

1. Industrial policy: tools, targets, and goals

INTRODUCTION

This book is about industrial policy in the US. However, this description is probably not complete enough to tell the reader what policies are dealt with between the book's covers. There are two preliminary problems. The first is that the book is written by a pair of economists and there is a widely quoted truism that, "... (a)ny random collection of six economists is sure to produce at least a dozen different opinions on the subject ...!"¹ The second problem, closer to the subject, has been expressed by many other authors; that no generally accepted definition of industrial policy exists in the literature.²

Our first task is to address the question of what industrial policy is, and we answer that question in this chapter. Much of the discussion revolves around the problem of market failure and the options and needs for government to intervene to make markets work better. In the next chapter, Chapter 2, we point out that a frequent problem with industrial policy is that governments are not always capable of replacing or improving markets adequately. Next, in Chapters 3 and 4, we ask what role these ideas have played in America's economic past and in more recent times. Chapters 5, 6, and 7 deal in more detail with the industrial policies of the Obama administration, pointing out ways in which these policies mark a turning point in the role of industrial policy in America's economic history. We conclude, in Chapter 8, with a discussion of what role industrial policy might play in the future.

According to many the concept of industrial policy is alien to American tradition. Government intervention in markets is inconsistent with their reading of US economic history which, they feel, is based on rugged individualism; limited scope of government; and reliance on markets, free of government interference, to allocate resources. The historical record, however, shows this reading to be incomplete.

It should not be too surprising that a look at American history provides a mixed picture of the role of industrial policy. We see a few presidents who criticized market interference by government in their rhetoric,

but succumbed to pressure to support particular firms or industries in response to changing market conditions. We also see examples of presidential administrations that were able to employ targeted policies in order to achieve broader, long-term societal goals. We find that President Obama in his first administration has been more enthusiastic than most of his predecessors in using industrial policy to try to direct the American economy in directions that would be more favorable in the long run and consistent with a wide set of national goals. However, even President Obama has been constrained in the use of the term "Industrial Policy" because of a sort of *cultural taboo* that seems to surround these words.³

This *taboo* seems to be based on two premises. First, is the traditional argument that Americans want a government that intrudes as little as possible in their lives. This assumption has been easily exploited by the political rhetoric of many American presidents and politicians in order to polarize public opinion and achieve quick consensus. The second premise is the argument that all government interventions necessarily imply increasing government expenditures. This assumption seems to be especially powerful during today's economic crisis and the recent presidential campaign. Many might agree that industrial policy is a good idea but we simply cannot afford it!

INDUSTRIAL POLICY

Let us now return to the question of defining industrial policy (IP). It may be most useful to begin by pointing out what we believe IP is *not*. In our view, IP is not "industrial," as most people might think of the term, because it is not restricted to policy interventions related to industrial production, manufacturing sectors, and companies. Especially if we refer to contemporary markets, it is clear that IP can be directed also to non-manufacturing sectors and actors. Industrial policy programs can also focus on services and agricultural industries involving companies and also on other organizations like local institutions, laboratories, and universities. Having clarified this point, defining IP only according to its *targets* it is still not useful and it risks being misleading.

We should also caution readers about the perception of fiscal implications of IP. Industrial policy is not about "giving money" to companies, industries or regions, contrary to frequent reports in the media! Some IP interventions *do* entail financial payments to firms, regions, and population groups, but many do not. Industrial policy is about changing individual and collective behaviors and this is possible either with or without distributing money. Therefore, IP cannot be defined because of its possible *tools*,

which could include fiscal support and financial incentives or not, new laws and regulations, public procurement programs, antitrust measures, mechanisms for helping markets perform better for "buyers" and "sellers," or other policies that might be applied to targets to induce change.

If IP is not about "targets" and it is not about "tools," what is it about? The "missing component" is "goals." We argue that IP should always have the explicit purpose of achieving a set of economic and "meta-economic" *goals* that are defined by the government as desirable for the country as a whole. Industrial policy is the set of all government interventions on production dynamics driven by national societal goals that are based on a clear understanding of the relationships between *goals*, *targets* and *tools*. These interventions in production of goods and services could be directed toward manufacturing, as well as other sectors, including services, construction, and agriculture. Moreover they can target firms, sectors, regions, or population groups as a variety of other relevant actors and networks of actors that are all important participants to contemporary production dynamics.⁴

If one starts with a set of normative societal *goals*,⁵ then one can define specific *targets* where policy intervenes, and a variety of possible *tools* indicating how these IP measures could be implemented. Thus, IP entails the specification of all three elements: first of all goals, and then targets, and tools. An example might make this definition more clear. If the competitiveness of an important national industry, like biotech, were one of the selected *goals*, the education sector could be selected as the *target*, and a variety of incentives (monetary and non-monetary) for the development of company-school and company-university collaborations might be possible *tools*.

This approach implies a rich variety of possible IP goals, targets and tools. In this perspective it is first of all clear that for any national IP, goals will reflect a nation's broad objectives, and they will be selected through some process by which governments express preferences and needs.

It is possible, and in some countries, *common*, for regions to engage in IP, as well as national governments. In the US and in many other countries there are examples of sub-national industrial policies. There is much literature on ways that regions can pursue their own economic and social goals through local IP.⁶ One of the issues is how industrial policies promoted by local governments interact with national policies. The issue is important, but complex. It is beyond the scope of this book and so in the remainder of the book we concentrate only on national IP and on American federal government interventions.

One would not expect agreement among all societies as to their goals.⁷ Goals develop out of particular societal values, history, and patrimony

and they are normatively defined through different processes. One important implication of this approach is that industrial policies in different countries might have different goals.

Moreover, the definition of IP we adopt suggests a wide spectrum of "targets," ranging from sectors or regions to aggregations of entities, all the way down to particular firms, organizations, or institutions that will receive governmental attention or support in some way. The list of potential specific targets is long and it might include clusters and networks of firms, towns and localities, regions, universities, hospitals, laboratories, research centers, particular kind of firms, and even particular groups of people. Thus it is incorrect to say that IP should *never* involve specific firms, sectors or regions. However, specific entities become "targets" as a result of determination of the best way of achieving societal goals, not because of special requests by firms, sectors, regions, or groups.

Finally, the picture is complete only if we underline that IP interventions may adopt a variety of different policy tools ranging from financial measures to the definition of new rules able to modify actors' incentives and behaviors. We have all kinds of incentives (tax exemptions, subsidies, loans, facilities, laws and legislation) in order to promote particular types of activities (i.e., R&D, human resources training, export), investments (i.e. in machineries and equipment) and production (i.e., green industry, hi-tech or construction). We have all the traditional direct investments in infrastructure (i.e., transport, broadband or innovation centers) and other indirect measures that have the goal of encouraging the private sector to invest in this field. Talking about traditional tools, government procurement appears still to be a diffused practice of intervention in order to support particular productions and industries. Quite commonly utilized tools are related to trade issues: different levels of tariff protection or quotas across industries, non-tariff measures that discriminate against imports of particular goods, programs to support domestic consumption of domestic-produced goods and services (i.e., "Buy-American"), "voluntary" restrictions of exports negotiated with foreign countries, subsidies and preferential fiscal policies to promote export, diplomatic missions abroad, support of participation at international exhibitions, and national branding and marketing practices.

Some of the possible IP tools show a strong capacity to attract media and public opinion. This is the case, for example, for bail-outs, equity participation acquisition, public works, or public procurement. However, it is important to underline that there is a long list of policy tools that governments all around the world have utilized in different historical circumstances and it is clear that not all of them imply a burden for government budget.

To summarize, IP can encompass a wide range of goals, targets and tools. It is guided by the definition of a set of policy goals that are normatively defined as desirable for the economy and the society as a whole. Industrial policy is primarily about defining goals, and then targets and tools, to offer a strategy for development to a country's industry, economy, and society.

For these reasons, one first identifies goals for government intervention and only after they are selected, is it useful to select targets and specific policies or tools. There is a danger in getting these steps out of order and perhaps this confusion explains much of the opposition to IP.

In the perspective we present it is clear that the definition of a country's IP goals is crucial. Industrial policy has to be driven by broad economic and social goals and we suggest that this is its distinguishing feature. This is the difference between mere "policy for industry" and "industrial policy." Policies for industries, regions or firms have too often been promoted as responses to short-run problems and partial interests. On the other hand, IP has to be driven by wide economic and meta-economic goals defined through the *vision* that a government has about its country and society. Government should have broad and long-run vision and thus IP should have the same broad and long horizon.

To clarify this last point, it is useful to recall one highly debated example: the practice of corporate bail-outs. Bail-out interventions are not justifiable on IP grounds unless they are part of a wider transparent industrial policy framework where public interest goals are clearly specified. Without the focus on goals, corporate bail-outs, for example, should be considered short-run oriented gifts for uncompetitive companies. On the contrary, bail-outs *could* be part of a coherent assessment of a country's long-run needs, taking into consideration factors including its structural adjustment or social and environment sustainability, in which case they would be part of a wider IP program.

Much better, therefore, is to let societal goals justify particular IP interventions, as with the words of Amartya Sen:

[w]hile the tendency to avoid facing foundational questions is quite common, it is more a reflection of escapism than a demonstration of uncanny wisdom. Ultimately policies have to be justified in terms of what is valuable and how various policies may respectively enhance these valuable things. There is no escape, therefore, from considering both the question of what is fundamentally valuable and the question of what instruments enhance these things best. (Sen, 1988, p.772)

We will see in the coming pages, however, that it is time to underline that choosing appropriate goals, though necessary, might be insufficient

to justify government intervention. As many authors have argued, the selection of wrong targets or ineffective and costly tools, even in pursuit of noble goals, may lead to bad outcomes. And of course even the way through which societal goals are defined implies many potential failures. In fact, there is a clear risk of *government failure* because of selecting improper goals, targets and tools, which may result in situations that are *worse* than non-intervention! However, though the possibility that government might fail exists, this is not necessarily the case. But one must be cognizant of its possibility working on the best answers to these failures. In fact, we will argue in the rest of the book that one of the main challenges for the future of IP is how to offer innovative solutions to potential government failures.

INDUSTRIAL POLICY IN AMERICA

This book is not merely about IP in an abstract sense. It is also about how IP has been and could be practiced in the US. In general there is a lack of agreement on whether or not America has done IP in its two centuries of industrial development. We will illustrate in the following chapters of this book that IP ideas have a long history in America, going back to the days of independence. However, we will see that the experience of IP in America is full of contradictory rhetoric and practices. As we noted previously, the issue has always been a *taboo* in economic and political discussions, and even today the words “industrial policy” are still mentioned with some risk! This is why our book is entitled “Breaking the Taboo.” We will argue that, for many reasons, it is definitely time to break the taboo by introducing informed discussion and debate on the subject.

We will note that President Obama has been considerably more willing to use IP tools to address national goals than his predecessors. But members of Congress and the American public do not yet seem to be enthusiastic supporters of government industrial interventions, and one perceives a important ideological resistance. To implement an IP agenda, the next administration will need more support from Congress and public opinion than we have seen in the past in this field. The timing is critical, because of the economic crisis and the challenges coming from the new industrial powers. The time has arrived for *breaking the taboo* and discussing the nation's goals, targets, and tools for a new, effective American IP.

Thus, our book is about IP. And it is about American economic history and the use of IP. And, it is about whether IP as practiced currently is different from the way it has been practiced before. And, most important, it is about the future of industrial policy in the US.

We have pointed out that industrial policy must be driven by wide and possibly long-run societal goals normatively indicated by governments. Narrow and short-run goals can be acceptable but only if they are clearly part of a country's long-run national strategy defined by government vision in the name of the entire society's interest. We then pointed out that the definition of targets and tools is another crucial part on which policy-makers and analysts must focus. Wrong targets and tools are *not* likely to accomplish goals and may even produce high costs and negative effects.

However, as we will attempt to show, government intervention with goals, targets, and mechanisms properly chosen, might be appropriate and desirable. The failure of markets has long been argued as justification for government intervention. But the risks of government failure have also been noted and have been used as a justification for non-intervention. But this presents a false dichotomy because in different countries and historical settings *markets* and *government* have a long record of both functioning and failing. In the next paragraphs we will recall the main arguments of this long-running debate. We hope to arrive at a position in which we can dispassionately revisit this still-hot dispute.

BUILDING BETTER MARKETS

The late-eighteenth century saw the beginning of modern Western economic literature with Adam Smith, who suggested that, contrary to one's normal intuition, individuals seeking to maximize their own individual utility would – unwittingly – achieve an equilibrium in markets that would produce a kind of social maximization of welfare.⁸ This was a radical notion – that markets could be formed in which individuals working in their own self-interest, free to produce and bring forth whatever they chose, together with consumers who, themselves, entered the marketplace seeking to purchase goods and services that maximized their own utility would, over time, maximize social welfare of the entire community of producers and consumers.⁹ Smith introduced one of the most popular metaphors of the whole history of economic thought by describing how this desirable state would be achieved by the “invisible hand.”

From this literature came subsequent ideas that modified the view about this ideal mechanism. This literature pointed out that the ideal, efficient outcome was not, in fact, inevitable. Under some circumstances markets would not produce this social maximum state. With this critical literature came the popular notion of “market failure.”¹⁰ In cases of market failures corrective industrial policy interventions have often been considered necessary¹¹ and in the last decades the economics literature has

promoted a very intensive debate on the main situations in which markets appear to fail. Public goods, externalities, non-competitive and incomplete markets, and many relevant issues related to information have been among the most-frequently discussed topics. In the following pages we will focus on this debate, recalling what we believe appear to be the most recurrent questions in contemporary markets.

To connect this literature to what we discussed in the previous sections, in our perspective, market failures are a source of concern when market outcomes are not in line with those societal goals defined by government. When markets are not producing outcomes consistent with societal goals it could be the case that IP interventions might offer some possible solutions. This is why what we like to define "better-market building" is an important part of what we believe IP should be about.

The Provision of Public Goods

Public goods are those goods or services characterized by two characteristics: non-excludability and non-rivalry. This means that the goods or services produced by these industries can be consumed even by those not paying for them, and one person's use of a good or service does not limit other peoples' use of them. The impossibility of excluding non-paying consumers makes "free-riding" possible. The problem is that producers will underproduce these goods and services because the number of consumers who demonstrate that they benefit from the consumption by paying for them is reduced. Such markets are unsustainable because "the few" pay for "the many" and eventually public goods will be underproduced or this fragile structure could collapse altogether, leading to situations where these public goods are not produced *at all*. Thus, in the case of public goods, there is justification for government intervention in the market to assure that the optimal amount of goods or services will be produced.

Traditionally people have considered manufactured goods and ordinary services when discussing industries and the markets for their outputs. Today, however, we realize that there is another "good" that is crucial for industrial and post-industrial economies that is eclipsing traditional manufactured goods in importance. This "good" is knowledge. It has been the main engine of many nations' growth and development in the past century. We have even coined the term *knowledge-based economies* to describe economies in which knowledge is the crucial component of successful economic development. Knowledge has to be treated carefully, because it is critical for modern societies, and its underproduction occurs only with great peril. An example of knowledge as a public good is basic research. Basic research, unlike applied research, has unknown value when

it is conducted. One never knows what applications might arise from new knowledge. Furthermore, the results of basic research are typically distributed widely, through scholarly journals and conferences. In other words, the results of basic research cannot be kept away from those who have not paid for it. This research is non-excludable. In addition, one person's use of the fruits of basic research does not prevent others from using the same discovery – so the research is non-rivalrous. This means that the private sector has scant incentive to invest in basic research, and so if any basic research is to be done in a society, it will have to be funded by society at large, through government, and not by private investors. This is the role of the National Institutes of Health in the US, or research centers like CERN in Europe.

We can distinguish between two kinds of knowledge that a society needs. The first is the general basic knowledge offered to populations. We call this *G-knowledge*. Second, is the specialized knowledge – the direct source of innovation for companies. We call this *S-knowledge*.

G-knowledge is a public good produced by the education system, ranging from pre-schools to universities. This is basic knowledge that every advanced society must impart to every citizen, including knowledge of one's patrimony and culture. And it includes, as well, other skills that societies need to function, from knowledge of the sciences to civics to the humanities. Everywhere around the world, public and private education institutions produce this kind of good or service. It is a "public good" because it is non-excludable and non-rivalrous. Its nature as a public good is the reason why societies throughout the world have realized that it must be provided to the greatest extent possible, by government.

Of course there are private returns to education, as well, which will lead individuals to invest privately in their education if they perceive quality differences that are, somehow, "worth" it. This is the reason that we see both private and public educational institutions coexisting. But if societies rely on private investment to produce an educated populace, the amount of education is sure to be underproduced and societies will suffer the consequences. Organizations seeking employees demand skilled workers, whether the organizations are in the public or private sector. This does not mean that employees need only learn G-knowledge, as there is further specialized knowledge that must be attained by employees, as well. Organizations need the best workers possible, who will be ready to absorb further ad-hoc specialized training. Analogous knowledge is crucial for consumers who will appreciate the characteristics embedded in producer goods and services and demand those, accordingly.

Thus, it is clear that the quantity and the quality of G-knowledge produced by the education system has an important effect on companies' performance and on many fundamental aspects of society related to

industrial growth, competitiveness and development. Since G-knowledge is often available to companies without paying, there are low incentives for them to reveal how much they would be willing to pay for it and consume. In many wealthy countries this public good is too often taken for granted and companies pretend to underestimate how important the outputs of the education system are for them. This attitude may lead societies and economies to dramatic failures. Companies might be tempted to act as free-riders in consuming the products of the education system for free. And if society fails to produce a sufficiently-educated population, the firms can relocate – or “outsource” – to another community with a greater factor endowment. For these reasons, leaving funding of G-knowledge production only to companies’ demand is likely to result in serious under-financing and under-production of public education that produces G-knowledge.

This scenario suggests that industrial policy interventions in favor of the education system (the *target*) are appropriate, where the *goal* is avoiding the under-production of G-knowledge and those distortions that occur in societies in the medium and long run because of the myopic free-riding of firms.

The same arguments in support of government intervention to support G-knowledge may also apply to specialized knowledge, which we call “S-knowledge.” S-knowledge is the specialized knowledge produced by companies, universities and research centers that is the direct source of innovation in the production of goods and services, but in many cases S-knowledge cannot easily be kept and managed inside the walls of the knowledge-producer, the firms, research centers, university departments, hospitals, laboratories, and so forth. S-Knowledge can also be a public good because it can be “diffused in the air,”¹² “rooted in the land,”¹³ disseminated within a sector, or embedded in complex local, national and international networks of companies and institutions, and thus become non-excludable. The characteristics of non-excludability and non-rivalry of S-knowledge, as was true with G-knowledge, makes free-riding probable, leading to socially suboptimal production because it induces knowledge-producers to move from the sector, the market, or even the locality. These characteristics require IP interventions if the current technology or the property-right system cannot exclude non-payer consumers of non-rival knowledge.¹⁴

There are two circumstances in which firms overcome the disincentive to support education because of its public good nature. The first pertains to small groups of producers. The second pertains to groups consisting of very similar firms. Olson suggests that virtuous equilibrium among entities can be achieved without any external public policy interventions

if the groups are characterized by only a few actors.¹⁵ Under these circumstances, it is possible that some members of the group, understanding the advantages of sharing a common pool of knowledge, will unilaterally undertake the provision of public knowledge. Axelrod suggests that this is even more likely if the group is long-lasting.¹⁶ This arises because the time horizon is long enough that there is recognition that long-term sharing of knowledge will lead to cooperative behaviors overcoming the free-riding problem and the risk of under-provision.

If firms form a homogeneous group, where joint actions and cooperation are more likely to emerge for different reasons than merely the small size of the group, the free-rider problem can also be overcome. What occurs is that entities sharing common background, history, culture or values will find private ways to manage non-excludability of the non-rival-knowledge.¹⁷

Moreover, the information and communication technology (ICT) revolution has encouraged the diffusion of new processes of collective action also in this field of knowledge production. A particular process of “wiki-production” has emerged exploiting the non-excludability and non-rivalry as virtuous factors able to stimulate innovative path of collective knowledge-building.

Thus, the problems resulting from the public nature of S-knowledge can in some circumstances be solved privately, while in other circumstances, public policy interventions are needed. One can think of a continuum with two extremes. At one end we have small, old and homogeneous groups where private actions to overcome market failure have a higher probability of emerging. At the other end solutions can be found with young, large and non-homogeneous groups, where public policy interventions appear more necessary. Both solutions entail costs. Private responses, resulting from formal and informal negotiations and agreements among the involved partners entail transaction costs. On the other hand, public responses are also costly because of transaction costs and more generally because of the risk of government failure. Whenever government intervenes in markets there is the risk that programs miss their goals or that the mechanisms chosen are somehow inefficient. In the next chapter we will focus on the problems of government failure.

In the previous discussion, we observed that one of the major “outputs” of modern economies is “knowledge.” These days knowledge is produced by organizations or firms that transcend national boundaries. One reason for this is that capital is mobile, and so are people who are the “knowledge-producers.” This weakens national public policy regarding knowledge production. But at the same time, the needs and rewards for acquiring hegemony in knowledge are so great that there are increased

efforts at the national and regional levels for IP interventions with the goal of fostering and encouraging the development of national or local networks of knowledge producers.

An important part of the knowledge landscape is patent policy. This is perhaps the most important instrument we have for defining property rights in the case of knowledge, or "intellectual property." Patents have been the primary public policy tool designed to exclude free-riders from non-rival knowledge since the early stages of capitalism. Patents are still a crucial institution of contemporary economies, but it is important to recognize that their ability to maximize S-knowledge production is far from absolute. One reason is the weakness of national authorities in monitoring, policing and sanctioning the behaviors of would-be producers scattered throughout highly globalized markets. Moreover, the relevant knowledge required to produce innovation is not only produced by firms, but also by other institutions like universities, hospitals, or laboratories. Thus, in many cases, the relevant unit is not the single traditional firm but more complex multinational networks of local and non-local institutions sharing a common pool of knowledge.

If government chooses to promote production of knowledge, the complex groupings of actors makes it difficult to choose targets and means. Interventions that government might decide to promote definitively go beyond the simple protection of any single knowledge-producer's property rights. On the contrary, in many cases governments will have to consider encouraging the bilateral flow of knowledge between, say, firms and universities. This might be the best way of creating incentives that will maximize the collective benefits associated with this flow. Crucial decisions like who – the university, the company, the sponsor, or the researcher – will own the property rights of the output resulting from a specific university-firm joint program have different impacts on university performance and the cost structure of the firm, thereby changing incentives for both entities.¹⁸

In 1980 the US Congress enacted the Bayh-Dole Act, which allowed non-profit entities, such as universities, that receive federal funds to support research, to file for patents pertaining to their discoveries. Furthermore, these entities may retain any income that ensues from these patents, such as licensing agreements or sales of patent rights. This legislation was path-breaking because it encouraged universities and research laboratories to engage in development of S-knowledge to a far greater degree. The incentive was important and today virtually all of America's research-oriented universities have an "office of intellectual property" charged with assisting scientists in the marketing of their discoveries. The incentive therefore has led universities and laboratories

to "cross the bridge" between general, basic knowledge, and applied knowledge.

Finally, the trade-offs between the need to protect knowledge-producers' property rights for a reasonable, but limited, period of time must be defined so as to avoid bottlenecks in the complex paths of innovations. This is an ancient dilemma. Temporary institutional monopolies to remunerate profit-seeking innovators are crucial for growth, but what does "temporary" exactly means in a contemporary globalized market? This is a delicate issue, and will be determined by a number of factors, including structural features of specific countries, sectors, and products. Moreover, from a national policy perspective, patents risk inhibiting domestic technological upgrading while possibly offering unique advantages to free-rider competitors in other countries because of the difficulties in monitoring, enforcing and policing patents in foreign global markets.¹⁹

In spite of these concerns, there is no doubt that in the strategic field of knowledge production markets can fail and that IP tools might offer the best remedies to minimize the risk of S-knowledge under-production. However, many questions arise and the IP options must be chosen with full awareness of the pitfalls, some of which involve the specific nature of the country, sector, product, time period, and global economic relationships. These "special cases" of public goods are not rare. The debate on public goods production and ownership is a strategic field for all of the social sciences, such as economics, management, political science, and sociology, because of the complex impacts on individual and collective lives. One can go even further, noting that what makes societies different from one another is often the access of their citizens to a basket of selected and sophisticated intangible public goods such as knowledge, health, security or stability.²⁰

The Management of Externalities

The second reason for market failure is the often-noted existence of externalities of production or consumption: the creation of benefits or burdens on other people when producers or consumers act so as to maximize their own, personal, welfare. The issue is that an activity by a producer or consumer often produces "spillovers," affecting others.²¹ But these other consumers or producers are not charged or compensated for either the benefits or the burdens that they are experiencing. These spillovers create incentives that lead to either more or less production of a good or service than would maximize social welfare.

Creators of positive externalities, for example, will see an incentive to produce less or even exit a market when they realize that they are unable

to sell their output for its full value to society. An important example concerns knowledge-producers such as universities, research centers, and firms which are rarely fully compensated for the positive effects that their activities convey to the general community. These knowledge-based spillovers often arise from spatial proximity or because a producer belongs to a common network of firms or even sectors. Examples include worker training: companies that invest in training for their workers are likely to spread positive effects across other companies, space, and time, so that the firm cannot receive the full value of the training that is being produced. Another, less tangible, example is reputation:²² companies that have gained a good reputation are likely to produce uncompensated positive effects on the whole sector, region, town and even country. When a winery in the Napa Valley or in Tuscany produces a highly-regarded product, it creates a "halo effect" for all other wineries in these regions – and even for US and Italian wines in general. And there is little doubt that the reputation of Ferragamo or Armani has done wonders for the reputation of the Italian fashion industry. On the other hand, consider the consequences of firms that allow their quality to decline. Trouble-plagued automobiles, such as the Ford Pinto, some 1990s Jaguars, or some 1970s Fiats harmed the entire national auto industry in their respective countries.

The trouble with externalities is that the benefits or costs to others do not accrue only to the primary firm. The winery producing excellent wine or the apparel producer producing world-class fashion will sell more of its products, to be sure, but the benefits to *other* producers do not come back exclusively to the firm. The costs to the firm of maintaining excellent quality are returned only partly, and so the incentive will be to reduce those additional expenditures. Conversely, producers of inferior products often do so by saving on expenses – and the total social loss from this economizing is "split" between the firm and society at large. Therefore the incentive will be to continue producing inferior products.

It is easy to find other examples in the area of pollution, for instance, in which producers who are scrupulous in minimizing pollution incur higher costs of production – but consumers of these "clean" products may not be willing to pay the full additional costs of production. And firms that lower costs of production and produce pollution, such as BP or producers of natural gas using "fracking" technology are ordinarily able to capture the additional profit of low-cost production because they are not obligated to fully compensate society for its polluted environment.

It may be possible that individual firms will reach agreements for compensation of the positive and negative externalities through discussions and negotiations with other firms, or with government. But usually these negotiations are costly and, in the end, do not succeed. Parties affected by

externalities and those producing externalities have to collect information, discuss, mediate, negotiate and finally define a contract that entails further investments in enforcing, policing and sanctioning activities. A useful role of government can be the mere publication of quality data that consumers and others might be unaware of. What are the sources of smog? Which neighborhoods are the most beautiful because of gardening and landscaping by property owners? Which motorcycles produce the most noise – and which, the least? Which kinds of packaging produce the worst, and the best, long-term pollution in landfills?

In this context IP has been considered a possible answer. Governments can intervene in penalizing local negative externalities and rewarding positive ones. Intuitively, they can sanction negative-externality producers through fines or they can support the positive-externality producers through subsidies. Governments could offer incentives to knowledge-producers such as local universities or to good reputation-makers like companies that are the best performers in foreign markets. Government can also intervene by either regulating, or by allowing private parties to seek redress in the courts. In both cases injured parties will often be awarded compensation for their loss, and parties incurring benefits will be required to compensate the producer for their additional production costs.

Lastly, government might play a crucial role in encouraging discussion and negotiations aiming to find mutually acceptable solutions concerning compensation for the benefits or costs of externalities. This is the case of positive externalities related to public goods, such as health, education, and research. Government can act by highlighting the benefit of some positive externalities and thus encouraging the development of joint actions between parties lowering the transaction costs associated with negotiations.

Imperfect Markets

Markets characterized by perfect competition exist in any basic economics textbook, but rarely elsewhere! In the real world this *perfection* is hardly ever seen, and far more often we encounter *imperfectly-competitive* markets. For example, contemporary national and global markets are very often characterized by a few dominant companies. Many industries, such as telecommunications, pharmaceuticals, oil, and banking, are often characterized by the interaction of a small number of national or global oligopolists or by national or transnational cartels. In many countries, and in many industries, monopolists and oligopolists have maintained leading positions for very long periods of time. Of course, market concentration is not a new phenomenon and the aggressiveness of government-promoted

pro-competition policies has waxed and waned over the years. It appears, however, that in the present period national antitrust authorities have become weaker than they were in the past, with governments approving dominant positions and behaviors of firms that might have failed scrutiny in the past.²³ One reason for the apparent change in antitrust policy is that industries are no longer merely national in scope. If the world economy contains mega-companies, then every country has an incentive to allow the rise of its own mega-company which will be able to compete with the others. Antitrust policy has followed the "weakest link" pattern, allowing mergers so as to promote competition with the largest firm, most likely located in the country with the weakest antitrust policy. American banks will be allowed to grow in power and scope in order to compete with the most powerful banks in Europe, and Europe's food processing industry will be allowed to consolidate in order to compete with the largest food processors in the US. One country's own national antitrust authority has no power in front of global oligopoly characterized by few transnational giants. This antitrust authority has limited power in the face of a dominant firm that threatens to leave the country to seek better conditions. This is why national pro-competition authorities tend to be non-interventionist; the national firm is often considered a sort of national champion able to represent the national interest in the international arena. Even a monopolist may be welcome at home if it plays its game well in the international arena.

Of course different countries have to express their own individual policy answers, and the leading industrial countries, both the established ones and the newly emerging ones – are characterized by different situations. In Europe it is clear that national authorities have no role anymore in a sub-European context. In the US the extent of the domestic market is still relatively large and there may be sufficient room for many large national giants to co-exist – and even perform competitively. However it is also true that even in the case of the US the relevant extent of markets goes well beyond its borders and even America might need its international "champion." One can well imagine that Boeing is allowed leniency in competitive behavior on the grounds that it has to compete with Europe's Airbus. Today this system is being further challenged in both the US and Europe by China and many new emerging industrial powers. In China for example there is no tradition at all of antitrust policy. The government has encouraged regional giants to grow with the aim of conquering distant foreign markets. In many cases this strategy has been successful and the Chinese challenge could be considered *per se* – both in America and Europe – a very good reason to implement national champion policies.²⁴

In general it is also true that some kind of monopolies must be considered good for growth. When monopolies are temporary and based on the innovative capacity of a single firm to produce a good or service that is unique, this monopoly is not only desirable, but it is essential in the course of the dynamics of industrial development. These kinds of monopolies are the engine of all the dynamic economies characterized by profit-seeking innovators. In these cases the appropriate role of government is to ensure that these monopolies do not create permanent barriers to entry, so that the monopoly profits will only be temporary and that other profit-seeking entrants will soon erode the monopolist's initial profit. Making markets contestable is what IP can be called upon to do.

Another cause of market failure is the case of so-called natural monopolies. These are firms characterized by economies of scale and a limited size of the market. Economies of scale imply that the larger the firm is, the more efficient it is. In other words, breaking up such a monopoly raises costs and so consumers do not benefit. The appropriate role for government, therefore, is not to try to make natural monopolies competitive, but rather to regulate them so that prices charged to consumers will be equivalent to what a competitive firm would charge, with the hope that this will produce a rate of profit that is what a competitive firm would encounter. Regulation of natural monopolies is common. Declining-cost firms are common in public utilities, for example, such as natural gas, water, electricity, and sewage. The thought of having multiple electricity grids in a city illustrates how costly and ugly competition in an industry like that would be. The trouble is that monopoly regulation can be costly and there are many examples of attempts to regulate which have been ineffective and failed.²⁵

Incomplete Markets

Another important characteristic of real world economies is the incompleteness of markets. Markets are incomplete unless two additional variables – time and circumstances – are specified in addition to market structure. A widely quoted example will clarify this point. The demand for umbrellas depends not only on the relevant time (today, tomorrow, next month, etc.) but also the circumstances of the environment. In this case, "circumstances" describe the weather.

In many circumstances, despite the sophistication of contemporary market agents (consumers, producers, regulators) firms still bear the cost associated with variation in market circumstances. A number of these agents are exposed to considerable risk with respect to changes in circumstances. Examples include workers, property owners, managers, and

investors. There is reason to expect market failure in some more complex markets if markets don't perceive correctly the value of certain outputs. This situation pertains, for example, to the crucial subject of innovation. If we consider the "time" dimension of the market, innovation often anticipates future success of a discovery or future need for an intervention. The market may have trouble correctly assessing the value of innovation in the future.

There are two aspects to this future valuation. The first is the one that is commonly thought of – risk. What is the likelihood that an innovation in early stages will prove successful later? That is always an issue, and venture capitalists confront this question directly. The pharmaceutical industry is a good example of how relevant these issues are – and even more so the biotech sector which is primarily comprised of small- and medium-size enterprises, where the need for capital is critical and the small size of the firm usually is related to a small number of products under development (which increases risk even more). Not only is it possible that an innovation will fail either in additional animal studies, or in human drug trials, but it is also possible that another firm will beat them in introducing a similar product.

Even when a drug is approved, there is no guarantee that physicians and their patients will flock to the new product. It could be too expensive, there might be fears of side effects, or it could be too inconvenient. It is not uncommon for the FDA to find that a drug that has already been approved for use is more dangerous than thought. In some cases the remedy is to require placement of warnings on the label (which are guaranteed to scare physicians and patients). In some cases the FDA actually makes a U-turn and withdraws approval for a product. In other words, the future is full of risks, and organizations that can provide capital to the biotech company may not assess accurately the actual risk of the proposed investment. In some cases the scientists are not sufficiently skilled in guiding potential investors, who are led to think that the project is too visionary. Sometimes the fault is more subjective, with some diseases, such as cancer, better able to attract investors than others, such as cardiac disease. If investment decisions are made on subjective criteria such as how scared the general public is about particular illnesses, it is entirely possible that higher risk ventures will find support, while lower risk ventures will not. The end result is that there is likely to be an "overproduction" of innovation for some kinds of products and an "under-production" of other kinds of products.

One may imagine a role for industrial policy in a setting in which risk is likely to be assessed incorrectly. Note that the problem is not that the *level* of risk is particularly high that causes market failure (markets usually perform well in dealing with risk – even high risk), but that the level of

risk is *difficult to estimate*, that will scare-off potential investors. Possible government roles include both direct and indirect interventions. National or local governments can encourage public investments in those research activities selected as genuinely innovative and prophetic. In some cases there may be actual direct investment by government to enable scientists to carry their research a little further so that the degree of risk to private investors is better understood.²⁶ In many industrialized countries, this funding program is referred to as "bridge financing," as it attempts to enable entrepreneurs to cross the "risk chasm" to an area where private investors are more comfortable working. Of course these funding mechanisms are, themselves, taking on the risk that the private sector is apprehensive about taking.

National and local governments may also promote less direct interventions. In some countries there are government programs that try to make the "market" for innovation financing work better. These programs take the form of government-sponsored "technology fairs" that bring scientists and potential investors together so that investors can see a whole array of projects presented together for their consideration. These "fairs" may do nothing more than provide a venue for projects to be presented – either in "real space" or on the web. Or they might provide information or even rankings or ratings of options to assist potential investors.

Insufficient Information

The issue of insufficient information is another imperfection in some markets. Imperfect information and asymmetries of information are common characteristics of real-world markets. Adverse selection and moral hazard, common aspects of market failure, occur when one actor in a transaction is not completely able to observe the risks or behaviors of other actors in the transaction. Labor markets and markets for goods and services are all characterized by problems of imperfect information.

In recent decades the information technology revolution has dramatically changed the consumer-producer and producer-producer relationships. The labor market, as well as the markets for goods and services, has changed because of the internet, e-mail, Skype, and social networks. In many cases this technology upgrading has partially filled the gap of information that inevitably characterizes transactions between economic entities. However, this has not been the case everywhere and many imperfect information problems clearly persist in some markets.

The growing complexity and sophistication of goods and services traded in contemporary markets makes producer-consumer asymmetry of information even more severe than it was in the past. The abundance of

consumption options and information on different possibilities offered to consumers has not solved the issue of information asymmetries.

The risk is that if consumers are not able to evaluate and appreciate the complexity of available goods and services, they will not recognize the best quality products when they are available.²⁷ The companies that have invested in order to produce high quality goods and services (for example through training or R&D) will fail to attract customers willing to pay the higher prices that such products must attain to survive, and they will fail and exit from the market place.²⁸ The result will be an undesirable reverse Darwinian outcome, with bad goods and bad companies surviving, and the best goods and best companies disappearing. This too, has to be an issue for IP: national and regional governments cannot allow their best producers to fail and disappear because they have an interest in these markets succeeding because of positive externalities. In general the goal is to change the mechanism of incentives that, if left to imperfect market functioning, will reward the producers of the worst services and commodities. How is it possible to identify the best producers, thereby encouraging their activity? The issue takes an interesting turn in the contemporary world market because of international competition. This is the problem many industrialized countries have because of competition from low-cost producers located in emerging countries. The issue for industrial policy is how to protect companies from the competition of foreign firms that may offer lower quality goods without consumers being aware of quality differences. It is important to note that we are not suggesting that low-quality goods or services should not be brought to market, or that consumers should not buy them. Consumers differ in their preference for quality, price, and other attributes, and there is no doubt that a broadening of the scope of products and services in the marketplace benefits many consumers who desire these products. The issue is that consumers who prefer high-quality goods and services often need assistance in identifying which products are like this.

Economists often distinguish between two types of goods and services: experience goods and search goods.²⁹ The former group consists of goods and services whose quality is difficult to ascertain without actually using the product. Like breakfast cereal and novels by Hemingway, it is difficult to know whether the product meets one's expectations without actually using it. On the other hand, there are some goods that one cannot merely use once or a few times and see if one wants to continue using it. Brain surgery, solar collectors for one's home, or university education are examples of search goods – in which the consumer has only a single opportunity to use the product (or service) and so the consumer is obliged to learn whatever can be learned about the quality *a priori*. Clearly the problem

of inadequate information affects search goods far more than experience goods.

The problem of consumer information has interesting multinational implications. The immediate issue often relates to imported goods from low-cost producers (for example located in Asia or Latin America) that compete with higher quality products in America or Europe. There is certainly a problem if consumers do not know quality differences and they inadvertently purchased low-cost, low-quality products, perhaps at high prices, because they do not realize the quality deficiencies of the imported products. But often the price differences signal quality differences and consumers know that a shirt from WalMart, for example, is of lower quality than one from Brooks Brothers. Some people will purchase one shirt, and others will make the opposite decision. But what about products that appear to be the same – and perhaps are not priced differentially. Often the private market provides a remedy to this situation. Specialized magazines and websites are quite popular in many countries.³⁰ Many consumers purchase these sources of information and use it – especially as a guide to the purchase of expensive search goods like automobiles and major appliances. Such information is less available concerning the safety of children's toys or prescribed drugs or the purity of processed foods. Here additional information is important. Communication campaigns pertaining to product and service quality should be part of a country's industrial policy agenda in order to make consumer markets work efficiently. Examples of public interventions designed to diffuse information to consumers and to businesses are the promotion of fairs and exhibitions, missions abroad, and business-to-business (B2B) focused meetings and advertising. Of course not all producers of goods and services support increased access to information, and charges of government meddling and wasted expense are often raised when additional product testing and information diffusion by government is proposed. One must be skeptical of the opposition, however, and wonder what the motivations are.

The acceleration of globalization makes the problem of information asymmetries more complex. Production of both manufactured goods and services is being outsourced around the world. Manufacturing outsourcing spans a wide range of products, including the production of aircraft by Boeing and Airbus, manufacturing of pharmaceuticals, and even reading of radiological images between medical centers. Firms must be aware of quality differences in subcontractors, so that they can be assured that the quality level is what is desired. Entrepreneur-workers, producer-producer and producer-consumer relationships may involve actors located in very distant spatial and cultural context. This distance

increases the likelihood of information asymmetries and increases their consequences. Asymmetries that are expected to encourage undesirable processes of adverse selection involving goods, companies and people.

According to our perspective, market failure is a source of concern when market outcomes are not in line with the societal goals normatively defined by governments. In these circumstances, it could be the case that industrial policy interventions might offer interesting solutions. This is why "building better-markets" is an important part of what we believe industrial policy should be about. Better societies might need better-market functioning and this is why IP interventions might be in some circumstances recommended. In the previous paragraphs, we listed many examples and we discussed many current issues where better-market building policies appear to be important. However, as we are going to argue in the next pages, we believe that the domain for industrial policy goes also beyond market failure corrections.

Looking beyond market failures

The international history of economic development has clearly highlighted how governments have been promoting IP interventions with rationales that go well beyond market failure arguments.³¹ Two other themes appear in the literature as goals that governments have presented for IP. First, governments have designed and promoted IP actions having in mind complex sets of *strategic-economic objectives*. Second, IP has been suggested as a tool to achieve even more intricate *meta-economic* goals.³² We next discuss these additional goals of IP.

STRATEGIC ECONOMIC GOALS

The historical experiences of many established and emerging industrialized countries show that industry has been promoted for reasons of *strategic-economic* importance that have definitively gone beyond the correction of market failures that we have previously discussed. The rationale is that policy-makers can have a role in guiding a country, much as entrepreneurs and managers do in the case of companies. Government responsibility may be viewed as defining strategies in the name of national interest and citizens' welfare. In many established industrialized countries, since the times of Jean Baptiste Colbert (1619–1683), Alexander Hamilton (1755–1804) and Friedrich List (1789–1846),³³ it is possible to find a debate about the role that government might play in defining and implementing the national strategy for industrial development. In all the industrial development experiences of the most successful countries

governments have identified a set of goals that have been defined to be strategic for their economies and more generally for their countries.³⁴ Examples of these strategic goals are improvements in competitiveness, acceleration of growth, structural adjustments, industrial development, industrial and economic "independence," export promotion and import substitution, innovation and technological upgrading, the definition of measures to contrast industrial decline or phases characterized by crises and recession. In many circumstances governments have thought that they could promote IP interventions to achieve these goals by targeting selected companies, regions and territories, or specific industries. Strategic motivations have inspired policy interventions in favor of selected incumbents or new entrants operating in strategic industries. Sometimes the industries selected as targets of specific IP actions amount to attempting to "pick strategic winners," or the antithesis, "picking strategic losers." In some cases the justification is "too-big-to-fail" or more generally, "too-strategic-to-fail." Specific actions may entail "bail-out" interventions in strategically selected economic fields, "Sunrise" policies may be called for in those industries that are considered strategic for the future of the country, while "Sunset" policies may be undertaken in those industries that are no longer considered strategic. Structural change interventions may be undertaken in order to promote a shift toward those activities considered strategically important for the future of the country. Industrial policy programs to protect and to encourage the development of strategic "infant industries," defend declining sectors, or support "national champions" are also undertaken.

In the past, strategic sectors have included coal, steel, textiles, automobiles, shipping, defense, transport, and construction. Today's strategic sectors may include these, but may also include green industries, energy, software, telecommunications, ICT, aerospace, genetics, and biotechnology.³⁵

National strategic rationales for IP have been common in the history of economic development of all industrialized countries.³⁶ In post-war Europe, for example, national governments played a crucial role in developing what were defined as the main strategic sectors (i.e., chemicals, steel, energy, and transport). And the history of post-war industrialization of Japan is strongly rooted in the guiding role of the country's Ministry of Trade and Industry (MITI) and in its intention of selecting the strategic sectors in which government should heavily invest. As we will describe in more details in the next chapters, in the Seventies the US Government promoted interventions in sectors considered strategic for the interest of the whole country: it bailed-out Lockheed (1971) and Chrysler (1979) and, a few years later (1983), it raised motorcycle tariffs to save

Harley-Davidson from the Japanese challenge. In the weeks immediately after September 11th, the Bush administration intervened in favor of the airline industry. This active role played by the American government was explained by the need to avoid the risk associated with the potential failures of many companies in specific industries. But more generally it could be justified by the risk of contagion to the whole economy. In other words, the airline industry was considered too strategic for the American economy to be left to fail.

Even more visible are examples linked to the recent international financial crisis. Since 2008, in many industrialized economies firms have been assisted by government interventions in the name of the country's strategic interest. For example, in 2009, the British Government set up a Strategic Investment Fund to steer £750m to strategic industries and companies. In 2010 the French Government invested in the biotechnology industry creating a special fund to encourage existing companies and new entrepreneurship, arguing that biotechnology had become strategic for the country. At the same time, following its strategy of supporting French industry during the recession, the government supported and bailed-out some of its leading companies in other strategic industries, including banking, autos, aerospace and even – most surprisingly – the famous Meccano toy company. And in both the US and Europe governments have implemented strategies to avoid the collapse of the banking industry.

Since the very beginning of his first term, President Obama played an active role in the automobile industry, which has always been considered one of the most strategic sectors in the country. The risk of collapse of the whole national industry was severe and this industry has been considered too-strategic-to-fail. In practice, protection was accorded to two of its firms, General Motors and Chrysler (which were deemed too-big-to-fail). The Obama Administration supported the view that government must make “strategic decisions about strategic industries.”³⁷

Looking at global industry today, it is also clear that several highly performing new emerging industrial powers have promoted industrial policy interventions with explicit strategic goals. China and South Korea, for example, have shown how successful industrialization has been, when accompanied by industrial policy and planning, promoted and justified for strategic reasons.³⁸ The practice of identifying certain industries to support because they are considered strategic has a long tradition in South Korea and was evident during the last decades of that country's impressive industrial growth.³⁹ In the Sixties the strategic industries were determined to be fertilizer and oil refining first and later chemicals, steel, and machinery. In the Seventies non-ferrous metals, shipbuilding, and electronics became priority sectors. In the Eighties the list was even longer,

with the addition of machinery, electronics, automobiles, semiconductors, and biotechnology. All these industries have benefited from preferential government policies because they had been declared strategic in the wider framework of its industrial policy strategy. These policies included privileged access to credit and foreign exchange, loans at subsidized interest rates, favorable tax treatment, public investments funds, and import protection and restrictions on entry of foreign competition.

Looking at China, it is also clear that the massive industrial interventions have been justified within the framework of the government-led strategy of growth.⁴⁰ The definition and the implementation of “the national strategy” for industrialization is what explains three decades of national and regional policies all rooted in a sequence of ambitious long-run planning aimed at the promotion of growth, industrialization, and continuous structural change. Since 1978, when the Deng era began, this idea of government intervention in favor of the strategic economic interest of the country has been one of the main characteristics of the Chinese industrialization process. Picking strategic winners has been a crucial activity in the wider industrialization strategy promoted by the Chinese Government. In the last three decades of impressive double-digit continuous growth, “sunrise” policies have been promoted in those industries that have been defined as strategic for the future of the country. Structural change interventions have been stimulated in order to promote a shift toward those activities declared strategic. Industrial policy programs to protect and to encourage the development of strategic “infant industries” or to support “national champions” have also been pillars of the general strategy of Chinese industrial development. Though implementation of an industrial strategy in China's national interest is not a characteristic of the past, the identification of a set of priority and strategic industries on which government should focus its policy efforts is at the center of the country's present (and, presumably future) industrialization strategy. In the twelfth five-year program for China's Economic and Social Development, adopted at the Fifth Plenum of the Seventeenth Communist Party of China's Central Party Conference Central Committee, seven strategic industries were clearly listed:

- Alternative-fuel cars (hybrid cars, electric cars, fuel-cell batteries);
- Biotechnology (biomedicines, new vaccines for disease prevention, advanced medical equipment, marine biology);
- Green industries (energy-saving technologies, pollution control, clean coal, waste-matter recycling, seawater exploitation);
- Alternative energy, including next-generation nuclear power plants, solar power, wind power, smart grids, bioenergy;

- Advanced materials, including rare earth minerals, special glass, high-performance steel and fibers, composites, engineering plastic, nano and superconducting materials;
- Information Technology (IT), such as cloud computing, high-end software, virtual technology, new display systems;
- High-tech manufacturing of products including aircraft, high-speed rail, satellites, and off-shore equipment.⁴¹

Within this framework and its seven components, the Chinese Government has announced that it will promote planning and policy to support basic research, R&D in some key technologies, education system modernization in some selected disciplines, and major state-level science and technology projects. The government will also promote targeted fiscal policies and will increase investments in order to support domestic indigenous innovation and the industrialization of scientific research. Moreover, the government is going to launch fiscal, tax and financial policies to develop and reorganize the structure of the seven industrial groups, including guiding and encouraging mergers and acquisitions to increase manufacturing industry concentration and efficiency. The dimensions of China's future emphasis on growth and industrial development could not be clearer.

META-ECONOMIC GOALS

Finally we look at another set of IP goals, which we have called "meta-economic."⁴² Historically, many developed and developing countries have used IP to achieve broader goals than growth or industrial success. They have sought to achieve more complex goals that tend to go beyond the economic domain. In many cases IP has been called on to intervene to address issues of distribution of wealth among people or regions, access to merit goods, social or environmental sustainability and even foreign policy goals. As we argued in the introductory paragraphs, we consider these kinds of goals to be within the domain of IP as far the interventions target production dynamics in order to achieve normatively defined societal goals.

As an example, if equity is one of the societal goals defined by the government, it is reasonable to argue that improved access to health is a goal that might also be connected to IP interventions. This might be accomplished by a specific program that encourages the adoption of IT online connections between physicians, laboratories and hospitals, as a powerful instrument to force the entire reorganization of the health industry. It

would mean a single and updated database with all the information about patients, pathologies, diagnoses, and drugs. This would create a pool of information that might have a crucial impact on the management of the whole health industry with a clear impact on the long list of actors involved in the production of healthcare goods and services. This would be a kind of intervention with a broad impact on the targeted industry – the health industry – because of its expected advantages in terms of costs, efficiency in resource allocation, R&D, innovation, and healthcare services effectiveness. Keeping in mind our definition of IP provided in the previous pages, this same intervention can also be seen as a powerful tool in line with the wider societal goals of improving population access to health and equity.

The set of on-going interventions in favor of America's "green industry" is another example. There is no doubt that the Obama Administration is encouraging investments in this industry grouping because of its potential beneficial impacts on growth and industrial development. However it appears clear that green industry is also viewed as "worthy" because of other meta-economic dimensions such as environment sustainability, unemployment and social stability, political consensus, health, quality of life, and political independence from oil foreign producers. Industrial policy interventions have been implemented in many countries with the ambitious idea of promoting a specific model of society. With this objective, policies have often been undertaken in order to encourage the provision of "merit goods" and to deter production of "demerit goods" and to regulate some transactions that are considered to be socially harmful in some ways. Adopting this approach, government might be called on to intervene in some specific industries even at the cost of economic efficiency.⁴³ For example, government might encourage the production of education, research, energy, health care, or environmental protection industries. On the other hand, government might be called upon to discourage the production of those goods and services that are deemed non-meritorious and perhaps over-provided, such as cigarettes, alcohol, gambling, and sales of weapons. In many circumstances, governments have used the "merit" and "demerit" goods arguments to remove some transactions from the market domain. An example is commercialization of human organs donations, such as kidneys. The issue has always been highly contentious because of fear that organs could be purchased, sold and traded, with poor people being vulnerable to exploitation.⁴⁴ However, the limit of what is acceptable and what is not may vary country by country and also according to times. Interestingly for example, the market for human eggs and sperm has today become highly commercialized both in the US and in many European countries, though commercialization of kidneys is not. Blood

donations were commercialized in the middle of the twentieth century in the US, but are no longer. Commercialization of narcotics and prostitution is highly variable, country by country. In general the avoidance of commercialization of goods and services is in fact clearly rooted in specific cultural values leading societies to regulate or remove an activity from the market if it is thought to be non-meritorious or somehow dangerous for the society.

One can look at another industry: university education. In many European countries, such as Italy, France, Germany, and Spain universities are primarily public and essentially free to students. It is clear that to Europeans, university education is considered a meritorious activity that cannot be entirely left to the market domain. In the US, on the other hand, public and private universities co-exist and compete with one another, and even public universities, though less costly than private ones, are far from free. Of course the story is more complicated than this portrayal suggests, because resources are severely constrained in most European countries and also the US. In both continents public universities attempt to maintain access through low student charges, and (not unexpectedly) tend to be over-subscribed. Of course the question of quality arises whenever one compares educational institutions.

We accept the view that governments can intervene in some industries because of the desire to encourage (or discourage) production and consumption of meritorious (or non-meritorious) goods, but in many cases governments are strained to intervene directly in providing services, such as higher education or expensive medical care. Of course the definition of meritorious and non-meritorious goods and services is, by definition, normative and it is based on each government's specific vision about its nation's societal values.

The problem goes beyond the definition of "category," because it also involves the determination of the "correct" quantity of a good or service to produce. Medical care is certainly a merit good, but excessive amounts of it are wasteful and even dangerous. University training is similarly agreed to be meritorious, but one could have an abundance of PhD diplomas and a shortage of workers in skilled production occupations! And the picture is not a static one, but is dynamic. Governments might define the present preferences of society, but what about the future?

This is a crucial and contentious issue. What differentiates some countries and some economic sector policies from one another are the mechanisms through which governments define societal preferences – both in the present and in the future. And all of this, of course, proceeds even though it is recognized that populations are hardly homogeneous, and one can ask whether it is appropriate to essentially add individual preferences together

and act on some sort of "average." In many other cases, the definitions of "societal preferences" might depend on the paternalistic guidance of a well-intentioned influential elite – or from the acceptance of what a few powerful and self-interest lobbies impose.

Entering into the details of this kind of debate is beyond the scope of this book. However, here what we want to stress is that industrial policies are vehicles to achieve broader development goals of nations (or regions, or localities), where "the desired status of development" is a goal defined by each specific community, and not an objective toward which all societies naturally tend to converge.⁴⁵ This is why we have argued that IP depends on the definition of value-based societal goals and it is not about selecting the best tools for reaching given goals. In this perspective, IP interventions should be considered tools through which a particular community of people can promote its own model of society.

NOTES

1. Gerosky, 1989.
2. See Reich, 1982; Pinder, 1982; Johnson, 1984; Landesmann, 1992; Chang, 1994 and 2009; Cowling, 1999; Beath, 2002; Aiginger and Siber, 2006; Pack and Saggi, 2006; Bianchi and Labory, 2006; Aiginger, 2007.
3. Kuttner, 2008. For a selection of the speeches of President Obama see: Olive, 2008 and the following interesting links: <http://www.americanrhetoric.com/barackobamaspeeches.htm>; <http://www.whitehouse.gov/briefing-room/speeches-and-remarks>; <http://projects.washingtonpost.com/obama-speeches/>; <http://www.nytimes.com/interactive/2012/09/06/us/politics/obama-i-want.html>
4. See Schrank and Whitford, 2009.
5. Hirschman, 1981; Myrdal, 1970.
6. See Whitford, 2005; Bellandi and Di Tommaso, 2006.
7. See on this crucial and fascinating issue: Myrdal, 1970; Seers, 1969 and 1972; Hirschman, 1981; Arndt, 1987; Sen, 1988.
8. Smith A, 1776.
9. Smith, Ibid.
10. See Bator, 1958; Baumol, 1965; Stiglitz, 1988 and 1989. See also Pigou, 1929 and its notion of failures of industrial adjustments.
11. See Stiglitz, 1988; Chang, 1994.
12. See Marshall, 1948; Becattini, 1989.
13. See Becattini, 1989; Brusco, 1982.
14. Olson, 1965; Samuelson, 1954; Chang, 1994.
15. See Olson, 1965.
16. See Axelord, 1984.
17. See Schmitz, 1995; Nadvi, 1997; Nadvi and Schmitz, 1994.
18. Di Tommaso and Schweitzer, 2010.
19. The US is just now dealing with issues of patent policy in two interesting cases involving healthcare. The first is a policy to allow sales of "generic" biotech drugs that are not exact copies of the original, branded, product. In Europe the production of these "biosimilar" drug products has been going on now for two years, and the US is about to allow product entry into this market. The second is the contentious issue of whether

or not a firm can patent a human gene so that screening for serious diseases can be restricted and licensed. It is far from obvious whether granting patents in the this field will promote research and discovery, or will *inhibit* them.

20. On peace and stability as public goods see Møller, B., 2004.
21. See Pigou, 1929; Coase, 1960
22. Di Tommaso and Rubini, 2012.
23. See Crane
24. An interesting case is the one of alternative energy production, such as solar panels and wind turbines, that have been strongly supported by the Chinese Government and, more recently, also by the American Government. A large American manufacturer of solar panels, Solyndra, had received close to \$500m from the 2009 American Recovery and Reconstruction Act, but recently filed for bankruptcy, claiming that it could not sell its panels because the price of panels imported from China, which was heavily subsidized, was undercutting the market <http://www.economist.com/node/18388864> (last accessed July 2012). See also: <http://www.forbes.com/sites/toddwoody/2011/08/31/what-solyndras-bankruptcy-means-for-silicon-valley-solar-startups/> (last accessed July 2012).
25. See, for example Crandall, 2005.
26. On this topic, see Mazzucato, 2011.
27. Di Tommaso and Rubini, 2012.
28. Ibid.
29. Nelson, 1970.
30. In the US there are quite developed private markets for diffusion of information concerning consumer goods and services. One popular source of this information is the magazine *Consumer Report*. There is a similar magazine in Britain, named *Which?*
31. See Chang, 1994, 2002a and 2002b; Stiglitz, 2001; Amsden, 1989, 1994 and 2003.
32. Di Tommaso and Schweitzer, 2005; Di Tommaso and Bellandi, 2006.
33. See List, 1885 (original German edition published in 1841); Sargent, 2004; Chang, 2002b.
34. For a highly documented and original analysis on this topic, see Chang, 2002b.
35. Di Tommaso and Schweitzer, 2005.
36. Chang, 2002b.
37. "The global revival of industrial policy, Picking winners, saving losers: Industrial policy is back in fashion. Have governments learned from past failures?" *The Economist*, August, 5, 2010, print edition.
38. Chang, 1996; Nolan, 2001; Di Tommaso et al, 2012.
39. Chang, 1996.
40. Di Tommaso et al., 2012.
41. The Communist Party of China, Central Committee's Proposal for Formulating the Twelfth Five-Year Program for China's Economic and Social Development (2011–2015), was adopted at the Fifth Plenum of the Seventeenth CPC Central Committee.
42. Di Tommaso and Schweitzer, 2006
43. Musgrave, 1959; Musgrave and Musgrave, 1984; Chang, 1996; Ver Eecke, 2007.
44. See, for instance, the Istanbul Convention. http://www.healthytransplant.com/documents/Istanbul_Declaration.pdf (last accessed July 2012).
45. Myrdal, 1970; Seers, 1972; Hirschman, 1981; Sen, 1983; Dykema, 1986; Ingham, 1993.

2. Better markets, better government, better society

INTRODUCTION

In the previous chapter we illustrated the main reasons that might justify industrial policy (IP) interventions: that market failures might lead to outcomes that are inconsistent with a country's societal goals, its national strategy of industrial development, or its desire to promote its preferred model of society.

In this section we point out that, although these criteria are important, they cannot guarantee that in *every* such situation IP interventions will be successful because there is a risk of "government failure." In fact, there is a sizeable literature that has suggested that the *anticipation* of government failure may reduce industrial policy's domain.¹ The traditional government failure literature argument in this field points out that it is possible that the consequences of policy failures may be worse than the benefit the interventions are supposed to offer, and this is why it may be preferable to avoid any kind of government intrusion in production dynamics! In the next pages we will discuss these arguments and offer our ideas and perspectives.

GOVERNMENT FAILURES

Textbooks and newspapers abound with examples showing how government actions, including attempted industrial policies, sometimes end in failure (and even fiasco). Thus, given that government failures are considered by many to be a concrete possibility, societies risk being destined to accept one of two bad outcomes:

- a failed market that cannot be corrected by government;
- a failed government that cannot be improved in its functioning.

Although these last arguments have been popular and powerful in the decades dominated by the Washington Consensus, our perspective is different and so we adopt a different approach. Given, as we have argued, that IP has several important justifications, and given that the reasons for

government failures are many and complex, the future of IP interventions is strongly connected to the capacity of promoting innovative solutions to these possible failures. As we consider the risks of both market and government failure, we argue that successful IP must go beyond defining societal goals and then specific targets and tools, to address needs for remedial actions to either improve market performance or replace them with government regulation. In other words, IP must also consider how to improve government capacity of achieving the specified societal goals.²

In the following section we discuss these arguments. We will describe the main sources of government failure and then we will highlight the possible solutions to these failures.

Many theories have discussed policy goals, assuming that governments are always able to pursue them. However, theoretical analysis and empirical evidence show that this is not necessarily true. Public institutions can fail to achieve their objectives for several reasons, or can divert them from true public interests to partial ones. Some of these explanations of government failures are discussed next. We will start with what we call the "external" sources of failure and then move toward what we define as the "internal" sources of failure.

External Sources of Government Failures

We argued that IP is first about defining societal goals according to which targets and tools should then be selected. Thus, we have to start with the first potential source of government intervention failure: the mechanism through which politics defines IP goals, targets, and tools. Severe failures emerge whenever IP goals diverge from the ones that should be considered societal goals. Other frequent and costly failures arise when goals and targets are improperly confused with one another. Consider, for example, the case of government interventions driven by specific targets (that is, specific single industries or groups of industries, companies, or regions) and not by societal goals.

National politics might define societal goals by "listening" to what a society demands. It may act considering demands of all elements of society, or it may deliberately decide to follow only some selected requests. Then, it may define priorities by giving different weights to the different demands expressed by partial interests. Finally, it can define goals autonomously, and erroneously anticipating what society does not actually demand.

The political arena is where various interests interact and contribute to the definition of general and specific policy goals. Different groups have different weight and capacity to express their demands for policy. Using Hirschman's powerful concepts, different social segments have different

capacity to express their "voice."³ These differences in influence interfere with the politically driven activity of defining public interest goals. In this perspective IP encounters its first source of *failure* because, in defining what societal goals are to be pursued, some partial interests might be too influential. The goals-definition process risks being driven only by the strongest and best organized pressure group. Not only is government not able to "listen" to other less organized demands, but it is not able to "see" future demands. Industrial policy risks being narrowly limited by the goals demanded by the strongest special interests.

These kinds of problems have frequently emerged during the last 200 years of industrial history in many countries. What is seen all too often are instances of government support of regions, sectors, industries, and firms without any clear goals having been defined, let alone having performed a careful analysis of the long-term effects of government support. A good example is the automobile industry. In many countries at different historical times this industry has been targeted by government interventions. Special programs for its support ranging from bail-out subsidies to import restrictions, to buy-back programs for old cars have been promoted in the US,⁴ Europe, South America, Japan, Korea, and China. Of course the automobile industry interacts with many other industries that act as either substitutes or compliments. One can think of railroads, public transport, airlines, ships, and even bicycles! And each of these industries creates different impacts on social dimensions (such as quality of life, environmental quality, and urban development). How much of this "special attention" can be explained with reference to the entire society's interests? And how much has been driven by the demand of strong and well-organized interests of oligopolists and unions? How have these special policies led to neglect of other present and future societal needs?

In general governments tend to be too vulnerable to the pressure of "partial" interests and this is why industrial history (up to the present time) contains many examples of policies targeting specific industries, regions and companies where the linkages with wider societal goals have been vague and weak. However, as we have argued, these are examples of what IP should *not* be about. These are examples of questionable interventions in favor of specific industries, regions and companies that are unacceptable with reference to the wider goals one society should define to shape its present and future.

The point is also that governments fail in defining industrial policies genuinely driven by societal goals because they tend to be vulnerable to what strong and well-organized special interests can offer. Governments might choose specific IP goals (and perhaps specific targets and tools, as well) because they are excessively partisan or opportunistic. In both cases

governments fail to define goals (and also fail to select targets and tools with adequate caution) because they see the opportunity of exchanging consensus (and political support) for their "special attention." Industrial policy might fail because it is a very powerful instrument in the hand of politicians oriented only by the desire of maximizing the chances of winning the next election or maintaining power in other ways. And in contemporary democracies the reality could be even worse than this. Not only are politicians influenced by election dynamics but they also tend to be obsessed by trends in public opinion polls. And not only do they offer special concrete interventions to gain political strength, but they also show a great propensity to launch announcements of these interventions in ways that maximize political gain. The results are frequently characterized by lack of any real attempt to implement effective real policies but merely a sequence of announcements of future intervention in order to increase standings in short-run public opinion polls.

It is clear that in our contemporary democracies the media plays a crucial role in expressing (and orienting) societal demands. If – as we have argued – politics should define societal goals by "listening" to societal demands and sometimes even anticipating them, media have a large role in this field. And both in Europe and in America industrial policy goals, targets and tools are popular issues that have been frequently debated in the media.⁵ Bail-out interventions to support specific companies or special plans to support sectors and regions are topics that have always attracted media attention with the effect of polarizing public opinion and building political consensus. And of course this is a common and simple mechanism that might play an important role in the negotiations between politicians and special interest groups.

Opinion polls are an important potential source of government failures. The difficulties government has in defining long-run strategies are exacerbated by reliance on public opinion polls to determine acceptability of government interventions. Government and their policies risk being dependent on short-run public opinion polls (and not, necessarily, to voters). This situation creates a number of sources of government failure. Industrial policies driven by opinion polls are, by definition, a failure because they cannot consider medium- and long-run goals. Traditional government failure arguments in the past have extensively suggested how politics and policy are influenced by the short electoral mandates and cycles. The present scenario offers an even more dramatic picture where policy goals are continuously conditioned by the narrow horizon of opinion polls, which seem to come out nearly every day.

All these considerations raise complex political economy issues. The relationship between politics and society's many partial interests – and in

particular, the relationships between politicians looking for consensus and partial interests searching for special attention – are at the core of many policy and government failures. The IP debate, involving support and strategies for industries, regions and companies, has become one of the most interesting fields of negotiation between politicians and groups of individuals with highly organized, narrow, economic interests.

The deterioration of the relationships between politics and some segments of society might induce a gradual shift from a "profit-seeking" society to a far less efficient "rent-seeking" society. While both motivations imply making profit, it is assumed that profits are transitory, and can only be maintained by product improvement or greater efficiency. Rent-seeking, on the other hand, attempts to generate profits and then place barriers that will protect those profits from competitors. The literature has argued that this undesirable shift would first of all imply a waste of resources that will be misallocated.⁶ For example, companies that might, otherwise, invest in R&D or human resources in order to make better products will, instead, invest in activities that will capture political attention. In the long run rent-seekers will continue to invest in these remunerative activities and they will tend to grow in number and ambitions. At the same time profit-seekers will be discouraged and they will tend to be few in number and expectations. A process of adverse selection will affect the whole economy, politics, and society. On the other hand, the most "vulnerable" politicians and the most successful rent-seekers will be rewarded. At the same time politicians driven by societal-goals and profit-seekers will gradually be forced to change or to abandon their activities.

This kind of setting will become the ideal context for the emergence of other even less desirable phenomena! The negotiation between "rent-suppliers" and "rent-demanders," the more or less transparent exchange between political consensus and policies in favor of specific industries, regions and companies may further deteriorate, thereby encouraging practices of favoritism, nepotism and corruption.

Internal Source of Government Failures

The second source of government failure which we wish to highlight is linked to the internal functioning of government. We argued previously that societal goals that ought to define IP have to be specified by a country's government in a complex environment. Failures of government actions can arise because several internal forces tend to distract policy-making from these societal goals. A country might have defined innovative, noble, strategic, or even courageous industrial goals but then the government is not able to achieve these goals. Policy-making might

be distracted by other goals, and it might be inefficient and ineffective. Policy-making can be "benevolent" in trying to achieve societal goals and highly capable in implementing policies. However, policy-making might also be highly "malevolent" and incapable.⁷

In this field the first issue we need to consider is the disjunction between costs and revenues. Typically the revenues that sustain government interventions are derived from sources unrelated to the cost of producing the intervention. This is a cause of redundant and rising costs. And if technological possibilities exist for lowering cost functions or raising productivity, these opportunities are likely to be unexploited.

Moreover, it has been said that bureaucrats in general are no different from other types of economic actors in pursuing their own personal interests. There is no reason to suppose that bureaucrats always behave altruistically, just because they are employed by the public sector. It is more plausible to assume that, since civil servants derive utility from higher salaries, prestige, office perks, promotion, and greater power of their position, that they seek these results, even when it implies acting to the disadvantage of social output.

A third often-mentioned source of internal government failure is that bureaucracy pursues internal goals that may be different from the ones that it is supposed to have. In the absence of market indicators such as consumer behavior, market shares, and profit-and-loss accounts that the public can see to evaluate performance of public agencies, these agencies develop their *own* parameters to guide, regulate, and evaluate their own performance. These internal parameters are the ones which "drive" the agency. They provide the motivation behind individual and collective behavior within the agency and determine its real agenda.

The three issues mentioned above might, together, explain why government directions or agencies tend to be distracted from the societal goals that they were indicated to pursue. At least it is reasonable to argue that – if some additional incentives designed to modify bureaucrats behaviors are not introduced – the government agency in charge of the (industrial) policy implementation will be ineffective in reaching their institutional goals. In a society with a reasonable degree of transparency, where media and public opinion have a good "oversight capacity," it is reasonable to imagine a scenario in which government policy agencies achieve some second-best goals (and none of the first-best goals) in order to be able to pursue both the agency's and the bureaucrat's goals.

Finally, it is clear that as in any complex organization internal asymmetries of information between government directions, divisions, units, departments, agencies are not unusual. And it is clear that information asymmetries within each of the individual government positions are very

common. Principal-agent and adverse selection problems have a high probability of emerging, increasing the likelihood of government agencies being distracted from their original goals and, instead, promoting ineffective and inefficient policies.

There are two kinds of asymmetries involved in government intervention: the one between top decision-makers and the lower level bureaucrats, and the other between the government and the policy-targeted groups. Both junctions are potential sources of government failures. In the first case the asymmetry arises when there is poor top-down control between agency directors and lower level functionaries and inadequate communication and coordination between bureaucrats. In the second case governments might be in a position of substantial ignorance of the situation that it would like to correct. In the relationship between government and policy targets, deficiency of information is another common condition that may bring about the failure of government intervention. Government needs costly information on its institutions and on policy targets.

BUILDING BETTER GOVERNMENT

All the above-mentioned arguments tend to suggest that the debate on IP has to include new rigorous discussions about the possible remedies⁸ of all the sources of government failures.

This is particularly true in times when the international crisis has pushed many industrialized countries to adopt a new interventionist approach in production dynamics.⁹ The new resurgence of IP in recent years has been motivated by the need to offer quick solutions to unexpected contemporary emergencies and not by theoretical developments. Societies demand urgent policy interventions and they appear highly disoriented by the crisis and by the entry of new industrial powers in the domestic and international markets. National industries seem to request long-run strategies in order to respond to all the changes imposed by the globalized markets. Market failures continue to call for solutions in crucial fields like knowledge production, the core activity on which the present and future prosperity of all innovative countries is based. However, in this context, "more-government" is not what has to be demanded. On the contrary, what we all urge are *better governments* and *better markets* in order to build *better societies*.

This is what IP is all about, going beyond the anachronistic dichotomy of market versus government. There is no need at all to further propel the ideological market-government debate. For many, it still seems tempting to "paint with a broad brush" and speak generally about the need to use

more (or less) market solutions, or to rely more (or less) on government intervention. This is a mistake with dangerous consequences, given that policy solutions to today's large problems are more than urgent. The problems to be managed are complicated and it is clear that a "one size fits all" approach to industrial policy is more likely to be erroneous than not.

In this perspective the focus on all the remedies that are directed to mitigate potential government failures is a crucial part of highly demanded (and opposed) IP programs of the present and of the future. We cannot re-start with the traditional arguments of the last century, which suggested that imperfect markets are better than failed government. What was written in the Eighties and in the Nineties pertained to a very different world. At that time the Soviet Union system and Japan were the most quoted challenges, China was a rural isolated country, and the internet did not exist. In the new world order, for many industrial powers like China, South Korea, India or Brazil IP is not a theoretical option, but one of their strongest tools through which they have promoted successful industrial development strategies.¹⁰ Moreover the international crisis has quickly convinced governments in Europe and in America to launch their new industrial policies. In this scenario *better-government* studies and practices should be defined as the priority for policy-makers. In this perspective, in the following pages we will highlight what we consider the main issues that need to be studied and addressed.

Policy Transparency

Policy transparency is one key aspect that has to be treated in the new contemporary environment. Those who argued the dangers of government failures in the Eighties could not even imagine what can be done today through the internet, Facebook, YouTube, and so forth. Today the cost of watching politics and policy is close to zero. This has been a revolution with an enormous potential.

We argued that one of the main sources of government failure is in the relationship between politics and society. The risk is connected to the implementation of industrial policy able to listen only to strong, short-run partial interests. The web offers unique opportunity for minorities to organize their common interests expressing their voice and, in this way, attracting the attention of politicians. This opportunity might mean more participation in the policy-goals definition process going beyond the traditional institutions of representation of particular interests, such as unions, business association, and so forth.¹¹

At the same time new information technologies give to societies new

powers for watching and controlling the dangerous liaison between politics and society's many partial interests. Today, government documents and data are easily downloadable by citizens. Politicians' actions and speeches seem to be more accessible than they were in the past.

In this perspective new information technologies may foster citizen observation and participation of the debate process by which IP goals, targets and tools are selected; these technologies might even increase one's ability to influence the process. And these new technologies can also facilitate oversight by the public and the press. Policy accountability and traceability are now possible at very low cost. This is *per se* an enormous potential advantage that can be exploited to invest in better government building. Further improvements in this direction would of course require further investments in infrastructure and in skill attainment by the public.

Good Public Management

Good public management has been possible in many circumstances. Social scientists need to further investigate how to improve policy-making efficiency and effectiveness in contemporary globalized markets through the studies of innovative solutions.¹² Academic Schools of Government and Public Policy might play a role in the coming years of new IP resurgence. Public Management Theory and empirical studies might accompany the resurgence in IP practices. Increased attention by the management disciplines in the public sector, as opposed to the narrow corporate sector, may provide assistance in finding institutional solutions to solve common problems of principal-agent or adverse-selection problems. Considerable understanding of these issues already exists as they pertain to the corporate sector, but they might in principle now be applied to government agencies, ministries, departments, or public development agencies. Proper incentives for policy-makers and government white-collar workers can be defined in order to avoid distractions from government policy societal goals. Contemporary firms require complex organization forms and good management practices and so do contemporary governments. Well-trained policy-makers can make the difference. Highly motivated government officials can drive governments toward paths of excellence, efficiency and policy effectiveness. Moreover, *homo politicus* incentives can go beyond the ones postulated by neoclassical economics for *homo oeconomicus*. Loyalty, trust, and ethical belief are all part of human tradition, history and moral sentiments.

In this context, countries need to train their future policy-making class. Better management and better *public* management are crucial investments

also in the case of IP. Government agencies or departments are complex organization where human resources are the real competitive assets. As we argued, nations need better governments for better markets and better societies. Better governments need the best qualified human capital with the best technical competences and the strongest ethical sentiments. In this field government investments are highly recommended, and are likely to yield considerable dividends.

Good Policy Evaluation

One of the main pillars of the contemporary IP debate has to be the capacity to develop and implement rigorous techniques for ex-ante and ex-post policy evaluation. As we argued citizen oversight of political and policy activities are important. In addition, rigorous, sophisticated and technical evaluation practices are an important part of better government building policies.¹³ Evaluation practices should be developed and incorporated into the curriculum of any aspirant to a career in public service.

Government policies can be improved with regard to efficiency and effectiveness if carefully observed, supervised, and evaluated. This need for evaluation must, where necessary, be supported by a capacity to sanction improper behavior.

Collecting and processing information about policies is not a small matter, and a substantial amount of resources are required to obtain the necessary information. Again in this case new information technologies offer enormous advantages with respect what was possible, only a few decades ago.

In the last years, characterized by the economic crisis, governments around the world have not waited for new theoretical contributions able to go beyond the prescriptions of neoclassical economics and the Washington consensus. Governments have immediately and, apparently, instinctively promoted IP. In this unexpected setting policy evaluation techniques appear to be one of the most powerful tools in the hands of governments genuinely interested in better government building policies.

INDUSTRIAL POLICY: "WHICH WAY NOW?"

In this and the previous chapter we have painted a picture of what we believe IP could be and what are the arguments frequently made in its favor and against its implementation. We have listed and discussed market

failure arguments and we also underlined that individual countries might use IP to implement their own strategy of industrial development. We have also investigated the linkages between IP interventions and more complex societal goals, suggesting that IP might be about one country's wish to promote its own model of society.

Then we recalled the main reasons that suggest why government interventions may fail. Many political economy issues have been raised and many public management questions have been posed. Finally, we concluded by highlighting the need for feeding the contemporary debate on IP with a rigorous discussion about all the possible remedies to government failures. Transparency, good public management, and policy evaluation have been discussed as the main areas of interest with the idea of promoting a debate on what we have defined as better government building policies.

We close this chapter recalling our main message: contemporary IP is about promoting better market policies together with better government policies in order to build better societies.

In the next chapter we will start our journey in America to see what has been the country's historical experience with IP. In Chapter 5 we will move to the present, focusing on IP proposals and interventions during the campaign and the first administration of President Barack Obama.

NOTES

1. See: Wolf, (1989); Krueger, (1990); Le Grand, (1991); Chang, 1996.
2. Besley and Persson, 2008.
3. Hirschman, (1970).
4. See Chapter 1.
5. See for example, "Global revival of industrial policy. Picking winners, saving losers. Industrial policy is back in fashion. Have governments learned from past failures?" Aug. 5, 2010, *The Economist*; "The Economist, Industrial policy. Manufacturing concern," Feb. 22, 2012, *The Wall Street Journal*; "Economists Assail Campaign Proposals to Help Factories," Mar. 2, 2012; CNN, GOP candidate debate, January 26 2012: <http://my.firedoglake.com/scarecrow/2012/01/27/gop-candidates-debate-obscure-us-industrial-policy/>; "UK bioscience industry gets £250m cash boost from government," May 24, 2012, *BBC News*: http://news.bbc.co.uk/1/1/2012/05/20120524_uk_bioscience_250m_cash_boost_from_government.shtml; "Free the markets, Mr. Romney," Apr. 10, 2012, *Los Angeles Times*: <http://articles.latimes.com/2012/apr/10/opinion/la-oe-goldberg-romney-bad-biz-20120410>; "Quelle politique industrielle dans la mondialisation?" Oct. 27, 2011, *Le Monde*: http://www.lemonde.fr/idees/article/2011/10/27/quelle-politique-industrielle-dans-la-mondialisation_1594339_3232.html; "Il Paese torna a fare politica industriale," Oct. 13, 2011, *Corriere della sera*: http://www.corriere.it/politica/11_ottobre_13/napolitano-paese-industriale_93dce692-f581-11e0-9479-439a0eb41067.shtml.
6. See: Buchanan, Tollison, and Tullock (1980) Tollison, (1982).
7. Chang, 1996.

8. Ibid.
9. See: Aghion et al., 2011; Birdsall and Fukuyama, 2011; Bianchi et al., 2011; Di Tommaso et al., 2012; Lin, 2012.
10. Amsden, 1989; Chang, 1996; Di Tommaso et al., 2012; Lin, 2012.
11. See e.g., Mossberger et al., 2008.
12. Chang, 1996.
13. See e.g., Voytek et al., 2004.