2 Strategic Trade Policy: the Northeast Asian Experience
Trevor Matthews and John Ravenhill

Few observers would have ventured to predict in the early 1950s that, within three decades, Japan, South Korea and Taiwan would be among the world’s most dynamic industrialised economies. In terms of labour productivity, growth in manufactured exports, share of income derived from manufacturing, or growth in gross national product per person, the economic performance of these Northeast Asian market economies over the last forty years has been exceptional. ‘Never before in human history’, writes one economist, ‘have economies grown as fast for so long as in Northeast Asia over the past four decades’ (Garnaut 1989: 36). To another economist, ‘what has happened in capitalist East Asia during the postwar era is as close to a jump up the economic hierarchy of nations as nature ever makes’ (Wade 1990: 4).

Particularly spectacular has been the success of these economies in producing skill-intensive, high-value-added products that are competitive in cost and quality on world markets. Well known is Japan’s success in exporting cars, television sets, audio equipment, facsimile machines, video cassette recorders and random access memory chips. So also is Taiwan’s and South Korea’s export success in heavy industry products such as steel and ships, and in high technology products such as microwave ovens and machine tools. As the 1990s began, Korea was the world’s largest shipbuilder, it ranked as the world’s third biggest manufacturer of large capacity memory chips, and it possessed an automobile industry that appeared poised to join the world’s top producers. And Taiwan was making its mark in micro-electronics, notably in producing personal computers and computer add-ons and in designing large scale integrated circuits.

The rapid and spectacular economic achievement of the three
Northeast Asian economies has attracted world attention. Library
shelves now sag with studies describing and analysing the Northeast
Asian experience and drawing the policy lessons for other countries.
One question in particular runs through many of these studies: is
Northeast Asian industrialisation principally to be explained by inter-
ventionist government policy or is it best explained by the
untramelled free play of market forces? According to one school of
thought, the Northeast Asian successes are the result of consciously
planned strategies of export-led growth pursued by 'developmental
states'. A central feature of these policies has been the targeting of
'strategic' industries for special assistance on the basis of their per-
ceived potential for promoting economic growth, rapid technological
change and international competitiveness. According to this inter-
pretation, although industrialisation has been export-oriented, it has not
always embraced free trade. Import controls have on occasion been
used, along with other forms of industrial assistance, to engineer a
competitive advantage for the targeted industries in global markets.
To writers in this school, the remarkable success of the Northeast
Asian economies is evidence that selective industrial policies to foster
targeted industries do indeed work (Amsden 1990; Dosi, Tyson &

A second school of thought, in contrast, views the outstanding
performance of the Northeast Asian economies as vindicating liberal
prescriptions drawn from neoclassical economics. In the opinion of
this group, the Northeast Asian economies conclusively demonstrate
that freeing up the economy and conforming to market prices, both
domestic and international, are the keys to economic success (Krueger
1985; Naya 1988; Saxonhouse 1983; Tresize 1983). They concede
that some interventionist policies may actually have assisted industries
to prosper, but these policies all have one feature in common: they
have been market-conforming. In all other cases, industrial targeting
has at best been marginal in its effect and at worst actually detrimental
to national economic performance. In arguing the ineffectiveness of
activist industrial policies, these neo-liberal economists make much of
a number of well-publicised cases where Northeast Asian governments
are said to have signal aid to pick industrial winners. Some of
them have been particularly keen to refute claims that interventionist
policies based on what has become known as 'strategic trade theory'
have been a key factor in contributing to the export success of the
dynamic Northeast Asian capitalist economies.

In taking issue with economists who deny that strategic trade policy
has been important in explaining the economic success of the North-
east Asian market economies, we wish to emphasise three points about

our position. First, we do not intend to convey the impression that
strategic trade policy has been the only factor that accounts for the
dramatic economic performance of these economies. Indeed, we can
quite comfortably accept the assertion that strategic trade policy has
been neither necessary nor sufficient for the success of all industries
in all Northeast Asian countries at all stages of their postwar growth.
What we do argue though is that strategic trade policy has been
decisive for the success of some industries in some countries at a certain
stage of their economic development. Neo-liberal critics of strategic
trade policy must debate the issue at that level of particularity. It is
quite beside the point for critics to point, for instance, to Hong Kong
as if the existence of a 'laissez-faire' Hong Kong constituted a
refutation of the claim that state intervention has played a decisive role
in other countries at certain stages of their development.

Second, in arguing that the governments of the Northeast Asian
economies have effectively employed strategic trade policies to help a
succession of industries to become world class competitors, we do not
deny that policy failures have occurred. But we believe that it is not
sufficient for the critics of strategic trade policy to point to individual
cases of policy failure as conclusive evidence that selective policies
have been inimical to sectoral or national growth. Policy failures must
be seen in perspective. How frequent and typical are the failures? Do
the failures outweigh the successes? By what criteria is a policy
measure deemed to have failed? Is failure to be assessed in terms of
static efficiency (whether the policy failed to allocate resources to their
most efficient current use) or in terms of dynamic efficiency (whether
the policy failed to promote economic growth and technical innovation)?
Even if dynamic efficiency is the criterion, how should failures
be interpreted? As Wade (1990: 31) asks: 'If industries which receive
a lot of assistance grow more slowly than those which do not, does
this indicate the failure of assistance or does it indicate targeting of
industries that need assistance as a condition of subsequent fast
growth?'. On these questions we believe it is appropriate to take the
longer term perspective.

Third, in the absence of testable counterfactuals we also believe it
is appropriate to rest our argument on a presumption, one that is
disputed by some economists (Krueger 1985; Naya 1988). Here we
follow Robert Wade. In his magisterial study of the role of government
in Northeast Asian industrialisation, Wade (1990: 305–6) concluded
that the 'balance of presumption' must be that the various industrial
and trade policies helped more than hindered economic growth: 'To
argue otherwise is to suggest that economic performance would have
been still more exceptional with less intervention, which is simply less plausible than the converse.

This chapter examines one aspect of relations between government and business in Japan, South Korea and Taiwan: the strategic use of trade policy. The first section depicts the range of thinking to be found under the rubric of strategic trade theory. Most discussions of strategic trade theory have attempted to evaluate it within a partial or general equilibrium framework using calibrated models. We suggest that such approaches neglect an important body of literature on international trade that places at the centre of its analysis the dynamic and cumulative impact of technological change and innovative capacities on inter-country competitiveness and economic growth. We label this the ‘strategic technology approach’. The second section argues that the three Northeast Asian governments have used trade (and industrial) policies strategically and effectively in order to create competitive advantage for selected capital-intensive and high technology industries. Evidence is drawn from the extensive case study literature dealing with these targeted industries. This evidence, we contend, fits better the interventionist rationale of strategic trade theory than it does the market-following rationale of neoclassical trade theory. The third section considers the political and institutional factors that have allowed these Northeast Asian governments to avoid most of the pitfalls of ‘government failure’. The chapter concludes by canvassing some of the lessons that other countries can learn from the Northeast Asian cases.

‘STRATEGIC TRADE’ AND ‘STRATEGIC TECHNOLOGY’: RECENT THEORIES

The orthodox theory of international trade rests on the doctrine of comparative advantage. This doctrine, developed early last century by the English economist David Ricardo and elaborated by the Swedish economists Heckscher and Ohlin, explains trade between countries by reference to their relative endowments of factors of production. Countries will export goods that make intensive use of their relatively abundant factors; that is, goods in which they have a comparative advantage. Although based on a number of strict assumptions—perfect competition, given and freely available technology, and the absence of economies of scale—neoclassical theory provided a plausible explanation of situations where raw materials were traded for manufactured products.

Over the last two decades, however, economists have recognised that orthodox trade theory has not been able to explain the rapid growth of intra-industry trade in the period since the Second World War. This has occurred between countries with similar factor endowments and has often involved the exchange of products that are differentiated primarily by brand name, for example trade between Sweden and Germany in BMWs and Volvos. Not only that, but much of this intra-industry trade occurs within industries characterised by oligopoly, is generated by technological innovation, and has little to do with relative endowments of factors of production. In these circumstances, the assumptions of the orthodox theory of international trade appear, to quote one of the pioneers of strategic trade theory, ‘to do a major violence to reality’ (Brandt 1987: 10).

Economists have also increasingly recognised that the orthodox theory leaves out the strategic aspects of trade. In an oligopolistic industry a firm’s position in the marketplace will depend on its interaction with others—where there are only a limited number of firms in an imperfectly competitive market then the profit of one company will be determined in part by what its rivals do. Firms therefore may be able to improve their position by acting strategically. They may deliberately act to shape the choices available to their rivals and thereby to influence their rivals’ behaviour. This is the sense in which the word strategic is used in the sense in which it is employed in modern industrial organisation theory—that is, to describe an action which is undertaken not because it is immediately profitable in itself but because of the anticipated impact that it will have on actual or potential competitors. Helpman and Krugman (1989: 5–6) cite the example of investment in excess capacity which a firm does not intend to use, but whose presence deters potential competitors from entering the market. Who moves first, who makes the most credible commitment and who is able to deter rivals from entering the field—all may play a decisive role in determining profits. We enter the realm of game theory where the structure of the game becomes of primary importance (Dixit & Kyle 1985).

These notions of strategic behaviour in imperfectly competitive markets provided the foundation for the new theories of trade. A starting point was the recognition that countries specialise in producing different products for reasons that often have less to do with relative factor endowments than with the advantages that established firms gain from being the first to occupy a particular sector. Among these ‘first mover’ advantages is a firm’s ability to reduce average and marginal costs of production by manufacturing large quantities of a given product (economies of scale), to improve production techniques through practice over time (‘learning by doing’) and to establish a recognised brand name that differentiates its product from
those of competing firms. Advantages of this sort, combined with the
often large capital investments that newcomers would face, are pow-
erful deterrents to potential new entrants to an industry. In such
situations of imperfect competition, oligoplistic firms may be able to
earn abnormal profits (‘rents’) even in the medium to long term.

Three distinct strands of strategic trade theorising have been
developed within mainstream economics. The first is based on game-
theoretic considerations of strategy and credible commitments. The
second builds on notions of increasing returns to scale, and is an
elaboration of traditional arguments for infant industry protection.
The third focuses on rents and externalities. In addition to these three
strands, all of which lie within the mainstream framework, a fourth
line of reasoning has been developed which builds on the literature
on technological change. We refer to this last strand as the strategic
technology approach.

Credible commitments

Strategic trade theorists built on the logic of imperfect competition
by suggesting that government action may assist firms to capture rents.
As governments controlled instruments, such as tariffs and subsidies,
that were not available to the private sector, government intervention
might enable firms to make commitments and to undertake other
strategic moves that would otherwise not be credible deterrents to
potential rivals. Government intervention might also improve the
profitability of domestic firms. In addition, by helping to shift rents
from foreign to domestic firms, it might also increase the welfare of
the nation. This new model recast the traditional positive sum depic-
tion of international trade into a prisoner’s dilemna game. As Brander
(Dixit & Kyle 1985: 9) asserted, under this new model ‘even though
free trade may be a good policy for the world as a whole, individual
countries may be able to gain unilateral advantages from intervention-
ist policies’. With substantial economic rents available for capture,
governments could be tempted into beggar-thy-neighbour policy
games. By acting strategically, governments could engineer compara-
tive advantage for their domestic economies. The very structure of
international trade could be shaped by such intervention.

The original development of strategic trade theory by the industry
economists Brander and Spencer (1981) suggested that government
action can alter the strategic game played by domestic and foreign
firms by offering a subsidy to the domestic firm. An export or
production subsidy, by effectively lowering costs, may enable the
domestic firm to expand production and gain market share at the
expense of its overseas rivals. The subsidy may deter foreign firms
from competing for lucrative markets; the rents available in that
industry will thus accrue to the domestic firm and, more generally,
to the domestic economy. The theory demonstrates that a government
can, through predatory policies, raise national welfare at the expense
of that of another country. The classic example that is often given is
the subsidies provided by European governments that enabled the
Airbus consortium to enter the market for large capacity jet aircraft.

Once the principle of government intervention to help firms to
capture rents was established, other possible modes of intervention
were easily identified. All of these revolved around the ability of
governments to make a credible commitment in support of their
domestic firms; governments might budget funds for support of a
firm’s research and development, might publicly promise future pro-
tection for a firm’s product, or publicly commit themselves to
retaliation should a foreign government provide subsidies or protection
to its domestic firms (see Dixit & Kyle 1985 for a discussion of the
possibilities).

Realising economies of scale

Krugman (1984a) extended the strategic trade idea by suggesting that
protection of the domestic market may assist a domestic firm by
lowering its production costs. The assumption here is that the industry
is characterised by economies of scale whereby unit costs of produc-
tion fall as output increases. If a government closes off its domestic
market to foreign competition the domestic producer will enjoy longer
production runs than would otherwise be the case and thus reap
economies of scale. These ‘static’ economies may be reinforced by the
firm’s ability to ‘learn by doing’. The lower production costs that are
gained from exploiting a protected domestic market may then enable
the domestic producer to compete more effectively in foreign markets.

Rents and externalities

If the intention of strategic trade policy is to capture rents then the
significance of government intervention clearly rests on the scope and
magnitude of the rents available. Trade economists have traditionally
assumed that competition—if not from other domestic firms then from
overseas rivals—will soon erode any rents that are being earned. Often
they assume a considerable homogeneity of products such that one
can easily substitute for another. Industry economists—working closer
to the coalface—have been less convinced. For some, the proligeration
of brand name products originating from a small number of companies
suggests a widespread existence of 'mini-rents' in the economy which cumulatively add to significant amounts (Lipsey & Dobson 1987).

Estimating the extent of industry rents is particularly difficult in that some of the abnormal profits may not show up in firms' accounting statements as profits but be retained within the firm and utilised for new investment, employment of new staff, increased research and development expenditure, etc.—the very elements that strategic trade advocates see as providing an advantage to oligopolistic firms. Studies that rely on reported after-tax rates of profits for firms in estimating rents thus may fail to capture the concept. Attention has focused in particular on the possibility that a large portion of industry rents may not go to shareholders but may instead be captured by labour. Evidence in support of this proposition is provided by studies that show that there are significant differences in the wages paid to labour for the same type of job in different sectors of the economy—and that these differences between industries are consistent across time and across countries and are found at all levels of occupation (Dickens & Lang 1988; Dixit 1988; Katz & Summers 1989; Lipsey & Dobson 1987; Thaler 1989).

As the debate over the significance of rents—for countries, if not for individual firms—has remained inconclusive, some economists (for instance Baldwin 1992; Krugman 1987b; Krugman 1992) have suggested that the importance of strategic trade policy lies not so much in the potential for capturing rents but for generating externalities. Positive externalities refer to benefits for other sectors of the economy generated indirectly by a firm's activities. Following Viner (1951) and Scitovsky (1954), economists have distinguished between pecuniary and technological externalities. Pecuniary externalities are those that are transmitted through market transactions; that is, through the prices of inputs and outputs of other firms. Technological externalities refer to benefits that are not transmitted through market transactions. Such benefits include, for instance, the diffusion of technical knowledge that cannot be completely appropriated by the firm undertaking the research and development. In this sense, research and development (R&D) activities produce public as well as private goods.

The fact that technological advances can be readily copied deters companies from investing in R&D. As with other public goods, the market tends to underinvest in R&D. Studies have suggested, for instance, that early innovation in the computer industry was far slower than it might have been because the social returns to innovation greatly exceeded the private returns to computer manufacturers (Bresnahan 1986; Trajtenberg 1989).

In the strategic trade theory context the externalities problem took on a new importance. First, strategic trade theory focuses on high-technology, imperfectly competitive industries where externalities are likely to be more prevalent. Robert Baldwin (1991: 42), a leading international trade theorist, comments that 'recent empirical evidence indicates that knowledge spillovers associated with research and development efforts seem to be more significant than most traditional trade economists thought' (for evidence on the magnitude of externalities see Bernstein and Nadiri 1988; Jaffe 1986; and Levin et al. 1987). Second, strategic trade theory suggests that those governments that fail to take measures to overcome the market failures that produce externalities will disadvantage their own domestic firms in global competition.

Krugman (1992: 438) has recently emphasised how extensive externalities may be. He asserts:

What the new theory tells us is that meaningful externalities occur not only when there are direct technological spillovers, but in any situation in which there are increasing returns and [where] market size matters. That means almost everywhere. In other words, the marginal social benefit of a dollar's worth of resources is not, as conventional theory would have it, equal in all activities except for a few exceptions. Divergences between social rates of return are pervasive. There are good industries and bad, good jobs and bad, and the optimal policy is to subsidise the good and tax the bad.

Despite the economic dynamism implicit in the concept of externalities, they have been treated within a static framework by most economists who have participated in the debate over strategic trade theory. The reason is that the models employed by these economists are cast within partial or general equilibrium frameworks that simply do not accommodate either the cumulative benefits that dynamic externalities may have for other industries, or the gains from learning by doing. As a consequence, some of the most celebrated models that are frequently cited as reasons for rejecting the policy implications of strategic trade theory—most notably the cost–benefit analyses made by Baldwin and Krugman (1988a; 1988b) of European subsidisation of the Airbus consortium and of Japanese government measures in support of its semiconductor industry—fail to address some of the most significant issues raised by the strategic trade theory literature. In particular, they ignore any rents that accrue to the labour force from employment in more highly skilled jobs, and they ignore the externalities that may benefit associated industries. Their results are also heavily dependent on the assumptions concerning the values of key parameters built into the ‘calibrated’ model.1

In more recent work, Richard Baldwin (1992) has taken some of
these criticisms on board. In a study of Brazilian government support for the production of a commuter aircraft, the EMB-120, Baldwin found that his calibrated model, when using conventional assumptions, showed that the subsidy led to a net welfare loss, whereas when labour rents or spillovers in the form of skilled human capital formation were included, the subsidised project produced net welfare gains. As Baldwin (1992: 209) concludes, participants in a high-tech project are likely to acquire skills that are beneficial to the economy and outlive the project itself. In other words some of the subsidy may be capitalised in the form of human capital. Training and experience that could have been gained only from actually undertaking the project (learning-by-doing), and that is beneficial to the economy in ways that extend beyond the project itself, should be treated as an investment. As Baldwin (1992) himself concedes: the return on this investment should be appended to the plus column of the cost–benefit accounting. There are, of course, innumerable other spillovers that are for the most part extremely difficult to measure.

Somewhat ironically, Baldwin in this work continues to cite without qualification the results of the earlier studies co-authored with Krugman, and fails to acknowledge that these studies would be affected by exactly the same type of externalities he lists as affecting the Brazilian case. The importance of such externalities has yet to be acknowledged by most economists.2

THE STRATEGIC TECHNOLOGY APPROACH

Dissatisfaction with the way in which most international trade theorists have treated the role of technological change has led other economists to propose an alternative to the new trade theory. This alternative approach has its roots in the literature on economic development; in particular, the literature on technological innovation and adaptation. We will refer to this approach as the ‘strategic technology’ school.3

It is true that some of the contributors to the new trade theory have attempted to incorporate the view that technology is an endogenous factor that partly explains the pattern of international trade. Krugman (1990) points out that there is a 'natural alliance' between strategic trade theory, with its emphasis on increasing returns and imperfect markets, and the view that technological change is a key factor driving international specialisation. This is because technological development is normally associated with increasing returns in imperfectly competitive industries, and because the most important sources of increasing returns probably derive from dynamic learning economies and R&D. Grossman and Helpman (1991) as well as

Krugman (1990) have developed dynamic models of trade in which technological change is treated as endogenous and as having permanent effects on trade specialisation. In other words, their models recognise the possibility that a country that fails to innovate may suffer an absolute as well as a relative decline in its standard of living. But these models are couched in general equilibrium terms and assume that technology is freely available to and easily adapted by individual firms.

These assumptions are rejected by the strategic technology school. Its adherents deny that technology is essentially a body of readily codified and perfectly tradable knowledge, as is to be found in a freely available blueprint or training manual (Nelson & Soete 1988: 633). Instead, they emphasise two interconnected properties of technological knowledge: that it is characteristically specific in application and cumulative in development. It is specific in that much innovation is particular to a product or a production process; often, indeed, specific to one firm and to the localised and tacit experience of its employees. It is cumulative in that it is path-dependent, often involving a process of 'creative accumulation' where the new builds on the old (Pavitt 1986: 45). In that sense, the rate and direction of technological change cannot be fully understood in terms of market signals. Much is driven by the logic of the technology and the accumulated experience of those who have been using and adapting it. For that reason, transferring and exploiting technical and scientific information necessary for innovation can be costly and complex.

The cumulative nature of technological development means that the development and application of key technologies will not just have a one-off effect on the economy but may set the country on to a new and possibly irreversible technological trajectory. Again the emphasis is on the importance of historical 'first mover' advantages and on the nature of industrial specialisation. Early developers, it is argued, may be able to practise what Arthur (1989) calls 'competitive exclusion': that is, their gains from scale and learning economies may be of a sufficient magnitude as to deter others from entering the industry. Early entrants into an industry may benefit from a virtuous circle of innovation, economies of scale, learning by doing, and oligopolistic exploitation of technological leads, which in turn gives countries internationally competitive economies. On the other hand, economies that fail to innovate or successfully adopt technologies may be condemned to a perverse cycle which sees them specialising in raw materials or standardised products for which the market is growing slowly. One outcome can be the emergence of technology gaps between countries. These gaps (corresponding to absolute
advantages), the strategic technology school asserts, are more important than comparative advantage in explaining patterns of international trade (Dosi, Pavitt & Soete 1990, chs 6 and 7).

With the acquisition of technology being the key determinant of a country’s growth trajectory, there is in the strategic technology literature a central role for governments to implement selective measures which foster the development and application of new technologies. Here particular emphasis is given to ‘leading’ industries, ones that ‘drive and mold economic progress across a broad front’ (Nelson 1984: 1); in other words, industries that generate pervasive technological externalities for a broad spectrum of other sectors. In promoting these industries, Dosi, Pavitt and Soete (1990) suggest, firms and governments may have to choose between three types of efficiency: ‘Ricardian efficiency’, the neoclassical idea of distributing existing factors of production in a manner which generates maximum profits; ‘Keynesian efficiency’, the maximising of future profits through investing in goods and industries which have the greatest growth potential in international markets; and ‘Schumpeterian efficiency’, the allocating of resources to maximise the possibilities for innovation and technological dynamism.

Governments, it is argued, should intervene to promote future national welfare by fostering Keynesian and Schumpeterian patterns of efficiency. The targets should be industries judged to be in the country’s long-term comparative (and absolute) advantage, those whose products have high income elasticities of demand. Nelson (1984) terms them ‘strategic’ industries, for it is upon their strength that a country’s economic progress and its international competitiveness depend. Two concepts of ‘strategic’ are thus interwoven in the strategic technology literature. The first is the idea that there are some industries deserving of support because of the strategic economic advantages they confer on the nation. The second is the game-theoretical concept of ‘strategic’—the initiation of moves designed to give advantage to one’s own domestic producers.

But why should government intervention be necessary? Why would a rational profit-maximising firm not pursue Keynesian and Schumpeterian efficiencies? The answer lies in market imperfections. First, imperfections in capital markets can give rise to ‘short-termism’—the desire to see immediate high returns on investments. This myopia may derive from the structure of capital markets. In countries where companies are more dependent on equity than on long-term bank lending to finance major investment projects, corporate managers will be under pressure from their shareholders to deliver high returns in the short term. It may also derive from the highly uncertain and risky nature of high technology R&D, and the tendency of the market to discount heavily the possibility of future profits from technological breakthroughs. Uncertain about the technological feasibility of a project and the time it will take, about its total cost and about the commercial viability of the planned new product, private capital markets are often unwilling to invest in high technology R&D. This unwillingness will be the greater if a country lacks a vigorous market in venture capital. Second, in imperfect product markets characterised by increasing returns current market signals can be misleading indicators of future profitability (Dosi, Tyson & Zysman 1989: 17). Third, as Scitovsky (1954) pointed out, underinvestment from market failures also occurs because market signals do not reflect the ‘untraded interdependencies’ that exist among investment decisions when reciprocal externalities are present. Future profits in one industry may be inseparable from the successful establishment of another industry and vice versa—but as the market does not consider the two together the necessary investments are not made.

For members of the strategic technology school, the possibility that market signals may fail to yield socially optimal outcomes for the nation is a strong justification for government intervention to target ‘strategic transformative’ technologies. Under such circumstances, they argue, it may be necessary to trade Ricardian efficiency for Schumpeterian efficiency. For the targeting of strategic industries, even if it is temporary, may have permanent effects on the future trajectory of a country’s economic development and its technological progress. Japan’s policies to promote high technology industries have been motivated, they claim, by just such a Schumpeterian perspective (Dosi, Tyson & Zysman 1989: 23, 33).

NORTHEAST ASIA: SECTORIAL EVIDENCE

This section examines the ways in which the governments of Japan, South Korea and Taiwan have protected and promoted selected capital-intensive and high technology industries. It argues that the evidence—much of it drawn from industry case studies—is more consistent with the interventionist rationale of strategic trade theory than is it with the market-following rationale of orthodox trade theory. Indeed, much of the evidence is consistent with an interpretation that suggests these governments have deliberately used trade and industrial policies not only to engineer a competitive advantage, but also to secure for the domestic economy an absolute technological advantage, in products seen as holding the key to future competitiveness.
Japan

The two decades preceding the 1973 oil crisis were the years in which the Japanese government actively intervened to promote rapid industrialisation. In this pursuit the government was assisted by a political consensus in favour of rapid growth, ample opportunity to catch up with the West, a liberal trading regime that gave Japan access to overseas markets, a capital market insulated from international money markets, and access to dependable and cheap supplies of raw materials and energy—especially oil. Under this policy, the Ministry of Finance channelled finance to the large city banks, encouraging them to provide low cost capital to the industries judged to be basic to sustained economic growth. The capital was to enable the recipient firms to adopt the most efficient mass-production technologies and so to reap the benefits of a declining long-run average cost curve. To prevent the ensuing investment race from degenerating into ‘excessive competition’, the Ministry of International Trade and Industry (MITI) coordinated the pace of investment, formed price-fixing cartels and protected the domestic industries from foreign competition. The protected local market became the export platform for the ever-increasing domestic production that flowed from the race to invest (Yamamura 1986). Among the most important beneficiaries of these policies were the iron and steel, automobile, machinery and colour television industries.

Many of the conditions underpinning the high growth period disappeared in the years following the oil crisis. Environmental concerns undermined the pro-high-growth consensus as did the increased vote for the opposition parties; capital liberalisation reduced the ability of the Ministry of Finance to control the money market; international pressures, including Japan’s membership in GATT and the OECD, forced MITI to reduce tariff and quota barriers; and technological parity with the West ended Japan’s ability to rely on American and European experience in picking winners. MITI’s task was now to make winners. Its attention turned to promoting high technology industries, especially the semiconductor and computer industries. While the policy instruments at its disposal were very different from those available in the high growth decades, the general aim of its promotional policies remained the same: to advance Japan’s industrial structure so as to maximise its gains from trade (Itoh et al. 1991, chs 2, 3, 7).

Steel
Promotion of the steel industry lay at the heart of Japan’s postwar program of ‘heavy and chemical industrialisation’ (Imai 1980; Magaziner & Hout 1980; Yamawaki 1988). In 1950 the Japanese Cabinet instructed MITI to devise a policy for the development of a modern and internationally competitive steel industry. A five-year rationalisation plan (1951–1955) ensued. Under that plan and its successor, MITI (and the Ministry of Finance) intervened directly to boost the capital that the industry had for investing in the most advanced steel-making technology. The government did so by: using its influence over the banking system to ensure that ample capital was made available to the industry at favourable rates; providing steel companies with generous depreciation allowances and exemptions from property taxes; subsidising the construction of deepwater ports adjacent to the coastal steel mills to accommodate giant ore and coal ships; allocating scarce foreign exchange to the industry for the purchase of the latest equipment and technology from abroad; and extending preferential low interest loans to the industry through the Japan Development Bank (JDB) and the Long-term Credit Bank. The subsidised JDB loans also acted as a green light to other lenders. Although governmental subsidies declined in importance after 1960, the government continued to guarantee much of the private lending. Investment poured into the industry, resulting in a phenomenal increase in gross crude steel capacity. Howell et al. (1988: 193) describe the leap in capacity from 28 million metric tons in 1960 to 148 million metric tons in 1975 as ‘the largest expansion in such a time frame in the history of the world steel industry’.

MITI also influenced the direction and form of this investment. It also ensured that the principal Japanese producers adopted the latest technologies. Through its controls over technology imports, for example, MITI was largely responsible for the industry’s early adoption of the basic oxygen furnace (BOF) technology, allowing production costs to be cut by some 20–40 per cent. To ensure that this Austrian technology was disseminated to other firms, MITI arranged for one company, Nippon Kokan, to import the technology and for the other companies to share the royalty costs in return for their having access to it (Howell et al. 1988: 199). This case illustrates MITI’s method of keeping royalty costs down. By permitting only one firm to bid MITI enhanced the bargaining power of the purchaser, enabling Japan to import the technology at lower prices than those paid by some other countries. According to one estimate, Japanese producers paid 1 cent per ton for the BOF technology compared to 35 cents per ton paid by American steel producers (Goto & Wakisugi 1988: 190).

MITI moreover was determined that Japanese mills be of optimal size to exploit the economies of large scale characteristic of the industry. In targeting the industry, MITI favoured the very largest
firms. Under the first rationalisation plan, 71 per cent of government funds flowed to only four of the forty-four steel firms (McCraw and O'Brien 1986: 96, note 40). It feared that, left to themselves, competition between the six major steel companies would result in an excess of new projects below the optimum size. To prevent this form of market failure, MITI encouraged a system of investment coordination among the largest companies to enable them to 'take turns' in building completely new integrated mills (Howell et al. 1988: 215–18; Imai 1980: 206–12) As a result of this official encouragement of huge new 'greenfields' facilities, especially at seaboard locations to take advantage of new sources of iron ore and coal shipped in from Australia and Brazil, Japanese mills were soon among the largest and most technologically advanced in the world. American producers, by contrast, lagged in the adoption of the new technologies, preferring 'piecemeal innovation'—the strategy of upgrading existing production facilities rather than investing in wholly new facilities. Indeed, by the mid-1970s Japan led the world in the use of large capacity furnaces, BOF furnaces, continuous casting techniques and computer-controlled production processes. The average capacity of an integrated Japanese plant had by then reached 7.4 million tons, while the average of an American plant was only 2.9 million tons (McCraw & O'Brien 1986: 86). There is little doubt that MITI's intervention in investment decisions greatly assisted Japan to exploit early-mover advantages to enable it to become by 1970 the world's most efficient steel producer.

To have made these massive investments, Japan's oligopolistic steel producers needed some assurance of market stability. The government provided that assurance. It permitted the formation of recession cartels and it protected the domestic market from imports. In fact, throughout the entire postwar period the import of steel products into Japan has been almost negligible. In the 1950s and early 1960s, when production costs in Japan were still high in comparison with other countries, the 'extremely high' levels of tariffs were an effective import barrier (Yamawaki 1988: 289; Yamazawa 1990: 176). So too was the system of rationing foreign exchange for imports. This system had the same effect as import licensing. Also acting as a non-tariff import barrier were the pressures exercised by the steel producers over their consumers and over the trading companies that distributed domestic and imported steel. These pressures effectively discouraged the distributors and the large customers (such as the automobile producers) from importing steel, even during the 1980s when steel producers in Korea, Taiwan and Brazil gained a cost advantage over the Japanese mills (Howell et al. 1988: 287).

The protected and rapidly growing home market enabled the industry to achieve impressive scale economies and to be well positioned to capture export markets when, by the late 1960s, capacity began to outstrip domestic demand. In that sense the Japanese steel industry is an illustration of how protection can serve as a form of export promotion. Exports were essential if firms were to maintain the high rates of capacity utilisation that were necessary if they were to cover the heavy fixed cost of their borrowed capital. Leaving aside the question of whether or not the Japanese producers actually engaged in predatory dumping, the industry's successful export drive caused serious dislocation to its competitors (Borrus 1983; Howell et al. 1988, ch. 7; Sato & Hodin 1982). Indeed, the excess capacity brought about by Japan's drive to expand its own steel capacity was in no small part directly responsible for the problems of severe excess capacity in the world's steel industry and for the bankruptcy of many steel companies in Europe and the US in the years since 1973. That no Japanese steel company has gone to the wall or has had to be bailed out by the government during these years of structural recession is further evidence of the long-term benefits the industry enjoyed from the government-sponsored low interest loans of earlier decades (Krugman 1987b: 287).

Did the targeting of steel help Japan? Krugman believes not. In his judgement, MITI's targeting of the steel industry encouraged Japan to invest in an activity with low returns, generated no visible side effects, acted as a drag on Japan's growth, and 'probably reduced Japanese national income' (Krugman 1987c: 289; Krugman & Obstfeld 1988: 270–1). As evidence, he points out that the depressed world industry after the mid-1970s meant that there were no rents for the Japanese industry to capture; likewise, the approximate technological parity between the US and Japan after 1960 meant that there were few technological externalities to generate. This evidence is hardly conclusive. After all, there were years in the decade 1960–70 when the rates of profit earned by the steel industry exceeded the profit rate for all manufacturing (Imai 1980: 195). Furthermore, the fact that the Japanese industry was demonstrably superior to the US industry in process technology did provide scope for technological externalities (Eady & Nelson 1986: 258–59). The industries that used steel as an intermediate product also benefited from the pecuniary externalities. By nurturing more advanced industries (such as steel and automobiles) and assisting them (not least through import protection) to exploit dynamic scale economies, industrial policy helped Japan to close the technology gap with the US and Europe and to widen the range of Japan's competitive exports. In the process, the foreign propensity to import Japanese goods rose steeply while Japan's
propensity to import declined (Itoh 1990; Itoh et al. 1988; Itoh et al. 1991). Japan resided two benefits: a falling domestic price for a crucial intermediate input and, because of steel's relatively large share in export demand, a rise in national income relative to its trading partners.

Automobiles
Policies to assist the Japanese automobile industry during the high-growth era illustrate the mechanism whereby import controls act as export promotion measures (Itoh et al. 1991, ch. 11). In 1951 the automobile industry was designated a strategic infant industry to be fostered by the government. (This represented a victory for MITI over the Bank of Japan, which had argued that Japan should base its foreign trade on comparative advantage, predicting that efforts to develop the automobile industry will be futile' (Mutoh 1988: 148). From then until the late 1960s, the industry benefited from a bundle of protectionist and promotional policies (Mutoh 1988; Ueno & Muto 1980).

To encourage investment in the industry, the government supplied low interest loans through government-affiliated financial institutions, granted subsidies for technological development, provided substantial depreciation allowances for 'important' machinery, exempted necessary machinery and equipment from import tariffs, and, despite the severe foreign exchange restrictions, approved the import of foreign technology. Moreover, to secure efficient mass production, MITI arranged Japan Development Bank loans of 10 billion yen for the Nissan-Prince, Toyota-Hino and Toyota-Daihatsu mergers (Ueno & Muto 1980).

At the same time the government sheltered the industry from foreign competition. It did so by means of protective tariffs, which until the early 1970s were much higher than those imposed by the United States and Europe (Winham & Kabashima 1982: 77); an excise tax, which discriminated against foreign cars; foreign exchange controls on imports; and severe restrictions on foreign direct investment. The latter two measures, reflecting the government's continuing shortage of foreign exchange and its fear of losing control over the direction of industrial development, established a system of prohibitions on all external transactions, including capital transactions. The measures kept foreign nationals at bay by insisting that technology licensing be decoupled from foreign equity' (Encarnation 1986: 122). Despite the attractions of a rapidly growing protected domestic market for cars in Japan, and despite the fact that the entry barriers facing domestic producers were relatively low (Ueno & Muto 1980: 165), the restrictions on foreign investment prevented any foreign manufacturer from gaining a beachhead in Japan. Foreign producers were forced to settle

for licensing agreements and government-approved joint ventures. Even when joint ventures were permitted as a means of obtaining advanced technology from abroad, MITI still insisted that within five years 90 per cent of the licensed parts be produced in Japan (Winham & Kabashima 1982: 77).

Sheltered from foreign competition, the domestic industry—a competitive oligarchy characterised by product differentiation—was able to entrench itself in the home market. Unlike normal infant industry protection, however, the protection of the Japanese automobile industry was deliberately 'time-bound', for MITI and the industry realised that foreign pressures were certain to lead to the opening of the Japanese market. MITI made it clear that protection was a temporary measure, designed to give the industry just enough time to prepare for liberalisation. The threat of future competition spurred the local manufacturers to accelerate their investment in ever-expanding productive capacity and to avoid excessive price competition. Faced with an expanding domestic demand, investment surged, permitting the manufacturers to exploit considerable static and dynamic scale economies and to engage in further capacity-expanding investment. Led by Toyota, the Japanese manufacturers embraced the techniques of lean and flexible manufacturing, enabling them dramatically to improve quality while at the same time producing a wider range of models on the same assembly line. The industry at this time enjoyed excess profits (Mutoh 1988: 324; Ueno & Muto 1980: 186).

By the time passenger car imports were liberalised in 1964, the Japanese automobile industry was internationally competitive in terms of costs and quality. And by the time foreign investment restrictions were lifted in the 1970s, foreign producers found that the high capacity domestic firms had pre-empted the market. When domestic demand began to slacken in the early 1970s, the irreversible effects of these time-bound protective measures were strong enough to give the Japanese producers a decisive competitive advantage in foreign markets (Itoh et al. 1991, ch. 11). Exports jumped spectacularly from a mere 11,500 cars in 1961 to 1.3 million in 1971 (Ueno & Mutoh 1980: 161).

The benefits flowing from these measures were, moreover, not only the once-and-for-all gains derived from Japan's winning a dominant—and profitable—position in global automobile markets and thus securing a larger share of world profits. They were also the longer term benefits derived from the external economies flowing from the new techniques of flexible manufacturing and from possessing a world class industry producing a product with a high income elasticity of demand. The latter permitted Japanese cars in the 1970s to capture
almost all the growth in the low-priced import market in the United States. In the words of one analyst, 'the American market, and to a lesser extent the West European market, became the engine that drove the growth of the Japanese auto industry' (Dunn 1989: 165). Thus, in terms of rents, externalities and growth efficiency, the promotional and protectionist policies of the 1950s and 1960s must also be judged a success. This is so, it should be stressed, despite the often-cited failure of MITI to rationalise the industry into two large groupings. The point to be made about that proposal is that the process of negotiated reciprocal consent between MITI and the private sector meant that MITI did not persevere with the plan once the industry's resistance was apparent. While it might have been a failure for MITI it does not represent a failure of MITI's overall strategy of protection and promotion of the industry. In fact, the protective 'greenhouse', by permitting firms to avoid price competition and to make excess profits, lowered entry barriers and made it possible for eleven manufacturers to co-exist. But business tie-ups reduced the number of effective competitors to six. And as they were dominated by the Toyota and Nissan groups of companies, MITI's policies actually resulted in a considerable degree of de facto rationalisation (Mutoh 1988: 323–24).

Colour television

Of Japan's achievements in the high growth period, one of the most dramatic was the rapid emergence of the colour television industry and its swift capture of export markets. In 1962 the Japanese television industry was producing barely 4000 sets a year. Four years later it was producing over half a million sets and exporting 267,000. In 1970 Japanese production overtook American. By 1975 Japan was making 11 million sets, two-thirds more than its US competitors, and of these sets fully 4.7 million were sold overseas (Peck & Wilson 1982: Table 1).

Some observers see the success of the Japanese colour television industry on world markets as owing little to government targeting. One even asserts that a firm like Sony owes 'nothing whatever to bureaucratic promotion, but everything to innovation, rivalry and low cost' (Kasper 1990). To depict the industry in that way, however, is to disregard the degree to which the surge of colour television exports was made possible by a combination of government policies: import tariffs and quotas, controls on direct foreign investment, lax enforcement of antitrust laws, tax incentives for exports, and a government coordinated and financed R&D program. As economist Kozo Yamamura, a leading American specialist in Japanese industrial policy, has argued, these unique policy incentives 'cannot be ignored' in any explanation of the Japanese producers' success in capturing a large slice of the American market (Yamamura 1986: 179).

The fledgling industry benefited greatly from import protection. Targeted by the Provisional Measures Law Concerning the Promotion of the Electronic Industry (1957), tariff rates ranged between 20 and 30 per cent until 1968. Despite liberalisation after that date, imports in 1980 amounted to no more than a minuscule 0.1 per cent of the domestic market (Yamamura 1986: 253). The industry also benefited from another form of effective market closure: restrictions on foreign direct investment (Peck & Wilson 1982: 209). Those restrictions, despite the undervalued yen and Japan's lower wage costs, prevented US firms from establishing subsidiaries in Japan or from acquiring the smaller Japanese producers and using their facilities for manufacturing portable sets. Throughout the 1950s and 1960s, Japanese producers were effectively insulated from foreign competition in the domestic market.

The closed market enabled the seven major Japanese manufacturers to reap the advantages of scale economies, especially for small sets. It also enabled them to cartelise the domestic market and to collude in setting high domestic prices. Resale price maintenance was facilitated by the keiretsu system of vertically integrated sales outlets (Yamamura 1986). In turn, the costs of establishing a keiretsu distribution system acted as a barrier not only for potential Japanese entrants to the industry but also for aspiring foreign entrants. In addition, potential foreign entrants faced legal obstacles. Unlike domestic firms they were prevented from underwriting instalment loans for consumer purchases, were not permitted to make restrictive dealing arrangements with retailers, and if they wished to own 50 per cent of ten or more retail outlets they needed the approval of the government (Yamamura 1986: 246–7). The closed market compelled US manufacturers to license their technology to Japanese producers, a move that speedily closed the technology gap between the two industries. Special governmental grants and long-term low interest loans made it easier for the Japanese companies to purchase this foreign technology, as did the high domestic earnings.

The scale economies and the high profit base not only permitted the Japanese manufacturers to upgrade their production processes and incorporate new technological developments, they also 'provided the firms with the motivation and means to sell their products on world markets at prices below those commanded at home—possibly below the cost of production' (Yamamura 1986: 247). Using the extensive and detailed evidence presented in three antitrust cases against the industry heard by the Fair Trade Commission of Japan and in a
number of US suits alleging antitrust and antidumping behaviour by Japanese television manufacturers, Yamamura & Vandenbarg (1986: 265) argue that it is 'indisputable' that the Japanese manufacturers sold on the American market at prices far below those charged in Japan. They also show that this dumping occurred with the connivance of MITI, which sanctioned the industry's legal export cartel and its system of common minimum prices for exports. Yamamura and Vandenbarg go further. They claim (1986: 259–63) that this collusive behaviour was consistent with the allegations by the American industry that the seven Japanese manufacturers were engaging in predatory behaviour. For example, the agreements not to compete with each other for the accounts of major US customers and to exchange detailed information about their US sales among themselves enabled them to increase their market shares at the expense of their American competitors. The massive surge in shipments of Japanese-made sets following the 1974–75 recession and the low-price tactics of the Japanese manufacturers severely harmed the American industry and decisively allowed the Japanese producers to gain a large share of the US market. The number of US producers fell from 27 in 1960 to five in 1980, employment plummeted and the US economy lost domestic value-added as the remaining manufacturers shifted their operations abroad. Even though America retaliated and negotiated an Orderly Marketing Agreement (OMA) that restricted Japanese imports, the technologically superior Japanese firms captured much of the rents created by the OMA by setting up their own subsidiaries in the United States (Peck & Wilson 1982: 209).

Government policy greatly assisted the Japanese industry in another way: through MITI's sponsorship in the 1960s of a research and development program to develop solid-state technology for colour television receivers. This R&D program generated external economies and facilitated the speedy commercial application of solid-state technology by domestic manufacturers, a breakthrough that Millstein (1983) describes as the crucial turning point in the technological superiority of the Japanese industry over the American. By 1971, two years before the leading US manufacturers were able to offer a line of solid-state products, 90 per cent of Japanese production was based on the new technology. This breakthrough gave the Japanese industry an invaluable edge over foreign competitors in developing the next generation of high technology consumer products based on television—the video cassette recorder (VCR). By the late 1980s, American firms had virtually abandoned the VCR market to the Japanese.

**Semiconductors and computers**

Over the last decade, semiconductor production has become the archetypical strategic industry. Countries covet a flourishing semiconductor industry not only because its technology spills over to other advanced industries but also because it is seen as essential for a nation's economic, technological and military strength. Characterised by steeply rising scale and learning economies, by extremely short product cycles, by highly expensive R&D, by pervasive external economies, and by enormous start-up costs, 'the semiconductor industry is about as far as one can get from the classical model of a perfect market' (Krugman 1983: 147). Little wonder the industry is regarded by many as the ideal target for strategic trade policy.

There is no doubting that the Japanese government singled out the semiconductor and computer industries for special assistance. In its vision of Japan's industrial structure in the 1980s, MITI stressed the need for a shift to a 'knowledge-intensive industrial structure' centred on advanced technology. Central to these visions was the development of the semiconductor and computer industries. Policies to promote these industries have included overt and tacit measures to protect domestic producers from import competition, demand-pull measures to benefit Japanese firms, a 'buy Japanese' policy of government procurement, subsidised loans for new investment, subsidies for R&D, officially sanctioned price and investment cartels, and government-sponsored collaborative R&D. The form of assistance, the subsequent market behaviour of the industry and the fact that the policies benefited domestic at the expense of foreign producers are consistent with the patterns to be expected on the basis of analyses offered by strategic technology theorists.

Although the most intensive fostering of the computer industry has occurred since 1976, the year when computer-related items were freed of quota and foreign investment restrictions, policies to promote the industry date back to the 1950s and 1960s. In those early years, when IBM held the basic patents for computer technology, protection was prominent in the armoury of measures to assist the infant mainframe computer industry. MITI, acting as gatekeeper to the Japanese market, bargained with IBM for its patents. In exchange for opening its patents to Japanese firms, IBM was allowed to set up a wholly owned subsidiary in Japan. MITI, however, was not prepared to give IBM free rein. Not only did MITI restrict the amount of profit that IBM could repatriate, it also delayed the start of IBM production in Japan by two years, prevented IBM importing parts for its locally manufactured computers, authorised which models IBM could produce in Japan, controlled the production run for each model, and required that a large proportion of IBM's production be exported (Anchordoguy 1990: 307). In essence, MITI prevented IBM from
expanding beyond a certain share of the market. Texas Instruments was treated even more cavalierly. MITI refused to act on TI's application for patents on its semiconductor technology or its application to set up a subsidiary in Japan. MITI also stalled in allowing two other semiconductor firms—Fairchild and Motorola—to produce in Japan. Along with high tariffs and restrictive quotas, these delays permitted domestic producers to copy TI's semiconductor technology without having to pay for it and to produce for the local market without fear of foreign competition. Moreover, by dragging its feet on trade and capital liberalisation, the Japanese government provided domestic firms with 'the time to build up the economies of scale and technical expertise necessary to take away the market share from their foreign competitors' (Anchordoguy 1990: 309–10).

Even after tariff and quota barriers were lowered, domestic Japanese-owned computer and semiconductor producers continued to enjoy the protection afforded by officially sanctioned non-tariff barriers. These have included such stratagems as: requiring importers to meet convoluted certification procedures 'designed to exhaust all but the largest and most determined foreign firms wishing to sell in Japan' (Aho & Aronson 1985: 85); excluding foreign firms from the councils that determine product standards; reserving the most lucrative part of the market to Japanese firms—as Motorola found when it was told that the Tokyo–Nagoya area had been reserved for a Japanese manufacturer of cellular telephones (Anchordoguy 1990: 311); requiring foreign but not domestic firms to sign up customers before they could apply for licences (as Motorola also found); allowing sole-source tenderings; and encouraging 'buy Japanese' procurement policies.

Government procurement has in fact been one of the demand-pull measures used to promote the domestic industries. Here Japan is no different from many other countries in encouraging local, prefectural and central government agencies as well as public schools and the national universities to buy their computers from domestically owned firms. As a source of demand, however, public procurement has been quite modest and accounts for less than 14 per cent of the value of all computers sold in Japan (Okimoto 1989: 99). For some Japanese companies, though, one public agency has exercised substantial demand-generating power. That agency has been Nippon Telegraph and Telephone (NTT) which, until its semi-privatisation in the mid-1980s, held the domestic telephone monopoly. Through its procurement and R&D budgets, NTT has been able to channel large amounts of funds to its 'family' of domestic telecommunication–semiconductor–computer suppliers—notably NEC, Fujitsu, Hitachi, and Oki. Between 1980 and 1986, its procurement budget alone amounted to $13.6 billion. This 'procurement bonanza' (Okimoto 1989: 100), most of which flowed to the four telecommunication companies in the NTT family, enabled the recipients to exploit economies of scale and learning economies and to plough capital back into R&D. Moreover, as Anchordoguy (1990: 315) suggests, the cross-subsidisation of the semiconductor and computer industries with NTT's telecom profits gave the integrated Japanese producers an unfair advantage over their foreign rivals.

Foreign firms have also found themselves at a distinct disadvantage in competing with domestic firms as a result of a computer-leasing scheme designed to stimulate demand for computers made by Japanese firms. In the 1960s, the dominant method of marketing computers in Japan was the rental system, pioneered by IBM. Because cost recovery took place over a long period, firms needed to borrow large amounts of capital to finance such rental schemes. In 1961, to ease themselves of this burden, the major domestic firms—Fujitsu, Hitachi, NEC, Toshiba, Mitsubishi and Oki—established, with MITT's backing, a joint leasing company. This quasi-private company—the Japan Electronic Computer Company (JECC)—has been the recipient of a massive flow of low interest JDB loans (as much as $2 billion between 1961 and 1981) to help it purchase computers from its member firms and lease them to the public at competitive rates. The intention of the scheme was predatory, to take market share from foreign firms, for IBM Japan (not to mention other US producers) could not rent their computers through JECC.

JECC has been described by America's best-informed student of Japanese computer policy as 'the most important single institution spurring the industry's development'; for without JECC, 'it is highly unlikely that a competitive Japanese computer mainframe industry would have ever developed' (Anchordoguy 1989: 60; Anchordoguy 1990: 318). JECC benefited the industry in three important ways. First, by purchasing computers from the manufacturers, JECC provided the member firms with up-front cash that could be immediately reinvested in plant, quality improvement, and R&D. This relieved the producers of having to obtain the large bank loans they would have needed to finance and administer their own rental schemes; loans that no company at that time with the possible exception of Hitachi would have been able to obtain from the banks. Being essentially an interest-free loan, the up-front payment constituted a 'vast, but relatively invisible' subsidy that Anchordoguy (1989: 69) estimates was worth a total of $22.5 million during the 1960s.

Second, the JECC arrangement made it possible for domestic computers to be leased at prices some 40 per cent below those that
IBM charged, even though the domestic producers’ costs were higher than IBM’s (Anchordoguy 1989: 64). By undercutting IBM, JECC created an artificial market for domestic machines. Demand surged. Within eighteen months of JECC’s formation, the share of rented machines jumped from 4 per cent to 46 per cent. By 1965, it reached 78 per cent. More significantly, despite the technical superiority of IBM’s machines, JECC enabled Japanese firms in 1965 to capture a majority share of the local market. Just four years earlier, foreign producers had held 82 per cent. There is little doubt that in a free market IBM would have continued to hold the lion’s share of the market. The manipulated market under the JECC arrangement made sure that that did not occur.

Third, by only purchasing machines that users had requested, and by requiring manufacturers to buy back returned machines at book value, JECC ensured that the companies with the best machines got the best deal. Although JECC channelled a large flow of indirect subsidies to the industry and operated as a price cartel, its procedures forced its members to compete vigorously in terms of quality and technological development.

In the 1970s, no longer able to rely on market protection, MITI turned to another policy instrument to assist the computer and semiconductor industries: the use of joint government–private R&D projects. Like JECC, this instrument was predatory in intent. The goal of many of the projects was to match or surpass the technical capabilities of the leading foreign firms, notably IBM. For example, the 1966–1971 Super High Performance Electronic Computer (SHPEC) program was to catch up to IBM’s System 360 series; the 1972–1976 3.5 Generation Project was in reaction to IBM’s 370 series; and the 1976–1979 Very Large Scale Integration (VLSI) Project targeted the expected use of VLSI memory circuits in IBM’s Future Series. Because the projects were designed to foster countervailing power against a foreign oligopoly, foreign firms, notably IBM Japan, were excluded from the research consortia.

Observers generally credit the VLSI project with enabling Japan to close the technology gap with the US, and indeed to achieve technological superiority in areas such as non-silicon products, new materials, and high density memory devices. They doubt that Japanese firms would have been able, without the catalytic effect of the VLSI project, to commercialise the 64K dynamic random access memory (DRAM) chip as early as they did or to capture 70 per cent of the world market for 64K chips by 1981–82. Because the projects had the effect of correcting particular market failures, various economists have judged the projects to have been economically worthwhile

(Fransman 1990; Goto & Wakasugi 1988; Shinjo 1988). For example, by providing incentives to encourage the leading semiconductor firms to participate in joint research, the projects organised by MITI and by NTT were able to overcome the collective action problem which often deterred firms from collaborating on R&D. These projects were also able to correct the market failures (ones associated with externals, public goods, declining costs, and uncertainty) that threatened to cause underinvestment in basic research. By bringing together technical staff from the participating firms, the joint research projects also checked the tendency of the lifetime employment system, with its low labour mobility, to hinder the diffusion of technical knowledge among firms. Among additional economic benefits to flow from the VLSI project, Fransman singles out the synergistic effects of the improved flow of information among the participating firms and the economies of joint R&D (from pooling technical information, sharing costly non-divisible equipment, and avoiding wasteful duplication in research). To counter the argument that the market could have been relied upon to produce these benefits, he points out that not only did MITI have to force the firms to participate in the joint projects but that in the whole postwar period there were only two cases of spontaneous research cooperation among Japan’s major electronic firms not prompted or assisted by the government or a government agency such as NTT (Fransman 1990: 279).

In the 1980s, MITI based a further series of joint R&D programs on the VLSI model. These projects targeted new technologies such as optoelectronics, supercomputers, and future electronic devices. Having reached the technological frontier in many areas of computers and semiconductors, the problem facing Japanese companies at that stage was the uncertainty and risk inherent in ‘over the horizon’ R&D. MITI helped reduce these uncertainties. It did so by socialising the risk, by reducing the transaction costs of collaborative research, and by selecting in close cooperation with industry the technologies for development. MITI’s funds not only acted as a magnet attracting additional corporate investment into the selected areas, but were also important in their own right. Around 20 per cent of the research resources spent by certain firms on R&D projects with a time horizon of ten years or more came from MITI (Fransman 1990: 288).

A crucially important feature of all these projects has been their focus on developing generic technologies—those with broad application to products and processes—and seeing that these were diffused among competitive firms. The government reduced the cost of the riskiest and most uncertain aspect of the R&D process and it gave the competing firms a common technological base. But it left the
commercialisation of the technological advances to the firms. In this way MITI shrewdly avoided the pitfalls of attempting to pick winning products. It also ensured that competition would have to centre on improving quality and lowering costs. Further, by providing the institutional context in which semiconductor producers could work with the producers of semiconductor fabrication equipment, the VLSI project helped to generate the technical synergies to be derived from ‘learning by using’ (Stowsky 1989).

By establishing itself at the forefront of semiconductor process technology and by massively investing in new equipment to exploit scale and learning economies, the Japanese industry emerged in the 1980s as the global leader in quality and price. Facing significant dynamic learning economies (Yamawaki 1992), the semiconductor producers followed a predictable and rational path of below-cost sales, thereby undercutting their American competitors, a move which prompted charges of predatory dumping (Dick 1991). Whether or not this practice of forward-pricing was intentionally predatory, it did have a predatory effect. In 1980–81, having commercialised the technology developed in the VLSI project, Japanese firms captured a dominant share of the world market for the 64K DRAM. By the end of 1986, Japanese firms held 90 per cent of the market for the 256K DRAM and were to dominate future generations of this product. The Japanese producers in 1986 overtook their US competitors in the production of semiconductors. In 1979 the US industry had held 57 per cent of the world market; by 1990 its share had fallen to 37 per cent (Flamm 1991: 26). The decline in American competitiveness has been even more dramatic in semiconductor tooling, where the US share fell from 85 per cent of the world market in 1978 to 50 per cent in 1987 (Borrus 1988b: 68).

Some strategic trade theorists have been reluctant to concede that MITI’s policies to promote the computer and semiconductor industries benefited Japan. Their evaluation is based on two criteria: (a) did the targeted industries earn excess returns? and (b) did the industries generate technological externalities sufficient to justify the costs of the promotional policies? To take one prominent example, Krugman (Krugman 1987c: 293; Krugman & Obstfeld 1988: 272–4), admittedly writing in the mid-1980s, claimed that it was too early to say that MITI’s policies had been successful: on the one hand, price cutting had so far prevented the Japanese semiconductor firms from earning above normal rates of return on their investments; on the other hand, the putative external economies flowing from the knowledge generated by R&D in the semiconductor industry had ‘yet to be seen’. Along with a number of other contributors to the new trade theory, Krugman was sceptical that these technological externalities, by definition unpriced, could be measured. And even if they could, and were shown to be large, he was doubtful if they were of the sort that could be appropriated and largely retained within Japan’s borders (Krugman 1984b: 112).

Evaluations of this sort have been challenged. On the question of excess returns the critics question the claim advanced by Krugman and others (e.g. Pugel 1987: 214) that industry returns were low, on the grounds that the claim is not based on a systematic analysis of profits adjusted for the entire business cycle, does not take into account profit linkages over a sequence of generations of a product, and wrongly assumes that strategic trade theory requires that profits be present for the whole product cycle (Lawrence 1984; Raubitschek 1987). The claim is also questioned for being based on a standard accounting rate of return that does not adequately capture the concept of rents. Empirical studies, in fact, have shown that Japanese semiconductor firms have typically recovered their costs over the course of more than one product cycle (Dick, 1991). Moreover, by the late 1980s, largely as an unintended consequence of the US–Japan Semiconductor Agreement, the Japanese semiconductor firms had actually turned themselves into what The Economist in 1990 dubbed ‘a rent-collecting chip-making cartel’.

Krugman’s scepticism about externalities has been challenged from three directions. First, by studies that demonstrate the presence of social rates of return in high technology industries. For example, economic modelling by Flamm (1987: 223–39) shows that the social return on investment in computer technology is ‘quite high’ even under fairly conservative assumptions.

Second, by observers who deny that new technological knowledge is quickly and easily transmitted abroad by such means as ‘reverse engineering’. They argue that crucial advances in the design and production of semiconductor fabrication equipment diffuse more readily in the country of origin. This is because they are transmitted through the close ties between engineers in the fabrication equipment producers and those in the user firms. This tacit technology is embodied in experience, not simply in the products themselves (Borrus, Tyson & Zysman 1986). These observers also point out that the keiretsu links between upstream and downstream producers in Japan serve to hinder the international diffusion of technological spillovers (Borrus 1988b), as does the exclusive membership of MITI’s joint research projects. To the degree that leading industries, such as semiconductors, yield opportunities for innovation in the downstream industries, and if information about such opportunities circulates more
effectively within rather than across national boundaries, these industries may be thought of as 'strategic' for the nation, and thereby deserving of special protection or promotion (Nelson 1984: 3).

Third, by scholars in the strategic technology school who emphasise a quite different notion of spillovers (Dosi, Tyson & Zysman 1989; Tyson 1988). The issue as they see it goes beyond the 'false formalism' (Tyson 1988: 115) of debating whether technological externalities can be measured. The issue also goes beyond the undoubted presence of linkage externalities (i.e. the spillover effect resulting from increasing returns in the semiconductor industry on the costs of higher value-added downstream industries). In their eyes, the issue concerns the role of the semiconductor as a 'strategic transformative' technology, one that is radically transforming the products, production processes and product quality in a wide range of industrial sectors, contributing profoundly to productivity growth, and directly affecting the international competitiveness of national producers that exploit its transformative potential. MITI's wisdom in promoting the semiconductor and other advanced technology industries lies in its recognition both of the need to target industries on the basis of their growth and technological potential and of the need on occasion to trade off allocative efficiency for technological efficiency. For example, woven through the text of MITI's vision for the 1980s is a clear understanding of the major long-term 'ripple effects' of 'epochal technological innovation', of the bargaining leverage that possession of this technology would give Japan, and of the need for the government to promote these technologies when their development is 'urgently needed by the economy and society' and when it requires massive investment, R&D coordination among firms, and a long gestation period before results can be marketed (MITI 1980: 136, 145, 148). From the 'strategic technology' perspective, MITI's achievement lies in the 'long-term beneficial effects (of its policies) on the competitive position of Japanese producers in a variety of critical industrial sectors on world markets' (Dosi, Tyson & Zysman 1989: 32). The strategic implications of these effects are being felt by its competitors today. As the US semiconductor industry has learned to its cost: 'a competitive advantage, once lost, is exceedingly difficult to regain' (Flamm 1985).

Republic of Korea

It has become a generally accepted axiom among neoclassical economists that an export-oriented strategy of industrialisation is superior to an inward-looking one based on import substitution (Bhagwati 1990; Greenaway & Reed 1990 survey the literature). Because it exposes exporters to world prices for their inputs and their output, an outward-oriented strategy is said to ensure that resources are allocated according to a country's comparative advantage. These economists frequently depict Korea as a pre- eminent exemplar of export-oriented industrialisation (see Balassa & Associates 1982; Krueger 1978; Little 1981). By maintaining the exchange rate near the free trade level, exempting intermediate inputs and export sales from indirect taxes and granting exporters unrestricted and tariff-free access to imported inputs, the Korean government has provided a virtual free trade regime for exporters. In this way it has assured exporters in internationally competitive industries that production for export would be no less profitable than production for sale on the domestic market. In other words, it has 'offered little incentive for industries producing exportables to keep their output at home' (World Bank 1987, vol. 1: 35).

These export-promoting incentives allowed Korea to exploit its comparative advantage. As shown by Westphal and Kim (1982) and Nam (1981; 1982), 'effective incentive rates' were neutral in their effect for well-established export industries in the sense that they did not distort prices relative to what those prices would have been under a free trade regime. Moreover, because the effective incentive rates on exports for individual industries were narrowly dispersed around the overall average, the policies did not discriminate between export industries. As a result, Korea's pattern of exports at that time reflected its comparative advantage in labour-intensive products such as textile fabrics, wigs, plywood, and footwear. As Westphal puts it, Korea's export-oriented strategy provided 'an almost classic case of an economy following its comparative advantage and reaping the gains predicted by conventional economic theory' (Westphal 1978: 375).

However, to depict Korea's industrialisation strategy as essentially one of export-promotion based on non-selective policies of 'unshackling exports' is to tell but half the story. It fails to acknowledge three important aspects of the Korean development strategy. First, that the Korean government has since the early 1960s actually pursued two proximate industrial objectives: to encourage exports from industries where Korea has an established or readily attainable comparative advantage and to promote infant industries (Westphal 1990). While the first objective has utilised measures without any discernible trade or industry bias, the second has relied on protection and other selective measures to promote industry (Pack & Westphal 1986; Westphal 1982; Westphal 1990). Second, that the two objectives were interlinked. Infant industries were forced to export. In that sense, the Korean government used import substitution as a means of export promotion. Third, that among the export incentives offered to
established export industries were many genuine subsidies. These subsidies included: reductions of direct taxes earned in export activities; accelerated depreciation allowances on capital used in export production; generous wastage allowances on duty-free imports of raw materials; preferential rates on overhead inputs such as electricity and railway transportation; and, most importantly of all, preferential access to short- and long-term credit for exporters. As Nam (1990) writes, Korea pursued its outward-oriented strategy by following the export subsidy not the free-trade route. According to Amsden (1990), subsidies were as crucial in the 1960s to the cotton textiles industry in competing with Japan, despite Korea’s low wages, as they later were for the steel and shipbuilding industries.

There is, in sum, little in the Korean experience to lend support to the neo-liberal interpretation that Korea’s industrialisation strategy was built around free trade and an aversion to selective intervention. Instead, analyses of Korea’s extensive and coordinated use of subsidies to promote infant industries and to encourage exports show that Korean policy has been informed by a ‘strategic’ orientation consistent with interventionist rations advanced by strategic technology and strategic trade theorists. True, the Korean evidence does not directly indicate that Korea deliberately used trade and industrial policies as a strategic move to deter foreign competitors, and thereby shift profits to Korea. The evidence does, however, point to those policies having a deterrent effect on foreign shipbuilders, automobile manufacturers, and semiconductor producers. For example, backed by a credible government commitment to develop the semiconductor industry, Korean firms were able to present a convincing challenge to Japanese dominance in memory chips. Indeed, price cutting by Samsung on 1M DRAMs forced Japanese companies out of the market (Tyson 1992: 126). In steel, shipbuilding and automobiles, the Korean firms chose to add to surplus capacity rather than to provide markets for Western and Japanese producers. The evidence also points to the Korean government’s having deliberately employed trade and industrial policies to generate technological external economies, to establish internationally competitive export industries, and to encourage those industries to exploit static and dynamic scale economies. In addition, the export success and profitability of the automobile and semiconductor industries suggests that Korea’s policies of selective assistance resulted in profit shifting.

In promoting its targeted infant industries, the Korean government has aggressively used a range of selective policy instruments. These have included import restrictions, tax breaks, controls on direct foreign investment, and the preferential allocation of credit. By means of these instruments Korean policy was designed to shift Korea’s comparative advantage from labour-intensive to capital- and skill-intensive production, to foster the rapid acquisition of domestic technological mastery, to permit the exploitation of scale economies, and to compel infant industries to begin exporting early.

Protection was the main promotional incentive for designated infant industries. Under the First Five Year Economic Plan (1962–1966), these industries included cement, fertilisers, synthetic fibres, and oil refining. They were followed in the late 1960s by steel and petrochemicals. In the 1970s, under the plan to promote self-sufficiency in the ‘heavy and chemical’ industries (HCI) and to upgrade Korea’s export potential in capital and intermediate goods, import protection was extended to nonferrous metals, shipbuilding, heavy machinery, transport equipment, motor vehicles and, although they were neither heavy nor chemical, consumer durables and electronics. Although the HCI drive was abandoned in 1979, the automobile and electronics industries continued to be protected. Import restrictions were still used as late as 1988 to protect high-tech products such as computers, electronic amplifiers, cameras, VCRs, integrated circuits, teleprinters, and colour TVs (World Bank 1987, vol. 1, ch. 3).

Protection generally took the form of quotas that set ceilings on imports. These quantitative restrictions were designed to give the targeted industries an acceptable level of domestic sales and a satisfactory rate of return on investment. The quotas applied to a sizeable proportion of imports. In 1978, as a result of the HCI drive, the proportion of restricted items was 40 per cent of all import items (Nam 1982, 540:17) For particular industries being promoted, the share of restricted items was often very high. For example, the proportion of iron and steel products facing restrictions jumped from 28 per cent in 1967 to 75 per cent in 1978 (World Bank 1987: 59).

The quotas frequently gave absolute protection to a newly targeted industry and were removed only when the industry had become internationally competitive. Protection from imports also took the form of tariffs, strict local content requirements, ’buy-Korean’ government procurement, health and safety inspection requirements, and applying a ‘law of similars’, under which an import licence is issued only if an importer can show that the specific item cannot be obtained domestically.

In addition to protection, the government also promoted the development of strategic domestic industries by restricting and regulating the inflow of foreign direct investment. Industries were encouraged to use licensed technology and foreign capital loans rather than foreign direct investment (Haggard & Chen 1987; Koo & Bark
barriers in the HCI sectors and of maximising scale economies in production, R&D, and exporting. For example, the *chaebol* were given preferential access to concessionary credit to establish general trading companies modelled on Japan's *sogo shosha* in order to achieve scale economies in exploring new markets and in establishing overseas sales networks (Rhee, Ross-Larson & Pursell 1984: 65).

In fact, what is quite distinctive about these various measures to protect and promote domestic industries is that they were crafted in such a way as to be export promoting. Exports were encouraged by allowing exporters to practise discriminatory pricing on the home market; and exports were induced by allocating preferential credit on the basis of export performance and by requiring both export industries and infant industries to meet export targets. Evidence indicates that the government has sanctioned non-competitive market structures in order to elicit export-related sales from infant industries. By limiting the entry of firms into an industry and providing them with a protected home market, the government enabled the favoured firms to subsidise their export sales by charging higher prices in the protected domestic market. In this way, they could maximise their profits by selling a proportion of their output overseas up to the point where the marginal cost of production equals the marginal revenue from these sales (Westphal 1982: 271). The result, as Westphal writes, is that 'infant industry' has been a less apt characterisation in Korea than 'infant exporter' (Westphal 1978: 375). Moreover, by making access to concessionary credit and to discretionary permits (e.g. to work with foreign firms or to import technology) conditional on export achievements, the government required potential recipients to be exporters. And its export targets virtually compelled export industries and infant industries alike to keep expanding their exports (Rhee, Ross-Larson & Pursell 1984). As Amsden (1990: 74) has written: 'Big firms and small firms, young firms and old firms, chaebol and nonchaebol had to export. Investment and trade policies became intimately bound'.

It was this insistence on making exports 'a compulsion rather than a choice' (Amsden 1990: 69), that enabled the Korean planners to elicit from the recipients of governmental subsidies progressive increases in production volumes, in quality, and in productivity. The insistence that infant industries compete in international markets also helped the planners to achieve the elusive balance between economies of scale, often requiring monopolised or oligopolistic market structures, and competition (Green 1992: 420–1; Mody 1989: 307). Targeted industries soon became leading export industries. This group includes a number that were direct beneficiaries of the HCI drive,
such as steel, shipbuilding, electronics, and automobiles. (For a positive reassessment of the HCI drive see World Bank (1992).

Even the export success of the semiconductor industry, often said to have been the result of private initiatives, stems in part from the policy of the HCI years to promote the large diversified conglomerates: by the mid-80s they had attained the market power to internally cross-subsidise the development of the semiconductor industry, to surmount the high entry barriers, and to provide the marketing know-how (Mody 1989; Mody 1990). It also benefited from the rapidly growing domestic demand for memory chips created by the earlier HCI policies (Yoon 1992) as well as from more direct assistance and intervention, such as a public research institute that planned and coordinated semiconductor R&D, fiscal investment incentives, large amounts of concessional credit, government-initiated integration of upstream and downstream segments of the market to maximise technological spillovers, and the assigning of the three private sector champions (Samsung, Goldstar and Daewoo) to profitable segments of the protected telecommunications market (Wade 1990: 312-18). The profitability of the semiconductor champions at the end of the 1980s, and the marked inroads they were making in world markets, were at least as much a result of governmental promotion as they were of the foresight and patience of the chaebol.

The Korean experience shows that import substitution policies need not be incompatible with an export-oriented development strategy. It shows, in fact, that protection can be used in combination with subsidies to foster the creation of internationally competitive industries and to give those industries a profitable domestic platform from which to launch an export push. Recent research on Korean industrialisation suggests that the Korean strategy was successful in attaining international competitiveness for two reasons (Amsden 1990; Biggs & Levy 1990; Pack & Westphal 1986; Westphal 1982; Westphal 1990; World Bank 1992). First, it assisted firms to realise static and dynamic internal economies of scale. Second, by helping firms to move down their learning curves and by correcting imperfections in capital markets and international technology markets, it generated external economies. These are precisely the benefits that writers in the strategic technology school believe can be realised by appropriate state action.

By providing firms with a protected home market and by using subsidies to socialise the risk of large scale investments, the Korean government enabled firms to achieve scale and learning economies based on large and expanding production volumes. This in turn allowed firms to exploit their falling cost curves to capture export markets from foreign competitors. It also made it possible for the government, once export markets had been staked out, to wind back its subsidies and the level of protection. Korea in this respect followed the Japanese model: it supported at any one time only a 'narrow moving band' of infant industries, providing protection until a targeted industry was internationally competitive, then moving on to the next target. The compulsion to export, in its turn, enabled further economies of scale to be exploited, thus further reducing unit costs of production and leading to lower domestic prices than would occur in its absence (Pack & Westphal 1986: 273).

A number of economists who have been associated with the World Bank's project work in Korea have emphasised the second way in which infant industry protection and subsidies can yield net benefits to the economy: through accelerating the acquisition of technological mastery (Amsden 1990; Dahlman, Ross-Larson & Westphal 1987; Dahlman & Westphal 1982; Rhee & Westphal 1977; Westphal 1982; Westphal, Kim & Dahlman 1985; Westphal et al. 1984a; Westphal, Rhee & Pursell 1981; World Bank 1992). In their view, late industrialisation is a process of borrowing foreign technology and optimising its assimilation. But this process of 'industrialisation through learning' (Amsden 1990) is hindered by market failures. The imperfect appropriability of investments in technological acquisition leads firms to underinvest in technological effort. The less than perfect tradeability of technology hinders the acquisition of technological capability. It also generates external economies for local firms who are able to benefit from domestic learning. They benefit in the form of lower prices, more locally appropriate inputs, and a cost-free diffusion of the new techniques. The failure of interlinked industries to realise that the welfare of one depends on the investments of the other causes underinvestment and a consequent failure to generate mutually beneficial pecuniary externalities. Similarly, technological externalities, arising from complementary learning sequences in firms linked to each other in the production chain, result in their failure to coordinate their investment in training and technology. The imperfect knowledge that foreign investors have about local conditions leads them to underinvest in local learning or technology transfer. The Korean government, it is suggested, has overcome many of these failures by its policies of promoting and coordinating large investments in related industries, of subsidising the import of technology, and of requiring foreign investors in joint ventures to adhere to strict conditions concerning technological transfer to ensure indigenous learning. (Pack & Westphal 1986; World Bank 1992). These policies have all contributed to Korea's "capability acquisition" (World Bank 1992) and its ability to capture dynamic technical externalities, as has the policy of requiring infant
industries to begin exporting sooner rather than later. Evidence points to exporting as a particularly important mechanism of acquiring technological mastery (Dahlman, Ross-Larson & Westphal 1987; Pack & Westphal 1986; Rhee, Ross-Larson & Pursell 1984; Westphal 1982; Westphal, Kim & Dahlman 1985; Westphal et al. 1984a; Westphal et al. 1984b). In summary, Korea's trade and industrial policies, as Biggs and Levy (1990) write, 'emerge as a coherent package of non-neoclassical policy instruments to force the pace of organisational learning'.

Taiwan

Taiwan's remarkable economic growth, like that of Korea, is frequently cited as demonstrating the benefits of an export-oriented industrialisation strategy. And, as in the case of Korea, the key elements in the strategy are said to be the virtual free trade regime enjoyed by exporters and the small role played by the government in the domestic economy: by 'getting the prices right', the Taiwanese authorities provided the crucial conditions for rapid export expansion which in turn generated the high rate of real output growth. As in the Korean case, however, this interpretation of Taiwan's economic development is incomplete. It overlooks the fact that while exporters (but not import-competing industries) have benefited from a near free trade regime, they have also benefited from substantial governmental subsidies: concessional credit for export production, short-term export credit, preferential tax treatment for export sales, and governmental help in overseas marketing. It also overlooks the fact that Taiwan's export-oriented policies have co-existed with (indeed depended on) import substitution policies for a different set of industries. As Wade (1990) demonstrates in his impressively detailed account of Taiwan's industrialisation, the Taiwanese government has guided and steered the economy to a far greater degree than is consistent with neoclassical theory. It is our argument that much of Wade's evidence of government steerage in Taiwan fits comfortably with the interventionist policy implications of strategic trade and strategic technology theory.

Both before and after the adoption of an export-oriented industrialisation strategy in 1958–1962, Taiwanese planners consciously took the initiative in steering resources into selected industries so as to shape the investment and production patterns in the economy. The aim was to promote the development of Taiwan's production and technological capacity in more skill- and capital-intensive industries and 'thus to permit a steadily more differentiated range of export products' (Wade 1988: 45). Various measures have been used to effect this steerage. They have included trade controls (including controls on direct foreign investment), fiscal incentives for the production of specified products, selective credit allocation, state-sponsored R&D organisations, and the extensive use of public corporations to create new capacities in upstream activities where entry barriers were high (notably in steel, shipbuilding, petroleum and petrochemicals, synthetic fibres, heavy machinery, and nuclear power). More recently, publicly owned enterprises have been used to acquire and commercialise new technology in the information industry. Among the industries whose establishment and development the government has promoted in its successive four-year economic plans have been: in the 1960s, electrical and electronic appliances, the heavy and chemical industries, and synthetic fibres; in the 1970s, steel, petrochemicals, electrical machinery, electronics, precision machine tools, and computer terminals and peripherals; and, in the 1980s, automobiles, semiconductors, and bio-technology.

In selecting these industries (and in some cases specific products), Taiwan's planners employed a number of criteria: whether an industry was considered to require large long-term investments beyond the capabilities of the capital market; to have a high potential for technological change; to be of military significance; or to be of special importance for the economy's future growth, 'either to reduce the economy's vulnerability to foreign (especially Japanese) suppliers, or to generate a higher value-added, more income elastic, more closely interlinked set of productive activities' (Wade 1988; Wade 1990: 180, 334–35). These criteria were supplemented by a close study of Japan's industrial trajectory and of changing patterns of demand in world markets. Apart from the military criterion, the planners were very much guided by notions of Keynesian and Schumpeterian efficiency.

Trade policy, as Wade shows, has been used as an important instrument of governmental steerage to bring about secondary substitution and to build Taiwan's technological capacity. Quantitative restrictions have been more important in this respect than tariffs. Although imports have been publicly classified as 'prohibited', 'controlled' and 'permissible', the classification conceals the degree to which items in the permissible category are subject to further administrative controls. These take the form of a de facto 'law of similars' as well as origin and agency restrictions; that is, certain permissible items cannot be imported if similar items (in terms of price, quality and delivery) are available locally; if they come from particular countries, which happen to be Taiwan's main competitors; or if they are not imported by end users. The law of similars has covered a number of capital-intensive basic products such as steel, petrochemicals, chemicals, and certain items of heavy machinery. Even exporters have not
been able freely to import some very important intermediate products and capital goods (Wade 1988: 142). Nevertheless, exporters have been able to buy most inputs at close to world market prices because the government has ‘used world market prices as a guide to what the prices of domestic items should be, using the threat of imports as a means to make sure their guidance is followed’ (ibid: 141). The authorities relied more on this threat than on forcing infant industries to export as the preferred means of overcoming the lethargy-inducing effects of protection (ibid: 155).

Despite the ample evidence showing that the Taiwan government has actively employed trade and industrial policies to shape the pattern of investment and production in the economy, the evidence does not point to the government’s having deliberately used these policies in a game-theoretic way to shift profits away from foreign rivals. One reason for this may lie in Taiwan’s industrial structure. Taiwan’s economy is not dominated by huge diversified conglomerates as is Korea’s. Nor did the Taiwanese authorities attempt to create such conglomerates. Indeed, the mainlander-dominated government was concerned to prevent the emergence of large corporations in the predominantly islander business community as these may have posed a threat to its power. Aside from the large, often publicly owned corporations in upstream industries, highly competitive small-sized firms have been a pervasive feature of Taiwan’s manufacturing export industries. Government subsidies to these small firms may not have been nearly as effective as subsidies to large oligopolistic firms in making a credible commitment that would persuade foreign rivals to produce less or to withdraw from the market. On the other hand, subsidies may well have had a deterrent effect in certain product markets characterised by monopolistic competition—differentiated, non-standardised product markets with low or negligible entry barriers, the very sorts of markets in which Taiwan’s export firms were pursuing a strategy of niche-marketing (Biggs & Levy 1990; Levy 1988). Available evidence does not, however, permit a definitive answer.

The relatively small size of the domestic market in Taiwan, combined with the proliferation of small firms in the export sector, has similarly tempered the government’s ability to employ the second main type of strategic trade policy—protecting domestic firms from imports to enable them to reduce unit costs by exploiting sizeable static and dynamic economies of scale, and thereby to capture export markets from their foreign rivals. Likewise, the relatively small size of the home market has no doubt reduced the scope for local firms to practise discriminatory pricing in the protected domestic market in order to subsidise their export sales. But this is not to say that policies to help firms realise economies of scale have been inconsequential. The protection and subsidies given to producers of intermediate products and capital goods, and the restrictions on entry into some of those industries (such as synthetic fibres and petrochemical derivatives), have allowed many of these upstream manufacturers to achieve considerable economies of scale, which in turn have flowed on to domestic users in the form of lower prices—a valuable pecuniary externality for exporters. In addition, given the presence of monopolistic competition in many of Taiwan’s product markets, subsidies may have permitted exporters to expand exports and to move down their average cost curves, in turn bringing about more competitive export prices as well as lower prices for domestic consumers (Venables 1984; Venables & Smith 1986 presents a theoretical discussion of this possibility).

More important than the ‘strategic trade’ effects of Taiwan’s selective industrial and trade policies have been their effect in generating external economies and enabling them to be captured by the domestic economy. As Wade (1990: 353–54) and Biggs and Levy (1990) have argued, many of these policies can be interpreted as efforts by the Taiwanese authorities to ensure that market conditions—capital constraints on large, long-term investments, information asymmetries, coordination failures among firms—did not obstruct the realisation of external economies. Some of the externalities, as mentioned above, have been pecuniary—where one firm’s increasing returns to scale are enjoyed by other firms and industries in the form of lower prices or higher quality inputs. Others, though, have been technological externalities—unpriced spillovers from one firm’s activities which benefit the production function of other firms and industries.

Taiwan has maintained a dualistic trade regime: government policies have favoured export sale by the mainly small- and medium-sized enterprises in the export sector but favoured domestic sale by firms in the import-competing sector. By initiating investment in and directing capital towards consecutive sets of basic upstream industries, the government’s planners provided new profit opportunities intended ‘to spark an endogenous downstream expansion of private firms as a result of its initiatives’ (Biggs & Levy 1990: 383). These initiatives helped generate sequential externalities that contributed to the economy’s productivity and growth over and above the profits earned by the targeted upstream industries. These investment initiatives also generated simultaneous externalities—benefits that are contingent on the complementary and simultaneous decisions of interdependent actors, and which are often lost if left to the uncoordinated investment
decisions of private agents—by ensuring the concurrent expansion of related industries.

Other policies had the clear objective of promoting Taiwan's technological capability. Among trade policies, the use of the law of similars fostered technological acquisition through 'learning by using': by preventing manufacturers importing particular intermediate products, these measures brought downstream users and local suppliers together and encouraged the latter to upgrade their production processes so that their products would meet the specifications demanded by the users. 'Repeated across many products, this mechanism can nudge the production structure of the country upwards' (Wade 1990: 360). The government helped private firms search for the most appropriate foreign technology and negotiated licensing agreements on their behalf. Government controls on direct foreign investment were used to set conditions for technology transfer. And the government set up state-owned technology research institutes to acquire and adopt foreign technology. Government-supported R&D—necessary to overcome the market failures associated with information spillovers, with the capital constraints and coordination difficulties faced by Taiwan's proliferation of small-sized firms, and with high entry barriers resulting from short product cycles and steep learning curves in high technology sectors—has been a particularly important measure in promoting 'strategic technologies' in Taiwan. Studies of government-initiated R&D in the machine tools industry (Fransman 1986) and in the informatics industries—computers, semiconductors, telecommunications (Mody 1989; Mody 1990; Schive 1990; Wade 1990: 106–8)—indicate the crucial role played by the state in assisting these strategic industries rapidly to master, improve, disseminate and commercialise the new technologies and to achieve international competitiveness. As Biggs and Levy (1990: 369) observe, 'externality-creating investments promoted (and sometimes undertaken directly) by government appear to have been unusually important in Taiwan's successful industrialisation'.

GOVERNMENT FAILURE IN NORTHEAST ASIA

Most economists who have acknowledged that there may be a case in theory for strategic trade policy have denied that it will succeed in practice. The reason, stated succinctly by Paul Krugman (1987b: 143) in a phrase often cited in this debate, is that one should adopt 'free trade as a rule of thumb in a world where politics are as imperfect as its markets'. Commentators who fear that intervention will lead to government failure point to the probability that governments will have insufficient information to make decisions on efficiency that would otherwise be dictated by millions of consumers in the marketplace (Krugman 1987b: 139; Lawrence 1984: 105; Spencer & Brander 1983: 711).

They also bring to bear on their analysis the formidable armoury of the theories of collective goods and rational choice. As government intervention will inevitably change income distribution, the danger, according to Krugman (1987b: 141) is that the 'politics of policy formation come to be dominated by distribution rather than efficiency'. Benefits from government intervention will tend to accrue disproportionately to small groups whereas the costs will be spread widely across society: collective goods theory would predict in these circumstances that the beneficiaries of such intervention will have the incentive to organise to press for government action. In the oft-employed metaphor of neoclassical economists, interventionist governments run the risk of opening a Pandora's box whereby government policy will be captured by rent-seeking groups. (Brander 1987: 28; Krueger 1990: 83; Krugman & Obstfeld 1988: 207). As Baldwin (1992: 225) notes: 'Political economy theory would therefore lead us to expect that governments would systematically choose the wrong trade policies'. Rational choice theories, moreover, provide a host of reasons why decision makers in public office will pursue policies that primarily benefit themselves or their organisations rather than the general interest (Stiglitz 1989; Wolf 1988). And, finally, even in the unlikely event that government intervention is successful in improving the short-term welfare of the economy, critics argue that it will probably be counterproductive in the long run because it will provoke retaliation by trading partners adversely affected by these policies.

If our argument, that Japan, Korea and Taiwan all successfully pursued elements of strategic trade policies in certain industries during specific periods of their postwar development, is to be credible, we have to explain why these countries did not always succumb to government failure. Again it is important to emphasise that we are not suggesting that government failures never occurred in these countries: there are examples of these governments picking losers, of their protecting politically important domestic constituencies, and of policy making being captured by rent-seeking interests. But such acknowledgement does not contradict our argument that on other occasions the state has acted strategically and decisively through industrial and trade policies to promote national welfare.

To explain why some states have behaved in a developmental rather than a predatory manner is no mean task. There is always a danger—
as was characteristic of some of the literature on state strength—of lapping into tautologies which equate the characteristics of the state with certain policy outcomes, and vice versa. An answer to why some Northeast Asian states have successfully pursued developmental strategies requires a multifaceted approach that encompasses characteristics of the state itself, the relationship between the state and the industrial sector, the culture in which the state is embedded, and the environment (strategic and economic—both international and domestic) prevailing at the time such policies were pursued. Taken individually, none of these factors may be necessary, and certainly none are sufficient, to explain the outcome (some of the characteristics, such as elite planning agencies, were present in other countries without leading to similar positive results). Moreover, even when they occur together, the factors do not guarantee a particular outcome—state actors had to make the conscious choice to seize the opportunities available to them.

The development of industrial policy in all three states was led by technocrats located in planning agencies (Johnson 1982, 1987). There were differences between the ‘pilot agencies’ in the three countries: MITI had the widest range of powers; the Korean Economic Planning Board, established in July 1961 immediately after the military coup of Park Chung-Hee, resembled MITI in its mandate; while Taiwan’s Council for Economic Planning and Development lacked the same status as primus inter pares among that country’s economic ministries (Choi 1987; Wade 1990). But recruitment to all three agencies was highly competitive. The public service as a whole in all of the countries (at least after the overthrow of Rhee in Korea) operated on meritocratic principles, and jobs within the planning agencies were among the most highly sought after. As Vogel (1991: 92–101) and Evans (1989) note, neo-Confucian and Weberian characteristics predominated in these bureaucracies: selected in a highly competitive meritocratic manner and enjoying long-term career rewards, bureaucrats are imbued with both a sense of responsibility for the overall welfare of society and a sense of corporate commitment and coherence.

Because of the centrality of their role in government and the high calibre of their staff, the planning agencies were held in high esteem both within the bureaucracy and within society as a whole. Such agencies were able to overcome the information failure problems pointed to by critics of state intervention, not only because they had their own detailed intelligence about the domestic and international economies, and staff of sufficient calibre to be able to digest such data and engage in rational planning on the basis of them, but also because of their relationship with the private sector. This relationship is best captured by Evans’s (1989) idea that the Northeast Asian states were ‘embedded’ in a specific set of social ties that provided institutionalised channels for the collection and exchange of information and for ‘continual negotiation and renegotiation of goals and policies’.

Yet despite the close working relationships with business, the planning agencies for the most part did not succumb to rent-seeking behaviour. The explanation for this lies in their members’ commitment to corporate coherence, the perception on the part of technocrats that career success was dependent on national economic performance, and the ability of the agencies to identify and articulate a clear sense of the national economic interest that gained widespread social acceptance. This insulation from the business sector—the fact that the state is not beholden to individual companies—has afforded it the freedom to discipline individual firms by ensuring that they were subject to the forces of competition, either domestically or internationally. A necessary permissive factor enters the equation here: for the state to act in this manner it must exercise control over key policy instruments such as access to credit, import licences, and tariff protection.

The autonomy of the industrial planning agencies from individual companies, unlike the relationship between other ministries and their clients, has made it less likely that the agencies will succumb to rent-seeking interests. Various administrative arrangements within the agencies may help to enhance this autonomy. Okimoto (1989: 113), for instance, notes that MITI is organised into two types of bureau—‘horizontal’ (which looks after the economy as a whole) and ‘vertical’ (which oversees particular sectors)—providing a series of internal checks and balances against particularistic interests. And in Japan MITI does not interact primarily with individual firms but works through industry associations that, in Olson’s (1982) words, were more ‘encompassing’ than ‘distributional’ in character. Furthermore, it has been suggested that the structure of Japanese business organisations—particularly the horizontal keiretsu with their firms representing a variety of different sectors—is itself akin to an encompassing rather than a distributional coalition (Jankowski 1989). A similar argument might be made for the chaebol in Korea.

To assert that the state has acted autonomously in the pursuit of strategic trade policies is to argue, in Wade’s (1990) terms, that the state at times has pursued a strategy of ‘big leadership’; that is, it has intervened to change the pattern of incentives sufficiently to make a ‘real difference to investment and production patterns in an industry’. On occasion this has led industry down a path it initially opposed.
Haggard (1990: 39, 40, 98), for instance, records that the move to outward-oriented industrialisation in Korea and Taiwan did not reflect business interests and, indeed, was possible only because the state designed the policy in isolation from such interests. The state has been able to exercise 'big leadership' either because it was able to convince business interests through 'administrative guidance' of the desirability of pursuing a particular course of action, or because it could compel them through the exercise of the policy instruments under its control. There were significant differences between the three countries in the ways in which government and business interacted. These inevitably have affected the modalities of government intervention in the economies. In Japan, administrative guidance was frequently sufficient to ensure that firms pursued the desired policies. In Taiwan, Wade (1990: 321) suggests that the government has used state-owned enterprises and public laboratories to lead the push into new fields, and relies on arms-length incentives to steer the smaller and medium-sized private firms. In Korea, in contrast, the government has relied more on using targeted credit to steer the chaebol into particular activities.

Although the state in all three countries at times performed a 'big leadership' role, for the most part the relationship between business and government was a cooperative one (Johnson 1982: 311). Okimoto (1989: 145) concludes his discussion of industrial policy in Japan by suggesting that to perceive government–business relations as a 'Manichean' struggle misses 'the subtlety and complexity of the relationship', a relationship that is not adversarial but based on cooperation in attempting to achieve common goals. Samuels (1987) depicts the Japanese relationship as one of 'negotiated reciprocal consent'. In their study of government–business relations in Korea during the Park regime, Jones and Sakong (1980) argue that because of the dependence of the government on economic performance, and thus on the achievement of private business, a mutuality of interest existed between government and business. That mutuality of interest was reflected in a partnership between the two, albeit an unequal partnership. Amsden's (1990) study of Korean industrialisation stresses the importance of reciprocity in government–business relations: in a direct exchange for subsidies and other discretionary privileges, business complied with the strict performance standards demanded by the government. In all three countries the relationship between the state and business has evolved toward a more equal partnership as the very success of developmental policies has created strong private companies. This has given the latter substantially more autonomy and consequently has reduced the effectiveness of the policy instruments controlled by the state.4

When economists write of the political economy problem that they perceive as inevitably accompanying state intervention in the economy they clearly have in mind a pluralist political system (most often, of course, the United States) where legislatures are of importance in the policy-making process, where the state is weak, and where politicians, acting individually or collectively, have the capacity to interfere in policy making to promote particularistic interests. Such images had little resonance in the three countries where, until recently, in Johnson's (1987) aphorism, politicians reigned but bureaucrats ruled. A single party monopolised government in Japan from 1955 to 1993; for most of this period the Diet was ineffective. Korea and Taiwan for most of the postwar period have not only been subject to military rule but have been militarised societies. Until the lifting of martial law in 1987, Taiwan, unlike Korea, did not even make the pretence of being a democratic polity. In all three countries, politicians have become more important in the last decade; this trend has important implications for the autonomy of the state. (On Japan see Muramatsu & Krauss (1984); on Korea see Haggard & Moon (1990) and Moon (1988); and on Taiwan see Cotton (1991) and Wu (1989).)

Organised labour and other social forces that might have opposed the state's industrial policies were effectively excluded from policy making. Haggard (1988: 263) writes of a 'relative vacuum on the left' that was characteristic of politics in South Korea and Taiwan. Groups opposed to reforms were either suppressed or integrated into state-sponsored corporatist organisations (Deyo 1987). The postwar land reforms in the two countries removed the power of the landlord class and reduced the likelihood that the regimes would be subject to rural-based revolts. The Japanese political system has been described as 'corporatism without labour' (Pempel & TsuneKawa 1979), a system in which organised labour has had little effective input into higher level political decision-making.

If the argument is accepted that the success of the state in Japan, Korea and Taiwan was based on its autonomy from societal forces, an explanation is still needed as to why such strong states did not pursue a predatory approach in pursuit of their own interests rather than those of society as a whole. There is a 'statist paradox' to be explained—why those states best placed to pursue predatory policies chose not to do so. A persuasive explanation is to be found in the 'situational imperatives' listed by Johnson (1982: 307), in particular the serious external and, especially in the cases of Taiwan and South Korea, internal threats faced by governments in the early postwar
years. Poor natural resource endowments made industrialisation the only possibility for achieving rapid economic growth. State elites in Taiwan and Korea had the benefit of learning from previous mistakes (the Kuomintang from its disastrous experience on the mainland; Korea from the rent-seeking of the Rhee years), and could look to Japan as an economic model to emulate. Yet ‘situational imperatives’ do not become imperative until they are perceived as such by the state elite. It was the perception that the legitimacy and indeed possibly the integrity of the state, and thus their own political fortunes, were tied to economic performance that was crucial.

In short, a combination of factors caused the three states to pursue a developmental rather than a predatory trajectory. In Evans’ (1989) terminology, the state was embedded in a set of relationships—with economic and social actors and with the international economic and security systems—that enhanced state autonomy, improved state capabilities, and facilitated the pursuit of developmental objectives. Yet this conjuncture of domestic and international circumstances did not dictate outcomes: rather, policies were determined by the vision of political elites and their creative response to adverse circumstances.

The final issue to be addressed in this section is the argument that strategic trade policies will not work because ‘a country that attempts to use such policies will probably provoke retaliation’ (Krugman 1987b: 141). Arguments such as these, typically made by economists, are completely ahistorical and acontextual. The success of the Northeast Asian developmental states owed much to the regional security context of the immediate postwar years (Cummings 1987). In a period when the United States was the undisputed economic hegemon, it was willing to allow the three Northeast Asian economies (as well as those of Europe) to discriminate against its economic interests in order to pursue its security agenda. As the security situation has changed, and the US economy declined relative to that of its major competitors, so the US government has been far less willing to tolerate the employment of predatory policies by its trading partners. Nevertheless, there are other reasons why an automatic retaliatory response to strategic trade policies might not be forthcoming. These include the difficulties of providing sufficient proof to satisfy legal requirements to document the existence of or detrimental effects of such policies; the possibility that the offending state will have domestic allies or effective paid lobbyists in the political systems of its trading partners; or because the offending country does not cast a sufficient shadow in the international trading system to be deemed to be of concern. In any event, retaliation may be counterproductive: the US discovered to its cost that the voluntary export restraint on Japanese cars created windfall profits for Japanese producers, and strengthened MITI’s hand in dealing with the Japanese car industry.

CONCLUSION

We have reviewed one dimension of government–business relations in Northeast Asia: how governments have intervened through selective sectoral policies to provide support that has enabled businesses to undertake activities that would not have been possible if dependent on the firms’ own resources. These policies have been consistent with prescriptions that can be drawn from the literature on strategic trade theory. We have also suggested why the interventionist policies pursued by the governments of Japan, Korea and Taiwan did not succumb to state failure as often as neo-liberal critics of state intervention have argued would occur.

In the first section of this chapter, we identified four variants of strategic trade theory. In these different variants, government intervention is asserted: to foster rent-shifting by enabling firms to make credible commitments; to help firms to realise scale and learning economies by providing protection of the domestic market and/or by facilitating exports; to assist in the realisation of externalities; and to set economies on a more beneficial technological trajectory than would otherwise have occurred. To what extent do the experiences of the three Northeast Asian countries substantiate these various strategic trade arguments?

Not surprisingly, there is little evidence in our three cases of game-theoretic-type strategic actions along the lines of the original Brander/Spencer formulation of strategic trade theory. For, even leaving aside the contentious issue of whether there are significant rents to be gained from such interventions, the conditions under which such action would be possible are rare, particularly for countries that are not at the technological frontier. The game-theoretic variant of strategic trade theory assumes that industries susceptible to government intervention are characterised by a very small number of producers, substantial barriers to entry, and significant economies of scale. Although the number of such industries undoubtedly is increasing as the costs of research and development escalate, and global alliances between firms become commonplace, they are still relatively uncommon and, perhaps more importantly, not the type of industries that countries can enter unless they are already close to the technological frontier. Government commitments would only be credible to potential rivals if domestic companies have already acquired substantial capabilities in the relevant industries. Such actions would not be
expected, therefore, in economies that are passing through the early stages of industrialisation. Accordingly, game-theoretic strategic commitments figured in our cases, it was after a substantial industrial and technological base had been established. Most of the examples are from Japan, especially in the semiconductor industry. There is also some evidence to suggest that government commitments have enabled Korean companies to enter the semiconductor industry, and to drive out Japanese producers from the low end of the market.

More prevalent have been actions in accord with the variant of strategic trade theory that builds on the infant industry argument to suggest that government intervention through protecting the domestic market and through facilitating exports may enable firms to capture the benefits of scale and learning economies. The larger the domestic market, the greater the potential for realising such benefits. Japanese companies thus have tended to benefit more than their Korean counterparts, which in turn benefited more than Taiwanese firms, from having a secure home market (although it should be noted that in most industries in Japan there has been vigorous competition in the protected domestic market between a number of companies, whereas Korea and Taiwan in some sectors have granted companies domestic monopolies). Governments in all three countries have also, however, utilised various policy instruments to enable domestic firms to realise scale and learning economies through penetrating foreign markets.

The third and fourth variants of strategic trade theorising both build on the notion of realising externalities, and we will consider them together here. Our case studies show many examples in all three countries where government intervention in the form of sectoral trade and industry policies has occurred with the intention of realising externalities, of changing technological trajectories, and of shaping comparative advantage. None of the governments has been content to entrust the course of economic development exclusively to the market. All three have consciously targeted industries that were perceived to be strategic for the economy's future growth—industries that were skill- and capital-intensive, industries that were expected to generate technological spillovers and other externalities, and industries whose products were identified as having high income elasticities of demand. A similar set of industries was identified for government support in all three countries—steel, heavy and chemical industries, automobiles, electrical and electronics, semiconductors and, most recently, bio-technology. The similarity in the industries assisted is unremarkable given, first, the importance of these sectors to modern industrialised economies and, second, the fact that both Korea and Taiwan consciously set out to emulate the Japanese model.

Various policies have been used to overcome factors such as coordination and information failures that prevent externalities from being realised. Again, there are great similarities across the three countries. Governments have sponsored research and development activities designed to acquire and disseminate foreign technologies; they have used their powers over foreign investment to require technological transfer and/or to insist that foreign investors take on local joint venture partners. The net result was to shift production to the local economies, production that would otherwise have been carried out overseas. A remarkable feature of the three countries was the relatively small role played by transnational corporations.

In short, the state has intervened decisively in Japan, Korea and Taiwan at various times to change the structure of incentives for particular industries in a manner that has significantly affected their patterns of economic development. Conclusions about the replicability of this experience with strategic trade policies must, however, be drawn cautiously. We have argued that the success of the policies pursued by these states depended on the political and institutional contexts in which they were applied. To avoid state failure in the pursuit of similar policies in political systems that lack the normative consensus, the exclusionary characteristics and/or the weak legislatures of Japan, Korea and Taiwan will be much more difficult. Similarly, to reproduce the elite planning agencies of these countries elsewhere, without the supporting political and economic environments, is to invite very different results. This is not to say that there are no possibilities for the construction of functional equivalents to the development-promoting Northeast Asian structures and agencies, but rather that other countries will have to devise their own structures rather than mimic those from an alien context (Haggard & Moon 1990).

These qualifications about the application of strategic trade policies notwithstanding, there does appear to be potential for other countries to benefit from similar policies. As we have seen, such policies are most likely to be successful when countries are still at the catch-up stage, a considerable way behind the technological frontier. For one thing, market failures are more likely to be a feature of less advanced economies. For another, as economies mature, the instruments of intervention available to the state lose their effectiveness as corporations gain increasing autonomy. And such policies may be all the more important in an increasingly integrated global economy. There is now intense competition between a growing number of economies seeking
to become next-generation NICs. One dimension of this competition
occurs in bargaining with transnational corporations for a share in the
global production process. State intervention to enhance the benefits
that domestic economies gain from participation in global production
chains may be decisive in determining the technological trajectories
that countries will follow. States which fail to intervene to promote
industries that generate externalities that can be captured by the
domestic economy will be in danger of missing out in the struggle for
economic growth.

NOTES

1 ‘Calibration’, in Richardson’s words (1989: 19), ‘amounts to making the
assumed behaviour and one period’s data mutually consistent’. As Krug-
man (1986: 661) acknowledges: ‘the gimmick is to specify the model so
that the number of free parameters and the number of discrete pieces of
data are the same. This means that [a calibrated model] is empirical work
only in the sense that the data is allowed to determine some of the results.
The data is not given a chance to reject the model’. Calibrated studies,
in other words, have a number of very significant weaknesses and their
results are very dependent on the parameters estimated by the researchers.
Richardson (1989: 22) lists their defects as ‘simplicity, judgemental use
of data and econometric estimation, insistence on maintaining rather than
testing hypotheses, and imprecise statistical robustness’ and concludes
that ‘calibration countered models are more art than science’. Despite
Krugman’s (1992: 434) admission that ‘Nobody really believes in the
calibrated results’, they continue to be widely cited by critics of strategic
trade policy (The Economist 1990, for example).

2 Two calibrated studies that do report positive results from strategic trade
policies are Daltung, Eskeland & Norman (1987) and Baldwin & Flam
(1989).

3 The most comprehensive presentation of this approach may be found in
Dosi, Pavitt & Soete (1990); one of the more accessible treatments is
Dosi, Tyson & Zysman (1989); see also Pack & Westphal (1986). The
approach builds on the work of theorists of technological change such as
Nelson & Winter (1982), and Mowery & Rosenberg (1989).

4 In Wade’s (1990: 28) terminology, the relationship between business and
government in the three Northeast Asian countries may have been
characterised more frequently by big followership than by big leadership.
Big followership refers to situations where government policies enable
firms to undertake activities that they themselves wished to initiate but
which they are unable to finance from their own resources. For the
purposes of qualifying as strategic trade policy, however, it is immaterial
whether governments ‘lead’ or ‘follow’—the key question is whether the
sectoral policies pursued produce outcomes that would not have occurred
if left to market forces alone.

BIBLIOGRAPHY

Aho, Michael & Aronson, Jonathan David 1985, Trade Talks: America Better
Listen, Council on Foreign Relations, New York

Amsden, Alice H. 1990, Asia’s Next Giant: South Korea and Late Industrial-
isation, Oxford University Press, New York

Anchorduguy, Marie 1989, Computers Inc.: Japan’s Challenge to IBM, Harvard

computer and semiconductor industries’, Japan’s Economic Structure:
Should It Change?, ed. K. Yamamura, Society for Japanese Studies,
Seattle

Arthur, W.B. 1989, ‘Competing technologies, increasing returns and lock-in

Balassa, Bela & Associates eds 1982, Development Strategies in Semi-Industrial
Economies, Johns Hopkins University Press, Baltimore

Baldwin, Richard 1992, ‘High-technology exports and strategic trade policy
in developing countries: the case of Brazilian aircraft’, Trade Policy,
Industrialization, and Development: New Perspectives, ed. G.K. Helleiner,
Clarendon Press, Oxford

Baldwin, Richard & Flam, Harry 1989, ‘Strategic trade policies in the market
for 30–40 seat commuter aircraft’, Wirtschaftliches Archiv, vol. 125,
no. 3, pp. 484–99

Baldwin, Richard & Krugman, Paul 1988a, ‘Industrial policy and interna-
tional competition in wide-bodied jet aircraft’, Trade Policy Issues and
Empirical Analysis, ed. R.E. Baldwin, University of Chicago Press, Chi-
cago

—1988b, ‘Market access and competition: a simulation study of 16K

Baldwin, Robert E. 1991, Are Economists’ Traditional Trade Policy Views Still
Valid?, National Bureau of Economic Research Working Paper No. 3793,
Cambridge, Mass.

Bernstein, J.I. & M.I. Nadiri 1988, ‘Intra-industry R&D Spillovers, Rates of
Return and Production in High Technology Industries’, American Eco-
nomics Review, vol. 78, no. 2, pp. 429–34

Bhagwati, Jagdish N. 1990, ‘Export-promoting trade strategy: theory and
evidence’, Export Promotion Strategies: Theory and Evidence from Developing
Countries, ed. C. Milner, Harvester Wheatsheaf, Hemel Hempstead

Biggs, Tyler S. & Levy, Brian D. 1990, ‘Strategic interventions and the
political economy of industrial policy in developing countries’, Reforming
Economic Systems in Developing Countries, eds D.H. Perkins & M. Roemer,

Borrus, Michael 1983, ‘The politics of competitive erosion in the U.S. steel
industry’, American Industry in International Competition: Government Pol-
icies and Corporate Strategies, eds J. Zysman & L. Tyson, Cornell
University Press, Ithaca


Evans, Peter B. 1989, Predatory Developmental and Other Apparatuses: A Comparative Analysis of the Third World State, typescript.


Greenaway, David & Reed, Geoffrey 1990, 'Empirical evidence on trade orientation and economic performance in developing countries', Export
Promotion Strategies: Theory and Evidence from Developing Countries, ed. C. Milner, Harvester Wheatsheaf, Hemel Hempstead


Kasper, Wolfgang ed. 1990, Competition and Economic Growth: The Lessons of East Asia, Egon Sohmen Foundation, Tegernsee, Germany


---1987b, 'Is free trade passe?', Economic Perspectives, vol. 1, no. 2 (Fall), pp. 131–44


Levy, Brian 1988, 'Korean and Taiwanese firms as international competitors: the challenges ahead', Columbia Journal of World Business, pp. 43–51
Moon, Chung-In 1988, 'The demise of a developmentalist state? Neoconservative reforms and political consequences in South Korea', Journal of Developing Societies, vol. 4
—1982, 'Commercial policies and the structure of protection in Japan',
STRATEGIC TRADE POLICY


Westphal, Larry E. et al. 1984b, 'Republic of Korea', World Development, vol. 12, no. 5/6, pp. 505–33


