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An Industrial Policy Framework for High Value Engineering

Chris Collinge

1 The Context

In this chapter I argue that industrial policy obeys a logic, and I suggest that this logic—as it bears upon different sectors including high value engineering—can be analysed in terms of the relationship between business and its environment, including particularly the governmental environment. The relationship between businesses and the state is a reciprocal one, with businesses impacting upon the state in various ways, and the state in turn shaping the structure of the economy and the environment for business development. However, when we focus upon the impact of the state upon the economy, and upon particular sectors within the economy, then it emerges that this impact can take only a limited variety of forms, at least within liberal market or coordinated market economies (Hall and Soskice 2001). By sketching a general

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framework for analysing industrial policy options, we can identify the policy options available to government in the promotion of particular sectors such as high value engineering, and we can also identify the choices that have actually been made regarding different sectors in the past and the reasons for those choices. To begin with, the framework that is proposed here is necessarily static, but subsequently, it is possible to place this within a dynamic context by accommodating certain variations in the performance of economies over time and space. In the second part of the chapter I therefore consider how the industrial policies pursued by government have varied, in response to unstable and uneven development, and how this has been affected by changes to governance patterns.

2 The Logic of Economic Policy

Historically, there has been a close bond of mutual influence between the state and the economy. The economy in a particular place, in its structure and its behaviour, has had a major impact upon the organisation, scope, and priorities of the governing institutions and authorities in that place. Authorities in places with strong manufacturing industries, for example, have had to reflect the interests of these industries in their services and have derived both their incomes and their personnel (politicians and officials) from the communities that depend upon these sectors. As the importance of high value engineering has grown around the world, so the impact of this sector upon the composition and behaviour of state agencies in particular places has grown correspondingly. At the same time, however, governing authorities have also shaped the economy in its development at national and sub-national levels, through their general activities as well as through those policies that are specifically designed to be 'economic'. Governing authorities are amongst the largest employers in most areas, for example, and they have contributed significantly over the years to the physical and social infrastructures (utilities, housing, education, social services, leisure, cleansing, and environment) that make private enterprise viable and successful. Alongside these general activities, however, they have also developed specific industrial policy instruments to influence economic outcomes.

3 The Statics of Industrial Policy

Economic policies can take a wide variety of forms according to circumstances and the interests of those involved in their formulation and implementation. To clarify the policy choices that have been made by national and sub-national agencies, and the ways in which these choices have been constrained by intra- and extra-governmental pressures, it is necessary to begin by identifying the different types of economic initiative that are in principle available for implementation. This framework applies primarily to those societies where a division has been instituted between the state and the economy, between the 'public' and 'private' sectors, whether they are liberal market or coordinated market economies. It applies less clearly if at all to those remaining societies in which no such division between the state and the economy has been instituted, or in which this division is emerging slowly. There are many different ways of analysing and classifying economic policies and activities. For our purposes here it is important to suggest a way into this type of analysis.

3.1 Basic Approaches to Economic Policy

The economic system is made up of processes (transactions such as managing, cooperating, exchanging, and competing) which take place between participants (employers, employees, firms, governments, and other agencies) who have different amounts of power. However, before analysing these instruments in detail it is possible to distinguish three broad orientations towards economic policy on the part of government, orientations that frame their policy choices:

- *the active approach*, whereby government (including sub-national government) uses positively the powers and instruments at its disposal (such as the ability to set interest rates or tax rates, and to build infrastructure) to influence an economic process (such as the attraction or retention of innovative businesses) as a way of achieving a particular end result (such as economic growth, productivity growth, job creation, an improved trade balance). This approach is based upon the belief that the state must act upon the processes concerned because otherwise the desired result will not be achieved, or achieved as well.

- *the counter-active approach*, whereby government reduces its use of the powers and instruments at its disposal, and acts assertively to limit the powers at the disposal of other bodies (such as at other level authorities, private cartels, or trade unions) to influence economic processes (such as FDI, company recruitment practices), and thereby releases market forces from prior intervention as a way of achieving a particular end result. This approach is based upon the belief that government and other powerful agents must act less upon the processes concerned—for example, they should not attempt to 'pick winners'—and that by doing so they leave decisions to other agents that are better placed to decide.
- *inactive approach*, whereby government does not use the powers and instruments at its disposal to intervene in an economic process, but neither does it act to limit the power at the disposal of other bodies (such as, say, monopolistic private utilities) that already influence the processes concerned. This approach is based either upon an ignorance of particular economic issues, or upon political paralysis or grid-lock, or upon a belief that the current mixture of market and institutional forces is about right already and producing the desired result. Politics is, after all, the art of the possible.

Each of these approaches has been operative over the years across capitalist economies, and each has been adopted on occasions by national and sub-national governments. The first two may be regarded as all-embracing philosophies, perhaps labelled 'interventionist' and 'disinterventionist', which determine most details of policy and define opposite ends of a political spectrum from left to right. Coordinated market economies may lean more towards the interventionist end, and liberal market economies towards the disinterventionist. But in practice it is likely that all three approaches will be combined, with active policies towards some parts of the economy (e.g. the politically sensitive agricultural or financial sectors) being pursued alongside counter-active policies towards other parts (e.g. less favoured manufacturing industries), and inactive policies elsewhere. This is very likely in federal systems such as the USA, where power is divided and dispersed. Furthermore, it is likely at least in European countries that counter-active policies (such as efforts to reduce 'red tape' and 'bureaucracy') can only be taken so far, and that beyond this point there will be social, political, and economic pressures to retain existing arrangements (such as the legal and administrative framework protecting health and safety at work, or the development of an economic or social crisis on the back of excessive de-regulation, as in the case of financial liberalisation). The debate between political parties in practice concerns where the balance between these three dispositions is to be struck in regard to each part of the economy.

3.2 The Range of Policy Instruments

To explore further the options open to industrial policymakers, however, it is necessary to examine the powers and instruments which states and governments have at their disposal, powers which they may choose to use actively, or to renounce using for counter-active reasons. The instruments of economic policy are those factors that are under the control of the policymaker and that can be altered in order to achieve a desired objective. The objective might be, for instance, to attract or to expand high value engineering businesses. The instrument in this case could be assistance with inward investment or capital formation, with R&D, training, and apprenticeships.

There are two broad types of contribution which the different tiers of government in market economies have made over the years to economic development. First of all, they have taken responsibility for providing a social framework (e.g. social order, cultural orientation, legal and property rights, housing and health care) within which private enterprises can flourish. Secondly, they have also taken responsibility on many occasions for producing the economic conditions that permit and encourage enterprise (such as an institutional framework of trade agreements and regulatory equivalence, macroeconomic fiscal and monetary policies, microeconomic policies for particular sectors, appropriate infrastructure, an educated and skilled workforce, access to information and ideas, social capital in the form of networks and clusters, and sometimes risk capital). It is the second of these two contributions that is normally regarded as 'economic policy', and this has been performed in a variety of different ways, sometimes by supplementing or overriding the market, sometimes by removing impediments to the operation of market forces.

Much economic policymaking (although by no means all) is designed to influence the performance and behaviour of employers—usually private but also public and voluntary sector organisations. The existence of businesses and other employing organisations is based upon certain preconditions that must be established and maintained. These preconditions include an ordered social framework (involving, for instance, contract law, dispute settlement, or adequate public and environmental health). They also include the ability to draw productive resources into the enterprise, and to deliver finished goods and services back out into the economy. It is possible to regard each employing organisation as the centre of a web of connections comprising links on the input side of production, links on the output side, and links to the wider social framework, which are listed in the Table 1.

It is through these connections that government acquires the levers or instruments of economic policy. Clearly, these instruments cannot be operated in isolation from one another but are interdependent (e.g. providing industrial accommodation creates a demand for building

Table 1 The instruments of economic development

Social framework	Defence, property rights, law making and enforcement, cultural dispositions (e.g. entrepreneurialism, trust), housing, education, social security, family stability`
Physical infrastructure	Utilities (water, power, communications), commercial land and premises (e.g. science parks), highways, communications including transport networks and fibre optic networks
Factors of production	Plant, equipment, finance (debt, equity, grants, subsidies), technological knowledge, business information and advice, skills—in business, research and design, making, selling,
Factors of consumption	To boost demand in the economy, by producers and consumers, by the public or private sectors
Social capital	Vertical and horizontal collaborative relationships (e.g. 'triple-helix' brokerage) building and sustaining high-trust environments

services, and may draw firms into the area that will create a market for other businesses). In practice, different elements have been grouped together—whether for political, technical, or administrative reasons—forming policy patterns or modalities such as 'public enterprise' or 'industrial development'. The purpose here is to show how the different policy patterns that are acknowledged by practitioners are composed by drawing upon the range of instruments that are in principle available. Each category will be examined in more detail.

3.3 Social Framework

The disruptive economic effects of social disorder are especially apparent at certain times in history (civil war, organised crime, family breakdown, and anti-social behaviour). Governing authorities have contributed over the years to the development of the economy by establishing a degree of social order based upon policing, social security systems (which serve in part to pre-empt the disorder that would result from widespread destitution), medical services and environmental health provision (given the disrupting effects of mental illness, infectious diseases and epidemics, and uncollected waste). The legislative responsibilities of central government have established property rights, civil and criminal laws (commercial law, for instance, defines corporate status and limited liability), regulations that set minimum standards of business behaviour (e.g. regarding employment practices), criminal law and the prevention of corruption. More recently, authorities have contributed to an ordered community by providing housing and education services, and by supporting family stability.

3.4 Physical Infrastructure

A major contribution of authorities to the economy over the years has concerned physical infrastructure such as the provision of utilities, land and buildings. However, the nature of this contribution has necessarily taken different forms at different times. During the early phase of industrialisation in Europe, local and regional authorities undertake the provision of utilities—water, gas and electricity, transport—through a pattern of trading activity. During the Edwardian period in the UK local councils became indirectly involved in the provision of land by using the regulative powers available for town planning. In the 1920s and 1930s, and once again in the 1960s, British local authorities began to construct industrial sites and premises, and to promote these to attract mobile industries by way of industrial development committees and boards. They also developed tourist attractions and promoted these. In some cases local authorities have provided financial assistance—grants or loans or subsidies such as rent or rate relief attached to the offer of sites and buildings. In the 1980s and subsequently science parks and incubator units have continued to be built, as well as *grands projects* like Trans-European Networks and the Channel Tunnel.

3.5 Factors of Production

During the 1970s there was growing awareness on the part of government in Europe and the USA of the non-physical requirements of business, and in the 1980s some governing authorities began to provide specialist advisory services regarding particular issues (such as marketing) or the needs of particular sectors (such as motor vehicles or ethnic minority businesses). Here we see a decisive move towards the pattern of economic policy known as economic development. In some cases regional authorities developed light industrial units adjacent to the science faculty of the university, creating a 'science park' that was intended to enable technology to be transferred from research into business.

It has been argued repeatedly that enterprising companies are being starved of finance. In particular, it is argued that the clusters of business activities which thrive in certain areas depend upon a second tier of venture capitalists and consultants who facilitate the flow of resources (Kenney and Von Burg 1999). Without necessarily using their own funds, governing authorities can and have addressed this problem by bringing venture capitalists into their areas and arranging surgeries for these with entrepreneurs. Many authorities have also supported training schemes as part of an economic development programme, thereby helping to enhance the employability of unemployed people.

3.6 Factors of Consumption

National and regional agencies have sometimes used their purchasing power to supplement demand in the economy, diverting their own spending where possible towards local firms. This is very apparent in the use of defence contracts, for example, and high value engineering will benefit from high speed rail, nuclear power, renewable energy, and other large public projects. In the 1980s many local authorities sought to persuade companies to contribute to employment by making contracts for the purchase of goods or services conditional upon them doing so. For a century or more government at all levels have also attempted to bring demand into the area by attracting tourists, and this activity has taken off in recent years with municipal investment in major schemes that will appeal to visitors. At the same time authorities have recognised the importance of international tourism and now organise overseas promotions and business conferences. Inward investment can be attracted by creating the right macroeconomic and trading conditions and will be discouraged where these conditions are unhelpful.

3.7 Social Capital

The willingness of businesses within an area to link up with one another in supply/value chain relationships, partnerships, or collaborations of various sorts depends upon a flow of information against a background of networking experience and more particularly of mutual trust. It is generally recognised that trust represents a much more efficient way of handling transaction costs than contracts involving lawyers (Fukuyama 1995). Authorities may contribute to this by bringing potential collaborators together from (say) universities, enterprises, and venture capital or other sponsoring organisations in a manner that relates to what has been described as the triple helix (Etzkowitz and Leydesdorff 2000).

3.8 The Targeting of Policies

It is likely that the instruments of policy which have been identified above will be targeted, that they will be applied selectively within the economy to particular types of employing organisation. There are as many different ways of selecting targets as there are ways of classifying employers, but in practice authorities have used criteria such as:

- where employers are located (e.g. in the inner-city),
- company size or age (e.g. small firms, new firms, large overseas firms),
- sector (e.g. high value engineering; business services; motor vehicles; electronics) or cluster (e.g. life sciences or biotech),
- company form (e.g. private, mutual society, public limited, cooperative, community enterprise),
- race or gender of proprietors (e.g. ethnic minority business).

Business advice, for instance, has been tailored to the needs of cooperatives or of ethnic minority businesses, and whilst some governments have constructed whole strategies around assistance to the private sector others have focused upon the public sector or cooperative and community enterprise development.

4 The Dynamics of Industrial Policy

The next step in the development of this framework is to move from presenting a static homogeneous picture of industrial policy towards one that allows for dynamic change and heterogeneity. Two particular issues with which governments at every level are repeatedly preoccupied are the instability of economic progress over time from one year to the next and the unevenness of economic progress over space, from one place to another. Each of these issues has posed difficult problems for government to resolve.

4.1 Unstable and Uneven Development

Most economies experience fluctuations in activity over time, and over a period of perhaps 8 or 10 years it is generally possible to observe a cycle of business expansion and contraction. Typically, the business cycle involves the growth of activity to a point where further expansion is constrained by structural barriers of one sort or another (such as the quantity of available capital or labour) at which point inflation or balance of payments difficulties cause activity to slow down or to contract. Less typically, but more importantly since the 1980s, instability has also been associated with speculative investment bubbles fuelled by over-exuberance producing a series of Minsky Moments in which asset prices collapse and indebtedness rises to unsustainable levels. The regular business cycle is therefore now combined with a more erratic cycle of speculative bubbles and credit crunches, affecting different sectors. In 2007, for example, we saw the culmination of such a speculative housing bubble facilitated by low interest rates and the securitisation of mortgages in the USA, followed by a classic Minsky Moment in which the international banking system froze and nearly collapsed, and sovereign debt rose to new highs. This required massive government intervention including taking-over banks and insuring private savings.

In Britain, Europe, and the USA there has also been a tendency over the years for economies to develop unevenly from one place to another, with some nations, regions, and districts growing ahead of the whole, whilst others lag behind to greater or lesser degrees. This unevenness reflects differences in the conditions which are encountered by businesses in different places. Locations vary, for instance, in the access they offer to raw materials, skills, sources of finance, and markets for finished goods and services. There is often unevenness at the sub-national level between faster- and slower-growing regions, and the composition of the economy can be an important factor here. Jane Jacobs has, for example, stressed the virtues of each region or city containing a related variety of sectors—not too homogeneous, not too heterogeneous—as a basis for sustained growth (Jacobs 1972; Cooke and Leydesdorff 2006). There is also unevenness within regions between inner-city, suburban, and rural areas. Inner-cities and urban areas even within prosperous regions may have depressed conditions compared to surrounding small towns, suburbs, and rural areas. It has been argued that this reflects the constraints upon living and working in these areas, the differential availability of entrepreneurial skills, or of suitable sites for expansion or modernisation.

The pattern of unevenness across a nation evolves over time as the constraints upon business activity change, and as companies have encountered new patterns of demand in product markets. Improvements in electricity supply, transportation, computers, and telecommunications, for instance, have given firms more choice about location, allowing them to move nearer to consumers, or closer to administrative and governmental centres, or into areas where labour is cheaper and the environment more congenial. These changes have also given larger multi-plant firms the flexibility to establish a spatial division of labour, to move their activities from one area to another as conditions fluctuate, and to respond to recession by withdrawing investment altogether from those places where production is more costly or less efficient. These processes have important consequences for the well-being of communities, allowing the physical environment and standard of living to fall below the national average in depressed areas, causing problems of overheating and congestion in areas that are growing too quickly (Harvey 2007). It also has implications for the well-being of businesses, allowing some to benefit from external economies, whilst others fail to do so, or suffer adverse external economies. There is also a connection between instability and unevenness. When the economy is in a downturn phase it is often (but not always) the areas which are already depressed that experience the greatest contraction in activity, and those that are affluent which experience the least.

4.2 Centralisation, Fragmentation, and Decentralisation

Since the early 1930s there has been a continuous centralisation of control over sub-national authorities in the UK, over their structures, resources, operations, and functions, and this process has modified the relationships between authorities and their economies by redirecting these through the apparatus of national or supra-national government. One of the purposes—and benefits—of this centralisation has been to compensate sub-national authorities for economic unevenness, dampening the fiscal impact of economic change by drawing upon resources that have been pooled at the centre. From the point of view of national or federal government, another benefit has been the ability to target redevelopment resources where they are needed most, or will do the most good, and at the same time to draw sub-national expenditures into the framework of national fiscal and monetary policies.

One of the drawbacks of centralisation, however, is the danger of diminishing the responsiveness of government to the needs and interests of businesses and communities. It is to reduce this danger that the influence of national or supra-national government has over the years been channelled through centrally appointed regional offices, or regional development agencies (Collinge and Srbljanin 2002). Indeed, reviews of sub-national economic development and regeneration by national government have pointed towards a greater role for sub-national agencies in the development and delivery of economic policies. So although it is now mediated via a multi-scalar hierarchy, the interdependence of governments and economies continues to the present day, with sub-national agencies dependent upon their economies, and businesses requiring government assistance from one level or another. Indeed, by increasing the role of the market in government functions, and by strengthening the role of partnership in the provision of services, central government has in many ways reinforced the integration and interdependence of governance and the economy.

4.3 European Integration and Globalisation

These processes of centralisation must themselves be placed in a wider geopolitical context by observing that they do not end at the national borders. A major factor has been European integration which continues around the euro despite recent growth in protectionist and nationalistic tendencies. A similar increase in the exposure of places—economies and authorities—to external influences has been occurring under the process of globalisation. The UK government has been a particular champion of globalisation since the 1980s, as can be seen in the restructuring of the City of London that occurred under the heading of the Big Bang in 1986. During the Big Bang a restructuring of the London stock and bond markets was combined with the introduction of a new light-touch approach to regulation, and an openness to foreign banks and to the concentration of finance capital internationally. At the same time many building societies were demutualised and began to adopt a more aggressively speculative approach to borrowing and lending. All of this itself took place against a background of increased international capital flows and the removal of national restrictions upon these flows that was overseen by the World Trade Organisation (Epstein 2005). The effect was to strengthen the competitive position of the City of London during the 1990s, turning it into the world's most important banking centre, and paving the way for a long period of great prosperity for city workers, for parts of Greater London, and for the wider region of the south east. At the same time, through its focus upon investment in international equity and currency markets, and more recently upon the housing market and upon mortgage-backed securities, this process did little to support domestic activity in midland and northern regions, and may even have harmed manufacturing through its impact upon the sterling exchange rate.

4.4 Growth Management and Growth Promotion

As regards overtly economic policies, for over a century governing authorities in developed economies have been devising ways both to manage economic growth and to smooth the process of economic transformation or decline. During periods of economic growth, authorities must manage this growth and the demands that it imposes upon overheating markets—labour and capital, land, infrastructure and property markets—through the various levers at their disposal. Such *growth management* strategies will (depending upon circumstances) use levers that include the expansion of education and housing provision, the expansion of development control, and the proactive investment in office and factory accommodation. In extreme circumstances they will include tight planning restrictions and the diversion—deliberate or otherwise—of economic growth towards less favoured areas. The land use planning functions of government fall largely into this category, being used by authorities particularly during periods of economic growth to channel and to contain development pressures (Hall et al. 1973). During periods of economic recession, however, this regulatory function has been complemented by—or in some cases absorbed into—more active economic policies that look for ways of positively supporting enterprise, the workforce, and the wider community. Such *growth promotion* strategies involve a switch away from the management of overheating towards industrial promotion and economic development, with a commensurate switching of staff away from development control towards economic policy. Given enduring patterns of uneven development, with some regions growing quickly whilst others are restructuring or contracting, we can indeed find both approaches operating simultaneously across a country, with some authorities (typically in more prosperous areas) emphasising *growth management*, others (typically in less prosperous areas) engaging more directly and over the longer term in *growth promotion* (Collinge 1992, 1999; Collinge and Mawson 1994).

The uneven nature of economic growth across any territory means that it is possible, depending upon circumstances, to promote growth or to reduce contraction, in places through judicious promotional activities backed up with infrastructure initiatives, and through direct investment (whether foreign or domestic, whether private or public sector, and including capital spending by the authorities themselves). There are two aspects to growth promotion:

- In what might be called the *recession management* arm of this strategy, there are concerns to defend existing capacity in preparation for a future recovery in the economy. Capacity will be defended by supporting threatened sectors—manufacturing or services—through rent and tax relief, through assistance in addressing problems including financial problems or help with lobbying. Capacity will also be defended by supporting threatened workers with the preservation of employment, with preservation and extension of skill levels (including the development of entrepreneurialism), and perhaps through intercessions with creditors of one sort or another (e.g. landlords) where this is possible. At the same time the social capital of the place must be preserved by supporting employment, encouraging employers—including the authority itself—to retain their workforce, and the maintain the general appeal of the area.

- In what might be called the *restructuring* arm of this strategy, the overall mix of the economy—its vulnerability and resilience—will be reviewed and efforts will be made to secure a sounder balance for the future. The sectoral or cluster focus will be upon certain nascent activities, upon building up social capital in the form of sectoral or cluster organisation, and (perhaps) upon intervention in the supply of entrepreneurs, venture, and development capital through (for example) advice and brokerage schemes of one sort or another. The other side of this coin will particularly focus upon skill development. It is possible to envisage the promotion of high value engineering skills and activities as contributing to this restructuring. Indeed, engineering skills and associated inward investment have been promoted over recent years as ways of reversing economic decline.

Needless to say, each of these strategies will be modified according to circumstances and pursued within the limits of authority powers and budgets.

5 Conclusions

Government at the national and other levels has responded to the requirements of business by providing or supplementing the social and economic conditions for economic development. It has also responded to the pressures associated with instability and unevenness by relating its economic policies to variations in performance over time and between locations. Strenuous efforts are made nationally, for instance, to moderate and to manage the business cycle in order to achieve sustained growth, and one way or another, authorities have been drawn into this process.

Efforts have also been made to support existing industries in depressed areas, to attract investment or customers to these areas, and to contain and channel growth in more prosperous parts of the country especially when there is a danger of overheating. In this chapter a framework has been presented to show the range of policy options that are available to governments and their agencies—whether liberal market or coordinated market economies—at different spatial scales, and during different episodes in their economic development. Depending upon the circumstances, these policies can be selected and targeted to achieve the promotion of high value engineering.

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