Globalisation, Economic Development and the Role of the State

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Chapter 4
The Political Economy of Industrial Policy

1. INTRODUCTION

UNTIL recently there existed a moderate consensus on the agenda of the debate on the role of the state, although there were intense debates concerning how best to achieve the individual items on the agenda. The items on the agenda included an improvement in income distribution, the achievement of macroeconomic stability, the provision of public goods (e.g., infrastructure, education and environmental protection) and, more controversially, anti-trust activities. State intervention in industry was, except anti-trust activities, looked at with suspicion as opening the window of opportunity for business interests to loot the state exchequer. This suspicion seemed more than natural when state intervention in industry – or industrial policy – did not make theoretical sense according to the conventional framework. Nevertheless, the rise of East Asian economies where the state has implemented strong industrial policy measures with great success has aroused interest in industrial policy, as manifested in the ongoing debate on the applicability of industrial policy in other, notably Anglo-Saxon, countries.

In this chapter we argue that industrial policy not only makes sense but can sometimes provide a better alternative both to the unregulated market and to other forms of state intervention (for example, central planning). After reviewing the industrial policy debates, we introduce some recent theoretical developments in the studies of economic institutions and technical change and spell out the logic of industrial policy, both from the static and the dynamic points of view. Regarding the former, we discuss why the market mechanism
may lead to coordination failures and why such failures can be costly. Then we discuss the role of industrial policy in overcoming such failures. Regarding the latter, we discuss the nature of economic change and see what role industrial policy can play to promote it. We then move on to discuss possible problems of industrial policy, where problems of information, rent-seeking, politics and institutions are examined.

1.1 The Industrial Policy Debates

Despite the fact that industrial policy, far from being a novelty of East Asia, has been an integral part of economic policies of many advanced capitalist countries during the postwar period, it has become an important issue only since the late-1970s. In the English-speaking world the OECD has been the pioneer in this area (see the series of country studies published by the OECD in the early-1970s). In the UK, industrial policy became a controversial issue with the (not hugely successful) introduction of industrial policy programmes by the Labour government in the late-1970s. The famous UK deindustrialisation debate also, to a degree, discussed industrial policy as a possible way to halt deindustrialisation and revive the economy. During the 1980s, studies of various European countries' policy responses to the industrial crisis of the late-1970s also emerged. The issue of industrial policy, however, has probably been most hotly debated in the USA, especially in the early-1980s, with the Harvard Business Review as the major forum. The recent rise in strategic-trade-policy literature has also been heavily influenced by (and has influenced) the industrial-policy debates.

1 See NEDO (1978), Stout (1979), and Cairncross et al. (1983).
4 For some interesting reviews of the debate, see Norton (1986) and Thompson (1989).

1.1.1 Does Manufacturing Matter?

One of the central points made by the proponents of industrial policy is that manufacturing does matter, although a pro-manufacturing attitude does not necessarily imply an endorsement of industrial policy. The proponents of industrial policy argue that the UK and the US economies are deindustrialising (the shrinking share of industrial output and employment in the national economy) due to neglect of the manufacturing industries, and that, given the vital importance of the manufacturing sector for a prosperous economy, this is a dangerous sign (Cohen and Zysman 1987). They think that macroeconomic measures, while important, are not sufficient for a vigorous development of manufacturing since allocation of capital is more important than aggregate capital formation for productivity growth (Reich 1982: p.75). The conclusion, thus, is that the state should intervene to promote industrial development, if necessary, using industrial targeting (Reich 1982: Johnson (ed.) 1984).

Many opponents of industrial policy argue that the advanced capitalist economies are moving towards becoming post-industrial economies, where service activities become the centre of economic life (for example, Bhagwati 1988: pp.110-14). Given that the tendency to move towards service activities is dictated by market forces (that is, demand for services increases as income rises), the argument goes, favouring manufacturing is not only unnecessary but also harmful. That is, favouring manufacturing would block the natural-selection mechanism of the market by hampering the necessary reallocation of resources towards service activities, and therefore damage the long-term viability of the economy (e.g., Burton 1983). Therefore, it is argued that we need not, and indeed should not, have policies that favour manufacturing, not to mention industrial policies geared to the needs of specific sectors (for the most sophisticated version of this argument, see Bhagwati 1989).

6 For example, Dornbusch et al. (1988) take a pro-manufacturing position but recommend better macroeconomic management rather than industrial policy as the major solution to the current industrial decline of the USA.
Confusion about the very concept of deindustrialisation and lack of understanding of the logic of long-term structural change (away from manufacturing towards services) seem to have produced many ill-informed discussions on the deindustrialisation issue. Fortunately some recent studies have spotted the source of confusion and clarified some of the major theoretical issues (Rowthorn and Wells 1987; Baumol et al. 1989). The conclusions emerging out of the ‘manufacturing matters’ debate are the following.

First of all, the long-term structural shift towards a service economy does not happen solely because people want more services as they grow richer, as was believed by some proponents of the theory of post-industrial economy. The major reason for such a structural shift in employment towards services seems to be the (relative) cost-inflation of services due to their lagging productivity growth (compared with that of manufacturing), rather than a real shift in demand towards services as incomes rise.7

Secondly, deindustrialisation, defined as the decrease in the share of manufacturing employment in total employment (and the decrease in the share of manufacturing output in total output in current prices), is an inevitable long-term result of different productivity growth rates between manufacturing and services, and is not necessarily related to the declining competitiveness of the economy’s manufacturing sector. Even successful exporters of manufactures, such as Japan and West Germany, have experienced deindustrialisation in this sense. This implies, contrary to what was believed by those who condemned deindustrialisation as a sign of industrial decline, deindustrialisation and industrial decline are not one and the same thing, although industrial decline can affect the timing and scale of deindustrialisation (see Rowthorn and Wells 1987: Chapter 1). Therefore it is wrong to argue that an economy’s manufacturing sector is in trouble solely on the ground that it is deindustrialising in terms of the above definition.

Thirdly, the fact that deindustrialisation is an inevitable long-term trend does not necessarily mean that a country can ignore manufacturing completely and rely fully on services. This is largely because many services are either basically non-tradable (e.g., governmental services, legal services, child care, elementary and secondary education) or have a large non-tradable component (for example, transportation, distribution), although there are other services that have become, or are rapidly becoming, tradable (e.g., financial services, management consultancy, higher education). With a growing share of services in national income, compensating productivity growth in manufacturing is needed—on the reasonable assumption that no dramatic increases in productivity in agriculture and services are likely in the foreseeable future—if a country wants to maintain its income level without running into balance-of-payments problems.

1.1.2 What is Industrial Policy?

A major problem with industrial policy issues is that the very concept of industrial policy is not clearly defined, resulting in heated but often fruitless debates. A good example of this is the discussion on the postwar Japanese experience, which inspired many of the industrial-policy debates. Opponents of industrial policy point out that subsidies and governmental loans to industries in Japan are small (in relative terms), even smaller than in many European countries, and on this ground claim, as the title of one article goes (Trezeise 1983), that ‘industrial policy is not the major reason for Japan’s success’. Proponents of industrial policy argue that the non-quantifiability of the famous Japanese ‘administrative guidance’ system makes people underestimate the success of Japanese industrial policy (Beltho 1985).

Unless we define what we mean by industrial policy, we cannot judge who is correct and who is not.

Reich (1982), the most prominent proponent of industrial policy in the USA, includes the following policy measures in his definition of industrial policy: favouring promising industries; creating skilled workforces; developing infrastructure; regional policy (p.75). Pinder

7 Of course, this is not to argue that a change in the employment structure has no impact on our socio-economic life. Growing importance of service activities may have significant impacts on people’s lifestyles, on their relationships with other human beings, their perceptions of the world, etc., especially by providing people with different work experiences from those in the manufacturing sector (on the ‘constitutive’ nature of labour processes, see Bowles and Gintis 1980). I thank Michael Landesmann for raising this important point.
(1982), a British proponent of industrial policy, goes a step further and regards all of the following as components of industrial policy: general industrial support policies such as manpower policy; fiscal and financial incentives for investment; public investment programmes; public procurement policies; fiscal incentives for R&D; firm-level policies such as specific R&D support; anti-trust policy; merger policies to create 'national champions'; support for small firms; regional policies such as the development of physical and social infrastructure and the establishment of industrial complexes; generalised trade protection; sectoral policies such as the organisation of recession cartels in depressed industries; product upgrading in labour-intensive industries (pp.44-52).

The tendency to adopt an encompassing definition exists even among those who oppose industrial policy. Donges (1980), an ardent European critic of industrial policy, categorically states that industrial policy 'embraces all government actions which affect industry' (p.189). Corden (1980) also implicitly adopts this definition when he states that 'the best industrial policy may be to provide an adequate infrastructure, some limits on the powers of monopolies and cartels, an education system that helps to generate the human capital for industrial success, indicative guidance about industrial prospects (without compulsion or subsidies), stability and simplicity in the system of taxation, a free and flexible capital market and a steady movement towards zero sectional protection, whether direct or indirect' (pp.182-3).

Despite the fact that all the above policies would have implications for industrial development, we do not think that classifying every policy that affects industrial development as industrial policy is a useful way to proceed. In the above examples, industrial policy is used as a catch-all term for policies affecting industrial performance, that is, effectively, every economic policy. Such a practice overloads the concept of industrial policy, rendering the concept meaningless.

Johnson (1984) provides a more focused definition of industrial policy by defining it as 'a summary term for the activities of governments that are intended to develop or retrain various industries in a national economy in order to maintain global competitiveness' (p.7), but falls into the same trap of overloading the concept when he includes not only what he calls 'micro' policy of 'industrial targeting', but also such policies as 'governmental incentives for private saving, investment, research and development, cost-cutting, quality control, maintenance of competition, and improvements in labour-management relations' (p.9) into the category of industrial policy.

As Johnson (1984) rightly points out (p.9), targeting or micro-industrial policy cannot succeed without favourable macroeconomic conditions. However, why should all policies that constitute preconditions for the success of another policy be treated as components of the latter? If one adopts this logic, one can argue that targeting should be a component of macroeconomic policy because, under certain conditions, it is possible for targeting to have an impact on such macroeconomic variables as savings and investments. For example, targeting some big projects and financing them through inflationary means may increase ex post savings. However, does this make such industrial targeting a macroeconomic policy? We think not. In our opinion the best way of defending industrial policy is not to include in it everything that is good for industrial development, but to narrow its definition and demonstrate that its benefits are bigger than its costs.

Landesmann (1992) makes an important contribution by emphasising the particularistic, or discriminatory, nature of industrial policy. According to him, industrial policy is 'designed to be specific, i.e., directed towards particular industries, firms, regions, groups in the labour market, etc., rather than general... Implicit in industrial policy formulation and execution are therefore always trade-offs between different groups, regions, industries, etc.' (p.245). According to this definition, we may exclude such general policies as creating skilled workforces or improvements in labour-management relations from the realm of industrial policy, making the concept more focused.

However, Landesmann's concept of industrial policy is still somewhat overloaded, because it includes policies designed to affect both particular regions and particular groups in the labour market. True, industrial policy affects different regions and different groups differently, but its effects on particular regions and groups are better viewed as by-products than as aims of the policy. Likewise regional and group-oriented policies may affect particular industries (e.g.,
setting up an industrial park for the garment industry in a high-unemployment region), but this does not make them industrial policies. The existing definitions of industrial policy, then, tend to be too overloaded to be useful in practice. We propose to define industrial policy as a policy aimed at particular industries (and firms as their components) to achieve the outcomes that are perceived by the state to be efficient for the economy as a whole. This definition is close to what is usually called 'selective industrial policy' (e.g., by Lindbeck 1981).

In our definition, first of all, we emphasise the words particular industries, and therefore implicitly exclude policies designed to affect industry in general (e.g., educational investment, infrastructural development) and policies aimed principally at categories other than industry (for example, regional policy, group-oriented policy) from the domain of industrial policy. Secondly, we emphasise the word efficient to stress that the guiding principle of industrial policy in its purest form is efficiency, and not other aims (e.g., equity). Efficiency is defined more broadly than in conventional economics and includes transaction-cost economising as an important dimension. Thirdly, we emphasise the phrase the economy as a whole to stress that, although it is directed at specific industries, industrial policy ultimately aims to improve the efficiency of the economy as a whole and not just that of particular industries. Therefore, in an industrial-policy regime, whenever the efficiency objective of an individual industry and that of the whole economy clash with each other, the latter is permitted to dominate. Lastly, we emphasise the phrase perceived by the state, to

stress that the perception of the state may not necessarily be correct or justifiable to everyone.11

2. THE LOGIC OF INDUSTRIAL POLICY (I): THE STATIC DIMENSION

We define industrial policy as a policy intended to affect particular industries to achieve outcomes that are perceived by the state to be efficient for the economy as a whole. More concretely, it means that there is a case for the state 'selectively monitoring entry, establishing mechanisms to make possible more ex ante coordination than is possible through market mechanisms alone, and for governmental regulation or overview to constrain or supplement profit incentives' (Nelson 1981: p.109). However, what is the logic behind opting for ex ante coordination by the state instead of ex post, or 'spontaneous' (in Hayek's words), coordination by the market? Broadly we can say that this is because markets fail, but this seems hardly enough. To answer this question we need to look more closely at the nature of the coordination problem the market mechanism is supposed to solve, but often fails to do.

2.1 The Nature of the Coordination Problem

In the model of perfect competition, upon which mainstream industrial economics is based, there is no need for ex ante coordination of the plans of different agents regarding production and pricing decisions (Pagano 1985: Chapter 8). In this 'perfect decentralisation

11 This part of the definition helps us deal with those who downgrade the importance of industrial policy, say in Japan, by saying that Japan would have grown fast and become rich anyway given factors like the 'catching-up effect' and high savings ratios (e.g., Krugman 1984). From our perspective, however, the important point is not whether Japan would have become rich or not without industrial policy but whether the structure of the present Japanese economy is in line with what the Japanese state intended when it implemented industrial policy measures (by choosing what technology to deploy, where to channel the savings, etc.). And in this respect, there is no doubt that the Japanese industrial policy has played a crucial role.
model', as Demsetz (1982) aptly calls it, there is no need for ex ante coordination because assumptions are made to ensure that the actions of individual agents are negligible — infinitesimally small in the limiting case — in the sense that a unilateral action of a single agent is unable to change the aggregate outcome (Khan 1987: pp.831-4). When individual agents are negligible, there is no interdependence among individual agents and hence no need to coordinate their activities ex ante.

One crucial assumption to guarantee the total absence of interdependence supposed in the neoclassical model of perfect competition is that production technology is characterised by decreasing returns to scale (DRS) — at an infinitesimally small output level in the limiting case. Even under the widely-used assumption of constant returns to scale (CRS) — not to mention the disturbing case of increasing returns to scale (IRS) — the perfect-competition model does not guarantee a solution to the coordination problem, as was pointed out long ago by Richardson (1960: pp.31-2). When CRS technology prevails in a large-number setting, ex ante, firms may behave as if the demand curve is horizontal (that is, as if they are individually negligible), but ex post there is no guarantee that the market will clear, since an individual firm, not being bound by production technology, can produce as much as it wants. In other words there is no way to determine the number of the firms and their respective outputs in an industry characterised by a CRS production technology, as is recognised even by standard neoclassical textbooks (e.g., Varian 1984: p.88). Therefore even with CRS technology there may be so few firms in a market as to give rise to interdependence and consequently to the need for ex ante coordination.12

Of course the coordination problem will not exist except in the case of IRS technology if all the firms can correctly predict how much the other firms will produce, as implicitly assumed in textbooks. However, as Hayek (1949a) remarks, '[t]he statement that, if people know everything, they are in equilibrium is true simply because that is how we define equilibrium' (p.46). If everybody knows everybody else's plan, then why do we need a price system or any other coordination mechanism? In other words, equilibrium in the perfect-competition model is attained only because the coordination problem is assumed away from the beginning!

As Hayek (1978) somewhat derogatorily says, 'a state of affairs which economic theory curiously calls "perfect competition", that is, 'a situation in which all the facts are supposed to be known', leaves 'no room whatever for the activity called competition' (p.182).13 He argues that '[t]he peculiar nature of the assumptions from which the theory of competitive equilibrium starts stands out very clearly if we ask which of the activities that are commonly designated by the verb "to compete" would still be possible if those conditions were all satisfied... Advertising, undercutting, and improving ('differentiation') the goods or services produced are all excluded by definition — "perfect" competition means indeed the absence of all competitive activities' (Hayek 1949b: p.96).

Models of oligopoly in the neoclassical tradition recognise the coordination problem arising from the indeterminacy of the market outcome in a small-number setting. However their solutions to the coordination problem are not entirely satisfactory. The usual solution to the problem is to employ the concept of the mixed (or randomised) strategy (e.g., patent race in Rasmussen 1989: pp.295-8). However a mixed strategy does not guarantee an optimal solution except in the probabilistic sense that, if the situation occurred an infinite number of times, randomising one's actions would yield the highest average payoff. When the situation is not recurrent, employing the concept of probability is less than meaningful (for a classic discussion, see Knight 1921, Part III), and it is therefore dubious to describe the mixed strategy equilibrium as optimal. For example, how can firm A's strategy regarding its investment in production capacity for a 4Mb

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12 Moreover, as Williamson (1988) states, 'it does not suffice to demonstrate that a condition of large numbers competition obtains at the outset. It is also necessary to examine whether this continues or if, by reason of transaction specific investments and incomplete contracting, a condition of bilateral trading evolves thereafter' (italics original) (p.71).

13 What Hayek calls the 'competition as a state of affairs' view is still dominant in the field of industrial economics (on different notions of competition, see Hayek 1949, 1978; McNulty 1968; O'Driscoll 1986). For example, even the most updated industrial economics textbook, Tirole (1988), argues that replacement of one monopolist by another through a patent race 'does not mean competition, as one monopolist replaces another' (p.396, no.12). However, Hayek would have argued that the replacement was a result of 'the activity called competition'.

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memory chip be 'randomised' in any meaningful sense, when, given the speed of technical progress, it is clear that the next round of investment will be in a 16Mb memory-chip capacity?

One way of avoiding the difficulty of employing probabilistic behaviour by individual agents in non-recurrent situations is to interpret the mixed strategy as an 'evolutionarily stable strategy' (ESS), whereby individual agents do not randomise their actions but there are sufficiently different types of agents in the population for the aggregate outcome to be the same as when individual agents randomise (for the concept of ESS, see Maynard Smith 1982). However, even in the biological world where the concept originated, the ESS equilibrium holds only approximately, because "[genetic] heterogeneity and changing conditions must mean that often populations are not perched at adaptive peaks. Even when the conditions are constant, selection becomes progressively weaker towards the peak of a continuous fitness function: infinite time and infinite populations would be needed to achieve the peak itself" (emphasis added) (Parker and Maynard Smith 1990, p.31). And the intuitive meaning of ESS becomes even less clear in many industrial markets where the conditions change so rapidly that the selection mechanism does not have time to work to its full extent and where the agents (being humans) learn and change not only their 'genes' (behavioural characteristics) but also the selection mechanism (the environment) and consequently the ESS itself (see Section 3.1 below).

The deficiency of the unregulated market as a coordination device was already recognised by Marx, who saw firms as islands of planned economy in the capitalist sea of anarchy. According to him, "[t]he same bourgeois consciousness which celebrates the division of labour in the workshop, the lifelong annexation of the worker to a partial operation, and his complete subjection to capital, as an organisation of labour that increases its productive power, denounces with equal vigour every conscious attempt to control and regulate the process of production socially, as an inroad upon such sacred things as the rights of property, freedom, and the self-determining "genius" of the individual capitalist. . . . [I]n the society where the capitalist mode of production prevails, anarchy in the social division of labour and despotism in the manufacturing division of labour mutually condition each other ..." (Marx 1976: p.477). 14 Marx saw an enormous waste of resources in the failure of the market as a coordination device (what he called the anarchy of the social division of labour) and hoped to extend the ex ante coordination that already existed in the firm to the economy-wide level — what he called the despotism in the manufacturing division of labour or what Williamson (1975) calls the 'hierarchy' — through central planning or at least some form of central coordination of individual activities (Pagano 1985: Chapter 3).

Why are coordination failures 'wasteful'? There are coordination failures, the counterargument may run, but are not such failures corrected via the competitive process whereby firms perish unless they correct their mistakes? If so, why should any ex ante coordination be necessary? For example, it may be argued that even when an industry is characterised by IRS technology, it would still not require ex ante coordination, because if more than the optimal number of firms enter the industry, some would inevitably go bankrupt through competition, thereby finally achieving the optimal outcome.

The above reasoning assumes that resources invested in the bankrupt firms can be instantaneously and without costs shifted to other activities. Nevertheless it is only in the financiers' world (or the economists' world?), where every asset is 'general' and 'liquid' (as in Keynes' concept of liquidity preference), that any investment, if found unprofitable, can be instantly withdrawn at no, or at most little, cost. 16 However, in modern industrial economies, assets are often specific to investments and therefore cannot be redeployed without a loss in their value (for the concept of 'asset specificity', see Williamson 1975 and 1985). In a world with asset specificity, ex post coordination through...

14 Dobb (1925: Ch. 23) expresses a similar concern. He describes the capitalist economy as an 'economic anarchy', which gives fluidity to the economy but at the cost of instability due to coordination failure. In particular, he points out that miscalculations by competing firms might not cancel out because expectations tend to move in the same direction.

15 It should, however, be noted that Marx had another vision of socialist society organised on the basis of more democratic and less specialised division of labour, which Pagano (1985) aptly calls 'anti-firm communism' (p. 60).

16 Amable and Banuri (1991) argue that there is a correlation between the liquidity of the assets owned by different groups (e.g., financiers, industrialists, workers) and their degrees of support for unregulated competition in the market.
the market can be wasteful, as Marx argued, because a coordination failure that involves specific assets means a net reduction in the amount of resources available to the economy.\textsuperscript{17}

If the market fails to solve the coordination problem and if such failure can produce waste, there is a case for non-market, or \textit{ex ante}, coordination (Pagano 1985: Chapter 8). As new institutional economics demonstrates, the firm (or the hierarchy, in Williamson's words) is the most representative form of non-market coordination, but other diverse forms of non-market coordination mechanisms exist. As Winter (1988) puts it, "[m]arkets appear and disappear; firms expand in scope and then turn back toward specialisation; quasi-firms and quasi-markets proliferate" (p.168).\textsuperscript{18} Central planning is also an institutional device to solve the coordination problem (Richardson 1971), and industrial policy is another such device.

\subsection*{2.2 Industrial Policy as a Device of Coordination}

One characteristic of modern industrial economies is the use of production technologies that require large fixed investments, mainly in the form of machinery.\textsuperscript{19} Large fixed costs mean a decreasing average cost curve, or scale economies. Moreover, a large part of these fixed assets are specific or ' sunk' in the sense that their costs cannot be fully recovered when sold elsewhere. Scale economies often force firms to produce at a scale that will allow no more than a few firms in an industry, because, by producing at the most efficient scale, a firm can undercut its competitors and force them out of the industry. Out of fear of extinction, other firms have to adopt the same (or more efficient) technology or perish. The outcome is an oligopolistic industry in which strategic interdependence among the decisions of the firms exist.

Under certain likely conditions, strategic interdependence may lead to inefficiency (see below; also Telser 1987 and Yamamura 1988), providing a case for state intervention. The intervention needed here is not necessarily an antitrust-type policy, because the benefits from breaking up the oligopolistic firms (that is, reduction in the deadweight loss) may be more than offset by higher production costs due to sub-optimal scales of production. Below, we show the role of industrial policy in this context.

\subsubsection*{2.2.1 Investment Coordination}

An industry whose cost structure is characterised by significant scale economies is likely to experience a price war - firms selling at long-term losses (or at prices that do not cover fixed costs) to undercut competitors. Under adverse demand conditions, which might occur due to factors like external shocks (for example, a rise in energy prices) and a slower demand growth than was expected at the time of the investment decision, firms in the industry might prefer to engage in a price war rather than forego sales, and hence incur heavier losses due to their inability to recover fixed costs. This makes an industry with scale economies subject to the dangers of under-investment or over-investment, which may not be easily resolved through the market mechanism.

In a new industry (or an expanding industry) with scale economies, if many of the potential entrants expect that enough others would enter the industry to start a price war, there may be insufficient entry, resulting in a sub-optimal level of output - a case of under-investment. On the other hand, if they expect that not many competitors would enter, too much investment may be undertaken, because then they have an incentive to install as much capacity as possible to reduce their unit costs (which would provide a distinct advantage in future competition) - a case of over-investment. However, in Richardson's words, 'over-investment, by causing a collapse of prices, will penalise all suppliers' (Richardson 1971: p.441). And if some firms go bankrupt in this process, the resources put into their investments will have been

\textsuperscript{17} Some recent developments in mainstream theory attempt to incorporate these observations through modelling 'wasteful R&D' and the like. However, this type of model is not generally extended to the theory of competition in general.

\textsuperscript{18} The very diversity of coordination devices in a capitalist economy is a testimony to the diversity of coordination problems to be solved. And this is one reason why we emphasise the particularistic nature of industrial policy, since, to be successful, it has to be custom-designed to fit the nature of the coordination problem involved in a particular instance.

\textsuperscript{19} Marx's concept of 'constant capital' (which was absent in the Ricardoian system) and the Austrian concept of 'roundabout method of production' are two important ways of theorising such a characteristic.
wasted, insofar as they involve specific assets.

Since under- and over-investment are essentially problems of strategic uncertainty (each potential entrant not knowing the intentions of others), the state can intervene in this industry to assure optimal entry by guaranteeing potential entrants that there will not be more than optimal entry. It can do this through arbitrating private bargaining among potential entrants, but also by superseding private dealing and thus reducing the transaction costs involved in such bargaining. Licensing entry and regulating capacity expansion are the most common forms of state-imposed investment coordination. The negotiated industry-wide investment plans (the so-called 'investment cartels') in Japan during the 1960s for industries like steel, vinyl chloride, synthetic fibres, pulp, paper, cement, petroleum, petrochemicals, cars, machine tools and some branches of electronics are classic examples of investment coordination achieved through state-led private negotiation (Dore 1986; Magaziner and Hout 1980). An interesting variety of investment coordination is 'conditional entry' whereby the state links the number of entrants (or the scale of new capacity) to changes in demand conditions. An example of conditional entry is the Korean passenger-car industry, where, faced with a lagging demand growth, the state forced one of the three existing firms to exit on the condition that it would be allowed back when demand expanded.

2.2.2 Recession Cartel

Even industries with optimal capacity may experience price wars if there are unforeseen fluctuations in demand due to, say, downturns in the business cycle, a sudden import penetration, changes in raw-material prices or world recession (in the case of export-oriented industries). If the fall in demand is temporary, it may be desirable to organise a 'recession cartel', whereby individual firms limit their production for a limited period of time, rather than allow a price war.

In the conventional wisdom, cartel arrangements are strongly opposed because they are seen as creating allocative inefficiency (that is, deadweight loss) in the process of transferring consumer surplus to producers (that is, the process of creating monopoly profit). However, the costs of cartels (that is, the deadweight loss) should be weighed against their possible benefits. First of all, as we have already discussed, when there are specific assets involved, price wars can lead to bankruptcy and therefore social waste. Recession cartels may allow such waste to be avoided. Moreover, even assuming that there is no waste involved in bankruptcy, prohibiting recession cartels may increase allocative inefficiency in the longer run. As Okimoto (1989) points out, without a recession cartel stronger firms will survive at the cost of weaker ones, eventually extracting more monopoly profit after the recovery. Thirdly, and most importantly, letting firms engage in a price war may have disastrous consequences for long-term productivity growth if firms have to reduce their investment levels in order to make up their losses from the price war.

As was common in the interwar period in many advanced capitalist countries, recession cartels may be organised through private initiatives. Nevertheless such cartel arrangements may be costly to organise, for example, when a large number of firms are involved, due to the cost of overcoming the collective-action problem. For another example, if the sellers do not publicly quote prices and make separate deals with separate buyers (say, because the number of the buyers is small), it will be difficult to detect breaches of the cartel agreement (Tirole 1988: p.241). In this case the cartel may have to spend a lot of resources on monitoring. Or if the history of the industry is such that firms do not trust each other, working out an arrangement may incur a large bargaining cost. If, for whatever reason, it is costly to make a recession cartel work on private initiatives, the state may intervene and organise a more credible arrangement, thus cutting down the transaction costs involved (e.g., on state-led recession cartels in Japan, see Magaziner and Hout 1980, and Dore 1986).

2.2.3 Negotiated Exit/Capacity Scrapping

If the demand downturn turns out to be of a long-term nature, the cumulative costs of a recession cartel may exceed its benefits. In this case, apparently, there is a need for market forces to weed out the weak. However leaving the adjustment to the new long-term demand situation to market forces can also be costly. A permanent fall in demand requires some firms to exit, but this may cause a war of attrition,
whereby no firm wants to exit first because it will benefit by staying if others exit first (Ghemawat and Nalebuff 1985; Fudenberg and Tirole 1986). A war of attrition can lead to a protracted price war, leaving everybody worse off than they would have been with timely exits (Tirole 1988: p.313).

Of course, if there is no specific asset involved, the form of adjustment in this situation may not matter because exit (and the consequent redeployment of physical and human capital) does not cost anyone anything. However, when the assets involved are specific there is a case for orderly exit or capacity scrapping. Obviously, if there are no transaction costs, the parties involved may work out a contract with side-payment schemes. However the existence of transaction costs hinder such contracts, and there is a case for state intervention. Orderly exit or capacity-scrapping arrangements organised or assisted by the state can take the following forms.

First of all, some firms can exit altogether in return for some side-payments. Side-payment may take the form of direct compensation by the remaining firms, as seen in the Japanese textile industry in the early-1980s (Dore 1986). State subsidies may quicken the process, especially when negotiations over side-payments prove difficult. Mergers can also make it easier to devise side-payment schemes, as seen in the reorganisation of the French chemical industry (Hall 1987: pp.208-9). Side-payment can also take the form of an increase in a firm’s share in other markets in return for exit from one market. This option may be feasible if the firms concerned belong to larger entities simultaneously operating in multiple markets (for example, conglomerates) – the 1980 industrial reorganisation programme in Korea is a good example of this.

Secondly, all firms can scrap some of their capacities according to some established criterion, for example according to each firm’s share in total industrial capacity or according to its market share. The best examples are seen in the capacity-scrapping arrangements in the Japanese aluminium, shipbuilding, textile, petrochemical and steel industries in the 1970s and the 1980s (Dore 1986: p.142; Okimoto 1989: p.110). The advantage of capacity scrapping based on an exit arrangement is that it can improve the vintage structure of capital, thus raising overall productivity (on the vintage effect, see Salter 1960). A capacity-scrapping arrangement may need state intervention more than an exit arrangement does because it is more difficult to monitor the compliance of the parties involved. It is fairly obvious whether a firm is in operation or not, but it is difficult to observe whether a firm really has scrapped its capacity. The presence of government inspectors in capacity-scrapping processes, as in some Japanese capacity-scraping arrangements, may help to solve this problem (see Dore 1986).

Thirdly, there is the interesting practice of ‘mothballing’, defined as stripping equipment down and concreting in the mountings so that it requires a good deal of time and effort to rehabilitate it, as practised in Japan (Dore 1986: p.142). This mitigates the problem of credibility that is inherent in recession cartels by making cheating costly. However it keeps open the option of returning to the former levels of production if necessary (although at a cost) and therefore avoids the risk of scrapping too much capacity due to an unduly pessimistic forecast of future demand. As a hybrid between recession cartels and capacity-scrapping arrangements, mothballing may be appropriate when it is uncertain whether the demand downturn is permanent, while recession cartels (capacity-scrapping arrangements)

20 Of course, there are other options open for firms. One is to find a hitherto unexploited market, say, through exporting. Another is to diversify into other related industries, as shown in the examples of some Japanese firms in declining industries like textile, brewing, and food-processing, which have successfully diversified into biotechnology (see Okimoto 1989: p.128).

21 However, devising a side-payments scheme is not easy because the estimate of future costs and benefits from exit may differ among the agents concerned. For example, in some branches of the Japanese textile industry dominated by many small-scale firms which were hard-pressed by imports from the NICs in the early-1980s, the government put the view that exit compensation should be financed by the remaining firms who benefit from such exit, while the remaining firms argued that the exiters’ share of the total market was minute (and hence benefit negligible) and that any room left in the market by the exit of home producers was likely to be taken up by imports (see Dore 1986: p.226).

22 In this case, side-payments will mainly involve compensations for workers who are laid off. For example, in the case of the Japanese shipbuilding industry, additional unemployment benefits and special placement services for workers, provided by the state, were important in arranging a speedy capacity-scrapping arrangement (see Renshaw 1986: p.145; Dore 1986: p.143).
are appropriate when the demand downturn is certain to be temporary (permanent).\(^{23}\)

Fourthly, with state arbitration or even decree, firms can divide a market into segments and exit from some segments in return for the exit of others from the segments where they are given permission to stay. Such a segmentation arrangement may be a good idea when the industry can easily be divided into segments (e.g., ships over or under a certain tonnage). One example of such market-segmenting or specialisation arrangement is given by the reorganisation of the Korean electronic telephone-switching-system industry in 1980, when, faced with serious overcapacity, each of the four incumbent firms was forced by the state to specialise in a different product. The market-segmentation arrangement in the Japanese industrial machinery industry in the late-1960s is another such example (Dore 1986: pp.137-8).

### 2.3 Concluding Remarks: Credibility, Fairness and Flexibility

In the first part of this section we discussed why the market mechanism may fail to solve the coordination problem, and why coordination failures can be costly. In the second part we discussed how state intervention can prevent and/or reduce coordination failures. Investment coordination, recession cartels and negotiated exit/capacity-scraping arrangements were examined.

Common to all these forms of industrial policy is the problem of strategic uncertainty. Of course the existence of strategic uncertainty does not necessarily mean that state intervention is the optimal solution. After all many non-market institutions enable long-range planning by reducing strategic uncertainty (Schumpeter 1987: pp.102-3; Eatwell 1982: p.210).\(^{24}\) Long-term supply contracts, technological cooperation and vertical integration between firms all fall into this category (Richardson 1972). In a situation of strategic uncertainty, making one's commitment credible is vital in working out a coordinated outcome. And, as we argued, state intervention can help overcome the problem of credibility in such situations. Investment coordination by the state is a way of avoiding over-investment and under-investment due to the difficulty of making credible commitments concerning one's investment decision. A state-led recession cartel is a way of overcoming mistrust inherent in a private recession-cartel arrangement. The presence of government inspectors in capacity-scraping or mothballing arrangements can also help to make the commitments credible.

Another problem common in all the arrangements we discussed is that of devising a scheme that is considered fair among the participants. Decisions regarding the quota of each firm in recession cartels, which firms should exit, which firm should cut how much capacity, and so on, all involve the question of fairness. The capacity or the market share of each firm may provide focal points for such fairness, but they need not do so necessarily, especially when the firms involved are heterogeneous. For example, in the case of the Japanese shipbuilding industry, '[t]he large companies and efficiency-oriented civil servants wanted to see the big companies cut capacity, and many of the small companies to close down. The small companies wanted the large ones to take all the cuts. Companies which had newly invested in up-to-date berths...wanted special exemptions' (Dore 1986: p.145).\(^{25}\) Although the state may not necessarily be better situated to work out a 'fair' norm, it can help this process by representing the national interest, which may serve as a focal point in negotiations.

The third problem is the question of flexibility. The limits of human cognition (or bounded rationality) mean that the demand (and other) forecasts on which investment decisions are based can prove wrong.\(^{26}\) For example, even if demand has fallen substantially, we do

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23 In this particular case, no exit was negotiated, and the cut was graduated to the size of the firm, ranging from 40% for the seven biggest firms to 15% for the 21 smallest (Dore 1986: p.145).

24 And this is why 'consumers do not wish to contract for their future purchases because they cannot forecast what their future needs and opportunities will be and producers do not generally wish to commit themselves to forward purchases of inputs because they cannot predict the productive possibilities that will be open to them' (Richardson 1971: p.437).
not know whether this situation will last long enough to justify exit or capacity scrapping. And if it is not implausible that demand might improve in the future, it may be wise to bear certain short-term costs, say through a recession cartel, in order to keep open the option of exploiting improved demand in the future. Conditional entry is one device to maintain flexibility in an expanding industry. Mothballing is a device to maintain flexibility in declining industries where demand is unlikely to improve.

3. THE LOGIC OF INDUSTRIAL POLICY (II): THE DYNAMIC DIMENSION

In the previous section we paid little heed to endogenous technical change, considering mainly changes in demand. However we cannot possibly ignore this issue, as the very strength of the capitalist system is its ability to generate endogenous technical change. By its nature, technical change is an unpredictable process, and no one, including the state, can claim superior knowledge of its future course. Moreover, it is often argued, technical change is an evolutionary process, whereby only those who develop better technology survive. Therefore some opponents of industrial policy argue (e.g., Burton 1983) that, however well industrial policy may solve the 'static' problem of coordination, it will do more harm than good in the long run because it hampers the workings of the natural-selection mechanism of the market economy.

After all, does not the failure of central planning prove that the coordination problem (which it solved at least to a degree) may be far less important than the attainment of dynamic efficiency? Indeed the advocacy of central planning is usually based on the proposition that a centrally-planned economy can solve the coordination problem as well as, if not better than, a market economy, and not that it generates more dynamism (see essays by Lange and Taylor in Lippincott (ed.) 1938; see also Lavoie 1985: Chapter 4). As Rosenberg and Birdzell (1986) argue, 'the failure of planning can be attributed in part to its conception of an economy system as a lifeless machine, without the internal capacity to change, adapt, grow, renew, reproduce itself and shape its own future. Plans ... do not ordinarily provide for creating extensive classes of people with capacity to engage in independent economic activities not envisioned by the plan. But a growth system is like a living organism with impulses of its own. The result of planning for growth is to produce an economy that is, not a wholly lifeless statute of the real thing, at best a tame zoo-bred shadow of the natural animal' (p.331). How then can industrial policy cope with the problem of change? Before we answer this question we need to look more closely at the nature of economic change.

3.1 Knowledge, Change and Evolution

According to Hayek and the Austrian school, the essence of our economic problem is that those variables treated as data by orthodox (that is neoclassical) economics keep changing (Hayek 1949b: pp.93-4). The market, far from already embodying all the information necessary for coordination, can only gradually reveal them through a competitive process (Kirzner 1973: Chapter 1). Hayek (1949c) argues that 'the various ways in which the knowledge on which people base their plans is communicated to them is the crucial problem for any theory explaining the economic process, and the problem of what is the best way of utilising knowledge initially dispersed among all the people is at least one of the main problems of economic policy - or of designing an efficient economic system' (pp.78-9).

According to Hayek, human knowledge can never be fully codified, and therefore the crucial question in economics becomes: 'how can the combination of fragments of knowledge existing in different minds bring about results which, if they were to be brought

27 In the case of the Japanese aluminium smelting industry, one reason put forward for not cutting capacity to the level dictated by current relative prices (mainly due to the oil price hike and the consequent rise in electricity prices) was the need to maintain a sizeable industry to support an R&D capacity, which is an important precondition for regaining international competitiveness if the cost situation improves in the future (Dore 1988: p.143).

28 While arguing that the coordination failure of the market entails enormous waste and therefore needs to be replaced by less wasteful ex ante coordination through central planning, Marx was also a precursor of the Schumpeterian, and to some extent the Austrian, "process" view of competition which emphasises the role of market competition in developing the "forces of production" (see e.g., Marx 1981: pp.373-4).
about deliberately, would require a knowledge on the part of the
directing mind which no single person can possess' (Hayek 1949a:
p.54). In particular, as Svennilson puts it, when the knowledge
involved is technical knowledge, 'only a part, and mainly the broad
lines, of [such] knowledge is codified by non-personal means of
intellectual communication or communicated by teaching outside the

The virtue of the market mechanism, according to this argument,
is that it acts as the most economical mechanism through which
dispersed agents exchange information without explicit coordination.
If this is the case, the market mechanism may need to be preserved to
promote economic change, because it is 'highly conducive to the
achievement of many different individual purposes not known as a
whole to any single person, or relatively small group of persons
(Hayek 1978: p.183).

If we recognise the importance of competition in generating
change, should we not understand the market process as an evolution-
ary process, whereby natural selection operates to pick the winners?
And does this not mean that industrial policy is harmful because it
attempts to tinker with the natural-selection mechanism, which is
beyond any human comprehension? We think likening economic
process to an evolutionary process is a helpful analogy. However an
analogy is an analogy, and therefore should not be taken too literally.

First of all, biological evolution is characterised by the lack of
conscious planning (Gould 1983; Dawkins 1986), whereas economic
evolution is characterised by the human ability to learn consciously
(from one's own and others' experience) and accordingly change
one's behaviour. That is, mutation at the genetic level is essentially a
random process, whereas economic mutation or 'industrial muta-

tion' in Schumpeter's language (Schumpeter 1987: p.83) - is often
subject to intentional changes. That this is the case is potently
demonstrated by the examples of some late-developing nations which
forged ahead by overcoming initial disadvantages through conscious
learning, despite the existence of 'cumulative causation' - where the
initial (dis)advantage leads to further (dis)advantages - in modern

Secondly, biological evolution is essentially a Darwinian pro-
cess in which only hereditary characteristics can be transmitted, whereas
economic evolution is essentially a Lamarckian process in which
acquired characteristics can also be transmitted (Hodgson 1988:
p.143). This is because human beings have the ability to codify
knowledge (for example, languages and signs), and, more importantly,
store it (for example, books, computer memories), however limited
such ability may be. And that acquired characteristics, and not just
hereditary characteristics, can be transmitted means that learning
plays an important role in the process of economic evolution.

Thirdly, natural selection in the biological world, while system-
atic, is independent of the actions of the units of selection, that is, the
individual organisms. However the selection mechanism in economic
life is not 'natural' in the sense that it is totally out of reach of the
conscious attempts by the objects of selection (in this case, firms) to
change it to their advantage. The participants in economic life enhance
their ability to survive not only by changing themselves (the genes) but
also by changing the environment (the selection mechanism). For
example, a firm operating in an industry with network externalities (for
example, typewriters, computers, telecommunications) can change its
chance of survival by spreading its own technology - for example by
encouraging other smaller firms to produce clones of its products or by
providing loans to its customers. Advertising is another example
whereby firms change their possibility of survival by changing the
selection mechanism - that is, consumer preference.

29 In contrast, in the neoclassical framework, every piece of 'information' (or
knowledge) is seen as obtainable, albeit at a cost (e.g., search cost) (for similar
30 The importance of the migration of skilled technicians in transmitting technical
knowledge from one to another part of the then industrialised world during the
19th century (i.e., Europe and the US) documented by Rosenberg (1976: pp.154-5)
shows the difficulty of codifying technical knowledge.
31 For evolutionary arguments in economics, see Aichler (1956) and Nelson and
Winter (1982).

32 The same view of economic evolution lies in the French state's claim that it was
involved in rescue operations of the declining sectors not 'to save endangered
species but to provide funds for their mutation' (italics added) (Foruma, 9 April,
33 On the notion of cumulative causation, see Young (1928), Kaldor (1985), and
Stigler (1951).
3.2 Industrial Policy as a Device to Promote Change

In the previous section we examined the nature of change in the capitalist economy. In particular we examined the evolutionary argument, which likens the process of change in the capitalist economy to biological evolution. We argued that the fundamental difference between biological and economic evolution is that, in the latter, the units of selection have the capacity to intentionally 'mutate' and change the selection mechanism itself, at least to a degree. This is essentially due to the human ability to learn, especially from others, and to the ability to pass on (at least part of) the knowledge acquired through codification (e.g., by writing a book on Japanese business management) and institutionalisation (for example, by introducing some elements of Japanese business management). How then can industrial policy be used as a means to promote economic change and learning?

3.2.1 Economic Change, Coordination and Industrial Policy

One important point not addressed by the opponents of industrial policy who employ the (misunderstood) evolutionary argument is that economic changes may require coordination to be successful. In a world of interdependence, the existence of a better alternative does not necessarily mean the advent of a change. For example, there exist more efficient alternatives to the QWERTY typewriter (and computer) keyboard, but an agent (or even a group of agents) who unilaterally shifts to an alternative keyboard will be penalised unless others also opt for it (David 1985). More generally, when interdependence prevails between economic agents, changes would not automatically be made without the guarantee that complementing changes would also be made (Richardson 1960: Chapter 2).

For example, if a successful computer industry depends on a strong semiconductor industry, people will be reluctant to invest in the computer industry unless there is a credible commitment for adequate investment by the potential investors in the semiconductor industry, and vice versa. As Abramovitz (1986) argues, 'if the capital stock of a country consists of an intricate web of interlocking elements', then it is difficult to replace one part of the complex with more modern and efficient elements without a costly rebuilding of other components' (emphasis added) (pp.401-2). Now, '[t]his may be handled efficiently if all the costs and benefits are internal to a firm', but when the capital stock is interdependent in use but divided in ownership, and thus the accompanying costs and benefits of change are divided among different firms and industries, 'the adaptation of old capital structures to new technologies may be a difficult and halting process' (emphasis added) (p.402).

Although it is possible that potential investors in complementary projects may devise a contract between themselves, such a contract may be costly to draw up, particularly when there is asymmetry in asset specificity of investments between different investors (the failure of the complementary investments to materialise can be more damaging to the investor with greater asset specificity). State intervention in this case may cut sharply the transaction costs involved in such contracts. Such intervention need not involve financial resources such as subsidies. As we discussed earlier, governmental announcements (for example, the French and East Asian 'indicative-planning' exercise) may suffice if they can provide obvious focal points for coordination between complementary investments. Financial incentives provided by the state, say, for cooperative research in new industries, although not necessary, may make the state's commitment to its announcement more credible by serving as a signalling device (Porter 1990; Chapter

34 Of course, computer firms may decide on in-house production of semiconductors, but there is no guarantee that scale economies in computer production and semiconductor production will be of the same magnitude. If the semiconductor industry is subject to a larger scale economy (as is the case), the in-house production option will be costly compared to the option of production by independent semiconductor producers.

35 Porter (1990) reports that '[i]n the United States and often in Europe, the process of reaching technical standards is frequently protected as firms jockey for their individual positions. In Japan, MITI has frequently applied significant pressure on firms to set basic standards, pushing them to move on to the next stage in the innovation cycle' (p.653). Also see the examples of the Japanese computer and machine tools industries in Due (1986: pp.134-6).

36 It may not matter whether a country goes for superconductivity or biotechnology, but it matters whether enough complementary investments are made in either of these industries.
12. Thus seen, industrial policy that coordinates complementary investment decisions may be essential for economic change in a world of interdependence, rather than be an obstacle to it.37

3.2.2 Codifiability of Knowledge, Product Cycle and Industrial Policy

The limited codifiability of technical knowledge requires that we have to incorporate the problem of knowledge generation into our industrial-policy framework. The problem of knowledge generation is captured in more practical terms by the theory of the ‘product cycle’ (see Vernon 1987), which is known to be incorporated into Japanese industrial-policy practice (Okimoto 1989: Chapter 1; Magaziner and Hout 1980: Chapter 4).38

According to this theory, a young market is characterised by a phase of experimentation in which different ways of doing the same thing vie with each other. As the market matures, most technical knowledge becomes codified and easily transmissible. When a few technologies emerge as the best-practice ones, they are adopted across the industry, as firms learn from the experiences of others. As a market matures and finally becomes senile, the discovery potential in that market gradually diminishes (as knowledge becomes more codified) and the role of ‘competition as a discovery procedure’ (Hayek 1978) is accordingly reduced.39 Let us examine how the idea of the product cycle can be incorporated into the practice of industrial policy.

37 For a classic discussion of the problem of coordinating complementary investments, see Richardson (1960). Also related are concepts like Hirschman’s ‘linkages’ (Hirschman 1981) and Dahrendorf’s ‘development block’ (Dahrendorf 1988).

38 Magaziner and Hout (1980) argue that MITI’s greatest strength appears to be its understanding of the competitive stages through which an industry moves and its ability to fashion appropriate policy (p.38). They document that ‘[for businesses in the early, rapid growth phases of development … policy calls for protection from foreign competition, concentration among producers, government support of the industry’s cash flow, and stimulation of new technology … For businesses which are already internationally competitive … government assistance recedes [with the significant exception of occasional officially sanctioned recession and export cartels co-ordinated by the industry associations] as it is no longer necessary. Finally, for businesses in competitive decline, MITI becomes active again, this time trying to bring about capacity reduction and rationalisation’ (pp.38-9).

39 Of course, we should not forget the possibility of ‘rejuvenation’, whereby a new series of exogenous technical changes turn a mature industry into a young one again, although we may not go as far as Pierre Dreyfus, a former French Minister of Industry, who argued that ‘[there are no condemned sectors; there are only outdated technologies]’ (quoted in Hall 1987: p. 210). I thank Nathan Rosenberg for reminding me of this important point.

40 A good example of the shift in policy emphasis according to product cycle is the production cartel among six Japanese computer peripheral equipment producers organised by MITI in the late-1970s. ‘The products handled through the cartel included [mainly] standard peripherals whose design had stabilised and where further innovation was remote’ (Magaziner and Hout 1980: pp. 82-4).
As an industry enters its senile stage, production shrinks, labour is shed and capacity is scrapped. The material and human resources employed in an industry may be highly specific to that industry so their redeployment may be extremely difficult, or even impossible. In the face of a possible loss in value of specific assets, the owners of the assets will resist change, and this may result in a considerable waste of resources if a war of attrition among the firms concerned or protracted labour disputes take place. The role of industrial policy in this phase will be to encourage private negotiations regarding exit and capacity scrapping between the relevant agents, or even to impose a centralised solution when negotiations reach a stalemate. Retraining and relocation programmes organised by the state will also greatly assist the process of negotiation by reducing the would-be displaced workers' resistance to the firm's decision to exit or scrap the capacity.

3.2.3 Diversity of Innovatory Sources and Industrial Policy

Nelson (1981), in discussing the innovation mechanism of the capitalist economy, argues that the waste that is bound to be generated by competitive innovative attempts (say, due to duplication) may be a price worth paying to avoid the dangers of relying on a single mind for innovation (that is, monopoly). Or as Abramovitz (1986) puts it, 'in the uncertainty that obscures early efforts to explore new fields, it would be quite unwise to concentrate all efforts on a single approach to a still cloudy goal' (p. 103). This is because innovation is basically a chase after a moving target, a job in which nobody can claim absolute superiority. That is, 'were man omniscient and omnipotent, he would not choose to organise his R&D activities through private enterprise [given the wasteful nature of competitive R&D activities]. The case for private enterprise as an engine of progress must be posed in recognition of bounded rationality' (Nelson 1981: pp. 103-9).

This is a powerful argument. Unless human rationality is unbounded, there will be a pressing need to preserve a diversity of the sources of knowledge in an ever-changing world - although this statement should not necessarily be interpreted as an advice against all `collusive' behaviours amongst firms (Jorde and Teece 1990: pp. 81-)

2). However, does the state have any role to play, if this is the case? Should it not just leave things to evolve on their own?

One point against the apparent laissez-faire implication of this `diversity argument' is that imperfections in the capital market put a follower firm in a disadvantaged position if there is a high fixed-investment requirement. In this situation the state can act as a surrogate capital market and subsidise a potential entrant that is deemed to be at least equally capable as the incumbent firm except in its financial ability. State-organised venture-capital schemes conducted in countries such as Korea, France and the United Kingdom are good examples of this.

The state can contribute to increasing the diversity of innovatory sources in a more direct manner. For example, it may expand the pool of potential entrants into an industry with high R&D components by subsidising related R&D activities by firms which operate in similar lines. Or, alternatively, it may encourage related basic research in universities or public laboratories, which will publicise the results of their research. This of course carries some possibility of duplication, but it may be a price worth paying to preserve and develop diversity.

3.3 Concluding Remarks: The Socialisation of Risk

In the first half of this section we discussed the nature of change in the capitalist economy. We argued that the process of change in the capitalist economy is best characterised as a quasi-biological evolutionary process whereby the agents can and do change both their own `genes' (behavioural characteristics) and the selection mechanism (or environment). Drawing on this argument, we discussed the dynamic dimension of industrial policy in the second half of the section. It was pointed out that coordinating changes, encouraging experimentation and preserving diversity are the most important roles industrial policy can play.

42 See the `long nurse story' (pp. 337-9) and the case of high fixed R&D costs (p. 414) in Tirolo (1988) for the implications of an imperfect capital market for R&D activities.
The crucial theme emerging from our discussion in this section is that of the 'socialisation of risk', whereby risks involved in economic changes are borne by society rather than by individuals. In the models in the orthodox tradition, where individuals make decisions in an atomised fashion, risks involved in changes are necessarily borne by the individuals. To those who subscribe to this view, the socialisation of risk opens doors to the moral hazard of excessive risk-taking by those individuals whose risks are borne by society (see Section 4.1 below). However, in the real world, many changes involve interdependent decisions. If the risks involved in these situations have to be solely borne by the individuals, necessary changes may not come about. The socialisation of risk through state intervention is a means of promoting changes that involve interdependence.

Contrary to what is implicitly assumed in mainstream economics, the capitalist economy has developed on the basis of the growing socialisation of risk. As Rosenberg and Birdzell (1986) argue, 'the West has grown rich, by comparison to other economies, by allowing its economic sector the autonomy to experiment in true development of new and diverse products, methods of manufacture, modes of enterprise organisation, market relations, methods of transportation and communication, and relation between capital and labour' (p. 333). And in such a process, institutional arrangements that, by 'internalising benefits and externalising costs of private investment' (North 1981: p. 62), allow experimentation and risk-taking beyond a scale whose risk can personally be borne by the experimenter (for example, systems of limited liability) have played an important role. The socialisation of risk through state intervention, then, may be seen as but one extension of these already existing institutional arrangements.

4. POSSIBLE PROBLEMS OF INDUSTRIAL POLICY

4.1 Problems of Information

One common objection to industrial policy is based on problems of information (e.g., Burton 1983; Grossman 1988). There are two major elements in this argument. First of all, it is argued that the state does not possess enough information to decide correctly on the future industrial structure of the economy. This is the problem of 'insufficient information'. Secondly, it is argued that the state is at an informational disadvantage vis-à-vis the firms that are subject to industrial policy. The firms, the argument goes, may use their informational advantage to extract more than they deserve on social grounds (a moral hazard problem). This is the problem of 'asymmetric information'.

With the exception of some staunch free-marketeers (e.g., Burton 1983), those who employ informational arguments (e.g., Cairncross et al. 1983; Grossman 1988; OECD 1989) support a generalised industrial policy targeted at certain types of activities rather than at particular industries (e.g., investment, R&D), against selective industrial policy—the type of policy we defined as industrial policy proper at the beginning of the chapter. If the state has all the relevant information, the argument goes, particularistic interventions may work, but since this is unlikely to be the case, the state should support productive behaviour in general rather than pick the winners on the basis of incomplete information (Price 1980; Lindbeck 1981).

4.1.1 Insufficient Information

Concerning the insufficient-information argument, note first that insufficient information does not prevent us from planning our future economic life. Actually the uncertainty of the future is exactly the reason why we plan for the future. Overcoming uncertainty is one of the most important functions of business management, especially in large modern corporations (Richardson 1960; Williamson 1975; Stinchcombe 1990). A firm chooses its production technology, capacity, liquidity position, inventory level and so on, to minimise the potential loss in case of abrupt changes in environmental factors such as market demand, macroeconomic conditions and the state of technological development—in other words, to overcome parametric uncertainty. A firm goes into long-term binding contracts concerning its purchases of raw materials, labour power, parts and equipment, on the one hand, and its sales of products, on the other, to minimise a potential loss in the event of opportunistic behaviour by its business partners—in other words, to overcome strategic uncertainty. It is inadequate to argue that the state should not attempt to plan the future of the national economy because of insufficient information, when firms can and do
plan their own future despite — or rather, precisely because of — insufficient information.

Secondly, the informational requirement for intelligent state intervention is not always so great as to disallow state intervention altogether. Entrepreneurs themselves often operate on the basis of informed guesses or of "animal spirits" in making investment decisions. Frequently much of the information used by the firm to make investment decisions — for example, estimates of present and future demand, the availability of best-practice technology, the financial situation of the firm, the distribution network of the firm — are readily available to anybody, and not just to the firm itself. Moreover, a large part of the information used by the firm is acquired from external sources such as consultants, research institutes and state agencies (e.g., a central statistical bureau). Thus, it is not necessarily true that the state suffers from insufficient information whereas the firms do not. In fact one of MITI's resources in dealing with the private sector has been its 'superior information' (Okimoto 1989: p.145), thanks to the more extensive informational network in the hands of the state.\footnote{Needless to say, due to the limited human ability to process information, the greater availability of information does not guarantee a better decision (see Chang 1994: Chapter 2, Section 2.1.2). See also the Korean case discussed in Chang (1995).}

Thirdly, in the context of late development (or the concept of late development, see Gerschenkron 1962), the problem of identifying desirable industrial structures is far less serious. This is because late-developers can have the 'second-mover advantage', by which they can watch the countries on the frontier of economic development and learn from their experiences.\footnote{Of course, it has to be recognised that there exists 'second-mover disadvantage', because the first-movers would reap more rents from innovation. I owe this point to Sandeep Kapur. Also see Lande (1990) and Amsden and Hikino (1993).} Even in a country like Japan, which was pretty close to the frontier of industrial development, it is recognised that "[s]etting priorities, picking the next likely winners, has not been difficult throughout the postwar period when the objectives of policy were primarily "catching up" objectives" (Dore 1986: p.133). The insufficient-information argument loses most of its force in the case of late-developers (that is, almost all countries) where the scope for 'conscious mutation' is great (also see Dore 1989).

4.1.2 Asymmetric Information

Concerning the asymmetric-information argument, note first that asymmetric information is not confined to the relationship between the state and firms, but is a ubiquitous problem in economic life, as we have repeatedly pointed out. Informational asymmetries exist between firms and lending institutions and between managers and shareholders. It exists, moreover, within the firm itself, that is, between headquarters and subsidiaried (or other component parts of the firm).

If the asymmetry of information is always so severe as to disallow state intervention, neither financing somebody else's investment projects nor managerial planning can be justified. After all, large modern corporations came into being despite the dangers of the principal-agent problem, because there are ways of controlling managerial excesses (see Chandler 1962). And likewise there are ways and means to reduce informational asymmetry between the state and firms.

Secondly, the problem of asymmetric information is not unique to industrial policy as defined by us, but it applies to other policies too. Moreover, general industrial policy, which its supporters assume to have no moral-hazard problem due to asymmetric information (for example, Corden 1980: pp.182-3; Balassa 1985: p.319), may suffer even more acutely from such a problem. As contracts become more and more general, the contingencies to be considered become more and more numerous, resulting in prohibitive transaction costs in drawing up effective contracts. This means that general industrial policy can be compromised by unforeseen contingencies. An interesting example is the US 1981 tax-code provisions, which were originally intended to boost industrial R&D but ended up subsidising advertising firms (Lawrence 1984: p.140, no.45). Industrial policy, as defined by us, being particularistic in its nature, tends to involve contracts that are more custom-designed and hence allow fewer unforeseen contingencies and less moral hazard. The use of plan contracts with specified targets between the state and individual firms in France is the best example of preventing moral hazard through the use of custom-designed policy (see Hall 1997: p.207).

Thirdly, the asymmetric-information argument assumes that local information is always better than global information because it
is more finely-meshed. However, people with localised information may make a substantively less rational decision due to the sub-goal-identification problem. If the aim of industrial policy is to improve the efficiency of the economy as a whole, it may actually be better, under certain circumstances, not to be affected by the localised information possessed by the firm. Especially when the decision involves externalities that are not borne by the firm, the state can make a better decision solely due to the more global nature of its information, and not because it is a superior being.

4.2 Problems of Rent-Seeking and Entrepreneurship

The ever-changing nature of the capitalist economy -- or Schumpeter's 'gates of creative destruction' (Schumpeter 1987) -- and the consequent pervasiveness of uncertainty give entrepreneurship a vital role to play in the capitalist development process as the generator and/or finder of new knowledge (Schumpeter 1987; Dobb 1925; Kirzner 1973; Nelson 1986). However, as Baumol (1990) argues, depending on the incentive structure in the economy, the existing stock of entrepreneurial talents may be diverted away from productive purposes into unproductive or even destructive ones. According to him, entrepreneurial talents can be used for destructive purposes when rents are granted to those who are best at destroying existing assets (for example, warmongering in Europe in the Middle Ages). They can be used for unproductive purposes when rents are granted to those who are best at transferring existing assets, as in rent-seeking (also see North 1990b: Chapter 8).

The state has a major role to play in preventing the diversion of entrepreneurial talents into unproductive venues by reducing profit-
tivity but a whole investment project (say, through spillover effects), the patent system may not be used. And in this case, the necessary incentive, the rent, needs to be created in other ways such as subsidies, import protection and industrial licensing.

If the rents are created by means other than the patent system, the crucial question becomes whether the state is able to withdraw the rent whenever necessary. This means, first of all, that when it is contemplating an industrial policy, the state should set strict performance criteria so that the rents would not go on regardless of the performance of their recipients. For example, in France the provision of state aid to ailing industries dependent on their performance is not unrelated to the relative effectiveness of those aids (Hall 1987: p.210). Secondly, the state has to ensure that it has the power to punish the firms if they resist the elimination of the rents. It is not a coincidence that industrial policy exercises were more successful in France, whose state has control over the banking sector, than in, say, the UK, whose state has had only a limited control over the flow of financial resources in the economy. 46

In addition, some industrial policy measures that may be used as means to preserve diversity – for example, venture-capital schemes and subsidisation of related commercial R&D and basic research – can also be used as means of keeping rents from becoming permanent. Even when new entry does not add to diversity (that is, when the entrants have the same technology and organisational structure), prohibiting the incumbent firm from expanding its capacity beyond what is justified by scale-economy considerations and allowing new entrants can prevent permanency of the rent.

4.3 Political Problems: Legitimacy and Democratic Control

An industrial-policy regime is not merely a technical means to achieve efficiency, but is fundamentally a regime of political economy. This means that a discussion of industrial policy cannot be satisfactory without discussion of the political problems associated with it. There are several political problems related to industrial policy, but we shall discuss only the two which are the most relevant in this context – legitimacy and democratic control.

4.3.1 Legitimacy

Some may argue that industrial policy should not be used because it undermines the legitimacy of the state. First of all, by opening the door for special interests, industrial-policy practice can erode the image of the state as a social guardian and therefore make people question its intentions. 47 Secondly, industrial policy gives bureaucrats the power to allocate property rights and hence creates scope for bureaucratic corruption. In addition to its efficiency consequences (e.g., an industrial licence may go to an inefficient producer), corruption may have consequences for the legitimacy of the political system (Krugman 1990: p.18). If industrial policy may endanger the legitimacy of the political system, should we not refrain from it, whatever its efficiency gains may be?

First of all, it should be pointed out that legitimacy is concerned with the socio-economic system as a whole, of which the political system is only a part. People may be generally disenchanted with the outcome of the socio-economic system – for example, high income inequality – even if the state is impartial and honest. For example, Dobb (1925) argues that monopoly ‘may give occasion for a psychological tendency to antagonism and distrust on the part of dependent groups and classes towards those in a position of advantage… If this happens... the society may cease to have the “general will” which is supposed to exist in a harmonious democratic community; its sections may not respond to the same idealistic appeals, and their latent antagonism may prevent them from subordinating their own sectional interests to the success of the whole’ (pp.157-8). 48 The problem of

46 For discussions of the different relationships between the state and finance in different OECD countries and their implications for industrial adjustment, see Zysman (1983) and Cox (eds.) (1986). On the same issue in the French context, see Hall (1987). For the Korean case, see Chang (1993).


48 And he continues: As a consequence, “harmony can only be obtained by coercion or by a series of compromises... and purely strategic considerations may tend more and more to override any considerations of maximum welfare and efficiency.” It “may also produce class struggle”, and, “Its conflicts of this kind, a considerable part of the economic resources of a community may be consumed, either in their conduct or in their prevention” (italics added) (p.158).
legitimacy is much more fundamental than whether or not a particular government, or a specific type of policy, is open to corruption.
Moreover, although the erosion of legitimacy is a serious danger when conducting industrial policy, it is by no means a possibility confined to industrial policy. Other, more general, policies may also suffer from the problem of legitimacy. For example, monetary policy may prima facie appear to be immune to interest-group activities, but it is well known that industrialists often lobby for expansionary monetary policies whereas financiers usually lobby for tight monetary policies. And there is no guarantee that such lobbying would not involve corruption and therefore endanger the legitimacy of the state.

4.3.2 Democratic Control

The fact that an industrial-policy regime apparently requires an elite bureaucracy has often raised concerns about democratic control. Especially among those who believe in parliamentary democracy of the Anglo-Saxon variety, the weakness of legislature in 'industrial-policy states' such as Japan and France (not to mention Korea, which has been non-democratic for the major chunk of its modern history) has been a great concern. To them the fact that bureaucrats, who are not subject to popular mandate, are powerful means that the whole political process is rigged to ensure that efficiency dominates democratic values.\(^49\) They believe that industrial policy is less subject to democratic control because it is open to bureaucratic discretion, in contrast with other 'even-handed' or general policies.

Against this view, it should firstly be pointed out that some degree of bureaucratic control is necessary for any society of reasonable sophistication, because 'many decisions have to be taken in response to rapidly changing situations and cannot, except at the cost of total stasis and chaos, be "left" until a highly democratic decision-making process has been completed. Almost immediately then, in any

\(^49\) It has to be pointed out, however, that parliamentary representation (the representation of individuals as individuals) is not the only legitimate form of representation. Representation along class lines (as in Scandinavian neo-corporatism) or even 'issues' (as in some American lobbying organisations) are all too pervasive to be dismissed as illegitimate (see Mair 1987, on different forms of representation).

real situation it becomes necessary to delegate powers from larger, more democratic bodies... to smaller, more "efficient" bodies. However, once such delegation has occurred, a great deal of the real day-to-day decision-making power is taken out of democratic channels and placed in the hands of small minorities which may then be beyond the effective control of the larger bodies' (Kitching 1983: p.39). That is, there may be a certain trade-off between democratic control and efficiency in decision-making. However no a priori criterion can tell us which mix of democratic control and efficiency - including the one existing in an industrial-policy regime - is the most desirable.

Secondly, it is not just industrial policy that suffers from the problem of democratic control. For example, those who criticise industrial policy usually support an independent central bank, but it is not clear to us why the democratic credentials of an official in the Japanese MITI or the British DTI should be viewed with suspicion whereas those of a German Bundesbank official should be accepted without question. No policy is free from the personal discretion of the policy-maker. Moreover other policies may be even less subject to democratic control than industrial policy due to their less transparent nature (Dore 1987: pp.199-201). Industrial policy usually clearly reveals the beneficiaries of the policy, whereas other policies (e.g., monetary policy) often do not clearly reveal who is benefiting from them. Such transparency may make it easier to exercise democratic control over industrial policy than in the case of other policies, if there is a will to do so.

4.4 The Problem of Supporting Institutions

Opponents of industrial policy often point out that 'industrial-policy states' have a particular set of institutional arrangements, especially an elite bureaucracy with a wide discretionary range and a cooperative government-business relationship.\(^50\) They argue that it is

\(^50\) Interestingly, American authors like Badaracco and Yoffie (1983), Schultz (1983: pp. 9-10), and Lawrence (1984: pp.112-5) usually emphasise the absence of an elite bureaucracy and British authors like Hare (1985: pp.112-5) emphasise the hostility between the state and the capitalists as the major obstacle to an effective industrial policy, reflecting the institutional characteristics in their respective countries.
difficult to change institutions and therefore that industrial policy cannot be a realistic option for other countries that lack such institutional arrangements, no matter what merits it may have.

Although an effective industrial-policy regime does require an appropriate set of supporting institutions, the difficulty of building it should not be exaggerated. Countries learn from their own past experience and from other countries and engage in institutional innovations. For example, in Japan many of the institutions that are often said to have arisen because of Japan's unique culture are actually products of conscious institution building. The fact that Japanese labour, product and financial markets were vastly more volatile in the early-1930s than they have been since shows that the renowned 'collectivist' characteristics of the Japanese are 'not just a "hangover" of ancient (feudal) cultural traditions' (Dore 1986: p.256) but also products of conscious institutional innovation (see also Magaziner and Hout 1980: p.2). Moreover, institutional innovation does not necessarily take a long time. The famous Japanese lifetime employment is basically a postwar creation (Johnson 1982: p.14). The French state, which is renowned for its interventionist and 'modernising' attitude, was famous for its laissez-faire and 'anti-modern' attitude before the Second World War (Cohen 1977; Kuisel 1981). The well-known Swedish labour-capital consensus emerged in a relatively short period of time out of one of the most contested industrial relations in Europe of the 1920s (Korpi 1983). Moreover learning from other countries with different institutions does not necessarily mean that a country has to exactly copy their institutions. It is often possible to create functional equivalents of foreign institutions. For example, the Swedish 'active labour-market policy' and Japanese lifetime employment are very different institutional arrangements, but they are functionally equivalent in creating a positive attitude among workers toward technological change by guaranteeing them jobs. In this regard, the following quotation from Dore (1986) is well worth consideration:

'Learning from the Japanese experience need not mean that we [the British] have to become Japanese, absorb the Confucian ethic, or raise our sense of national identity to the Japanese levels. What it does mean is that we should ask ourselves whether there are not other ways in which some of the things which Japanese institutions and traditions achieve for the Japanese might be obtained by other methods, other institutional arrangements, more consonant with our own tradition. If close cooperation and consultation between managers and workers seems to be a precondition for rapid innovation in manufacturing firms, and if it is difficult to achieve this, given our adversarial traditions, what forms of industrial democracy or workplace decision-sharing might substitute for the easy acceptance of bureaucratic hierarchy which facilitates cooperation in Japanese firms? If we cannot have, and do not want, lifetime employment to be the norm, if we want to preserve a more mobile system with the greater personal freedom which that provides, can we at the same time devise schemes which would give British employers the same incentive to invest in training their employees as the lifetime employment expectation gives Japanese employers? If the crucial aspect of the Japanese system of financing industry seems to be the way in which it facilitates long-term planning and investment, and reduces preoccupations with next year's bottom line, is there any way in which our own financial institutions could be mended to achieve the same effect, without necessarily modeling our stock exchange on Japan's? If inflation control in Japan crucially depends on institutionalised wage leadership and a nationally simultaneous pay settlement date, does that not suggest the wisdom of re-examining the many suggestions that have been made for introducing synchro-pay in Britain?' (p.252).

5. CONCLUSION

The common reaction to the argument for industrial policy has been one of suspicion and incredulity. The opponents of the regard industrial policy either as a bureaucratic meddling that is at best irrelevant — for example, 'industrial policy is not the major reason for Japan's success' (Trevisse 1983, title) — or as a peculiar form of state intervention that works only in countries with a particular culture — for example, 'Industial policy: It can't happen here' (Badaracco and Yoffie 1983, title). Such reactions are more than understandable when thinking that orthodox economic theory hardly recognises any form of coordination other than the idealised perfect market and ignores the role of endogenous technical change and learning.

However, as we have tried to show, industrial policy is a policy
practice that can be firmly anchored in economic theory if we incorporate recent developments in economic theory that take seriously the issues of institutional diversity and technical change. As a coordination mechanism, industrial policy can be most efficient in a context where interdependence and asset specificity are important. In this context, coordination through the market would incur high bargaining costs and coordination through central planning, high information costs; while industrial policy is likely to incur little of both types of cost. When we take the issue of technical change into account, industrial policy also emerges as a superior way to promote it. Industrial policy does not kill off the profit motive – which is the most important, if not the only, driving force behind technical progress – as central planning would and, through the socialisation of risk, it can promote changes that are additional to what the market can produce on its own.

Industrial policy, needless to say, is no panacea. Like any other policy, or any other form of economic coordination, it has its own costs and benefits. Its benefits seem to have more than offset its costs in success stories like those of Japan and Korea, but we have plenty of other examples that show that its costs may overwhelm its benefits. The real question is not whether industrial policy can work or not (because it does), but how it can be made to work. In this chapter we have tried to provide some theoretical grounds for identifying the economic, political and institutional conditions under which industrial policy would work and have suggested some ways and means to achieve them.

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The Political Economy of Industrial Policy


