percent, as against 53.1 percent for Britain, which is in line with the 45–55 percent range estimated by Bairoch.

f. The 1820 figure is for Prussia only.

g. Before 1911, Japan was obliged to keep tariff rates low (up to 5 percent) through a series of unequal treaties with the European countries and the United States. World Bank (1991, 97, box table 5.2) gives Japan's *unweighted* average tariff rate for *all goods* (not just manufactured goods) for 1925, 1930, and 1950 as 13, 19, and 4 percent, respectively.

to tariff protection, many of these countries provided subsidies to promote targeted industries, set up state-owned enterprises or public-private joint ventures for risky projects, regulated foreign direct investments, and implemented many other measures of industrial policy during this period (Chang 2002, 2007).

Britain and the United States—the supposed homes of free trade—had the world's highest levels of tariff protection (45–55 percent) during their respective catch-up periods—from the mid-eighteenth to the mid-nineteenth century for Britain and from the mid-nineteenth century to the mid-twentieth century for the United States.

This was no coincidence. Robert Walpole, the so-called first British prime minister, is credited to have been the first person to launch a comprehensive infant industry program in 1721 (Brisco 1907). Walpole strongly influenced Alexander Hamilton, the first Treasury secretary of the United States, who first developed the theory of infant industry protection (Hamilton 1791). The targeted protections that Germany and Sweden provided to their nascent heavy industries in the late nineteenth and early twentieth centuries are well known, but even Belgium, one of the less protected economies, provided targeted protection. In the mid-nineteenth century, when Belgium's average industrial tariff was around 10 percent, the textile industries had tariffs rates of 30–60 percent and the iron industry had rates of 85 percent (Milward and Saul 1977, 174). At least for the 1870–1913 period, there is even evidence of a positive correlation between tariff rate and rate of growth (O'Rourke 2000; Vamvakidis 2002; Clemens and Williamson 2004).[5]

Third, the long-term historical experiences of the developing countries also provide some food for thought regarding industrial policy. Drawing on numerous studies that show a positive cross-section correlation between a country's degree of "openness" (variously measured) and its growth performance, the mainstream consensus is that industrial policy in developing countries since the 1960s has not worked. Even if we ignore many criticisms of these cross-section econometric studies (Rodriguez and Rodrik 2000; Chang 2005) and accept such a conclusion, the time-series evidence tells us a rather different story.

Until the 1870s, most of today's developing countries practiced free trade, either because they were colonies or because they were bound by the so-called unequal treaties that deprived them of tariff autonomy and imposed a low, uniform rate of tariff (3–5 percent). However, their growth performance during this period was very poor (see table 2). When the Latin American countries gained tariff autonomy in the 1870s and the 1880s, their per capita income growth rate shot up from 0.1 percent during 1820–70 to 1.8 percent during 1870–1913, making it one of the two fastest-growing regions in the world during the latter period (table 2).[6]

The growth performance of the developing countries during the "bad old days" of import substitution industrialization was a vast improvement over their performance before and, more important, has not been matched since the 1980s, when they abandoned much of their industrial policy. Per capita income in developing countries grew at 3 percent a year during 1960–80 (World Bank 1980, 99, table SA.1). Their growth rate fell to just above half that (1.7 percent) in the next 20 years (calculated from World Bank 2002), when these countries liberalized and

TABLE 2. Historical Rates of Economic Growth by Major Regions during and after the Age of Imperialism, 1820–1950

(*annual per capita GDP growth rate, %*)

Region	1820–70	1870–1913	1913–50	1950–73
Western Europe	0.95	1.32	0.76	4.08
Western offshoots[a]	1.42	1.81	1.55	2.44
Japan	0.19	1.48	0.89	8.05
Asia excluding Japan	–0.11	0.38	–0.02	2.92
Latin America	0.10	1.81	1.42	2.52
Eastern Europe and the former Soviet Union	0.64	1.15	1.50	3.49
Africa	0.12	0.64	1.02	2.07
World	0.53	1.30	0.91	2.93

Source: Maddison 2001, 126, table 3-1a.

a. Australia, Canada, New Zealand, and the United States.

opened up their economies. The slowdown in growth was particularly striking in Latin America and Sub-Saharan Africa, two regions that most faithfully implemented market-oriented reforms during this period. Per capita income in the two regions grew at 3.1 and 1.6 percent a year, respectively, during 1960–80 (World Bank 1980, 99, table SA.1), compared with 0.5 and –0.3 percent, respectively, during 1980–2004 (calculated from the World Bank and the United Nations Development Programme data sets).

Individually, this evidence as well as the evidence about the East Asian experience discussed earlier do *not* prove anything. However, taken together, they raise some difficult questions for the skeptics of industrial policy. If industrial policy was not confined to East Asia in the late twentieth century, it becomes difficult to downplay its role in East Asia by resorting to some region- and time-specific "countervailing forces." Even if many countries that have used industrial policy did not succeed, the fact that few of today's rich countries have become rich without industrial policy makes us wonder whether a good industrial policy may be a necessary, although not sufficient, condition for economic development. Looking at all these sets of facts together, we have to wonder, if industrial policy is so bad, how is it that in every era, the fastest-growing economies happen to be those with a strong industrial policy: Britain during the mid-eighteenth century and mid-nineteenth century; the United States, Germany, and Sweden during the late nineteenth and the early twentieth century; East Asia, France, Finland, Norway, and Austria in the late twentieth century; and China today.

Although the weight of evidence is, on the whole, on the side of (intelligently conducted) industrial policy, we do *not* need some absolute "proof" of its merit, either way, in order to take the debate forward. As far as we can agree that the chance of success for industrial policy is more than negligible, we can still have a productive debate on how to make it work better, even if we cannot agree on the

exact "batting average" of industrial policy. Therefore, in the rest of the paper, I discuss some of the lessons that we have learned (or should have learned) from the actual experiences of and the theoretical debates on industrial policy and suggest some ways forward, both theoretically and in terms of pragmatic policy.

What Have We Learned? Lessons from the Experiences and the Debates

In this section, drawing on the industrial policy debate and adding some of my own take on it, I explore how we can make industrial policy work better. I look at issues surrounding (a) targeting; (b) whether the state can "beat the market"; (c) political economy; (d) bureaucratic capabilities; (e) performance measurement; (f) export; and (g) changing global environment. Although it is quite wide ranging, this list leaves out some key issues in the industrial policy debate, especially the challenges of building productive capability and the problems due to adjustment costs (on these issues, see Lin and Chang 2009; Dosi, Cimoli, and Stiglitz 2009).

The Question of Targeting: Selective vs. General Industrial Policy

After at least three decades of intense debate on industrial policy, few people would deny that there are instances where state intervention in industrial development is justified. However, many would argue that industrial policy should be "general" (or "functional") rather than "selective" (or "sectoral"). They argue that the state should concentrate on providing things like education, R&D, and infrastructure that benefit all industries equally but are likely to be underprovided by the market, rather than trying to "pick winners" by favoring particular sectors or even firms. In other words, they reject industrial policy in the usual sense, while not rejecting the idea that the state can (and should) overcome market failures in relation to industrial development.

The first problem with this view is that the distinction between selective and general industrial policies cannot be taken very far. In a world with scarce resources, every policy choice you make, however "general" the policy may look, has discriminatory effects that amount to targeting. This point is easier to see in relation to R&D—a government giving out R&D subsidies implicitly favors the more R&D-intensive high-tech sectors—but it also applies to infrastructure and education, at least to the higher ends of them. We do not build some abstract infrastructure; instead we build either a road between the horticultural export region and an airport or a railway between a steel town and a seaport. Building the railway, instead of the road, means that the government at least implicitly favors the steel industry. Likewise, we do not educate some generic engineers; instead we educate either chemical engineers or electronics engineers. Therefore, a government that provides more funding to electronics engineering departments than to chemical engineering departments is implicitly favoring the electronics industry. The only policies that may be called truly "general" are policies regarding basic education and health;

calling them industrial policies stretches the concept beyond reason. Thus seen, selectivity and targeting are involved in virtually every (broadly defined) industrial policy measure. The only real difference is that of degree.

If targeting is unavoidable, can we at least say that the less targeted a policy is, the better it is? We cannot. The more targeted a policy is, the easier the monitoring of the beneficiaries is, and therefore the "leakages" are going to be less. Indeed, mainstream economists recommend more precise targeting in social policy for this reason (on targeting in social policy, see Mkandawire 2005). Why is this point not considered in relation to industrial policy? Of course, targeting has its costs. For example, too precise a targeting may, in a world with fundamental uncertainty, be bad because it "puts all eggs in one basket." Or it may make lobbying easier. Or it may make the beneficiaries too easy to identify, making it difficult for the government to maintain the necessary myth that its policies are impartial. And so on.

The debate on industrial targeting needs to move to a higher level. While accepting its potential problems, the inevitability of targeting should be acknowledged. We should drop the pretense that we can "not target" and instead try to attain the best possible degree of targeting, which may differ across industries and countries. We should stop thinking that there is a linear relationship, positive or negative, between the degree of targeting and policy success: some degree of targeting is inevitable, and, while more targeting may be desirable, too much may not be good. Perhaps we should think in terms of "targeting within universalism," as in the debate on social policy (Skocpol 1991, as cited in Mkandawire 2005, 23), rather than "targeting vs. universalism."

Can the State "Beat the Market"? Ability, Information, and Perspective

One of the classic arguments against infant industry protection (and by extension any selective industrial policy) is that the private sector would have promoted the industry in question if it were genuinely worth promoting (Baldwin 1969). Given that the government officials by definition know less about business than do businessmen, the argument goes, it is inevitable that their decisions are likely to be of lower quality than those made by businessmen. In other words, the state cannot "beat the market."

However, there are quite a few examples in history where government officials made investment decisions that blatantly went against market signals, sometimes even using state-owned enterprises as vehicles, only to build some of the most successful businesses in history. The four decades of protection, subsidies, and ban on foreign direct investment (FDI) in the Japanese automobile industry before its world market success, the entry of Korea into the steel industry through a state-owned enterprise (Pohang Iron and Steel Company [POSCO]) in 1968 (when the country's per capita income was only 5 percent that of the United States), or Brazil's entry into the aircraft industry, once again through a state-owned enterprise (Embraer) in 1969 (when its per capita income was only 8 percent that of the United States) are only some of the most spectacular examples (Chang 2002, ch. 2; 2007, ch. 5; 2008).[7]

These cases are euphemistically known as (the government officials successfully correcting) "capital market failures," but it would be far more honest if we admitted that the state can sometimes beat the market. Against this, Pack and Saggi (2006) admit that there *are* capital market failures but argue that the solution should be found in developing the banking sector, "perhaps by allowing foreign financial intermediaries into the country" (Pack and Saggi 2006, 270) that have "modern techniques of evaluating individual projects and managing the riskiness of their overall portfolio" (Pack and Saggi 2006, 285), rather than in industrial policy. However, this suggestion rings hollow today, when those "modern techniques" have created perhaps the biggest financial mess in human history.

More important, we do not *need* the assumption that government officials are omniscient or even that they are cleverer than capitalists in order to advocate industrial policy. The point is that many (although not all) of the "superior" decisions made by the state were made not because the government officials were omniscient or cleverer than businessmen but because they could look at things from a national and long-term point of view, rather than a sectional, short-term point of view.

It is because they saw things from a national point of view that the East Asian government officials could prevent domestic firms from outbidding each other in licensing foreign technologies or could take externalities into account and encourage things like exporting and training beyond what seems "rational" to individual businessmen. It was because they could take a more long-term view that the Korean and the Brazilian states could set up firms like POSCO or Embraer, ventures that "rational" private sector firms did not want to touch with a barge pole.

If we do not need to assume that bureaucrats are omniscient in order to justify industrial policy, we can have a much more meaningful discussion on how to improve the quality of industrial policy. If some bureaucrats are indeed better businessmen than capitalists, we can learn how to run better industrial policy by asking what kind of people they are, how they make the decisions, and how they implement them—in the same spirit with which we read books by and about famous businessmen. If bureaucrats make better decisions simply because they have more "systemic" perspectives, we can perhaps improve private sector decisions by encouraging the formation of industry associations or a national business association. We should also discuss whether there are organizational forms that encourage even more long-term-oriented and more systemic thinking in the bureaucracy.

Political Economy: Leadership, Bureaucracy, and Power

The ability of the state to improve on market outcomes thanks to its more systemic and longer-term perspective is only the starting point of running a good industrial policy. The debate has revealed a key difference between stories of industrial policy success and failure: the former had states that could impose strict discipline on the recipients of its support (Toye 1987; Amsden 1989; Chang 1994; Evans 1995). Since the state conducting industrial policy is at least partially suspending market discipline, it has to supply the necessary discipline itself. If government supports are seen

as "handouts," rather than as "advances" for the delivery of good performance in the future, the recipients of government support will have no incentive to perform.

Many complex political economy issues have been debated over the years. Here, I present what I consider to be the key lessons at three levels of political economy—that of political leadership, internal control structure of the state, and the power of the state vis-à-vis the rest of the society.

First, let us look at the nature of the top leadership. It cannot be assumed a priori that the leaders running a particular state are interested in economic development, whether through industrial policy or not. In order to appreciate this point, we do not need to go to the extreme and believe that all top political leaders are "predators" interested only in personal wealth and aggrandizement (although some may well be). Even if they are interested in economic development, the leaders may have a "wrong" vision. They may be looking backward rather than forward—Thomas Jefferson and his followers were vehemently opposed to Hamilton's policy, as they wanted to preserve a society made up of respected landlords and yeoman farmers (plus the slaves). Or the political leaders may be hostile to private sector development, as many developing-country leaders were in the 1960s and the 1970s. Or, as many nineteenth-century liberal politicians did, they may think that doing nothing, other than protecting private property, is really the best policy.

Second, even if the political leaders are interested in promoting economic development through industrial policy, they need to impose that vision on the rest of the state apparatus. While in theory the state is a hierarchical organization, in practice the wish at the top does not always permeate through the hierarchy. Once again, we do not need to go to the extreme and assume that government officials are seeking only their own self-interests (for example, the self-seeking bureaucracy approach of Niskanen) to see this point. There will naturally be some degree of self-seeking, but many real-life bureaucrats are dedicated public servants. However, there would still be problems arising from clashing visions (for example, the bureaucrats may be more conservative than the political leaders), turf wars between different groups within the bureaucracy, "tunnel vision" (which specialized organizations are wont to develop), internal coordination failures (coming from poor organizational design or the emergence of new issues that cut across the existing organizational structure), and many other reasons.

Third, even if everyone in the government, from the top leader down to the lowliest clerk, shares the same vision about industrial policy, the state still has to be able to impose its will on other agents in the society. Needless to say, the feasibility of this differs across countries (and across issues, even within the same country). In some extreme cases, the state may not even have full control of its claimed territories. In some developing countries, the state may not be able to implement policies because it is short of manpower and resources, especially when it tries to influence an industry with numerous small firms, where monitoring is costly. Even when the state has enough enforcement capabilities, some private sector agents will attempt to neutralize or even pervert policies through lobbying and bribing. Some groups may have such influence in the society that the state does things that they want or refrains from doing things that they do not want, even without explicit lobbying or

outright corruption, as we are witnessing these days in relation to the financial industry in countries like the United States or the United Kingdom.

Thus seen, between accepting the need for industrial policy and implementing it there is a huge range of political economy problems. Indeed, when considering that many developing countries are run by flawed leaders presiding over a politically weak and internally fragmented state, it seems difficult to imagine how industrial policy, even if it were "correct," can be implemented well in a developing country.

However, we should not let the best be the enemy of the good. The existence of numerous political economy problems should not make us believe that therefore we have to wait for a perfect state to emerge before doing anything.

In the real world, successful countries are the ones that have managed to find "good enough" solutions to their political economy problems and gone on to implement policies, rather than sitting around bemoaning the imperfect nature of their political system. Of course, in the long run, these countries' successes also owe something to their investments in the improvement of their state, including the quality of the bureaucracy, interest group organizations, and the very nature of their society, but when they started their development, they started with highly deficient political systems (on the history of institutional development in today's rich countries, see Chang 2002, ch. 3).

Quite a few of them, including some of the successful "industrial policy states," overcame their political obstacles to effective statecraft in situations that did not instill much hope. For example, between the fall of Napoleon and the end of the Second World War, the French state was notoriously laissez-faire, ineffectual, and conservative. However, this changed after the war, with the rise of *Gaullisme*, the establishment of the planning commission, and the foundation of the École Nationale d'Administration, the famous school for elite bureaucrats (Cohen 1977; Kuisel 1981). For another example, the Kuomintang (Nationalist Party) bureaucracy was one of the most corrupt and inefficient in modern history when it ruled mainland China, but after being forced to migrate to Taiwan, China, by the communists, it was transformed into a highly efficient and relatively clean one. This was done through a gradual but deliberate process of building "islands of competence" and then giving them greater responsibilities as they succeeded and increased their legitimacy and status within the bureaucracy, finally replacing much of the old bureaucracy with the new one (Wade 1990).

So, rather than assuming away the political economy problems (as some proponents of industrial policy have done) or using them as an excuse for policy inaction (as some opponents of industrial policy have done), we should find ways to devise imperfect but workable solutions to those problems. In order to take the debate forward, we have to improve our understanding of issues such as (a) how to form and deploy effective political visions to inspire individuals and groups to act in a concerted manner; (b) how to build nations and communities out of disparate groups that may even have a very long history of mutual hostility and mistrust; (c) how to work out social pacts and build lasting coalitions behind them; (d) how to accept but improve the customs and organizational routines in the bureaucracy; and (e) how to minimize socially harmful lobbying and bribing, while maximizing the

flows of information between the states and the private sector. In order to address these issues, we economists need to go beyond the usual boundaries and work with practitioners (politicians, government officials, and businessmen) as well as academics from other fields (political science, sociology, anthropology, psychology, and cultural studies).

Bureaucratic Capabilities: Important, but Not in the Way We Think

However willing and strong the state may be and however "correct" its vision may be, policies are likely to fail if the government officials implementing them are not capable. Difficult decisions have to be made with limited information and fundamental uncertainty, often under political pressure from inside and outside the country, which requires decision makers with intelligence and adequate knowledge.

On this ground, people have argued that "difficult" policies like (selective) industrial policy should not be tried by countries with limited bureaucratic capabilities. And it is for this reason that the World Bank (1993) recommended the Southeast Asian countries (Thailand, Malaysia, and Indonesia) as models of industrial policy for other developing countries. In these countries, industrial policy was quite circumscribed partly in recognition of the relatively low quality of their bureaucracies.

At the general level, I cannot dispute the proposition that capable bureaucrats are needed to design and implement good policies. I agree too that a policy that has succeeded spectacularly in one country can turn into a mess in another country in the hands of incompetent bureaucrats, in the same way in which the same recipe can result in a masterpiece by a top chef, a pleasing dish by a good cook, and a culinary disaster by an incompetent cook. I also agree that policies differ in their difficulties and therefore need to be chosen according to the relevant government's capabilities.

Unfortunately, these sensible points are often assembled into the policy world equivalent of the "do not try this at home" warning that accompanies the demonstration of difficult and dangerous tricks in television shows. It is argued that industrial policy is so difficult that it should never be tried by countries that do not have an East Asian–style high-quality bureaucracy, which in effect means *all* developing countries. Is this acceptable?

First, one critical assumption behind the "do not try this at home" argument is that industrial policy is exceptionally difficult. However, the assumption is made without any theoretical reasoning or empirical evidence. For example, World Bank (1993) assumes that policies getting the "fundamentals" right, such as human capital, agriculture, and macroeconomic stability, are easier than industrial policies, but there can be no such presumption. First, different governments have competences in different areas: the Japanese government was good at industrial policy, but not at macroeconomic policy in the 1990s. Second, the ease of a policy will also depend partly on its scale. For example, promoting a few industries may be a lot easier than organizing a mass education program. Third, it will also depend on the number of agents involved in the policy. Trying to coordinate investments among

a few large firms may be a lot easier than organizing a countrywide distribution of subsidized fertilizer that involves millions of small farmers who are not organized into cooperatives and are scattered all over the country.

Second, another implicit assumption behind the "do not try this at home" argument is that industrial policy requires sophisticated knowledge of economics, as exemplified by the following comment by Alan Winters, one-time head of the Research Department at the World Bank and now the chief economist of the U.K. government's Department for International Development: "The application of second-best economics needs first-best economists, not its usual complement of third- and fourth-raters" (Winters 2003, as cited in Stiglitz and Charlton 2005, 37). But is this true? The interesting thing is that while the East Asian bureaucracies were staffed by smart people, they were certainly not "first-best economists." Indeed, most of them were not even economists. The Japanese economic officials that engineered the country's "miracle" were mostly lawyers by training. Until the 1980s, what little economics they knew were mostly of the "wrong" kind—the economics of Karl Marx and Friedrich List—rather than neoclassical economics. In Taiwan, China, most key economic bureaucrats were engineers and scientists, as is the case in China today. Korea also had a high proportion of lawyers in its economic bureaucracy until the 1970s, while the brains behind the Korean Heavy and Chemical Industrialization (HCI) program in the 1970s, Oh Won-Chul, was an engineer by training. Both Korea and Taiwan, China, had rather strong, albeit officially unacknowledged, communist influence in their economic thinking until the 1970s.[8]

Third, many people who advance the "do not try this at home" argument believe that high-quality bureaucracies are very difficult to build and that the East Asian countries were exceptionally lucky to have inherited them from history. However, a high-quality bureaucracy can be built pretty quickly, as shown by the examples of Korea and Taiwan, China, themselves. Contrary to the popular myth, these two economies did not start their economic "miracles" with high-quality bureaucracies. For example, until the late 1960s, Korea used to send its bureaucrats for extra training to, of all places, Pakistan and the Philippines. Taiwan, China, had a similar problem of generally low bureaucratic capabilities in the 1950s and most of the 1960s. These countries could construct a high-quality bureaucracy only because they invested in training, organizational reform, and improved incentive systems. In addition, there was a lot of "learning-by-doing." By trying out industrial policy early on, the East Asian bureaucrats could more quickly pick up and improve the capabilities they needed to run industrial policy effectively. In other words, there has to be some "trying at home," if you aspire to become good enough to appear on television with your own act.

Last, but not least, the fact that something is "difficult" cannot be a reason not to recommend it. When it comes to personal advancement, we go to the other extreme and encourage our youngsters to aspire to become the best of the best (by reading biographies and what not), when most of them are going to end up as production-line workers or shop assistants rather than prime ministers or business tycoons. And when it comes to institutions, even developing countries

are routinely told to adopt "best-practice" or "global-standard" institutions used by the richest countries, when many of them clearly do not have the capabilities to run effectively the American patent law system, the British accounting system, or the Scandinavian welfare system. But when it comes to industrial policy, countries are told to aim low and not to try at all or, at best, to try to learn from the Southeast Asian countries rather than the East Asian countries (or other rich countries, for that matter). I am all for people warning against the risks involved in "aiming too high," but why should countries aim low only when it comes to industrial policy?

The critics of industrial policy have made an important contribution by highlighting the importance of bureaucratic capabilities in implementing industrial policy. However, this does not mean that a country with a low-quality bureaucracy should not aspire to implement "difficult" policies, like industrial policy (if it is difficult). Capabilities can be increased over time through deliberate investment and through learning-by-doing (of the "difficult" policies). To be more productive, therefore, the debate should focus on issues such as the following: (a) Exactly why is, or isn't, industrial policy more difficult than other policies? (b) If it is more difficult than other policies, can it be made "easier" by learning from "best practices"? (c) If the capabilities needed are not those in mainstream economics, what bureaucratic capabilities are needed for good industrial policy? (d) How can we build those capabilities most quickly and cheaply?

Performance Measurement: Difficulties and Mitigations

Even with a willing, strong, and capable state, imposing discipline on the recipients of state support is not a straightforward business. At the most general level, we can say that the recipients should be rewarded for good performance and punished for bad performance, but translating that principle into practice is not easy, not least because of the difficulties involved in measuring performance.

Especially when industrial policy is comprehensive, as it was in the case of East Asia between the 1950s and the 1980s, objective performances become difficult to measure, as virtually all prices are "distorted." There will also be efforts by the recipients of state help to manipulate the performance indicators. These are real and serious problems, but the industrial policy debate has revealed that there are ways to overcome them.

First of all, when launching an industrial policy program, performance targets should be clearly specified and the reporting requirements on them set so that the recipients cannot weasel their way out of bad performance. Publicly announcing the targets will make their manipulation more difficult, although it will reduce policy flexibility.

Second, the targets should be set in consultation with the business community, so that they are realistic and do not simply reflect some bureaucratic dreams. However, they should not be set purely on the basis of what entrepreneurs say, as they are likely to overstate the difficulties and understate the strengths, so there have to be independent third opinions provided by technical experts, academics,

journalists, and the like. The deliberation councils that were used in Japan and, less effectively, in Korea show how this process can be managed (Johnson 1982; Dore 1986; World Bank 1993).

Third, targets need to be revised along the way: they may prove to be too easy or too difficult, or they may be unexpectedly affected by external shocks. In particular, it is important for governments to acknowledge mistakes quickly and to change policies, as they did in East Asia. Having said that, government flexibility can be abused by lobbying, so too much flexibility should be avoided.

Fourth, in industries where export is possible, export performance should be given high status as a measure of performance, as in the East Asian countries, especially in Korea. Export performance indicators are far less open to manipulation by the recipients of state support than are indicators of domestic market performance, especially when the firms in question have significant market powers.

Fifth, policy makers need to pay more attention to the trends in performance indicators rather than to their absolute levels at any given point in time. This is particularly important in programs with a long time horizon, such as the plan to develop the automobile industry in Japan and Korea, which took literally two or three decades before bearing even the first fruits.

Once again, it is time for the debate to move on. Rather than debating whether setting and enforcing effective performance targets is possible (as it certainly is), we should concentrate on questions like the following: (a) What performance indicators should be used for which industries? (b) How do we set credible performance targets without becoming too rigid about them? (c) How does the government listen to the private sector without becoming beholden to it? (d) How do we operate with a long but not infinite time horizon?

The Importance of Export-Related Industrial Policy

I have just discussed the role of export in helping the state to better discipline the recipients of its support by providing a relatively objective and hard-to-manipulate indicator of performance, but export has other important roles to play in the conduct of industrial policy in developing countries.

To put it bluntly, economic development is impossible without good export performance. Economic development requires importation of advanced technologies, in the form of either machines or technology licensing, which need to be paid for with foreign currencies. Unless a country is so small or so strategically located that it receives disproportionately large amounts of foreign aid or foreign direct investment, it will simply have to export its way out of poverty.

The failure to promote export enough is one of the key reasons why the Latin American industrial policies were not as successful as those in East Asia. In the Latin American countries, economic growth kept hitting the balance of payments constraints. Even with its huge export machinery and massive government support for exports (subsidized bank loans, tariff rebates for imported inputs used for exports, export marketing support from the state trading agency), Korea found it impossible

to export enough to finance its rapid rate of capital accumulation until the late 1980s, running constant trade deficits.

So far, I am singing from the same hymn sheet as the World Bank. However, saying that export is the key to economic development is not to say that developing countries should liberalize their trade and closely follow their comparative advantages.

Of course, at the beginning of its economic development process, a country should try to increase its exports from its existing industries and other "nontraditional" industries where it has comparative advantages (for example, salmon in Chile, coffee in Vietnam, cut flowers in some African countries). The widespread view is that these industries do not need any export help because they are in line with the country's comparative advantage, but this is wrong.

Export success requires significant industrial policy even for comparative advantage–conforming industries, especially if they are "nontraditional" industries, where new productive capabilities may have to be built. The basic problem is that export markets have high fixed costs of entry, which smaller firms and farmers, who are likely to dominate these comparative advantage–conforming industries in developing countries, may not be able to bear. Direct export subsidies can offset the costs of entry, but these are now banned by the World Trade Organization (WTO), except for the least developed countries, so the help should be provided through other channels.

First, state marketing help can be crucial, especially for smaller exporters, as exemplified by the Japan External Trade Organization and the Korea Trade Promotion Corporation, known as the Korea Trade–Investment Promotion Agency since 1995, as well as the Danish agricultural marketing boards in the early twentieth century (on the Danish case, see Chang 2009). Second, the state could share risk with exporters through schemes like loan guarantees for exporters and insurance for payment defaults. Third, it can help exporters, especially small producers, to meet the high quality standards required in the export markets. This can be done through, for example, controlling the quality of export products, providing advice on sanitary and phytho-sanitary requirements in the agricultural export markets, and providing subsidized extension services for small farmers and small manufacturing firms engaged in exporting. Fourth, the state can help indirectly by providing legal and financial support for cooperative arrangements among exporters for the joint provision of marketing services, R&D, storage facilities (warehouses and refrigerated stores), processing facilities (creameries and slaughterhouses), and transport facilities (refrigerated trucks) (see Chang 2009).

In the longer run, if it is to continue the momentum of its export success, a country will have to rely on more than its comparative advantage–conforming industries. Especially given the nature of the industries with which developing countries are likely to start their export drives, export growth is likely to peter out soon after the initial stage and even a small rise in wages (which the export success will bring) may undermine the country's position in the world market. Sooner or later, it will have to upgrade its export industries into comparative advantage–defying industries, which requires even stronger industrial policy.

A good example of this is Korea. In the 1950s, Korea's main exports were tungsten ore, fish, seaweed, and basic textiles and garments. In the 1960s, the government developed nontraditional labor-intensive export industries like wigs, plywood, shoes, and cheap electronics assembly, with the help of massive export support programs, while upgrading existing export industries, especially the textile and garment industries. By the early 1970s, however, many of these export industries, especially plywood and wigs, were hitting the wall, so the country launched the HCI Program, developing industries such as shipbuilding, steel, petrochemicals, automobiles, and high-end electronics as export industries, despite the fact that it did not have comparative advantage in those industries at the time. Without these industries, however, Korea would not have sustained its export growth momentum, and thus its ability to grow quickly, beyond the 1970s.

Indeed, what truly distinguishes the East Asian countries from other developing countries is not that they had "freer" trade than others. After all, they had plenty of protectionism. Average industrial tariff rates were 30–40 percent both in Korea and Taiwan, China, until the 1970s, while both of them had numerous nontariff trade barriers. The real difference is that in East Asia, free trade, export promotion (which is, of course, not free trade), and infant industry protection were organically integrated, both in cross-sectional terms (so some industries are always subject to each category of policy, sometimes more than one at the same time) and over time (so the same industry may be subject to more than one of the three over time).

Therefore, while emphasizing the importance of export for economic development, we need to abandon the "export promotion vs. import substitution" dichotomy that has dogged the industrial policy debate for far too long. We need to debate how exactly to mix free trade, export promotion, and infant industry protection—across sectors and over time—in a manner that helps a country to upgrade its industrial structure and grow quickly. We also need to discuss the factors that determine the optimal mix of these three types of trade policy and the timing of switching between them.

A Changing Global Environment

Considerable changes have happened to the global economy since the heyday of industrial policy between the 1950s and the 1980s. Two mutually reinforcing sets of changes have happened—changes in the global business environment and in the rules of global trade and investment—that people argue have made industrial policy almost impossible to implement. Later I look more closely at the changes in trade and investment rules, which are more directly relevant to our discussion, but first I make some brief comments on the changes in the business environment.

Changes in the global business environment can be broken into two related components. The first is the increase in the importance of foreign direct investment and the other is the so-called "global business revolution," which has led to enormous concentration at the top tiers of the global value chain, which in turn has forced consolidation down the value chain.

The rising importance of FDI has made a lot of commentators think that it is very difficult, if not impossible, for countries to use "nationalistic" industrial policies for fear that transnational corporations will move away.

While the relative importance of FDI has increased enormously since the 1990s, the changes are not as dramatic as they are often thought to be.[9] The pace of change may slow down, as the current crisis is forcing transnational corporations to retrench. In the longer run, the trend may even be reversed. After all, globalization was reversed once during the interwar period. Moreover, the mobility of transnational corporations differs enormously across industries and in relation to different countries, so the feasibility of nationalistic policies depends on the industry and the country (Chang 1998, 2007, ch. 4). A country with a large domestic market and good supply-side conditions (skills and infrastructure) may implement a very nationalistic policy in an industry with low mobility (for example, automobiles and steel), but a country without those conditions cannot do the same, especially when it comes to high-mobility industries (for example, garments and shoes). Also, empirical studies reveal that industrial policy, such as imposing a performance requirement on transnational corporations, is not as important in influencing FDI decisions as market conditions (the size and growth of the domestic market), infrastructure, or quality of the labor force (Chang 1998; Kumar 2005).

Since the 1980s but accelerating since the 1990s, there has been an enormous increase in industrial concentration, starting with the top of the global value chain and increasingly cascading down the chain, a process that has been named the "global business revolution" by Nolan, Zhang, and Liu (2008). This revolution has enormously raised the entry barriers to higher-end industries faced by developing countries.

However, industry concentrations go up and down in the long run, so it is not certain that the current trends will continue forever. Especially given the turmoil in the world economy today, new spaces higher up the value chain may open up for developing-country companies as existing producers decline (particularly visible at all levels of the automobile industry at the moment), while recent mergers and acquisitions, which have come to account for an increasingly higher share of FDI, may be undone. In the long run, when new industries emerge, opportunities arise for new entrants (for example, East Asia and the electronics revolution), so some developing countries may emerge as major players in some new industries in the future. Moreover, value chains have become more "chopped up" and internationalized, adding further new opportunities for developing-country producers. Developing countries can now enter lower segments of those industries that used to be vertically integrated and located only in the rich countries (for example, automobiles), although this route is highly unlikely to allow them to reach the top of the chain.

More directly relevant for this paper than the changes in business landscape are the changes in global rules of trade and investment. The use of many of the classic tools of industrial policy are now either banned or significantly circumscribed by the

WTO. Quantitative restrictions (for example, quotas) have been banned altogether. Tariffs have been reduced and "bound." Export subsidies are banned, except for the least developed countries. Most other subsidies have become open to countervailing duties and other retaliatory measures. New issues, like regulations on FDI and intellectual property rights, have been brought under the jurisdiction of the WTO, making it difficult for countries to "borrow" foreign technologies for free or to put performance requirements on transnational corporations.

Thus seen, the WTO has certainly made industrial policy more difficult to implement. However, the constraints imposed by the WTO should not be exaggerated.

First, even on paper, the WTO by no means obliges countries to abolish all tariffs, and many developing countries have "bounded their tariffs" (or set tariff ceilings) at considerably high levels.[10] Of course, if the rich countries have their way in the current nonagricultural market access negotiations of the Doha Round in the WTO, industrial tariffs in the developing countries are, at 5–10 percent, likely to fall to the lowest level since the days of colonialism and unequal treaties (Chang 2005, 4). However, this is yet to happen.

Second, there are still provisions for emergency tariff increases ("import surcharges") on two grounds. The first is a sudden surge in sectoral imports, which some countries have already used. The second is the overall balance of payments problem, for which almost all developing countries qualify and which quite a few countries have also used. Since countries have discretion over the coverage and the levels of emergency tariffs that are meant to lessen the balance of payments problem, there is still room for targeting particular industries.

Third, not all subsidies are "illegal" for everyone. For example, the least developed countries are allowed to use export subsidies. Subsidies for agriculture, regional development, basic R&D, and environment-related technology upgrading were explicitly allowed (non-actionable in WTO parlance) until 1999. Even though the last three have become "actionable" since 2000, not a single case has been brought to the dispute settlement mechanism since then, suggesting that there is an implicit agreement that they are still acceptable. Moreover, the subsidy restrictions only cover "trade-related" ones, which means that "domestic" subsidies can be used (for example, subsidies for investments in equipment and in particular skills).

Fourth, the TRIPS (trade-related intellectual property rights) agreement has made technology absorption more expensive for developing countries (Chang 2001). However, this mainly affects the middle-income countries. The technologies that many developing countries need are often the ones that are too old to have patents.

Last, the TRIMS (trade-related investment measures) agreement bans measures like local contents requirements and trade-balancing requirements, which had been successfully used by both the developed and the developing countries (Kumar 2005). However, countries can still impose conditions regarding the hiring of local labor (a good way to create technological spillover effects), technology transfer, and the conduct of R&D in the host country. They can also provide targeted subsidies, directed credits, and tailor-made infrastructure (measures that Singapore and Ireland have used to attract FDI into "targeted" industries; Chang 2004), provided that these do not violate the most-favored-nation provision (Thrasher and Gallagher 2008).

Of course, even though the WTO rules allow quite a lot of industrial policy measures, especially for the least developed countries, this space is in practice highly constrained by other international factors. In the case of the least developed countries, the conditions attached to bilateral and multilateral aids and loans, on which they are quite dependent, significantly constrain their industrial policy space. Many developing countries are also parties to bilateral and regional trade and investment agreements, which tend to be even more restrictive than the WTO agreements (Thrasher and Gallagher 2008).

So, all in all, the range of industrial policy measures that developing countries can use has become considerably smaller, compared to the heyday of industrial policy in the 1960s and the 1970s, partly because of the changing global business landscape but more importantly because of the changes in global rules of trade and investment. However, there is still room for maneuver for countries that are clever and determined enough. Moreover, especially with the current world financial crisis, the global business landscape can change significantly, opening up unexpected possibilities of moving up and across global value chains for at least some developing countries. The global rules of trade and investment are not unalterable laws of nature. They can be, and should be, changed if they are found wanting.

Conclusions

In this article, I have tried to find some ways to overcome what I consider to be an unproductive confrontation between the proponents and the opponents of industrial policy and to take the debate forward by exploring some common ground between the two groups.

In the first substantive section, I briefly reviewed the debate on industrial policy, emphasizing that we need to look beyond East Asia between the 1950s and the 1980s in order to deepen our understanding of industrial policy. While I explained why I think that the weight of evidence is in favor of industrial policy, my aim was not to declare who has "won" the debate (which is impossible to prove anyway), but to establish the minimum common empirical understanding for a more productive debate. This common understanding is that industrial policy can work, sometimes spectacularly well, but it can also fail, sometimes miserably. This is a moderate proposition, which most (albeit not all, I realize) people on both sides of the debate can live with and on the basis of which they can engage in a pragmatic debate on how to make industrial policy work better.

In the second, and main, substantive part of the paper, I looked at most (although not all) of what I regard as the key issues emerging from the industrial policy debate. I discussed some theoretical questions regarding whether targeting is desirable and whether the state can "beat the market." I looked at implementation issues, ranging from "big" political economy problems, through to questions surrounding bureaucratic capabilities, down to nitty-gritty issues related to the measurement of performance. After emphasizing the importance of export performance as an indicator of performance, I talked about the critical importance of export policy, which

requires not just free trade but a mixture of free trade, export promotion, and infant industry protection. I then discussed how the changing global business landscape and, more important, the recent changes in global rules of trade and investment are affecting the feasibility of industrial policy and how these will evolve themselves.

While I could not avoid making some partial statements—I did not want to hide my status as a well-known advocate of industrial policy—my main purpose in this article was to plea for "thinking outside the box" and finding the common grounds for people on both sides of the debate.

We, on both sides of the debate, have focused too much on "grand" things like the Big Push, when much of real-life industrial policy has been about "boring" things, like getting the scale of production right and providing export marketing services. This is not surprising because most practitioners of industrial policy over the last two centuries have been pragmatic people who did not know many fancy economic theories. Some theoretical issues that both the proponents and the opponents consider to be critical dissolve into thin air once seen from a pragmatic point of view (for example, targeting or bureaucrats as businessmen). Many proponents of industrial policy do not fully appreciate how critical export is for the success of industrial policy, while many opponents do not fully appreciate how export success also requires industrial policy. We often let sensible worries (such as political economy and bureaucratic capabilities) degenerate into a recommendation for inaction, letting the best become the enemy of the good. Real-life success stories were often based on "good enough" compromises rather than perfect solutions.

Once the adversaries in the debate abandon theoretical grandstanding and focus on more practical issues, there are vast and fertile middle grounds to explore. This is not to say that there will not be disagreements. However, at least the two sides can have productive debates on pragmatic issues without thinking about destroying each other. Would that be too much to ask?

Notes

1. In addition to being unable to address the super-sectoral dimensions of industrial policy, World Bank (1993) and Lee (1996) have the following problems. Looking at 38 industrial sectors (basically at the three-digit level) in Korea between 1962 and 1983, Lee (1996) found largely negative correlation between a sector's receipt of government support (tariffs, nontariff barriers, tax incentives, and subsidized loans) and its performance, measured by various indicators (such as labor productivity, total factor productivity, or TFP, and capital intensity). The study should be commended for collecting much detailed data and looking at more than TFP, which has a lot of conceptual and practical problems; however, focusing on quantifiable measures, it could not capture many important aspects of industrial policy, even at the sectoral level (such as getting scale economies right and coordinating competing investments). Moreover, when infant industries require 10, 20, or even 30 years to mature, assessing Korean industrial policy in 1983 gives a bias against it—Korea's main industrial policy drive, the Heavy and Chemical Industrialization Program, was launched only in 1973. Third, by stopping in 1983, the study underestimates the performance of the young heavy and chemical industries, which suffered disproportionately in the 1979–82 economic downturn prompted by exogenous factors

(oil price rise and monetarist policies in the United States). World Bank (1993), looking at Japan, Korea, and Taiwan, China, assumed that sectors (defined at the two-digit industry classification level) with higher value added components or higher capital intensity were supported more by the government, thus obviating (perhaps unintentionally) the problem of relying only on quantifiable variables. It tried to correlate a sector's value added component and capital intensity with its performance (measured, unfortunately, only in terms of TFP) and found positive correlation only in Japan. However, the East Asian government targeted sectors at a much more disaggregated level than the two-digit one and never on simple grounds like capital intensity or value added component. For example, the textile industry in Korea, whose good performance the World Bank takes as a sign that "neglected" industries did quite well, was in fact one of the most "targeted" sectors until the mid-1980s because of its role as the main foreign exchange earner (Chang 1995, ch. 3, app.; also see Rodrik 1994).

2. Let me provide some basic factual refutation of these "countervailing forces" arguments, a full treatment that is beyond the scope of the paper. Before their economic development, the East Asians were typically described as lazy, unenterprising, individualistic people, "living for today" (see Chang 2007, ch. 9). Korea's savings rate on the eve of its economic miracle was barely 5 percent; it started rising after growth took off. At the end of the Japanese colonial rule, the literacy rate in Korea was only 22 percent and its industrial base was smaller than that of Ghana (Chang 2006). After the 1950s, Korea and Taiwan, China, did not receive an exceptionally high amount of foreign aid (Chang 2006). As far as I know, no one has provided any concrete evidence for the "special market access" story. Until the 1980s, Korea and Taiwan, China, were buying up textile quotas from other developing countries that could not even fill their Multi-Fibre Agreement quotas for the United States, showing that even if it existed, special market access could not provide big enough export markets to these two countries.
3. Of the 16 largest OECD economies studied by Maddison (1989) between 1950 and 1987, the seven fastest-growing economies, in per capita terms, were Japan (6 percent), Austria (3.9 percent), Germany (3.8 percent), Italy (3.7 percent), Finland (3.6 percent), Norway (3.4 percent), and France (3.2 percent).
4. The share of federal government in total R&D spending was 5.36 percent in 1953, 56.8 percent in 1955, 64.6 percent in 1960, 64.9 percent in 1965, 57.1 percent in 1970, 51.7 percent in 1975, 47.2 percent in 1980, 47.9 percent in 1985, and 47.3 percent in 1989 (estimated).
5. Irwin (2002) argues that this correlation was driven by high tariffs imposed for revenue reasons in the New World countries (the United States, Canada, and Argentina in his sample) that were growing quickly for other reasons (such as rich natural resource endowments). However, the United States was the home of infant industry protection at the time, and many of its tariffs were not for revenue reasons. Moreover, O'Rourke (2000) and Lehmann and O'Rourke (2008) show that the positive tariff-growth statistical correlation is *not* driven primarily by the New World countries.
6. Clemens and Williamson (2001) argue, on the basis of an econometric analysis, that around a third of this growth differential between Asia and Latin America during 1870–1913 can be explained by the differences in tariff autonomy.
7. In 1968, Korea's per capita income was $195 in current dollars, against $4,491 in the United States. In 1969, per capita income was $400 in Brazil, compared with $4,803 in the United States. The income data (see www.nationmasters.com) are from the World Bank and the Central Intelligence Agency.
8. The Nationalist Party's constitution was a copy of the Soviet Communist Party constitution. The second president of Taiwan, China, Chiang Ching-Kuo, who succeeded his father,

Chiang Kai-Shek, was a communist as a young man and studied in the Soviet Communist Party school in Moscow with future leaders of the Chinese Communist Party, including Deng Xiao-ping. Korea also had its share of communist influence. General Park Chung-Hee, who masterminded the Korean economic miracle, was a communist in his younger days and was sentenced to death in 1949 for his involvement in a communist mutiny in the Korean army, although he earned an amnesty by publicly denouncing communism. Many of his lieutenants were also communist in their young days.

9. The absolute amount of FDI going into the developing countries has increased by about 14 times from around $21 billion during 1983–89 to around $297 billion during 2002–07. FDI as a share of gross fixed capital formation in developing countries has risen from around 3.3 percent during the 1980s to 11–12 percent since the second half of the 1990s (partly reflecting the relative decline in investment during this period). The share of developing countries in world FDI has risen from 17.7 percent during 1983–89 to 20.7 percent during 1996–2007, if we exclude China (or from 19.6 to 24.3 percent, if we include China). The data are from various issues of the *World Investment Report* (UNCTAD various years).
10. Some countries reduced such ceilings substantially. For example, India cut its trade-weighted average tariff from 71 to 32 percent. However, many countries, including India, have fixed them at relatively high levels. For example, Brazil cut its trade-weighted average tariff from 41 to 27 percent, Chile cut it from 35 to 25 percent, and Turkey cut it from 25 to 22 percent (Amsden 2005, 219, table 11.2).

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