British Industrial Policy

Jeffrey A. Hart

in Claude E. Barfield and William A. Schambra (eds.), The Politics of Industrial Policy (Washington: American Enterprise Institute, 1986)

> *[In Britain] industrial policy is largely reactive. The management of industrial crisis in Britain tends, therefore, to comprise a set of negatives. On the government's side, there are no regional programs for industrial adaptation, no anticipatory loan financing—only rudimentary sectoral reconstruction—and no lame duck rescue agency (the IRC and NEB were both formally concerned with "viable" enterprises).*[1]
>
> *Industrial policy in Britain on the whole has been characterized by its liberal, voluntarist, and cooperative approach.*[2]

The British approach to industrial policy combines an overall market-oriented mythology with several poorly coordinated attempts at centralized administrative guidance. The key to understanding British industrial policy is understanding the general weakness of British firms in international competition. The reaction of the state to this generalized weakness has taken many forms, most of which have not been considered worthy of permanent institutionalization nor of generalization to or rationalization at the level of the whole economy. The generally ad hoc or reactive nature of industrial policy in Britain before the early 1970s came at a high cost. The state had to become more interventionist than anyone except the most ardent socialists ever intended. Even British conservatives, like Margaret Thatcher, have had to yield to the pattern of the past in dealing with industrial crises, despite their belief in the benefits of privatization, deregulation, and competition. The main difference between the United States and Britain is not in the mythology but in the practice, and the practice has been primarily the result of the state's belated response to weakness.

This chapter was written for presentation at a conference on industrial policy at the American Enterprise Institute, Washington, D.C., October 1, 1984, organized by Claude Barfield. Thanks are due to John Freeman for his extensive comments on that version of the chapter. Further helpful comments were provided by Claude Barfield and Howard Wiarda. The current version was written in April 1985.

The lessons that the United States can learn from the British example therefore are mainly those having to do with successful and unsuccessful modes of coping with the weakness of specific industries and firms in states with a tradition of decentralized authority for industrial policies. In this respect, the British case offers examples all along the spectrum of failure-success. Only in the past two years or so can one even vaguely identify British steel policies as realistic (it is hard to call the consequences of rapid rationalization "success"); but British policies toward the microelectronics industry have resulted in the nurturing of at least one enterprise, Inmos, which has become one of the few truly innovative European firms in that industry. The subsequent privatization of Inmos may be considered scandalous; but its creation and early growth were no mean feats, given the intense international competition in microelectronics. As in the discussion of other large industrial countries, this chapter will combine descriptions of overall economic and industrial policies in both crisis and noncrisis periods with a more detailed look at policies in specific industrial sectors. The three sectors to be singled out (for reasons spelled out later) are steel, automobiles, and information technology.

Organization of the State

The British government is at first glance well equipped with formal institutions for the making and implementation of industrial policy, but in fact the power for making economic policy generally is quite widely distributed among various conflicting agencies. The most important actors are (1) the prime minister and his/her cabinet, (2) the chancellor of the Exchequer (henceforth the Treasury), (3) the Department of Trade and Industry, (4) the National Economic Development Council and related agencies, and (5) the British Technology Group (and its predecessors the Industrial Reorganization Corporation and the National Enterprise Board).

The Treasury. The advantage of the Treasury in industrial policy formation is its connection with the Bank of England, which makes it authoritative on questions of government financing of industrial projects. In the 1975 reorganization of the Treasury, an Industrial Policy Group, headed by the undersecretary of the Treasury, was formed. Although this group survived the change in government in 1979, it was not much used by Sir Geoffrey Howe, the first chancellor of the Exchequer in the Thatcher administration. Its main function is to monitor the expenditures of the Department of Trade and Industry. The Industrial Strategy Staff Group, an interministerial group, is chaired by the representative from the Treasury and includes representatives of other ministries, the Confederation of British Industries (CBI), the Trade Unions Congress (TUC), and the National Economic Development Council. This group

functions mainly to discuss the industrial consequences of government regulation.[3]

The Department of Trade and Industry. In 1964 the Labour government created a Department of Economic Affairs (with an industrial policy division) to formulate and implement a national plan and a Ministry of Technology to deal with what Harold Wilson called the "white heat" of the technological revolution in industry. With the demise of the national plan in 1966, the Ministry of Technology was upgraded and the Department of Economic Affairs downgraded. In 1969 the Ministry of Technology absorbed the Ministry of Power, and some of the responsibilities of the Board of Trade were shifted to it. In 1970 the Conservative government merged the Board of Trade and the Ministry of Technology into the Department of Trade and Industry.

The Department of Trade and Industry was divided into a Department of Trade and a Department of Industry by the Wilson government after the election of 1974. The Thatcher government reunited the two departments again in June 1983. The Department of Trade and Industry is organized primarily along sectoral lines, employing experts in each major branch of industry to monitor developments, to administer aid programs, and to provide the minister with proposals for policy initiatives. The Department of Trade and Industry by its very nature is a highly politicized agency providing one of the more important conduits for the expression of the interests of manufacturing firms and unions to the government.[4]

The Department of Industry was responsible for managing the government interests in British Steel, the Post Office (and later British Telecom), British Leyland, Rolls Royce, British Aerospace, and the National Enterprise Board. It was therefore the locus of many important industrial policy decisions. Nevertheless, it played a subordinate role generally to the Department of the Treasury in overall economic policies and was often challenged and overruled by other agencies. Industry generally adopted a quasi-protectionist perspective while the Treasury traditionally defended the value of the pound on international currency markets and the Department of Trade perceived itself as the principal "guardian of free trade" within the British government. The merger of Industry and Trade by the Conservative government in 1979 was probably designed to rein in the protectionist tendencies of Industry.[5]

The National Economic Development Council. The National Economic Development Council (NEDC) was established in 1962 by the Conservative government during a period of slow economic growth. It has a somewhat complex organization. The council itself is a broad overarching body to summarize and reconcile the work of the ten Economic Development Committees (EDCs) and the thirty Sector Working Parties (SWPs) with the help of the secretariat-like National Economic Development Office (NEDO). At every

level of the NEDC (except the NEDO) there are representatives of the government, the trade unions, and management. At the council level, the trade unions are represented by the TUC while business is represented by the CBI. These are the most important national union and business organizations. The main animus behind the NEDC-NEDO-SWP complex is the belief that getting government representatives, union leaders, and firm managers together periodically for an exchange of views is valuable. Andrew Shonfield criticized the government's role in NEDC as being too close to that of management and labor: "It behaved as if it were an interest group arguing its case with equal partners who were expected to have other interests."[6] Gerald Dorfman called the complex the "institutionalized re-creation of pluralistic stagnation."[7] It was clearly one of several concertative arrangements set up by the British state to provide channels of access for labor and management to industrial policy making.

The SWPs (also called "little Neddies") produce documents periodically summarizing the status of their particular sector and recommending a set of governmental policies to improve that status. The SWPs represent firms that account for roughly 40 percent of total manufacturing production.[8] As Wilks argues, "Governments in practice have been reluctant to abolish the 'talking shop' of the NEDC, which supplies one of the few arenas for consensus generation."[9] In addition to consensus building, the NEDC provides an alternative way of obtaining information about industries to the more traditional, bureaucratic model provided by the Department of Trade and Industry. By the same token, it is more suited to industrial lobbying because of the direct role taken by industrial representatives on SWPs and the NEDC itself.

The British Technology Group. The British Technology Group (BTG) is the latest incarnation of a series of quasi-governmental entities designed by the British government to promote the growth of high-technology concerns. The first in the line was the Industrial Reorganization Corporation (IRC), which was set up in 1966 with an initial capital fund of £150 million. The IRC was active in the 1960s but was abolished by the Conservative government after the 1970 elections in its "u-turn over industrial policy."[10]

In 1975 the Labour government established the National Enterprise Board (NEB) as a state-owned holding company for the management of state-owned enterprises. Members of the board were to be appointed by the secretary of state for industry, with chairman and reporting chairman to be selected from the private sector. There were to be eight or nine other members, four of which were to be selected from the trade unions. The initial borrowing authority of the NEB was £1 billion. The authorizing statute for the NEB was the 1975 Industry Act, which instructed the NEB to promote "industrial democracy" while also achieving a high (15–20 percent) return on its investments. The NEB was unable to do either; it focused primarily on promoting

TABLE 1

ASSETS, RETURN ON ASSETS, AND NUMBER OF COMPANIES MANAGED BY THE NATIONAL ENTERPRISE BOARD, UNITED KINGDOM, 1976–1979

Year	*Assets* (millions of £)	*Return* (%)	*Number of Companies*
1976	959	11.8	13
1977	1132	11.4	33
1978	1576	11.3	46
1979	1502	4.8	68

SOURCE: Wyn Grant, *The Political Economy of Industrial Policy* (Woburn, Mass.: Butterworths, 1982), p. 105.

the growth of high-technology firms that had difficulty getting private financing. Of course, it inherited from the Department of Industry the task of managing the government's interests in British Leyland, and this job distracted the NEB somewhat from its activities in other areas. Nevertheless, several of the NEB's firms did respectably, and it was able to obtain a reasonable return on its investments, given the general background of recession and decline (see tables 1 and 2).

The initial portfolio of the NEB included 10.1 percent of the shares of British Leyland, Britain's largest automobile firm; 50 percent of the elec-

TABLE 2

NATIONAL ENTERPRISE BOARD SHAREHOLDING, UNITED KINGDOM, MARCH 1976

Company	*Business*	*NEB Share* (%)	*Cost* (millions of £)	*Date Acquired*
British Leyland	automotive	98.9	695	Feb. 1976
Cambridge Instruments	electronic	79.7	6	Feb. 1976
Albert Herbert	machine tools	100.0	36	Feb. 1976
Rolls Royce	jet engines	100.0	203	Feb. 1976
Brown Boveri	engineering	20.0	3	Mar. 1976
ICL	computers	24.4	12	Feb. 1976

SOURCE: Michael Parr, "The National Enterprise Board," *National Westminster Bank* (February 1979), p. 55.

TABLE 3

INVESTMENTS BY NATIONAL ENTERPRISE BOARD–BRITISH TECHNOLOGY GROUP, UNITED KINGDOM, 1980
(millions of £)

Firm	*Business*	*Amount*
Inmos	semiconductors	21.0
NEXOS	office automation	16.0
Cambridge Instruments	electronics	15.0
Data Recording	electronic equipment	15.0
Wholesale Vehicle	leasing	11.0
British Underwater	engineering	7.0
United Medical	medical	6.0
Argon Viewdata	teletext	4.5
Insac	software	4.0
Monotype	printing	3.5
QI Europe	NA	2.0
Total		105.0

NOTE: NA = not available.
SOURCE: Michael Davenport, "Industrial Policy in the United Kingdom," in F. Gerard Adams and Lawrence R. Klein, eds., *Industrial Policies for Growth and Competitiveness: An Economic Perspective* (Lexington, Mass.: Lexington Books, 1983), p. 345.

tronics firm, Ferranti; and 25 percent of the shares of Imperial Computers Limited (ICL). NEB was responsible for setting up two high-technology firms in the late 1970s: Nexos and Inmos. Nexos was supposed to develop a line of office automation software while Inmos was charged with the development and production of advanced semiconductor devices.

The Labour government also established an Advisory Council for Applied Research and Development (ACARD) to advise the cabinet on policies to promote research and development. One of the first major recommendations of ACARD was to centralize decision making in the area of information technology. In 1980 the Thatcher government created a minister of state in the Department of Industry to deal with information technology.

The Thatcher government abolished both the IRC and the NEB in 1979 and replaced them with the BTG. Management of British Leyland was taken away from the BTG and given back to the Department of Industry in the 1981 Industry Act.[11] The Thatcher government announced a general policy of privatization, which in this case translated into the selling of state-owned shares of private companies. In 1980, for example, the government sold its interest in Ferranti for $75 million. Even the Thatcher government, however,

saw some value in continuing to promote high technology through the BTG, as table 3 demonstrates.[12]

Wyn Grant suggests a reason for the Thatcher government's acceptance of the BTG: "The NEB as an organization is particularly suited to pursuing those industrial policy objectives concerned with efficiency and international competitiveness, rather than the employment objective which necessarily looms large in regional policy."[13]

Competition policy in the United Kingdom, as in most other large industrial countries, is rather weakly enforced. The Monopolies and Mergers Commission is the main responsible agency; but many major mergers have been actively promoted by the state (especially in the days of the IRC), and few mergers have been referred to the Monopolies and Mergers Commission for rulings.

Organization of the Interests

Labor is relatively powerful in Britain and is roughly comparable to labor in Germany in its influence in policy formation and implementation. The formal organization that aggregates labor interests is the TUC, a confederation of 112 unions organized mostly along craft rather than industry lines. Connections between the TUC and the Labour party are quite close (as in the case of the Deutsche Gewerkschaftsbund—especially the IG Metall—and the Social Democratic party (SPD) in Germany). Labor has consistently supported initiatives in the past two decades to institutionalize industrial policy making. In 1980, for example, the TUC–Labour party Liaison Committee advocated an expanded industrial policy based on a combination of comprehensive planning, an upgraded NEB, establishment of a National Investment Bank, and greater use of import controls.[14] To those who have followed the recent pronouncements of the AFL–CIO and the Democratic party, these policy proposals will sound quite familiar. Partly because labor is powerful, the state is organized to incorporate labor views in economic and industrial policy making but also to insulate certain areas of policy (especially macroeconomic and trade policy) from too much influence.

Business is represented primarily by the CBI, which aggregates the views of industry-specific associations with some tendency to weigh more strongly the views of the largest and most profitable firms in Britain.

Britain's merchant banking system has prevented the emergence of the kind of bank-manufacturing alliances that exist in Germany. The British system lacks the extensive system of personal contacts, close supervision of financial accounts, large shareholdings in specific firms, and bank memberships on supervisory boards of firms that typify the German system. The Bank of England plays a coordinating role in crises, and, increasingly, large banks like Barclays and Midland participate in rescue operations as lead banks; but Britain is still far from the so-called universal banking of Germany.[15]

The Evolution of Industrial Policy

The politics of industrial policy in the United Kingdom might seem at first glance to be primarily an outgrowth of interparty rivalry. The Conservative party and its allies are ideologically hostile to industrial policy. For example, in a 1977 policy document of the Tories, the following statement can be found:

> Should government have an industrial policy at all . . . ? Of course government must have an economic policy . . . but an economic policy that is not primarily directed to creating the conditions in which wealth-creating industry . . . can develop and flourish is bound to fail. An "industrial policy" which consists largely of interference, tinkering, and providing palliatives for structural defects is no kind of substitute for it.[16]

Despite the general ideological hostility to industrial policy, several Conservative governments have found themselves faced with decisions to accept forms of government intervention or to suffer major political costs. Although in some cases they still chose the more politically costly noninterventionist path, a sufficient number of exceptions made one question the firmness with which Conservatives were likely to pursue their preferred policies.

One example would be the passage of the 1972 Industry Act by a Labour-dominated Parliament and its acceptance by subsequent Conservative governments. The 1972 act gave wide latitude to the Department of Industry in dealing with governmental rescues of large private concerns. It also established a set of industrial development advisory boards, which were essentially corporatist institutions to help the government arrive at goals for industrial policy. This idea was quite consistent with the economic policy policy goals of the Heath government.[17]

Another example of Tory industrial policy initiatives is the Finance Act of 1972. That piece of legislation established a system of accelerated depreciation of all investments in new plants and equipment (see table 4). An allowance of 54 percent of the value of investments was permitted in the first year and 4 percent in subsequent years.[18] Thus Conservatives had accepted both concertative and supply-side investment policies in the early 1970s, policies that were also acceptable to the Labour party.

The Thatcher government, admittedly, came into office with a greater determination than earlier Conservative governments to undo the interventionist and statist policies of the previous Labour governments. Even they, however, did not insist on the rapid privatization of state-owned companies, nor did they abandon the institutions set up in the late 1970s to promote high-technology industries:

> Sectoral policies in Britain have been embraced by both sides of the equation. The Thatcher government is belatedly financing micro-

TABLE 4

ESTIMATED REDUCTION IN BRITISH CORPORATION TAXES DUE TO 1972 FINANCE ACT, ALL MANUFACTURING, FISCAL YEARS 1974–1982 (millions of 1985 £)

Fiscal Year	*Amount*
1974/1975	1450
1975/1976	2090
1976/1977	2060
1977/1978	2650
1978/1979	2800
1979/1980	2810
1980/1981	3220
1981/1982	2285

SOURCE: Department of Industry, as cited in Michael Landesman, "The Effects of Industrial Policies in the U.K., 1973–1981," paper delivered at a conference on industrial policies and structural adaptation, ISVEIMER, Naples, April 21, 1983.

> electronics, information technology, and robotics on the one hand, and successive governments have facilitated planned rationalization in textiles, steel and other declining sectors on the other.[19]

The Labour party, on the other hand, has not always been a bastion of support for government intervention generally and industrial policy specifically. The left wing of the Labour party and their allies in the trade union movement have long supported a socialization of production through state investment and other forms of governmental participation in the economy. Disillusionment with the national plan experiment in 1964 and with Tony Benn's stab at industrial policy making in 1974–1975, however, forced party leaders to reformulate their views.

Labour's shifting perspective on industrial policy is best seen by considering the following three periods: (1) 1964–1970, (2) 1975–1979, and (3) 1980 to the present. In the first period, the Labour government of Harold Wilson tried to formulate and implement a national plan, but the devaluation of 1966 ended that experiment and gave further impetus to alternatives to planning, especially government support for research and development and the establishment of concertative bodies for specific industrial sectors within the framework of the NEDC. In this case, macroeconomic realities imposed themselves in such a way as to disillusion moderate members of the party from traditional socialist approaches to economic policy.

In the second period, another leftist experiment—this time focusing on the promotion of state enterprises under Tony Benn's management of the

Department of Industry—ended badly, thus creating the basis for further policy experimentation and ideological revisionism. The prime minister personally took charge of preparing the 1975 Industry Act, in part a reaction to the Conservative's 1972 Industry Act, and was influenced in this by a socialist economist named Stuart Holland. The 1975 act established the NEB (its main lasting achievement), reduced the protectionist and interventionist elements of the earlier act, and helped to create the basis for a new agency to encourage foreign investment in the United Kingdom. Also, Tony Benn was replaced as minister of industry by Eric Varley, a man much more in line with the prime minister's way of thinking.[20]

Also in this period, the Labour government implemented an Accelerated Projects Scheme. Between April 1975 and June 1976, this program funded 111 projects with £72 million in direct assistance and £568 million in project costs. The main idea was to use the state to encourage investment in areas that the state deemed important (a sort of "pick the winners" state investment policy). This project was succeeded in 1976 by the Selective Investment Scheme (SIS), which was designed to attract both domestic and foreign private investment in the United Kingdom.[21] By June 1979 SIS had received 742 applications and by March 1980 had offered £106.5 million to 166 projects and allocated £1 billion for future investments. Compared with the tax benefits given to manufacturing in the 1972 Finance Act, the SIS looks extremely small.

In 1978 the Labour government was confronted with the imminent collapse of the Chrysler (UK). This crisis will be discussed at greater length below under the head of policies toward the auto industry. The important point for now is that the Labour government used Section 8 of the 1972 Industry Act to justify its expenditure of public funds to prevent the liquidation of Chrysler (U.K.). This part of the act left the handling of the state's participation in financial restructurings of "major" enterprises on the brink of collapse to the discretion of the chancellor of the Exchequer. It was included in the 1972 act because of the difficulty that previous governments had had in passing enabling legislation for earlier restructurings—Rolls Royce being the main exemplar. Industrial assistance to the private sector (mostly to prevent firm failures) under sections 7 and 8 of the 1972 Industry Act grew sharply from 1975 to 1979 (see tables 5 and 6).

The misfortune of Labour was that many of these otherwise well-designed and probably intelligent programs came under the scathing criticism of the Conservatives as, mostly in desperation, the Labour government used them increasingly to bail out failing firms in the late 1970s. A careful analysis of the distribution of funds shows a decided tendency to favor mature and declining industries at the expense of the more buoyant.[22] The Conservatives came into office in 1979 with the goal of undoing much of the Labour government's innovations, and they immediately closed down SIS. They also

TABLE 5

GOVERNMENT ASSISTANCE TO PRIVATE SECTOR INDUSTRY, UNITED KINGDOM, FISCAL YEARS 1972–1979
(millions of 1979 £)

Budget Category	*1972/ 1973*	*1973/ 1974*	*1974/ 1975*	*1975/ 1976*	*1976/ 1977*	*1977/ 1978*	*1978/ 1979*
Regional development grants	610	560	500	450	420	340	350
Section 7 of 1972 Act + NEB + Local Authority Act	50	80	120	550	330	480	360
Shipbuilding Aerospace and R and D	520	600	630	500	290	30	70
Total	1180	1240	1250	1500	1040	850	780

SOURCE: Grant, *The Political Economy of Industrial Policy*, p. 53.

converted the NEB into the BTG and gave the BTG the task of privatizing the industries under its control. The Conservatives did not undo everything. They did not insist on the immediate privatization of the holding of the BTG (to have done so would have been foolish). They kept the Labour government's schemes for promoting the microelectronics industry: the Microelectronics Industries Support Program (MISP), the Microprocessor Applications Project (MAP), and the Product and Processors Development Scheme (PPDS). Although these were relatively small programs, they helped make British manufacturers more aware of opportunities for applying microelectronic technology. There was a doubling of government spending for microelectronic R and D between 1978–1979 and 1979–1980.[23] Also the programs continued to use the economic development committees and sector-working parties set up by Labour under NEDC in the 1970s (especially as they had fewer direct political links to the trade unions).[24]

The Thatcher government shifted away from sector-specific policies back to the more traditional regionally focused policies of dealing with the effects of industrial decline: In December 1979, they designated several new areas as "special development areas," which made them eligible for Regional Development Grants.[25] Also, the Thatcher government implemented a new program of designating enterprise zones that could qualify for special government grants to local governments to upgrade buildings for use in attracting new investment or to purchase shares of local firms undergoing financial difficulties.

The Thatcher government, like some previous governments, had to face several industry crises: in steel, computers, and automobiles. Thatcher's chancellor of the Exchequer, Geoffrey Howe, was decidedly lukewarm on industrial policy as was her first minister of industry, Sir Keith Joseph. The

TABLE 6

DIRECT GOVERNMENT SPENDING FOR INDUSTRIAL POLICY, UNITED KINGDOM, 1981–1982
(millions of £)

Department	*Amount*
Department of Industry	
Regional Development	695
Science and Technology Assistance	212
Selective assistance to firms	62
NEB/BTG	41
Support for	
British Leyland	620
Rolls Royce	193
Steel	100
Shipbuilding	82
Concorde	32
Other Departments	
Northern Ireland	403
Scotland	180
Wales	104
Department of Energy	292
All Others	67
Total	3083

SOURCE: Wyn Grant and Stephen Wilks, "British Industrial Policy: Structural Change, Policy Inertia," *Journal of Public Policy*, vol. 3 (February 1983), p. 21.

subsequent minister of industry, Patrick Jenkins, was more pragmatic, however, especially with respect to the continuing rescue efforts for British Steel, British Leyland, and ICL.[26] The Thatcher government's desire to extricate the government was expressed fully in the cases of Laker and DeLorean motors but was not allowed to get in the way when these larger crises occurred.

Thus, although some reversals have occurred as one government has succeeded another, the general pattern seems to be one of growing mutual acceptance on the part of Labourites and Conservatives of a policy that rescues large failing firms deemed crucial to the overall economy, provides investment capital and other support for high-technology industries (especially microelectronics), manages the state's portfolio primarily with an eye to obtaining a reasonable return on investment (except in the case of major rescues), and otherwise leaves industry pretty much to the private sector. The two parties have both accepted the continuing decentralization of administrative authority over industrial policies. While there was oscillation over the merger of trade and industry ministries, authority remained essentially fragmented with Trea-

sury maintaining a great deal of veto power over the actions of the Department of Industry, the NEB, the BTG, and other such agencies. Concertative mechanisms for bargaining with and obtaining information from employer and union interests have persisted since their introduction in the 1972 Industry Act. Thus much continuity, a recognizable pattern, exists in British industrial policy of the past decade and a half.

I turn now to a closer examination of British industrial policies in specific sectors. The three sectors to be examined are steel, automobiles, and information technology (with a special focus on semiconductor components). These sector-specific cases will help to establish further the existence of continuity in British industrial policy. The examination of sector-specific crises demonstrates the reactions of the government to crisis. Differences across sectors will be investigated, especially those differences that concern the dynamism (potential for growth and technological change) and internationalization of firms in the sector.

Policies for Steel

British steel policies must be viewed in light of the general global overcapacity problem in the world steel market. Britain, like many other countries, had to manage the shrinkage of its steel-making capacity, especially in the late 1970s and early 1980s, because of recession, the decline in the demand for steel exports, and the reduced use of steel in manufacturing generally. The British steel industry in the middle and late 1970s was more of a disaster than that of other countries because of a major push to increase capacity just when demand took a major downturn. British policies of the early 1980s were much more realistic and effective than those of the 1970s. So the overall story is one of painful learning.

The problem begins after World War II. The British steel plants had done yeoman service during the war, but they were growing obsolete. Britain had many relatively small steel firms, most with very old plants. The macroeconomic policies of British postwar governments in maintaining a high value of sterling relative to other currencies had a dampening effect on the competitiveness of British exports, from which the British steel industry, like all the others, suffered to some extent. In addition, the management of the British steel industry was relatively conservative. When the Japanese and German steel industries were rapidly adopting new technologies, like basic oxygen furnaces and continuous casting, the British industries stuck with open hearth furnaces and an emphasis on liquid steel processing.[27]

Nationalization of the Steel Industry. Leftists in the Labour party focused on the steel industry as a key to their efforts to socialize the economy. In 1950 they nationalized the industry, but in 1953 the Tories denationalized it. This early attempt must have had the effect of discouraging private investment in

the industry. After fourteen years of sluggish performance, the Labour government renationalized the industry again in 1967—Labour took that long to regain a majority in the House of Commons. Fourteen of the largest bulk steel producers were consolidated into a state enterprise called the British Steel Corporation (BSC). BSC controlled 92 percent of British steel production and was at the time the third largest producer of steel in the world (by weight). It employed 270,000 people and produced 23.3 million tons of steel in its first year of operation.[28] There remained 210 private steel firms in the domestic market, most of which were quite small. Only two relatively large firms were left to compete with BSC: GKN and Johnson Firth Brown.[29]

In 1967 BSC steel relied on open hearth furnaces to produce 57 percent of its raw steel (a rather high percentage compared with Germany and Japan, but not too different from the United States). Subsidization of the industry began in earnest in 1968. The BSC had inherited plants on more than sixty major sites. Many of these were in bad shape. Nevertheless, the first financial task was to pay for the nationalization itself. The BSC found itself owing the former shareholders a debt of around £1.2 billion. The British government helped to pay this debt by passing the 1969 Iron and Steel Act, which wrote off some of BSC's debts and made up the difference with public revenues in the form of government loans. Subsidies subsequently took the form of a policy of forgiveness in repaying the dividends for those loans (called public dividend capital).

New Investments Create Overcapacity. In 1970 the newly elected Conservative government contemplated splitting BSC into two smaller firms but decided instead to undertake a careful study of the industry and BSC's prospects. This study resulted in a white paper published in 1973 calling for a "Ten Year Development Strategy" for steel. A £3 billion expansion program was suggested for the modernization of old plants and the construction of five modern facilities to raise steel-making capacity to 30 million tons per year (about double the current level). The basis for this recommendation was the belief on the part of the Department of Trade and Industry staff that demand for steel both domestically and in export markets was rising rapidly and that BSC had an excellent opportunity to profit from that increasing demand by modernizing and augmenting its productive capacity.[30] Although BSC's profits had been low, its early problems might have been due more to price controls imposed by the Iron and Steel Board than to inherent deficiencies in the firm itself.

In retrospect, the stupidity of this plan is crystal clear. Yet one must recall that the early 1970s was a time of economic boom and of shortages of raw materials. When demand for steel slumped after the 1973 OPEC price increases (in the United Kingdom demand dropped from 19.5 million tons in 1973–1974 to 15 million tons in 1974–1975), the foolishness of expansion

became evident, and the newly elected Labour government scaled back the size of the expansion. Unfortunately, the damage had already been done. BSC had begun to build major facilities at Scunthorpe, Lackenby, Ravenscraig in Scotland, and at Llanwern and Port Talbot in South Wales. Once begun the building was hard to stop because both parties had to satisfy important political constituencies and because British leaders were constantly aware of the threat of devolution of Scotland and Wales.

The result of the building of the new facilities were overcapacity. The new plants helped Britain become less reliant on domestic ores and coking coals (more expensive than and inferior to imports) because they were coastal. They should have allowed BSC to take advantage of the economies of scale available to plants using the basic oxygen process; however, these particular plants were scaled down to a size somewhat smaller than that required to realize maximal economies of scale—primarily for political reasons. Nevertheless, the new plants were sure to result in greater productivity, lower energy costs, and generally more internationally competitive production. Unfortunately, the stagnation of both domestic and export markets resulted in political pressures to keep the older and less efficient plants open, thus forcing the new plants to operate unprofitably at low levels of capacity utilization.

What should have happened, of course, was the shutting down of the older plants. Politically closing these was difficult because the whole effort had been sold originally as an expansion of capacity rather than as a modernization of existing capacity. The unions opposed closing older plants; the local communities that were involved did so as well. Fourteen ministers on the Labour cabinet in 1976 represented constituencies threatened by plant closures.[31] Thus big losses began for BSC in 1975 and continued through 1978. Imports increased their share of the British market from 5 percent in 1970–1971 to 20 percent in 1977–1978. BSC's share of the British market declined from 70 to 55 percent during the same period (see table 7).

BSC's huge operating losses required government subsidies to increase rapidly so that the firm could continue to meet its loan obligations. In 1977 BSC's chairman, Sir Charles Villiers, began to close obsolete plants and to reduce capacity. The firm continued to suffer large losses, however. In 1978 the minister of industry, Eric Varley, published a white paper on steel, *The Road to Viability*, which recommended drastic cuts in investment and production for BSC. Although the Labour government rejected these recommendations, nevertheless the BSC workforce was reduced by 44,000 between 1974 and 1979. BSC was near bankruptcy by the time the Thatcher government came to power in mid-1979.

The Thatcher Government Reduces Capacity. In June 1980, Sir Charles Villiers wrote to the minister of industry, Sir Keith Joseph, to ask for an additional subsidy for BSC of £400 million for fiscal year 1980–1981. The

TABLE 7

BRITISH STEEL CORPORATION LOSSES AND DECLINES IN MARKET SHARE, 1970–1979

Year	*Profit/Loss* (millions of £)	*Market Share* (%)	*Import Share* (%)
1967/1968	(19)		
1968/1969	(23)		
1969/1970	12		
1970/1971	(10)	70.4	5.6
1971/1972	(68)	66.0	9.6
1972/1973	3	63.7	12.1
1973/1974	39	62.2	13.2
1974/1975	73	58.0	15.7
1975/1976	(255)	55.7	18.2
1976/1977	(95)	55.0	19.1
1977/1978	(443)	54.8	20.4
1978/1979	(309)	54.1	19.4
1979/1980	(545)		
1980/1981	(668)		
1981/1982	(358)		
1982/1983	(1330)		

NOTE: Figures in parentheses are losses.
SOURCES: Iron and Steel Trades Confederation, *New Deal for Steel* (London: 1980), pp. 26 and 58; Keith Ovenden, *The Politics of Steel* (London: Macmillan, 1978), p. 170; British Steel Corporation, BSC Annual Reports and Accounts 1981–1982, p. 45; "British Steel Says Rivals Also Seek U.S. Steel Pact," *Wall Street Journal* (March 30, 1983), p. 3.

normal disaster at BSC had been compounded by a major strike. The alternative, according to Villiers, was liquidation. Immediately after the strike was settled, the Thatcher government recruited Ian MacGregor, at that time a partner of the firm of Lazard Freres in New York, to replace Villiers as the chairman of BSC. Despite the strong ideological objections to such a bail out on the part of the minister of industry, the subsidy request was granted in September 1980. An additional £110 million was granted in November 1980. An implicit *quid pro quo* for Sir Keith Joseph must have been a "get tough" policy on the part of the new chairman.

As soon as he took over in July 1980, MacGregor recommended a further reduction of the workforce by 20,000 and a reduction in production of 0.6 million tons per year.[32] At that moment, BSC was losing about $4 million a day.[33] Between January 1980 and May 1981 the workforce was reduced by 62,000.[34] MacGregor continued or accelerated several reductions planned by Villiers. Between 1977 and 1981, fifteen mid-sized steel works were closed,

as were thirty-one of the existing forty-nine blast furnaces in the public sector.[35] The total work force was eventually halved from 160,000 in 1980 to around 80,000 in 1981. The combination of layoffs and plant closures drastically increased the productivity of the remaining operations. BSC continued to sustain losses, but the losses were reduced. Furthermore, the 1981 Iron and Steel Act provided for a write-off of £3.5 billion of BSC capital with a reserve of £1 billion for future purposes deemed fit by the chairman. MacGregor asserted that maintaining production capacity at around 14.4 million tons would be possible, but people were concerned that low operating levels at the Ravenscraig plant would eventually lead to its closure.

The 1982 recession produced another increase in BSC's losses, and the Labour party began to criticize MacGregor and the Thatcher government for their policies. One issue was the rather large payments made to Lazard Fréres in compensation for the services of MacGregor while he was on loan to BSC ($1.2 million as of July 1980 and further payments depending on the length of employment with a ceiling of $3.3 million).[36] Also, government subsidies rose again in fiscal year 1983 to $871 million from $497 million the year before.[37] When MacGregor announced that he would retire as BSC chairman in August 1983 to run the National Coal Board, the head of the British Mineworkers, Arthur Scargill, referred to him as "the American butcher of British industry" and "a hatchet man." Nigel Lawson, chancellor of the Exchequer, said that "hatchet men are a great deal cheaper than this." MacGregor himself said that he was not a "butcher" but "a plastic surgeon trying to redeem the features of aged properties which need some kind of face lift."[38]

Another tempest brewed when Ian MacGregor announced in April 1983 that BSC and U.S. Steel were contemplating an arrangement whereby BSC would sell U.S. Steel slabs made at the Ravanscraig plant in exchange for a $100-million investment by BSC in the U.S. Steel Fairless (Pennsylvania) plant. This move simultaneously angered the United Steel Workers (who objected to a concessionary wage arrangement that would have been part of the deal), those people in the United States who were critical of subsidization of the British steel industry (that is, most of the Reagan administration), the Commission of the European Communities (which saw the deal as possibly unraveling a larger deal made between the United States and Europe limiting European steel exports to the United States), and those British citizens who found the spectacle of BSC making direct foreign investments in the United States with its largely government-subsidized revenues somewhat hard to take. The economics of this deal looked good; the politics stank.[39]

Regardless of what one may think of Ian MacGregor, the story of British steel policies is not a happy one. The Thatcher government pursued an adjustment policy, which shifted most of the adjustment costs onto the workers, whereas previous governments had avoided adjustment because they were not sure it was necessary. Some element of this earlier approach still

exists in the policies of the Thatcher government. In March 1982 the Thatcher government announced that it had instructed BSC to keep all five of its integrated plants open for the next three years, despite the fact that it had not allocated sufficient funds for this purpose.[40] When an attempt was made to close the Ravenscraig plant in the summer of 1983 before the elections, the government blocked it not to arouse discontent on the part of Scottish nationalists.

The lessons here are fairly simple: (1) Avoid expanding production capacity just before a decline in demand; (2) reducing overcapacity quickly when demand declines may be kinder in the long run than doing it slowly; (3) most democratic political systems will opt for the slow reduction of overcapacity; and (4) state enterprises can be successful in increasing investment when private enterprises have a history of overcaution, but they are also likely to contribute to delays in capacity reduction because of their insulation from short-term economic pressures. The British have learned all of these lessons, which have all been painful, especially for the workers.

Policies toward the Auto Industry

The British auto industry grew up in the 1920s and 1930s under an imposing set of tariff barriers but with relatively no restrictions on the entry of foreign firms, in this case the two American giants, Ford and General Motors, which began to manufacture in the United Kingdom in the 1920s. General Motors purchased Vauxhall in 1925. Ford's large plant at Dagenham was constructed in 1931. In 1945 foreign exchange restrictions limited the ability of British firms to set up their own overseas manufacturing facilities. Thus the British firms were imperfectly sheltered at home while effectively prevented from internationalizing at a crucial time. As a consequence, many rather small British manufacturers emerged only to become victim to later waves of internationalization and scale economizing in the global auto industry.

The first glimmering of what was to come was the merger of Austin and Morris in 1952 into BMC. This merger was prompted by increasing competition from Ford; but, because of less-than-alert management, opportunities for rationalization of production were overlooked, and the firm continued to produce in various small and inefficient plants. The Austin Mini, Austin's innovative front-wheel-drive vehicle, was introduced in the late 1950s and was a technical but not financial success. The larger domestic firms were able just to hold on to their shares of the market, but profit margins deteriorated steadily.

> [The] boom of the early sixties created an overexpansion of the motor industry without a rationalization of industrial structure. This was particularly harmful for the UK motor industry in that, by 1965, the European motor industry experienced overcapacity, so intensi-

> fying international competition. The failure to rationalize meant that between 1965 and 1969 the UK motor industry consisted of manufacturers who were too small and failed to exploit potential economies of scale.[41]

In addition, the government used the auto industry in the 1950s and early 1960s as a weapon in its fight against regional concentration of industry, thus encouraging the building of more small and inefficient manufacturing facilities in underindustrialized regions.[42]

In 1965 BMC purchased Pressed Steel, the only large independent supplier of auto bodies in Britain. When this purchase occurred, smaller firms like Rover and Jaguar clearly saw that they would have to cooperate with BMC or other large firms to survive. Leyland purchased Rover at the end of 1965; and BMC and Jaguar formed a joint venture called British Motor Holdings (BMH), which left Jaguar with considerable autonomy but guaranteed access to BMC's auto bodies. Thus by the end of 1965 only two major British-owned firms or groups, Leyland and BMH, were left.

During the recession of 1967, the financial weaknesses of Standard-Triumph became apparent, and it was taken over by Leyland. Chrysler purchased a 70 percent share in Rootes in 1967 with the permission of the British government. Rootes would have had to close had there been no purchaser; and only Chrysler, at this point desperate for an outlet in Europe, was willing to purchase such a firm. The IRC held 15 percent of the shares of Rootes until 1973, when Chrysler purchased the remaining 30 percent of outstanding shares. (Ford had purchased 100 percent of Ford (U.K.) in 1960.)

The Formation of British Leyland. In 1968, the continuing weaknesses of Leyland and BMC led the government to encourage the merger of those two firms into the British Leyland Motor Company. The IRC provided £25 million in loans for retooling as an added incentive. The traditionally independent-minded management of the auto firms was quite upset about this injection of government capital, and several executives resigned; but the head of British Leyland, Don Stokes, was amenable to the arrangement and was later rewarded by the Labour government with the deputy chairmanship of the IRC in 1969. British Leyland was thus freed from close supervision and scrutiny by the IRC.

British Leyland in 1968 was a very large firm. Its $1.9 billion in sales compared favorably with Volkswagen ($2.5 billion) and Fiat ($1.7 billion). It was building too many models, however, and its output was low given the number of workers employed. It took 185,000 workers at British Leyland to produce the $1.9 billion in sales. The same number of workers at Chrysler (U.S.) produced $5.7 billion in sales. Some people have suggested that the earlier mergers had been partly to blame: that Morris injected Austin with inefficiency in 1952 and that BMC had done the same to British Leyland in 1968.[43]

The early 1970s were boom years for British Leyland and a period of relative nonintervention on the part of the Tory government. This idyll was ended by two unforeseen catastrophes. British Leyland decided to make a major investment to increase capacity in 1973 (£500 million) just before the OPEC-induced recession that was to follow shortly. In March 1974, Tony Benn became minister of industry. The difficulties experienced by British Leyland during this period led the Ministry of Industry to undertake a series of discussions with Chrysler (U.K.) concerning the possibility of a merger between British Leyland and Chrysler.[44] After the passage of the 1975 Industry Act, one of the first industries to receive financial assistance from the NEB was British Leyland. One of the first to be denied was Chrysler (U.K.).

Lord Ryder, the first director of the NEB, issued a report in 1975 arguing that the government should be willing to back British Leyland financially to the tune of £2.8 billion over eight years. The argument was premised on the feasibility of British Leyland's remaining a mass producer of automobiles, which required both a rationalization of existing facilities and an expansion of capacity.[45] According to John Barber, deputy chairman and managing director of British Leyland: "We do not have the volume to compete with the real giants in the cheap end of the market."[46] Harold Wilson, agreeing with this assessment, accepted the Ryder report and issued the following statement: "The Government has decided that Britain must remain in the world league so far as a British owned automobile industry is concerned."[47] In this way, British Leyland became a state enterprise.

Shortly after the Ryder report was issued and accepted, the Central Policy Review staff published its own report on the auto industry suggesting that British auto manufacturers needed to internationalize by forming links with other European firms to meet the challenges of international competition. The policy review staff underlined the problems of too many models and plants but was quick to point out that merely increasing production of fewer models would not solve the problems of British firms. To realize economies of scale, production needed to be increased but not at the expense of overly reducing the number of models offered for sale (that is, they had correctly perceived the problems of Volkswagen). The policy review staff report had a particularly important influence on later government policies toward Chrysler, as we shall see.

The Collapse of Chrysler (U.K.). 1975 was a busy year for automotive policy, not just because of the two reports discussed above, but also because of the near collapse of Chrysler (U.K.). The crisis was a long time coming, but the precipitating event was a message sent in October from the chairman of Chrysler (U.S.), John Riccardo, to the British government announcing that Chrysler "would start liquidating Chrysler (UK) from the end of November . . . unless Her Majesty's government in the meantime took it over."[48]

Chrysler (U.K.) lost $35 million in 1974 and $71 million in 1975. Neither the NEB nor British Leyland were interested in purchasing Chrysler (U.K.), and even the Ministry of Industry favored liquidation initially (but only if combined with import controls). The cabinet objected, however, to import controls, while the Scottish Office strongly opposed the closing of the main Chrysler plant at Linwood. Because they were concerned about Scottish nationalism and the threat of devolution and because the closure of Chrysler (U.K.) would threaten arms sales to Iran (Chrysler [U.K.] had just completed an assembly plant there), the cabinet decided to rescue Chrysler (U.K.) with £72.5 million in loans and £90 million in loan guarantees.

The end of the Chrysler story is a sad one. In 1977 Chrysler (U.K.) was taken over by Peugeot/Citroen. Following the suggestions laid out in the policy review staff report of 1975, the government had first promoted greater integration between Chrysler (U.K.) and Chrysler (Europe)—especially Chrysler (France). When Peugeot purchased Chrysler's European interests in 1977, the British government made no objection to the inclusion of Chrysler (U.K.). The Linwood plant, never cost efficient since its construction in 1960–1962, at the insistence of the Board of Trade closed forever in June 1981, displacing 5,000 workers (a shadow of the original work force). Chrysler (U.K.) now became Talbot under the direction of Peugeot (now called PSA). In 1982–1983 Talbot received £50 million in loans from the British government.[49]

Continued Weakness at British Leyland. The 1975–1977 period was one of continuing weakness at British Leyland as well. "By 1979 Ford (UK), Vauxhall, and Chrysler (UK) had all become very much integrated into the European motor industry—a development encouraged by the Chrysler (UK) bail-out—whilst BL had become a secondary junior league producer."[50] Don Stokes, the managing director, was not a forceful individual and was replaced in 1977 by Michael Edwardes, who immediately asked and received support for a major reduction in the size of the work force, the number of plants, and the degree of centralization of management of the firm. He also won greater managerial independence from the NEB and implemented a new policy of establishing performance targets for divisional managers. He began a round of tough bargaining with the unions for wage restraints and was successful, especially after the beginning of the Thatcher government, in getting a series of wage restraint agreements.[51] In 1979 British Leyland made a deal with Honda to coproduce a mid-sized car that would be sold both in Europe and in Japan. This car would have a Honda engine, gearbox, and transmission with a British Leyland body and other components. In that same year, the government increased the flow of funds to British Leyland to £1,205 million.

During the campaign in 1979, the Tories had pledged to continue aiding British Leyland. This pledge helped them to win in important constituencies

TABLE 8

SHARES OF THE UNITED KINGDOM DOMESTIC MARKET FOR NEW AUTOMOBILES, 1968–1980
(percent)

	1968	*1973*	*1980*
British Leyland	40.6	31.9	18.2
Ford	27.3	22.6	30.7
General Motors	13.2	8.0	7.2
Talbot	10.2	9.7	9.4
Imports	8.7	25.8	40.5

NOTE: A problem exists with these data because of the strange distinction made in British statistical sources (mainly the Society of Motor Manufacturers and Traders) between captive imports and other imports. Captive imports are those marketed by firms already manufacturing in the United Kingdom. It is estimated that about half of the "imports" to the United Kingdom in 1979 were captive imports. The 1980 figures include captive imports under the appropriate United Kingdom firm's market share.

SOURCE: George Maxcy, *The Multinational Motor Industry* (London: Croom Helm, 1981), p. 221; European Research Associates, *EEC Protectionism: Present Practice and Future Trends* (Brussels: 1982), p. 144.

like Birmingham, Oxford, and Coventry. They showed themselves willing after the election to support British Leyland. In January 1981, Sir Keith Joseph announced that British Leyland would receive £990 million in aid. This aid was to help the company launch a new model called the Minimetro. In addition, the 1981 Industry Act increased the borrowing limit of the Department of Industry to permit the department to cover its lending needs to British Leyland after the transfer of responsibility for British Leyland from the NEB to the Department of Industry.[52]

In March 1981 British Leyland reported a loss of £535 million in the financial year.[53] British Leyland's work force in the United Kingdom dropped from 176,000 in 1977 to 96,000 in 1981. Its share of the U.K. domestic market had dropped from 40.6 percent in 1968 to 18.2 percent in 1980 (see table 8). The end of this decline was not in sight. By no stretch of the imagination, by no conceivable rhetorical flourish, could this record be interpreted as a success. Yet British Leyland was still there.

Again, the best explanation of British industrial policy in a specific sector, as in steel, lies in the weakness of its domestic firms. The intervention of the government has become massive and has bridged the ideological chasms separating the Labour government of Harold Wilson and the Conservative government of Margaret Thatcher. More continuity than discontinuity exists here, and it is all depressing. Perhaps I can end on a more upbeat note with my third case—information technology.

Policies toward the Information Technology Industry

Again, the underlying condition for British policy is the weakness of domestic firms. In this case, however, the type of intervention that the government has chosen has been somewhat more effective in promoting the growth, and not preventing the adaptive adjustment, of firms in the industry. The case of information technology illustrates the more general point made by John Ikenberry in his work on U.S. energy policies that each country, with its own characteristic set of governmental institutions and state-society links, has distinctive capabilities for responding to the needs of certain industries for supportive governmental policies.[54] Each state has "comparative advantages" depending on the industry in question. Apparently states and societies like those of Britain and the United States have the right characteristics for promoting innovation in information technology whereas the states and societies of France and Germany, for example, do not.

An increasingly important member of the family of industries included under the rubric of information technology is the microelectronics industry (information technology encompasses computers, office automation, telecommunications, consumer electronics, and electronic components). Access to innovations in microelectronics components, especially advanced products such as microprocessors and random-access memories, is crucial to the competitiveness of "downstream" industries. For this reason most industrialized countries in recent years have begun to focus their policies on promoting domestically owned microelectronics industries. The microelectronics industry began with a strong connection with military defense. The United States and the United Kingdom have the highest percentages of government research and development devoted to defense of the five largest industrial capitalist countries (see table 9). The fates of private firms like Plessey, Ferranti, and GEC in Britain have been tied to government defense policies at least since World War II. Like the microelectronics industries of other major

TABLE 9

GOVERNMENT RESEARCH AND DEVELOPMENT ALLOCATED TO DEFENSE, 1961–1967
(percent)

Period	*United States*	*United Kingdom*	*France*	*Germany*	*Japan*
1961/1962	71	65	44	22	4
1971/1972	53	44	28	15	2
1976/1977	51	46	30	12	2

SOURCE: Robert F. Wescott, "U.S. Approaches to Industrial Policy," in Adams and Klein, *Industrial Policies for Growth and Competitiveness*, p. 110.

countries, the degree of dependence on military applications has decreased, but a strong link still exists.

The first item to be discussed is British policy toward the information technology industry as a whole. Next the stories of two state enterprises, ICL and Inmos, will be told. Then some generalizations will be made about the role of government policy in information technology, especially in microelectronics.

Policy toward the Industry as a Whole. The United Kingdom has 4 percent of the world information technology market. The information technology industry in the United Kingdom has been growing at a rate of 12 percent annually. The United Kingdom's domestic market is increasingly dominated by foreign-owned firms. In mainframe computers, for example, IBM is dominant (as in most of the rest of the world) (see table 10). In semiconductors, the number-one firm is Texas Instruments, followed by Philips (based in the Netherlands but with large holdings of former United Kingdom-owned firms like Mullard) (see table 11).

The main British firms in the information technology industry are Imperial Computers Limited (ICL), General Electric Company (GEC—only a faint connection with General Electric in the United States), Standard Telephone and Cables, Ltd. (STC), British Telecom, Mercury, Thorn-EMI, Ferranti, Plessey, and Inmos. ICL, British Telecom, and Inmos are state-owned firms. GEC, STC, Thorn, Plessey, and Ferranti are private; but GEC, Plessey, and

TABLE 10

SHARES OF THE UNITED KINGDOM DOMESTIC MARKET FOR MAINFRAME COMPUTERS, END OF 1976
(percent)

Firm	*Share of Market*
IBM	47.2
ICL	26.7
CII-HB	8.5
Burroughs	6.1
Univac	6.0
NCR	3.0
CDC	1.3
Others	1.4

NOTES: Of the above, only ICL is British owned. Detail may not add to 100 percent because of rounding.

SOURCE: M. Delapierre, L. A. Gerard-Varet, and J. B. Zimmerman, "The Computer and Data Processing Industry," in H. W. de Jong, ed., *The Structure of European Industry* (Amsterdam: Martinus Nijhoff, 1981), p. 269.

TABLE 11

SHARES OF THE UNITED KINGDOM DOMESTIC MARKET FOR SEMICONDUCTORS, 1962–1977
(percent)

	1962	*1968*	*1973*	*1977*
Texas Instruments	13	23	18	22
Philips	49	22	17	18
Motorola	NA	6	14	11
ITT	2	7	13	8
GEC	7	4	NA	6
SGS	NA	14	3	3
Ferranti	10	5	4	1
Others	19	19	32	31

NOTE: Of the firms above, only GEC and Ferranti are British owned. Detail may not add to totals because of rounding. NA = not available.
SOURCE: Giovanni Dosi, *Technical Change and Survival: Europe's Semiconductor Industry* (Brighton: Sussex European Research Center, 1981), p. 75.

Ferranti are highly dependent on British military contracts.

Again the problem is the weakness and the smallness of British firms and a growing penetration of foreign-owned firms and imports into the British market. According to a study published by the Information Technology Economic Development Committee (of NEDC), "the U.K. information technology industry now has such a small share of world markets that it can no longer continue to invest adequately in product development, in marketing or in production facilities."[55] The global sales of IBM were more than sixteen times the total sales of ICL. The sales of AT&T were twenty times the sales of Plessey. The level of import penetration in information technology had reached the high level of 54 percent by 1982–1983.[56]

The Alvey Report. In 1982 the British government commissioned a report on the information technology industry, which posed the problem as follows:

> The issue before us is stark. We can either seek to be at the leading edge of these technologies; or we can aim to rely on imported technology; or we can opt out of the race. The latter we do not regard as a valid option. Nor is the reliance upon imported technology practical as a general strategy, though we cannot be completely self-sufficient either. . . . The only sensible option . . . is to share in the future growth and development of the world IT sector . . . in specific targetted priority areas.[57]

The Thatcher government accepted the recommendations of the Alvey Report

and the Electronic Components SWP for a special government-funded research program for advanced information technology aimed at matching, at least on a small scale, the efforts of the United States and Japan in this area. In September 1984 the Alvey Research Program announced the funding of thirty-four research projects, the total for this phase of the program being around $83 million. About half of that amount would go to Plessey, GEC, and STC. The program is supposed to run for five years with a total expenditure of $483 million.[58] The Alvey Research Program is the latest in a series of British efforts to promote the information technology industries. I will briefly examine the history of these earlier programs.

Policies of the 1950s and 1960s. In the 1950s, the British government encouraged the growth of the domestic computer industry primarily because of the needs of its Atomic Energy Agency for advanced computers. The National Research and Development Corporation (NRDC) was in charge of these efforts. In 1954 the Development of Inventions Act gave the NRDC more flexibility by extending the period in which the NRDC had to become self-supporting. In 1957 the NRDC initiated a project for the development of supercomputers. The principle contractor was Ferranti, along with the Department of Electrical Engineering at Manchester University. As a result of these efforts, Ferranti developed the ATLAS model, which turned out to be more successful in the British market than its main competitor, IBM's STRETCH model.[59]

In the 1960s, the Labour government during its period of developing a British industrial strategy increased the amount of government funding of research and development and encouraged the mergers which led to the formation of ICL. The IRC financed ICL initially with a loan of £3.5 million. In 1968 ICL received an additional dose of public R and D aid of £13.5 million, another £40 million in 1972–1973. The government adopted a preferential purchasing policy for government computers to favor ICL. In 1967 the government started buying shares in ICL; by 1969 it owned 25 percent of the shares.[60]

The NEB Promotes Information Technology. Nineteen seventy-eight was a particularly important year for policy initiatives in information technology. In one of its last major transactions, the NEB purchased 75 percent of the shares in a fledgling microelectronics firm called Inmos. The firm was founded by Iann Barron and two Americans, Richard Petritz and Paul Schroeder. These three held onto 5 percent of the shares of the firm. Petritz, formerly an employee of Intel, saw some opportunities for a start-up firm to produce very fast microprocessor chips (later called transputers). The founders approached the NEB with their ideas and were able to secure the support of the Labour government. Petritz became the chief executive officer of the firm, which

decided to build two plants—one in South Wales to produce 64K DRAMs (Dynamic Random Access Memories) and one in Colorado to produce 16K static RAMs and 64K DRAMs. By 1984 Inmos had 844 employees in the United States and 544 in the United Kingdom.[61]

The Electronics Components SWP in NEDC complained to the government about the purchase of Inmos without adequate consultation. They were concerned about the government's sponsorship of new competitors. Shortly after receiving these complaints, the Labour government announced two new programs, MISP (Microelectronics Industry Support Program) and MAP (Microprocessor Applications Project).[62] MISP was designed to help domestic firms come up to global standards in the manufacturing of integrated circuits. The program was relatively small: only about £24 million was to be spent. In fact, even that small amount was not spent during the five years allocated for the program. The firms questioned the emphasis on standardized as opposed to customized circuits implicit in the funding criteria.[63]

MAP was designed to increase the familiarity of British manufacturers generally with the microelectronics technology so that they would increase the use of that technology and thereby increase demand for domestic microelectronics and information technology products. In 1977 a survey by the Department of Industry had shown that only 5 percent of British firms were aware of developments in microelectronics. The MAP offered a series of training sessions for British industrialists that were quite well attended: 133,000 attended MAP awareness seminars by 1982.

The Privatization of Inmos and ICL. In 1979 the Thatcher government continued MISP and MAP but revised the previous governments' policies toward ICL and Inmos. As part of its overall policy of privatization, the Thatcher government instructed the British Technology Group (successor to the NEB) to look for private purchasers for its shares in ICL and Inmos. This instruction created an interesting political controversy between the Conservative and Labour parties because of the Labour party's firm belief that the policies of 1976–1979 had been responsible for maintaining some credible alternative to IBM (in the case of computers) and for making Britain the only country in Europe with an independent domestically owned mass producer of integrated circuits (Inmos). Peter Shore, Labour MP and shadow cabinet member, said that "to abandon public ownership now would be no more than ideological spite."[64]

Despite Labour objections, the Thatcher government proceeded with its plans. Kenneth Baker, the new minister of information technology, criticized the previous government's policies: "The previous government saw the NEB as a major interventionist instrument that could start up new ventures and buy companies that were about to collapse and save them . . . . [The problem is

that] civil servants aren't very good at that sort of thing."[65]

The irony of this statement was that the NEB and its predecessors had been set up in such a way as to minimize the influence of civil servants in industrial policy making. The members of the board of the NEB were primarily industrialists. Perhaps the belated recognition of this fact made the Thatcher government able to replace the NEB with the BTG without abandoning the idea completely.

The BTG dismissed Richard Petritz as chief executive officer on Inmos in July 1983 and replaced him with Sir Malcolm Wilcox. The first offer to come in was from AT&T, soon after its deregulation in the United States. AT&T had recently purchased a 25 percent stake in Olivetti. It wanted the Inmos plant in South Wales to ensure access to European Community markets and to avoid the 17.5 percent tariff on microelectronic imports.[66] AT&T offered $69 million for 60 percent of Inmos's shares in February 1984. AT&T also offered to put an additional $96.6 million into the plant in South Wales for retooling and said it would transfer the seventy-person Inmos design team, which was working on the transputer, to the control of ICL. The British government was not pleased with this offer since it had already invested over $140 million in Inmos and wanted at least to recover that sum from the sale. In addition, Inmos itself was opposed to the sale, as were the BTG, Sinclair, and ICL, all of whom wanted Inmos to remain in British hands. Peter Shore of the Labour party called the deal "technological treason," while David Owen of the SDP called it "little short of lunacy."[67] The bid was rejected soon after it was made simply for being too low. Merrill Lynch had estimated that a public offering of Inmos shares would bring in around $270 million.[68]

The firm had lost around $78 million cumulatively by the end of 1983, so there was still substantial sentiment among Thatcherites to sell it.[69] A parliamentary debate in June 1984 resulted in the passing of an amendment endorsing privatization of the firm.[70] Soon after this debate, Thorn-EMI offered $13.8 million for slightly less than 10 percent of the shares of Inmos. Inmos and the BTG welcomed the offer because it was a gesture of support and would help to counter offers from foreign firms like AT&T. Also in June Inmos was approached by a consortium of Dutch interests that wanted to finance the building of a new chip-making facility in Limburg for about $69 million.[71] While this offer was another shot in the arm for Inmos, it nevertheless conflicted with the company's plans to build another plant in the United Kingdom. In any case, the BTG had the right to veto the arrangement.

In the latest development, Thorn-EMI offered to buy the BTG's 75 percent of Inmos shares for $124 million. It was expected to purchase the remaining shares for around $39 million, but the offer to the BTG was not contingent on this purchase. Thorn had just submitted an unsuccessful bid of around $1.12 billion for British Aerospace. A merger of Thorn and British

Aerospace would have created a firm with $6.95 billion annual sales. GEC also offered to purchase British Aerospace, a merger that would have created a military industrial giant with $11 billion in annual sales accounting for about 25 percent of the expenditures of the British Defense Ministry.[72] When British Aerospace rejected the bid from Thorn, GEC announced that it might not go ahead with its bid because of the prospect of objections from the Monopolies and Mergers Commission.[73] It was rumored that Ferranti and Plessey were pushing for a hearing of the Monopolies and Mergers Commission if the deal went through.[74] When Thorn upped its bid for Inmos to $165 million in August, Inmos accepted; and the merger took place.

The privatization of ICL was concluded with a successful bid from Standard Telephones and Cables (STC) of $561 million in August 1984. Thus ended a long and not terribly successful experiment in state entrepreneurship. In its last years, ICL had undergone some severe financial difficulties. The big losses began in December 1980 and continued through 1981. The Thatcher government had replaced the managing director of ICL with an American named Robb Wilmott, formerly the manager of Texas Instruments (U.K.), who concluded a series of arrangements with Fujitsu to get access to Fujitsu chips and to market Fujitsu IBM-compatible mainframes in the United Kingdom and in Europe. A series of loans and loan guarantees from the government were required to prevent bankruptcy of the firm until it returned to profitability in 1981–1982.[75]

STC had been founded in 1880 as an agency for Western Electric. In 1925 it was acquired by ITT. ITT cut its stake in STC to 85 percent in 1979 and then to 35 percent in 1982. STC bought about 10 percent of the shares of ICL at the end of July 1984 in a "dawn raid" and then offered £350 million for the rest of shares needed for control. ITT approved because it saw the bid as a necessary counterpart to the arrangement between IBM and Rolm (another computer/telecommunications linkup). The ITT holding in STC created some political opposition to the STC-ICL merger, but the Thatcher government approved the deal anyway when ITT announced that it planned to reduce its share of STC from 35 to 25 percent (which meant a 26–27 percent share in the STC-ICL merged company).[76]

The merger mania of the summer of 1984 was a joint function of the desire of the Thatcher government to privatize and of the large cash holdings accumulated by the more dynamic British firms during the recovery of 1983–1984. The image one obtains from a close examination of these financial transactions is not one of a dead industry, but rather of one appearing to be undergoing some reinvigoration. The growing concentration of ownership may be a worrisome development; but, given the size of the internationally competitive firms in the same industry, Britain apparently is not alone in this development. In microelectronics and information technology, the British case seems to demonstrate a fortuitous combination of more than usually

realistic state entrepreneurship and hasty privatization. Possibly a state-owned Inmos and ICL might have done well by themselves. A Thorn-Inmos and STC-ICL may do better, but it is probably too early to tell.

Conclusion

The British case is a strange one. As in the case of Germany, we have to distinguish between ideology and practice. We must also consider variation in results of government policies across industrial sectors. The British state has been alternately interventionist and market oriented with respect to domestic business. The peculiar combination of concertative and interventionist institutions set up under both Conservative and Labour governments lends some continuity to policy. So does the overall weakness of British firms in international competition; a legacy of earlier policies of the defense of the pound in international currency markets. The result is that the British state seems relatively better organized to make intelligent industrial policies in the high-technology microelectronics and information technology fields, less well organized for making policy for declining industries like steel and autos.

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