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POLICY STAFF PAPER

NO. 93/14

**AND THE DEVIL TAKE THE HINDMOST:
THE EMERGENCE OF STRATEGIC TRADE POLICY**

by

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(December 1993)

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Executive Summary

In recent years, some policy analysts have advocated protectionist trade measures under the rubric of "strategic trade policy". All sorts of trade distorting potions for domestic economic difficulties have been peddled under the strategic trade policy nostrum. This approach is topical and controversial. In parts of the policy community, there is a belief that this prescription should be actively pursued. Yet, free trade is still the best trade policy. Mainstream trade theory and practical experience reassure us that multilateral and regional trade liberalization represents the soundest course.

The objective of this Paper is to: (a) outline the concept and economic logic of strategic trade and industrial policies, (b) present the essence of the debate on implementing these policies in view of the evidence from various countries, and (c) draw conclusions from the strategic trade debate for policy in Canada.

The theory of strategic trade suggests that if the government commits itself to subsidize "our" companies, foreign competitors can be driven out of concentrated international markets. Assuming that other governments do not retaliate, "we" can shift rents from "them" to "us". In the presence of economies of scale, incremental costs fall as producers move down their learning curve. Our government can ensure the long run viability of our companies by subsidizing the sunk costs of setting up large operations with spare capacity. Should the foreigners contest the market, our corporations would undercut their prices by cranking up volume and achieving lower unit costs. Strategic trade policy would enable our companies to capture rents in imperfectly competitive markets at the expense of our rivals. So goes the theory.

Industrial policy purports to work by moving resources from sectors that the government considers less desirable to those that it thinks are worth having in the country. In theory, government intervention in the guise of industrial policy can be justified on account of market failure. However, the proponents of industrial policy have jumped to policies which can generate popular appeal, but enjoy limited economic merit. We examine a few such arguments in this Paper. How and why should governments pick companies in growth oriented high technology industries and give them money to set up shop? Because these companies will generate rents and provide well paying jobs, the argument goes, government should subsidize selected corporations or industries that produce high value added goods.

The problem with these arguments is that if these businesses are valuable, now and in the future, the marketplace will allocate and shift resources without government programmes in most industries. It is possible that markets are not doing a perfect job. But to implement strategic trade and industrial policies, the authorities require detailed information on market

concentration, the magnitude of spillover effects, and the reaction of our trading partners before picking corporations that are to receive government money. It is a general property of strategic trade and industrial policies that their effectiveness depends on an exact reading not only of the targeted industry, but also of the impact on other industries with which it competes for resources. The crucial question here is whether the intervention by bureaucrats can outperform the market outcome. The Paper looks at several specific examples in Europe and Japan that suggest that picking "winners" leads to sub-optimal results.

The empirical evidence of industrial policy is, at best, a mixture of failures and arguable successes. In Japan, the "success" of industrial policy occurred from the 1950s to the early 1970s, but was a response needed to balance other distortions created by Japanese government policy, including exchange and interest rate controls. Moreover, Japanese policies were more directed at catching up rather than supporting industries of the future that one commonly expects strategic trade policy to deliver. From the mid 1970s on, Japan has not been the first mover and its corporations have not been the first ones to capture rents, even in the case of semiconductors.

Enhanced access to international markets and domestic markets free of impediments are linked and mutually reinforcing. Market economies work well because they constantly move resources from relatively unproductive uses to relatively productive ones. This is a powerful and enriching process of destruction and renewal. Free trade broadens the scale of the market, increases the pressure of competition and facilitates the process of creative adjustment. Departures from this fundamentally sound approach should be truly exceptional, limited to substantiated instances of market failure or the defence of otherwise competitive industries from the clearly predatory policies of other governments. But even in these latter instances, strategic trade and industrial policies represent a second-best option. International rule-making developed through trade negotiations should remain the preferred approach for Canada. Such negotiations can be tedious and frustrating, but they have delivered results that have served Canada well. Rule-making is more likely to bring permanent, optimal solutions than embarking on the uncharted, and essentially unchartable, waters of strategic trade policy.

Résumé

Ces dernières années, certains analystes ont préconisé la prise de mesures commerciales protectionnistes sous le couvert d'une «politique commerciale stratégique» qui justifierait toutes sortes de solutions faussant les échanges pour régler les problèmes économiques intérieurs. Il s'agit là d'une approche ponctuelle et controversée qui, selon certains, devrait néanmoins être activement poursuivie. Pourtant, c'est le libre-échange qui constitue encore la meilleure politique commerciale. La théorie commerciale courante et l'expérience pratique nous confirment que la libéralisation des échanges commerciaux multilatéraux et régionaux constitue la voie la plus sûre.

Ce document a pour objectif a) de présenter le concept et la logique économique des politiques stratégiques en matière de commerce et d'industrie, b) de résumer l'essence du débat sur la mise en oeuvre de ces politiques à la lumière de l'expérience de plusieurs pays, et c) de tirer des conclusions du débat canadien sur une politique commerciale stratégique.

La théorie du commerce stratégique suggère que, si le gouvernement s'engage à subventionner «nos» sociétés, les concurrents étrangers pourraient se voir évincés de marchés internationaux concentrés. En supposant que les autres gouvernements n'usent pas de rétorsions, nous pourrions «nous» attribuer «leurs» rentes. Par le jeu des économies d'échelle, les coûts différentiels diminuent à mesure que progresse l'apprentissage des fabricants. Le gouvernement peut garantir la viabilité à long terme de nos sociétés en subventionnant les coûts irrécupérables d'établissement de grandes opérations de production à capacité supplémentaire. Si des concurrents étrangers tentaient de s'accaparer le marché, nos sociétés casseraient leurs prix en accroissant la production et en réduisant les coûts unitaires. Une politique commerciale stratégique permettrait à nos sociétés de s'approprier des rentes dans des marchés imparfaitement concurrentiels et ce, aux dépens de nos rivaux. Voilà pour la théorie.

La politique industrielle tire présument son efficacité du déplacement de ressources vers des secteurs que le gouvernement juge plus utiles pour le pays. L'intervention gouvernementale sous le couvert de la politique industrielle peut théoriquement se justifier par l'échec des mécanismes du marché. Les partisans de la politique industrielle se sont toutefois ralliés autour de politiques généralement populaires, mais économiquement peu avantageuses. Dans ce document, nous examinons quelques-uns de ces arguments. Comment et pourquoi les gouvernements devraient-ils choisir des entreprises de pointe porteuses de croissance et leur donner de l'argent pour les aider à se lancer en affaires? Parce qu'elles généreront des rentes et qu'elles créeront des emplois bien rémunérés. C'est pourquoi, selon cet argument, le gouvernement devrait subventionner certaines sociétés ou industries qui produisent des biens à forte valeur ajoutée.

Le problème avec ces arguments est que, si ces entreprises sont vraiment utiles dans l'immédiat et pour l'avenir, les forces du marché vont généralement leur affecter de nouvelles ressources sans l'intervention du gouvernement. Il est possible que les mécanismes du marché ne trouvent pas la solution parfaite. Mais lorsqu'il s'agit d'appliquer des politiques stratégiques en matière de commerce et d'industrie, il faut que les autorités disposent d'une information détaillée sur la concentration du marché, sur l'ampleur des effets d'entraînement et sur la réaction de nos partenaires commerciaux avant de choisir les sociétés qui recevront des fonds publics. L'efficacité de ces politiques dépend généralement d'une bonne connaissance de l'industrie ciblée et d'une bonne compréhension de son impact sur les autres industries avec lesquelles elle rivalise pour l'obtention de ressources. La question cruciale qui se pose ici est celle de savoir si l'intervention des bureaucrates peut améliorer la situation commerciale de

l'industrie ciblée. Le document examine plusieurs exemples européens et japonais d'où il ressort que le choix de «gagnants» entraîne une sous-optimisation des résultats.

Dans les faits, la politique industrielle se traduit au mieux par un mélange d'échecs et de succès contestables. Au Japon, la politique industrielle «a réussi» depuis les années 1950 jusqu'au début des années 1970; mais une telle politique était requise pour corriger d'autres distorsions créées par la politique du gouvernement, y compris le contrôle des changes et des taux d'intérêt. De plus, les politiques japonaises visaient davantage le rattrapage que l'appui d'industries d'avenir du type habituellement ciblé par la politique commerciale stratégique. Dès le milieu des années 1970, le Japon a cessé de prendre l'initiative dans ce domaine et ses sociétés n'ont pas été les premières à s'accaparer des rentes, même dans le cas des semi-conducteurs.

L'accès amélioré aux marchés étrangers et le maintien de marchés intérieurs libres sont des objectifs complémentaires. Les économies de marché fonctionnent bien parce qu'elles déplacent constamment les ressources vers les utilisations relativement plus productives. C'est là un processus de destruction et de régénération puissant et enrichissant. Le libre-échange élargit la taille du marché, intensifie les pressions concurrentielles et facilite le processus d'ajustement innovateur. Cette approche fondamentalement saine ne devrait être délaissée que dans des cas vraiment exceptionnels, soit lorsqu'il faut contrer l'échec manifeste des mécanismes du marché ou protéger des industries par ailleurs concurrentielles contre les politiques manifestement abusives d'autres gouvernements. Mais même dans ces derniers cas, les politiques commerciales et industrielles stratégiques ne constituent pas la meilleure option. L'établissement de règles internationales par la voie de négociations commerciales devrait rester l'approche privilégiée par le Canada. Ces négociations peuvent être ardues et frustrantes, mais elles ont aussi donné des résultats qui ont bien servi le Canada. Le processus d'établissement de règles a plus de chances de déboucher sur des solutions optimales et permanentes que n'en a l'adoption d'une politique commerciale stratégique qui nous entraîne essentiellement dans l'inconnu.

1. INTRODUCTION

In the 1980s, the trade balance of the U.S. declined sharply, while Japan, Germany and the Asian NICs built up large, continuing surpluses. At a popular level, concern began to grow that American goods were being frozen out of many foreign markets, and in particular the Japanese market. American competitiveness was slipping away in high-tech industries. As a result "good jobs at good wages" were disappearing. Such developments led many people to question whether the traditional postwar reliance on multilateral free trade arrangements is still the best course for the United States. The evolving U.S. response to these pressures will have an enormous impact on the international trading system as a whole, and on Canadian prosperity in particular.

The challenges to the multilateral system have also come from the recent theoretical development of so-called strategic trade policy. Some analysts, such as Prestowitz¹, Reich² and Thurow³, have suggested that U.S. trade policy should "manage trade" to restore and sustain the competitiveness of American export industries. Traditionally, protectionist pressures have arisen to avoid job losses in older "sun-set" industries. The new trade policy would use the power of the U.S. market to promote specific market access targets abroad for those U.S. exporters (especially those in high technology industries where dynamic economy-wide externalities are assumed) who could dominate world markets, thereby preserving high-wage jobs in the U.S. At its core, the modern trade debate is not about jobs, but about wages and living standards. The new theory of strategic trade policy is often used as the intellectual support for managing trade through market share targets and targeted government support at home for those industries facing "unfair" competition from foreign suppliers.

Dornbusch diagnoses the U.S.'s trade problems as stemming principally from barriers to American imports in Japan, the consequence of which is to force down the value of the U.S. dollar and depress American real wages and living standards.⁴ Dornbusch advocates "results-oriented" trade measures and a policy of aggressive bilateralism. He would establish quantitative targets for American exports into Japan and, if that did not work, would threaten Japan with higher U.S. import tariffs. Dornbusch is not concerned about promoting exports of one industry

¹ Clyde V. Prestowitz, *Trading Places: How We Allowed Japan to Take the Lead*. New York: Basic Books, 1988.

² Robert E. Reich, *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*, New York: Knopf, 1991. Mr. Reich is now President Clinton's Secretary of Labour.

³ Lester C. Thurow, *Head to Head*, New York: Warner Books, 1992.

⁴ Rudiger W. Dornbusch, "Policy Options for Freer Trade: The Case for Bilateralism", in Robert Z. Lawrence and C.L. Schultze, ed., *An American Trade Strategy: Options for the 1990s*, The Brookings Institution, Washington, D.C., 1990, pp. 106-34.

over another. In his view, one dollar's worth of exports is as good for the United States as any other dollar's worth.

Laura D'Andrea Tyson offers a different version of a new U.S. approach to international trade. She argues that the United States needs a government policy that actively promotes the development of high value-added industries. The rapid development of certain strategic U.S. industries, such as the high technology electronic and communications sectors, she believes, confers beneficial spillovers on the rest of the U.S. economy. These industries, if sufficiently reinvigorated, would avoid a loss of U.S. markets under the onslaught of the aggressive trade practices of Japan and the European Union. After all, in her view, other governments actively support their high-technology industries. Ms. Tyson's contention is that the U.S. cannot afford to leave the development of such industries to imperfect international market forces alone. Consequently, her policy of managed trade envisages the negotiation of a series of international agreements, recognizing that governments do subsidize, protect and otherwise support their high technology industries. She would codify rules of the game for such intervention. If such agreements cannot be reached, Tyson argues that the U.S. should then set numerical targets for foreign exports to the U.S. or U.S. exports to other countries (applied to specific industries) and use the threat of various sanctions to achieve those outcomes.⁵

1.1 Strategic Trade Policy in Imperfectly Competitive Markets

Imperfect competition among a small number of large firms, especially in high technology industries, provides each firm an opportunity to make above normal profit or "rents". Taking such rents as given, trade environments that provide a country larger access to rents are economically superior to other situations. Strategic trade policy can, at least in theory, achieve such trade patterns. Alternatively, it can deter other countries from gaining such an advantage at "our" country's expense. Thus, strategic trade policy is essentially a rent-shifting device in imperfectly competitive environments.

Trade policy has the power to shift rents because it alters the world market conditions in our favour. Our export subsidies, for example, may be seen by firms as equivalent to domestic cost reducing innovations. Furthermore, they may preempt or deter foreign firms from rent draining expansion in third country markets. An import tariff may do the same at home. To alter the decisions of rivals in this way, foreign firms must view such domestic policy as a credible commitment. One way domestic firms can signal this is by incurring large sunk costs and building spare capacity with the potential of achieving economies of scale. If foreign

⁵ Laura D'Andrea Tyson, *Who's Bashing Whom? Trade Conflict in High-Technology Industries*, Institute for International Economics, Washington, D.C., 1992. To her credit, Ms. Tyson also is scathing in her criticism of the current international rules on dumping. For example, she views the anti-dumping methodology based on constructed value (including in the U.S.) to be arbitrary and contrary to good economics (e.g., the focus on average total cost pricing and a unilaterally imputed "normal" profit margin). Ms. Tyson is currently Chairperson of the Council of Economic Advisors in the Clinton Administration.

competitors still want to contest the market with us, our firms can expand output and lower unit costs to undercut the rivals' price. "They" are driven out and "we" capture the market. So goes the theory.

1.2 Strategic Trade Policy and Industrial Policy

In addition to rent-capturing through export promotion, advocates of strategic trade policy suggest other benefits of targeting and promoting high technology industries. One feature of many industries employing skilled workers and advanced technology is that the R&D in one sector has beneficial spillovers in the rest of the economy. On account of this theoretical reasoning, it makes sense for a government to target such industries and provide them subsidies to exploit their favourable effects. This is the old argument of industrial policy. From the viewpoint of industrial targeting, the proponents of strategic trade policy have basically extended the industrial policy argument to international trade. Industrial policy is an attempt by a government to encourage resources to move into particular sectors that the government views as important to future economic growth. Industrial policy has been practised with mixed results by countries such as Japan, France and, to some extent, by the United States and Canada. Several practical case studies are summarized in section 3.

The rest of this Paper is set out as follows. Section 2 sets out the theory and some considerations related to strategic trade policy and industrial policy. In section 3, we assess the relevance of these policies. In section 4, we do an assessment of strategic trade policy from Canada's trade perspective. Conclusions are found in section 5. In the Annex, imperfect competition and strategic trade policy are further illustrated. A companion study released as Staff Paper no. 93/16 explores more fully the impact of industrial and strategic trade policies on Japan's economic performance.

2 STRATEGIC TRADE THEORY AND INDUSTRIAL POLICY

2.1 The Stylized Theory of Strategic Trade Policy

Let us present, in a very stylized environment, the case of welfare improving policy that involves the use of subsidies to enhance the strategic position of a domestic firm engaged in competition for world markets with a foreign rival. Imagine that there are two firms, one Japanese and one U.S., serving a world market contained entirely in other countries. Each firm recognizes that its profit depends in part on what its rival does. How will firms behave in such a situation of a "strategic game"? In many possible ways. The Cournot or Bertrand models are two plausible theories.⁶ Cournot's idea is that stable equilibrium will occur when each firm is

⁶ In the Bertrand model, oligopolistic firms compete by setting the price of their product. A good exposition of the Bertrand and Cournot models is in Jean Tirole, *The Theory of Industrial Organization*, M.A.: MIT Press, 1988, chapter 5.

doing the best it can, in the sense of maximizing profit through the choice of its own output level, given the output level of its rival. With only two firms, each firm can generally earn relatively large profits. Furthermore, each firm could earn even greater profit if it could persuade its rival to cut back output.

Suppose that the Japanese firm discovers how to produce output more efficiently and is able to lower its costs of producing additional output. In the new Cournot equilibrium, the innovative Japanese firm will have a higher share of the world market and the U.S. firm will have a smaller share. The Japanese firm benefits twice from lower cost. First, it gains profits directly because costs fall. Second, the lowered costs improves its strategic position in the world market and indirectly induces the rival to contract. This contraction by the U.S. firm makes it possible for the Japanese firm to increase its profit. Thus, the Japanese firm benefits by more than the amount of the cost saving.

- **Profit-Shifting Trade Policy in Imperfectly Competitive Markets**

Consider an export subsidy (or a production subsidy) in Japan. The subsidy has the same effect as an innovation that lowers costs. A subsidy makes it economical for the Japanese firm to expand its output, even taking the output of the U.S. firm as given. The Japanese firm's expansion of output is credible. The rival U.S. firm can best respond by contracting output. In effect, the subsidy makes it possible for the Japanese firm to stake out a larger market share of a profitable international market than it otherwise could.⁷

Is the export subsidy policy in the national interest?⁸ There are two effects of the subsidy: the transfer effect and "strategic" effect. First, the cost of the subsidy is the additional tax burden on rate payers, but this tax is offset by lower costs to consumers and thus amounts to a transfer. Second, profits of the Japanese firm rise by *more* than the amount of the subsidy. The benefit to the firm exceeds the cost to taxpayers. Provided shareholders of the firm are Japanese nationals, this subsidy policy is in the national interest. But this policy is predatory. The gain to the Japanese economy comes completely at the expense of the U.S. firm.⁹

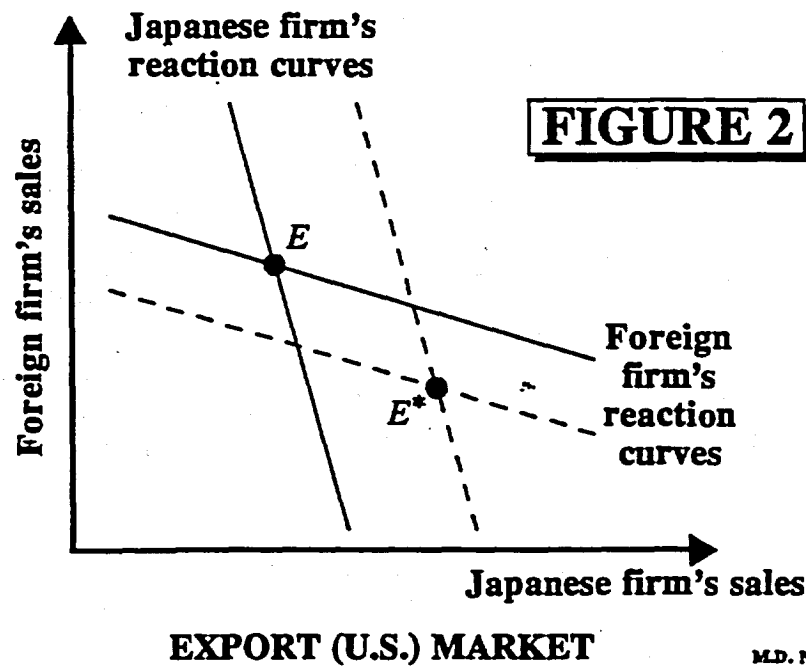
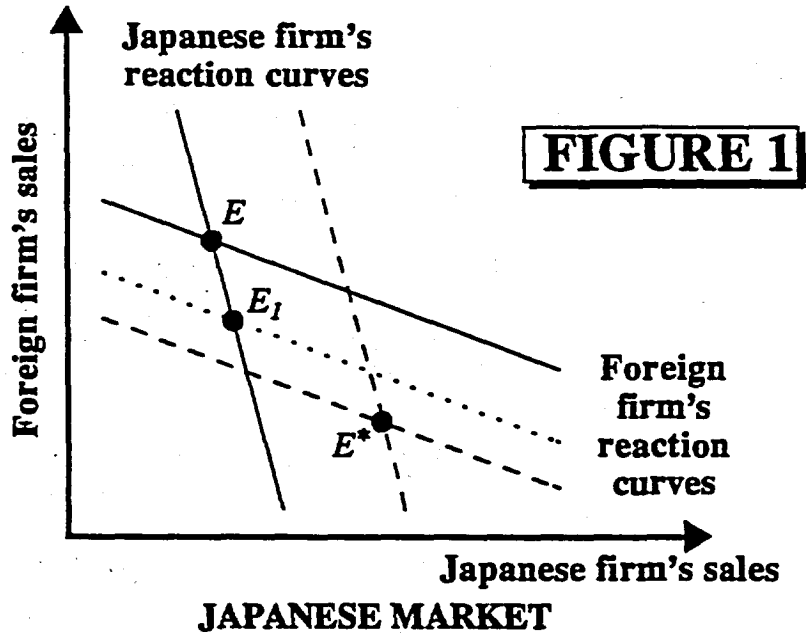
The main element in the strategic trade policy argument is that governments have access to tools such as subsidies, which the firms cannot generate internally, that can further deter rivals. Such government policies can lead to a national advantage. However, this case for

⁷ A numerical example of how a government's strategic trade policy can shift rents in international markets from foreign to domestic firms is provided in the Annex.

⁸ National interest is the maximization of the total real value of goods and services at the command of the whole society.

⁹ For the detailed model, see James A. Brander and Barbara J. Spencer, "Export Subsidies and International Market Share Rivalry", *Journal of International Economics*, (18) 1985: 83-100.

Import Protection as Export Promotion



M.D. Newcombe CPER/93

subsidies is not an argument for the general subsidization of exports. It would not work for most industries and would significantly increase the fiscal burden. The policy would have to be one of targeting particular industries, of "picking winners", which is not easy.¹⁰

- **Strategic Trade Policy and Economies of Scale**

Consider a situation where a firm has some form of advantage of size. The cost of producing an extra unit of output falls as a firm's production rises. The firm may also experience falling incremental cost as it moves down its "learning curve" or due to competition in R&D. Suppose that the Japanese government excludes the U.S. firm completely from the Japanese market by using either a quota or a tariff or procurement by government-owned firms.

To facilitate the illustration, consider Figures 1 and 2 in which the free trade situation in each case is shown by the solid line (or reaction curves). In Figure 1, the Japanese domestic market is initially supplied by a Japanese firm and a foreign U.S. firm. Each firm's reaction curve shows the amount of sales that would maximize its own profit, given the sales of its rival. As we move northwest along the Japanese firm's reaction curve, we observe the response to a larger and larger volume of imports from the U.S.. Japanese sales fall, but by less than the increase in imports. The price falls, as do the profits of the Japanese producer. Equilibrium, given by point E, is at the intersection of the two reaction curves, because only at that point is each firm doing as well as it can, given the strategic behaviour of its rival. Figure 2 shows the export market in the U.S. for the Japanese firm.

Now let the Japanese government impose an import tariff, the simplest and most traditional trade policy tool.¹¹ This raises the delivered cost in the Japanese market for the U.S. firm, and shifts its reaction curve downward as shown by the dotted line in Figure 1. The intersection point shifts to E_1 . But that is not the final equilibrium. Since the Japanese firm's output rises, its incremental cost falls. Similarly, the U.S. firm's marginal cost rises. This has further repercussions on their reaction curves in both markets. The Japanese firm's reaction curve shifts to the right, and that of the U.S. firm downward. These shifts in turn increase the Japanese firm's sales and decrease the U.S. firm's sales in both markets. This further lowers the Japanese firm's incremental cost and raises that of the U.S. firm, causing further output changes, and so on. Since all these changes work in the same direction, the qualitative prediction for the final outcome is unambiguous. The reaction curves after all these changes have worked out are shown by dashed line, and the resulting equilibrium is marked E^* . The Japanese firm has not only reinforced its advantage in the home market, but has also gained in

¹⁰ James A. Brander, "Rationales for Strategic Trade and Industrial Policy", in Paul R. Krugman, ed., *Strategic Trade Policy and the New International Economics*, MA: MIT Press, 1986: 23-46.

¹¹ Paul R. Krugman, "Import Protection as Export Promotion: International Competition in the Presence of Oligopoly and Economies of Scale", in H. Kierzkowski, ed., *Monopolistic Competition and International Trade*, New York: Oxford University Press, 1984.

the export market. Import protection has acted as export promotion. Defence has proved the best form of attack.¹²

By giving a domestic firm a privileged position in its home market, Japan gives it an advantage in scale over foreign rivals. This scale advantage translates into lower marginal costs and higher market share in international markets. The extra cost to Japanese consumers is mainly just transfers to the Japanese firm. The Japanese firm, however, also benefits in the form of enhanced profits from foreign markets, and these benefits can more than tip the balance.

In sum, economies of scale and imperfect competition give rise to incentives for interventionist unilateral trade policy. They also greatly expand the gains from trade. International trade expands market size, allowing the realization of economies of scale and increased competition in imperfectly competitive industries. However, the proponents of strategic trade policy argue that, from any one country's point of view, the gains come about much more from having access to the other country's markets than from allowing foreign firms to have access to domestic markets. This is the gist of the neo-mercantilist view. It assumes, of course, that other countries will not limit access to their markets, or at least not to the same degree.

2.2 The Logic of Industrial Policy and Its Implementation

The theoretical case for an activist government industrial policy rests entirely on the premise of *market failure*. In advanced countries, two kinds of market failure seem to be particularly relevant.

- **Imperfect Competition**

Imperfect competition in concentrated markets results in a divergence between private and social returns. This is one kind of market failure and leads to an inefficient allocation of resources. Monopoly rents in concentrated international markets, whether or not induced by governments, furnish one reason for targeting such industries by governments.

The policy of industrial targeting always promotes some sectors of the economy at the cost of others. How do you choose which sectors should be encouraged at the expense of the rest? In a market economy, as a result of natural forces, some sectors will be growing while

¹² When a single home firm and a foreign firm compete as Bertrand price-setters in a third-country market, an *export tax* rather than an export subsidy raises domestic welfare. The tax makes credible the home firm's promise not to undercut the price of its foreign rival and so allows the two firms to sustain a high degree of collusion. The home firm's profits may not rise, because this firm must pay the tax on its export sales. But the sum of tax revenue and domestic profits will rise with the introduction of a small export tax. See Jonathan Eaton and Gene M. Grossman, "Optimal Trade and Industrial Policy Under Oligopoly", in *Quarterly Journal of Economics*, (101) May 1986: 383-406.

others will shrink. To devise a useful industrial policy, a government must do more than decide which are the industries of the future or which ones promise largest rents. It must answer the much more difficult question: which sectors should be growing or shrinking more rapidly than they would if left to the market? To justify a government programme that shifts resources, it would be necessary to show that, for some reason, the shift is taking place too slowly. Picking winners requires planners to possess better knowledge than that derived through the marketplace. Such government intervention must be justified by an in-depth empirical examination of the relevant industry. In principle, trade and industrial policy should be targeted specifically on the activity in which the market failure occurs.

- **Externalities**

The second type of market failure takes place when externalities are present. Beneficial externalities exist to R&D, high technology and other industries. In advanced countries, firms devote a great deal of resources to R&D. While firms can appropriate some of the benefits of their own investment in knowledge, they usually cannot appropriate them fully. Some of the benefits accrue to other firms that can imitate the ideas and techniques of the leaders. Firms can "reverse engineer" their rivals' designs. Because patent laws provide only weak protection for innovators, it can be argued that high technology firms do not receive as strong an incentive to innovate as they should. Consequently, markets will allocate fewer resources than optimal to these industries. Does this provide an argument for government to step in with an industrial policy? Consider three important questions.

First, what is the ability of government policy to target the right thing? Clearly, there is no reason to subsidize the employment of capital or nontechnical workers in high technology industries. Policy should seek to encourage the generation of knowledge that firms cannot appropriate. However, a *general* subsidy for a set of industries in which this kind of knowledge generation is believed to go on is, at best, a blunt instrument.

Second, how important is the technological spillover in a given industry? Will a dollar of R&D in the semiconductor industry convey ten cents worth of external benefits, or ten dollars? Is the optimal subsidy 10, 20, or 100 percent? The answer is a difficult empirical problem. It is in the nature of externalities, benefits that do not carry a market price, that they are hard to measure. Perhaps, instead, government should subsidize research and development wherever it occurs. Moreover, how do we know when a firm is engaged in creating knowledge and when not?

Third, proponents of industrial policy tend to concentrate only on R&D in manufacturing as a source of uncompensated spillover effects. But don't doctors earn less than the happiness they provide simply by being accessible when you fall sick? Banks provide valuable

infrastructure. Is this reflected in their profits? Are teachers' salaries a measure of their true worth? Thus, services are at least as prone on the average as manufactures to yield uncompensated spillover effects.¹³ Is industrial policy suggesting subsidizing doctors?

Despite the criticism, the technological spillover argument is probably the best case one can make intellectually for an active industrial policy.

2.3 A Debate on Other Arguments for Industrial Policy

Proponents of the industrial policy have also played variations of the above mentioned themes. It is suggested that government should encourage the growth of: a) industries with high value added per worker; b) industries that have a "linkage" role with regard to other industries; c) industries that have future growth potential; and d) industries that have been targeted by foreign governments. Let us explore these arguments briefly.¹⁴

- **Picking High Value Added Industries**

In an economy, the value added varies considerably across industries.¹⁵ It also appears that workers in a number of industries earn *rents*. One study found that in 1984 the compensation for an average U.S. steel worker was 63% and for an auto worker 53% above the average U.S. manufacturing worker. The study estimated that workers in the U.S. transport equipment sector earn a premium of 27% above the industrywide average, and workers of fabricated metal a premium of 26%.¹⁶ This has led many commentators and policy analysts to

¹³ Jagdish N. Bhagwati, "Rough Trade", *New Republic*, May 31, 1993: 35-40.

¹⁴ For a critical assessment of industrial policy, see Paul R. Krugman, "Targeted Industrial Policies: Theory and Evidence", in Dominick Salvatore, ed., *The New Protectionist Threat to World Welfare*, New York: North-Holland, 1987: 266-96.

¹⁵ The value added by an industry is the difference between the value of its output and the value of the inputs it buys from other industries. The sum of value added in all industries is a country's national income. The value added to GDP in Canada in 1992, for example, was \$14.6 billion (or 2.9%) by agriculture, forestry and fishing; \$20.5 billion (or 4.1%) by mining; \$84.7 billion (or 16.9%) by manufacturing; \$30 billion (or 6%) by construction; \$34 billion (or 6.8%) by the public services; and \$318 billion (or 63.4%) by the transportation, trade, finance and other services. Source: Statistics Canada, Catalogue 15-001, various issues.

¹⁶ These estimates used the 1984 Current Population Survey and have been adjusted for differences in human capital and demographic factors such as sex, age, race, marital status and education; see A. Krueger and Lawrence H. Summers, "Efficiency Wages and the Interindustry Wage Structure", *Economica*, (56) 1988: 259-93. In 16 other countries, steel and auto workers earn a premium above the average manufacturing worker in their own countries. However, the premium is much greater in the U.S.. See Jaime de Melo and David Tarr, *A General Equilibrium Analysis of US Foreign Trade Policy*, Cambridge: MIT Press, 1992.

argue that a country can raise its national income by shifting its industrial mix toward industries that have high value added per worker.¹⁷

The problem with this argument is that it fails to ask why some sectors have higher value added per worker than others. Commentators often presume that high value added sectors must pay higher wage rates or earn higher rates of profit than low value added sectors. High value added sectors are often capital-intensive, like petrochemicals. In such industries, the high value added per worker is compensated for by extremely high capital costs, so that neither wages nor profit rates are particularly out of line. In other cases, high value added reflects human capital: high levels of training or skill. For example, aircraft production has higher labour productivity than the making of footwear. The higher value added in the aircraft industry results because it uses more capital and/or higher skills and technology than the footwear industry.

Suppose for a moment that high value added sectors are those that have large inputs of capital per worker. Could we then argue that a country can raise its national income by expanding these sectors? We know that if a country accumulates capital, it will indeed grow richer and shift its industrial mix toward capital intensive sectors and away from labour intensive sectors. This shift does not, however, need a special government policy, because it will happen as a natural consequence of market forces reacting to capital availability.

What would happen if a country did subsidize its capital intensive industries? Other things being equal, a given amount of capital will employ fewer workers in capital intensive than in labour intensive sectors. So a shift of capital toward the capital intensive part of the economy will initially tend to reduce employment. Although unemployment may eventually be eliminated by a fall in real wages that encourages all sectors to substitute labour for capital, the initial increase in unemployment is hardly the result that one looks for from an industrial policy.

Will such an industrial policy raise national welfare? Not unless it helps correct some market failure. If there is no market failure, the initial allocation of resources will already be optimal, and the government-sponsored reallocation cannot improve it. One study finds that, during the 1980-84 period, the wage of a typical worker in an export intensive industry exceeded that in an import competing industry by roughly 8%. However, one recent study finds that the evidence in high wage industries, such as the U.S. auto and steel sectors, does not support the

¹⁷ For one such view, see Lawrence F. Katz and Lawrence H. Summers, "Industry Rents: Evidence and Implications", *Brookings Papers on Economic Activity, Microeconomics*, 1989: 209-75. Mr. Summers heads the Department of the Treasury in President Clinton's Administration.

case for an industrial policy. The wage premium may even exacerbate the welfare costs of protection.¹⁸ Moreover, while some firms in high technology sectors earn high profits, others fail.

- **Encouraging Linkage Industries**

Some have argued that certain industries of the economy have large inter-industry linkages. Installing such industries could stimulate the development of both local suppliers (backward linkages) and new local customers or users of the product (forward linkages).¹⁹ The popularity of the linkage argument stems from the feeling that producing intermediate goods that can be used in a variety of sectors is a more fundamental economic activity than producing consumer goods that simply provide satisfaction to households. It is hard to escape the feeling that the makers of steel or computer chips are doing something more serious than the makers of toys or potato chips. For example, some observers argue that Japanese and French subsidies to investment in steel, by leading to cheaper steel, encouraged growth of all those industries that use steel, such as shipbuilding and autos. Sectors with high linkages that diffuse new technologies over a broad spectrum of industries have been dubbed "strategic sectors".

The linkage argument is that the government should direct more investment into steel as opposed to autos or shipbuilding than the private market would have. Will this raise national income? In the absence of a market failure, economic theory indicates that it will not. A dollar of capital services reallocated from autos to steel lowers the value of auto output by one dollar and raises the value of steel output by one dollar. The extra steel output can now be used to raise auto output back to its original level, but not higher; this only confirms that the original allocation was optimal.

It not clear that promoting strategic sectors is a "magic potion" for economic success. There is no evidence that one industry (microchips) or set of industries (computers and related industries) is inherently superior to another. One recent study finds that different countries have achieved high productivity levels on account of specialization in very different industries. Even among the NICs, the emphasis on heavy, capital-intensive industry has produced relatively little advantage, as the experience of South Korea (steel) and Singapore (petroleum refining) attest.

¹⁸ Jaime de Melo and David Tarr, "Industrial Policy in the Presence of Wage Distortions: The Case of the US Auto and Steel Industries", *International Economic Review*, (34) November 1993: 833-851.

¹⁹ The term comes from development economics, see Albert O. Hirschman, *Strategy of Economic Development*, New Haven: Yale University Press, 1958.

Despite the promotion of selected heavy sectors, their successes have been mainly in the labour intensive industries.²⁰

That the goals of most industrial policy nostrums are not worth having is in some cases only part of the trouble. They can actually frustrate the very goals that they claim to pursue. Consider a high technology intermediate good, such as integrated circuits. Because these serve as inputs into a whole range of modern producer and consumer electronics, the public is easily moved by a rousing call for the promotion of such an industry as a foundation for a phalanx of high technology activities. When domestic producers of such an input gain tariff protection against foreign suppliers, the price of this input rises, and with it the costs of those allegedly desirable high technology industries that incorporate the input. Rather than launching a whole sector, protecting an input can raise the costs of domestic users and cause them to cede the market to imported finished products. In 1991, the U.S. slapped a 62% tariff on screens for laptop computers imported from Japan, pursuant to a complaint under the antidumping law. This action might have pleased industrial policy enthusiasts who believed that a strong domestic laptop screen industry would surely encourage domestic production of laptop computers. Instead, the computer makers began moving their production overseas to escape the elevated cost.²¹

- **Promoting Industries With Future Growth Potential**

Another common argument is that industrial policy should seek to channel resources into industries with high potential for future growth. There is no question that technological change, shifting patterns of demand, and shifting comparative advantage lead to very different growth rates of industries within an economy. Sometimes, though not always, it is possible to predict which industries will grow fastest. Should the government try to "pick winners" and encourage labour and capital to move into the industries with the highest growth prospects?

Again the answer is that properly functioning markets will make such a government role unnecessary. Firms making investment choices and workers choosing their careers are already trying to pick the winning industries. Only if the government can do a better job of picking the winners than these private market participants can it improve on the market outcome. To put the point another way, if everyone knows that an industry will grow rapidly, capital and labour will move into that industry even without special government encouragement. Unless there is some market failure, adding additional incentives to move into the sector will actually overdo

²⁰ Daid Dollar and Edward N. Wolff, *Competitiveness, Convergence, and International Specialization*, Cambridge, M.A.: MIT Press, 1993.

²¹ *Business Week*, December 2, 1991: 38-9. Restricting imports of machine tools had different but equally adverse consequences. See *The New York Times*, October 7, 1991: D1,D4.

it. It is possible to invest too much in high-growth industry, as the discussion below of the experience with steel and aircraft will make clear.

The argument that the government should always promote growth sectors amounts to saying that private markets systematically undervalue future growth prospects. In advanced countries, capital markets work relatively efficiently. For instance, in the U.S., private investors often support ventures, such as the Alaskan oil pipeline and the development of biotechnology, that involve large initial expenditures in return for profits that will occur only after a long delay and which may be highly uncertain. Looking at these examples, both of which have attracted huge amounts of private investment, it is hard to argue that private markets are systematically shortsighted.

- **Responding to Other Countries' Industrial Policies**

A final criterion for industrial policy that is particularly popular in the discussion in the U.S. and elsewhere is the idea of industrial policy as a defensive measure. Suppose that other countries provide support to an industry, leading to a contraction of that industry in Canada. Should not Canada respond by supporting the industry? If it does not, the argument runs, Canada will, in effect, be allowing its industrial structure to be determined by other countries' industrial policies. The French economist Frederic Bastiat once wrote that the fact that other countries have rocks in their harbours is no reason to throw rocks in our own—that is, the fact that other countries distort their production with protection and subsidies is no reason for us to distort our own.

This issue, from a policy perspective, brings out the complexity of strategic trade policy. We know that trade theory finds free trade to be the first best policy. Non-distortive trade policy best serves a country's interests, independently of what others do. Consider a case where a foreign country subsidizes an industry, say textiles, that is already experiencing a diminishing comparative advantage in Canada. Clearly, Canada should accommodate this trend by not impeding the movement of resources out of labour-intensive textiles and into other sectors. Markets will tend to make this adjustment automatically, because the reduced relative price of textiles will provide the incentive. Unless there is some market failure in the Canadian economy, there is no need for a special government policy either to stop or to accelerate the pace of adjustment.

The policy analysis enters the realm of second or third best solutions in situations where foreign industrial policy supports an industry, say wheat, where the efficient Canadian industry has a comparative advantage. The foreign protection situates Canada on the horns of a dilemma. If Canada sits by and private resources move out of wheat production and into other industries, and if the wheat industry requires large sunk costs, then the resources will most likely not return easily to the Canadian wheat industry should the foreign country scrap its subsidy later on. If

Canada lets relatively inefficient, but highly subsidized foreign grain producers take over world markets, efficient Canadian industries will be wiped out. The non-cooperative outcome in this case will push Canada to come up with a subsidy to the threatened industry and perhaps some retaliatory measure against the foreign country. The danger, of course, is that interest groups in each country will move in and entrench what was supposed to be a short term defensive measure. This situation may continue over a protracted period, with taxpayers in both countries saddled with maintaining the subsidies. The current problems in the agriculture sector in industrialized countries are, *grosso modo*, evidence of this phenomenon. Industrial policy has resulted in distortions in all countries and made most of them worse off. Yet to abandon a competitive industry facing unfair competition is also unpalatable.

The practical application of strategic and industrial policy is beset with difficulties, whether the intention is to shift profits to oneself or to retaliate against rivals who are allegedly doing so. That government should aggressively pick and choose among industrial sectors is more an invitation for vested interest groups to capture trade policy with the politics of protection than a mechanism for promoting market champions. The first best solution requires that the institutions governing trade policy be based on multilateral negotiations and effective market-based rules. This is often a painstaking, incremental process—but it is critical to finding long term, economically efficient solutions.

3. THE EXPERIENCE OF STRATEGIC TRADE POLICY

"When they [*mercantilists*] say country, read aristocracy, and you will never be far from the truth."

John Stuart Mill
(Italics added)

3.1 Empirical Evidence on Strategic Trade Policy

Empirical work in this area is still in its infancy, although a number of industries have been examined in order to see what types of outcomes may be possible. The predominant method that has been used in these studies has been that of a "calibrated equilibrium".²²

²² This procedure calls for the investigator to posit a particular model of an industry by specifying the mode of conduct, the extent of market integration, the possibilities for entry or exit, and so on. The investigator then inserts what data and parameters are readily available into the model. Finally, unavailable data and parameters are generated by the investigator so that the equilibrium solution of the model matches the observed outcome for some base year.

In their study of the semiconductor market, Baldwin and Krugman found that there is great scope in that industry for government policy to alter the structure of competition, but less scope for strategic policies to generate national welfare gains.²³ Dixit concluded similarly that the welfare gains from strategic trade policy are modest in the automobile industry, except when the social value of the government revenue generated by tariffs is large or when much of the payment to automobile workers is viewed as rent rather than as an opportunity cost.²⁴ Baldwin and Krugman found that strategic subsidies to Airbus in support of their development of wide-bodied jet aircraft may have raised aggregate European welfare somewhat, but this finding stems more from the gain in consumer surplus that resulted from earlier product introduction than it does from any shifting of excess profits.²⁵

Greater support for the potential benefits of strategic trade interventions emerges from Baldwin and Flam's analysis of the world market for 30 to 40-seat commuter aircraft.²⁶ Smith and Venables, on the other hand, found substantial gains to Europe from further liberalization of its internal trade in a variety of oligopolistic industries, and particularly in the car market.²⁷

²³ Richard E. Baldwin and Paul R. Krugman, "Market Access and International Competition: A Simulation Study of 16K Random Access Memories", in Robert Feenstra, ed., *Empirical Methods for International Trade*, MA: MIT Press, 1988: 171-97.

²⁴ Avinash K. Dixit, "Optimal Trade and Industrial Policies for the U.S. Automobile Industry", in Robert Feenstra, ed., *Empirical Methods for International Trade*, MA: MIT Press, 1988: 171-97.

²⁵ Richard E. Baldwin and Paul R. Krugman, "Industrial Policy and International Competition in Wide-Bodied Jet Aircraft," in Robert E. Baldwin, ed., *Trade Policy issues and Empirical Analysis*. Chicago: University of Chicago Press for the National Bureau of Economic Research, 1988.

²⁶ Richard E. Baldwin and Harry Flam, "Strategic Trade Policy in the Market for 30-40 Seat Commuter Aircraft", *Weltwirtschaftliches Archiv*, (125) 1989: 484-500.

²⁷ Alasdair Smith and Anthony J. Venables, "Completing the Internal Market in the European Community", *European Economic Review*, (32) 1988: 1501-25; and Alasdair Smith and Anthony J. Venables, "Counting the Costs of Voluntary Export Restrictions in the European Car Market", in Elhanan Helpman and A. Razin, eds., *International Trade and Trade Policy*, Cambridge, Mass: MIT Press, 1991.

3.2 Experience of Industrial Policy

There is a great deal of controversy over what the industrial policies of major countries have tried to accomplish, let alone how successful they were. What follows is a brief account of some salient facts about industrial policy in France, Japan and the United States.²⁸

● French Industrial Policy

Since the 1960s, the French government has worried that world technology will become dominated by large U.S. or, more recently, Japanese companies. The support for French industrial policy is based on the logic that, if France cannot eliminate the market power of foreign multinational corporations, it must create market power at home and preserve its independence.²⁹ Government procurement has provided privileged markets for national firms. For example, the state-run phone company was required to buy its telecommunications and computer equipment from French firms. Extensive government subsidies have been used to promote industries, such as aircraft, that are regarded as key.

How has France's industrial policy worked? While the economy as a whole has done well, the sectors most coveted by the government have not done as well.³⁰ During the late 1960s, government was still the principal buyer of many high technology products. Having relied for so long on government, French industry became dependent on captive buyers. French industrial policy worked best when it promoted technologies and products for mostly military uses, such as military aircraft, nuclear weapons and nuclear power. Sophisticated French

²⁸ For a discussion of industrial policy in Canada, see Donald G. McFetridge, "The Economics of Industrial Policy," in *Canadian Industrial Policy in Action*, Collected Research Studies of the Royal Commission on the Economic Union and Development Prospects for Canada, no. 4, Toronto: University of Toronto Press, 1985; and Richard G. Harris, *Trade, Industrial Policy and International Competition*, in *Canadian Industrial Policy in Action*, Collected Research Studies of the Royal Commission on the Economic Union and Development Prospects for Canada, no. 13, Toronto: University of Toronto Press, 1985.

²⁹ William J. Adams and Christian Stoffaës, eds., *French Industrial Policy*, Washington, D.C.: The Brookings Institution, 1986.

³⁰ The French economy performed quite well until the late 1970s, achieving rates of growth slightly higher than Germany's and much higher than Britain's. Since then France has had a severe unemployment problem, but this is a problem shared by almost all Europe. Real GDP per capita grew at an average rate of 4.2% during the 1960-68 period in France, 3.1% in Germany, 2.4% in Britain and 3.6% in Canada. The same measure, during the 1968-73 period, grew by 4.5% in France, 4.1% in Germany and Canada, and 3% in Britain. However, the same measure moved up only slowly during the 1973-79 period at 2.3% in France, 2.9% in Canada, 2.5% in Germany and 1.5% in Britain. During the 1979-90 period, growth in the same measure was 1.7% for France and Germany, and 1.9% for Britain and Canada. Source: OECD Economic Outlook, *Historical Statistics: 1960-1990*, Paris: OECD, 1992, Table 3.2.

exports could not compete in the world market.³¹ France's computer industry remains dependent on protected markets, and her efforts to develop an aircraft industry have achieved technological success only at the cost of heavy monetary losses, as we discuss below.

The French experience demonstrates that, as a government becomes the major customer, supplier and financier of a business enterprise, the autonomy of that enterprise evaporates. Ultimately, the French government nationalized the very companies—profitable as well as unprofitable—that received the lion's share of its support. Such an ending might well give pause to those unions and companies in other countries that seek substantial favours from government. Consequently, few would regard France's industrial policy as the key to her economic growth.

- **European Support of Aircraft in the 1970s and 1980s**

The continued U.S. dominance of the manufacture of aircraft is a potent symbol of U.S. technological prowess. This effect is not lost on policy makers in Europe. Since the late 1960s, there have been two major cooperative efforts at government-supported aircraft development in Europe. One of these efforts was the joint development in the late 1960s by Britain and France of a supersonic aircraft, the Concorde. Private airplane manufacturers were unconvinced that it would be profitable to develop. The U.S. government declined to finance developing such a plane, but France and Britain agreed to foot the bill. There was hope of large technological spillovers and enhanced prestige flowing from European cooperation. In commercial terms, the results have been disastrous. Concorde are extremely expensive to fly. Only a few Concorde have been sold to the state-owned airlines of Britain and France.³² The best that can be said of the Concorde is that the experience of its development may have yielded technological spillovers for the next European attempt at aircraft production, the Airbus.

Airbus is a consortium of European governments that produces large passenger airplanes. Its costs have been subsidized by the member governments. Unlike the Concorde project, Airbus has succeeded in producing planes that are commercially viable: the A300 family of wide-bodied, medium-range passenger jets is comparable in performance and operating costs

³¹ TGV trains are an exception rather than the norm. See William J. Adams, *Restructuring the French Economy: Government and the Rise of Market Competition since World War II*, Washington, D.C.: Brookings Institute, 1989, pp. 247-49.

³² Geoffrey Carliner, "Industrial Policies for Emerging Industries", in Paul R. Krugman, ed., *Strategic Trade Policy and the New International Economics*, MA: MIT Press, 1986: 147-67.

U.S. planes and has achieved significant sales. However, after years of subsidy, Airbus production costs are substantially higher than Boeing. Airbus has taken a sizable market share, but only at the cost of continuing government financial support.³³

The Airbus experience is particularly interesting as it fits well into our discussion of strategic trade policy. The economies of scale in large passenger aircraft production are so huge that there is probably room for only one or two profitable producers in the global market. The European subsidy to Airbus could be viewed as an attempt to overcome Boeing's head start and snatch some of that profitable market for Europe. Boeing has not been driven out and Airbus is still absorbing a lot of European government money.

- **Japanese Industrial Policy**

Japan is the spectacular success story of the advanced industrial world, having emerged from postwar devastation into decades of impressive growth. Japan also has had a visible industrial policy. It is necessary to distinguish two phases in Japan's industrial policy. From 1950 until the early 1970s, the Japanese economy was run as a "shortage" economy. Since the mid 1970s, the government's role has been more subtle and ambiguous.³⁴

During the 1950s and 1960s, the price of foreign currency and the interest rate were kept low, so that foreign exchange and credit had to be rationed. Tariffs and import restrictions to protect selected "infant" industries were imposed. Government agencies, such as the Ministry of Finance (MOF) and the Ministry of International Trade and Industry (MITI), had a great deal of direct control over the allocation of resources. The ministries used this power to channel funds into heavy industries with high value added per worker and away from traditional labour intensive industries such as textiles. They tried to encourage those industries that they believed reflected Japan's future comparative advantage rather than its current trade pattern. Intermediate goods industries such as steel were special favourites.³⁵

³³ The provisions of the 1992 U.S.-EC bilateral agreement allow the Airbus 17 years to repay the first 25% of total development. See Laura D. Tyson, *op. cit.*, 1992: 207-09.

³⁴ Kozo Yamamura, "Caveat Emptor: The Industrial Policy in Japan", in Paul R. Krugman, ed., *Strategic Trade Policy and the New International Economics*, MA: MIT Press, 1986: 169-209.

³⁵ Japan's economic growth and the role of industrial policy are discussed in a companion paper to this one. See I. Prakash Sharma, "Japan Trading Corp.: Getting The Fundamentals Right", Policy Staff Paper, No. 93/16, Foreign Affairs and International Trade Canada, (December 1993).

● Japanese Targeting of Steel (1960 to early 1970s)

Beginning in the 1950s, the Japanese government designated steel as a priority sector. Virtually all the raw materials for steel making had to be imported into resource poor Japan from other countries. Japanese steel production tripled from 1963 to 1970, not only meeting the rapidly growing demands of the domestic economy but also making Japan the world's largest exporter. When a world steel glut developed after the energy crisis in 1973, Japan's industry had the most modern plants with the lowest operating costs. It continued to operate, while the steel industries of other industrial countries were either contracting sharply (as in the United States) or were supported by government subsidy (as in Europe).

This experience raises four major questions. First, was government policy the cause of steel's rapid growth? Possibly yes. The steel industry did grow rapidly. Second, did industrial policy correct some market failure, or did it move the economy in the same direction as market forces would have moved it anyway? Japan would probably have developed a comparative advantage in steel even without state intervention. To begin with, Japan's high savings rate gave it a growing comparative advantage in capital intensive industries like steel. Furthermore, falling transport costs and the emergence of new sources of iron ore and coal made it less necessary for steel industries in general to locate near coalfields or iron deposits. Consequently, Japan might well have had a growing steel industry even without the MITI/MOF intervention. Nonetheless, it is perhaps true that the Japanese government encouraged steel to grow even faster than it would have in a free market economy.

Third, did the policy accelerate economic growth in Japan? This amounts to asking whether the resources used in steel yielded a higher payoff to society than they would have had elsewhere. Japan's steel industry grew rapidly despite a profit rate substantially below the average for Japanese manufacturing. The return directly earned by the resources used in steel was actually not as high as what the same resources were earning elsewhere in the economy. For instance, while the 1971 rate of return in all Japanese manufacturing was 17.5%, the same measure for Japanese steel was 10.7%.³⁶

Fourth, was this policy good for Japan's economy? Japan's promotion of steel can be justified only if there were marginal social benefits not included in the market return. However, significant marginal social benefits have not been identified. Capital invested in steel earned a rate of return only a little more than half the average rate of return in Japanese manufacturing even during the prosperous 1960s, and ended up earning an even lower return during the

³⁶Paul R. Krugman, in Dominick Salvatore, ed., *op. cit.*, 1987, Table 2, pp. 287.

1970s.³⁷ Steel did not confer important technological externalities. Creation of jobs did not represent an extra benefit in Japan, because the economy was already running at full employment. Unless a plausible source of marginal social benefits can be identified, we must conclude that the targeting of steel—despite the industry's growth—was a mistake. It diverted resources to an area where the return was lower than elsewhere and thus acted as a drag on Japan's growth.

The case of Japanese steel is an instructive one. It is a reminder that the economic success of an industrial policy cannot be measured simply by looking at the growth or market share of the targeted industry.

Let us return to the crucial question of whether Japan's industrial policy was really the key to rapid growth during the 1950s and 1960s. Might the economy have grown just as rapidly without the policy? In the light of the steel case study, we should be cautious about attributing success mostly to industrial policy.

First, it is not clear that the activities of Japan's government were actually pushing Japan's industrial policy faster than they would have gone under *laissez faire*. Japan's industrial policy was applied in a regulated economy. To make up for distortions caused by rationing foreign exchange, imports and credit, MITI/MOF turned around and allocated resources in a sensible way. In the end, Japan arrived at the outcome that it would have even if the government had stayed out of the picture throughout. The government may have been making sensible investment decisions, but the market would have made similar decisions if left to itself.

Second, there is the possibility that the dynamism of Japanese industry had its roots in factors other than industrial policy and that Japan would have done well in any case. Reasons for Japan's success are many: Japan had the highest savings rate in the world, an effective educational system, good labour-management relations, and an outward looking business orientation and corporate management. It is possible that industrial policy may have been a minor positive factor or even a drag on economic growth. Some of Japan's most successful industries, notably automobiles and consumer electronics, were not among those that received high government priority.

The Japanese industrial policy of the 1950s and 1960s remains the picture of Japan that many retain. Foreign exchange and credit rationing are history. Japan's industrial policy since the mid 1970s has aimed at encouraging a new set of industries, the "knowledge intensive", or high technology, industries. The tools of industrial policy have been a combination of modest

³⁷ Paul R. Krugman, in Dominick Salvatore, ed., *op. cit.*, 1987.

subsidies for R&D and encouragement of joint government-industry research projects aimed at developing new technologies.

The industries targeted since 1975 are only a small part of Japan's economy. Neither automobiles nor consumer electronics (TVs, stereos, VCRs and so on) are part of the high technology area that has been the focus of research joint ventures. So the Japanese consumer products that have made Japan's export success so visible do not reflect the new industrial policy. Japan has, however, become a significant producer of some products in which recent industrial policy has played a key role. The most famous of these is semiconductor chips.

- **Japanese Targeting of Semiconductors (mid 1970s to end 1980s)**

Semiconductor chips, complex electronic circuits etched at microscopic scale onto chips of silicon, are key components of many new products. Until the mid 1970s, the technology for making such chips was largely a U.S. monopoly. Japan made a deliberate effort to break into this industry, with the government sponsoring joint research projects and at least initially providing a protected domestic market. In the late 1970s and early 1980s, Japanese producers shocked their U.S. competitors by taking a dominant share of the market for one kind of chip, random access memories (DRAMs).

That Japan targeted semiconductors, and that the industry achieved a large market share, is known. What is hotly disputed is how much support the Japanese industry actually received, how decisive that support was, and whether the policy helped Japan and/or hurt the United States. We know that not much government money was provided: the subsidy component of the targeting was actually quite small.³⁸ We also know that explicit protection of markets in Japan, by tariffs and quotas, was mostly removed after the mid 1970s. Some would argue that, in fact, the Japanese semiconductor industry succeeded with little government help.³⁹

Others argue that more subtle government help was crucial.⁴⁰ The proponents of this view argue that the joint research projects were a highly effective way of improving the technology. They also argue that the Japanese market was effectively closed through a tacit 'buy-Japanese' policy discreetly encouraged by the government. As evidence, they note that U.S. firms had a much smaller market share in Japan than in either the U.S. or Europe.

³⁸ This point is made by Richard E. Baldwin and Paul R. Krugman, in Richard Feenstra, ed., *op. cit.*, 1988. They maintain that: "... Japanese policy did not involve large subsidies. The tools of policy were instead encouragement with modest government support of a joint research venture"

³⁹ See James C. Abegglen and G. Stalk, Jr., 1985, *op. cit.*, for this view.

⁴⁰ See commentators, such as Tyson, *op. cit.*, 1992; C.V. Prestowitz, *op. cit.*, 1988.

Economists do not know which of these views is correct. It may be that the Japanese do not really know either. If we assume, for the sake of argument, that government policy was in fact crucial, was it good idea? As in the case of steel, the direct returns on Japan's investment in semiconductors have been quite low. Exact figures are not available, but it is generally believed that Japanese firms have earned a low rate of return on semiconductors since the late 1970s.⁴¹ So any gains from the encouragement of chips must be located in the technological externalities.

Now comes the great uncertainty. Semiconductor production—a highly dynamic industry where knowledge is the main source of comparative advantage—is exactly the kind of sector where the external economy argument should apply. But were the economy wide externalities large enough to justify the social cost? Nobody knows. There exists very little empirical work that quantifies what the extent of spillovers happens to be across industries and countries.⁴²

● U.S. Industrial Policy

The United States has a commitment to free market ideology that would preclude extensive and explicit government direction of the economy such as that of Japan during its early post-War phase. There are some areas, however, in which the U.S. government has had a major role in promoting industries.

The most notable of these areas is agriculture. Here the U.S. government has come closest to the kinds of industrial policy that one might recommend on the basis of the market failure and defensive criteria discussed earlier in section 2, although the picture is clouded by the U.S.'s use of predatory export financing and import restrictions. Recall that the problem of appropriating knowledge can be a reason for intervening in an industry. In agriculture, a farmer who makes a major innovation can be imitated by thousands of others, who derive the benefits without sharing in the costs and risks. To alleviate this problem, the U.S. government has long engaged both in research into agricultural techniques and in the dissemination of improved techniques through the Agricultural Extension Service. Also, the government has taken a leading role in large-scale projects, such as irrigation facilities. These kinds of intervention fit nicely into a market failure framework and are commended even by policy analysts who are sceptical about most industrial policy.

Another major role for the U.S. government is in defence. The U.S. government is by far the world's largest market for military hardware. U.S. corporations dominate the production of military goods such as fighter aircraft that involve large economies of scale. U.S. government spending on military goods sometimes helps U.S. corporations gain economies of

⁴¹ Policy analysts, for or against strategic trade policy, all agree on this point. Take, for instance, Clyde V. Prestowitz, 1988, op. cit., p. 57, "... (in July 1985) the Japanese producers of semiconductors were losing money."

⁴² For some evidence, see Jeffrey I. Bernstein and Ishaq M. Nadiri, "Interindustry R&D Spillovers, Rates of Return, and Production in High-Technology Industries", *American Economic Review*, (78) 1988: 429-34.

scale that help them in civilian markets. For example, one of the most successful civilian aircraft produced by Boeing, the Boeing 707 (introduced in 1960), owed a great deal to a previously developed military plane (the B-52 bomber). The Boeing 707 continues to be manufactured, long after its civilian sales are over, as the AWACS reconnaissance plane. Military R&D sometimes gives U.S. companies knowledge that they can apply elsewhere. As usual in industrial policy issues, however, the quantitative importance of these effects is a matter of dispute. European commentators, who sometimes feel that they are losing a race with the U.S. and Japan, have suggested that in practice the U.S. has as effective an industrial policy as Japan.⁴³

4. AN ASSESSMENT OF STRATEGIC TRADE POLICY FOR CANADA

"...It is important for those who live in the smaller open economies to appreciate fully the 'strategic trade policy' argument, both at the logical and empirical level, as it is being used in the large industrial countries. As these arguments are important inputs into the formation of trade policy within the United States, the European Common Market, and Japan, it is certain that those policies will affect our own country, and in ways that we may not fully understand."

—Richard G. Harris⁴⁴

The most touted merit of strategic trade policy is to snatch monopoly rents in newly-emerging international markets. This is a theoretical argument and is riddled with practical problems. Policy makers in Canada must take a hard look at practical aspects of this new mercantilist policy advice. Let us discuss the issues.

First, what kind of monopoly rents is the policy aiming to shift? We observe much monopoly rent due to trade restrictions. For example, the Japanese auto industry's profits due to the voluntary export restraints, or the Hong Kong textile and garment exporters' rents under the Multi-Fibre Arrangement. However, those are not the kinds of rents the new mercantilists are talking about. We want to know whether the future world markets in new products would have monopoly rents. These would be the profits, according to strategic trade policy, that each national government would find in its interest to capture. Even with a subsidy from the

⁴³ William J. Adams and Christian Stoffaës, eds., *op. cit.*, 1986.

⁴⁴ Richard G. Harris, "New Protectionism Revisited", *Canadian Journal of Economics*, (22) 1989: 751-78.

Canadian government, it not clear how long Canadian corporations would remain successful in deterring foreign competition. In profitable markets, there is always a possibility of new entry. As long as Canadian corporations depend on government subsidy, most of the benefits would be passed on to foreign consumers rather than to securing excess returns for our producers. When Canadian taxpayers have to give money to corporations on an ongoing basis, as Avinash Dixit has asked: where's the rent?⁴⁵

Second, how do we know by just observing a few foreign firms in a high technology market that they are raking in huge monopoly rents? Generally, in any project where substantial amounts have to be sunk into R&D, and only one or a few firms succeed and go on to the production stage, we should expect to see the successful firms enjoying large monopoly profits. The sunk costs of the entrenched firms may constitute an entry barrier to the industry, but prior to that there usually is free entry to the whole process. Without the prospect of monopoly profit, firms would not have undertaken the R&D investment. The observed profits are most likely a normal rate of return in a risky commercial venture. Consequently, the rent-shifting argument must not be employed uncritically to such industries.

Third, if a government announces a policy of export promotion in an emerging industry, that industry will come to anticipate the policy and firms will enter it. In the final analysis, there will be a number of successful domestic firms, but in the background there will also be more losers. The group as a whole will get zero rent—that is, the resources used up in the whole process would have been just as valuable engaged in the best alternative elsewhere in the economy. If the policy is pushed too far, it will actually harm the domestic interest. Special interests would argue differently. Some firms want to collect subsidies from the government. Labour might share in the benefits of protection in these industries. In all such cases, the rest of society would pay the cost.

Fourth, it is not enough to quantify future monopoly rents. The role for policy should be limited to situations where our firms are unable to capture these rents on their own. The strategic trade policy proponents argue that the government is able to make irreversible commitments that give our firms a strategic advantage against foreign ones and that the firms would be unable to replicate such strategic moves by themselves. This is an empirical question. The answers will vary from one industry to another.

Fifth, having empirically made a case for profit-shifting is not enough. We must also ask whether trade policy is the best way to achieve that aim. For example, rent is better captured from a foreign monopolist selling in our market by imposing a price ceiling or a profit reparation tax. Promotion of entry is better pursued by means of domestic subsidies.

⁴⁵ Avinash K. Dixit, in Paul R. Krugman, ed., *op. cit.*, 1986.

Consequently, even in industries where profit shifting is shown to be important, trade policies can only be justified if no other superior policies are feasible.

Sixth, adopting strategic trade policy would make the targeted high technology firm or industry expand by drawing resources from other industries in the economy. Resources and workers employed by high technology industries are generally limited even in advanced countries. Other industries must therefore contract, at least over the short term. Some of those other firms or industries may have excellent export prospects. In an economy wide sense, targeting specific industries can indirectly hurt other exports through the misallocation of resources. Some of these industries might also be oligopolistic and their strategic position will be worsened. The government authorities need to understand not only the targeted sector, but the rest of the economy to know if a policy is justified. Consequently, economy wide considerations radically increase the empirical difficulty of formulating interventionist trade policies and make it even more unlikely that these policies will do more good than harm.

Seventh, the political economy of strategic trade policy shows that the mechanism favours concentrated special interest groups in established industries and tends to ignore the dispersed groups of consumers and new emerging industries. Established industries may point to one niche or the other of their business as the "emerging" industry and lobby for protectionist or retaliatory trade policy measures. Special interests in one industry do not care if the rest of the economy is hurt. Therein lies the danger that trade policy may get captured by entrenched interests rather than promoting "winners".

Lastly, strategic trade policies are beggar-thy-neighbour policies. A country that attempts to use such policies will probably provoke retaliation. In many cases, a trade war between two interventionist governments will leave both countries worse off than if a hands-off approach were adopted by both.⁴⁶

In sum, the implementation of strategic trade policy imposes severe information requirements on policy makers and enforcement authorities. The way to avoid getting trapped in the above situations is to establish rules domestically and internationally. If such rules are

⁴⁶ For example, consider the case of the European telecommunications equipment industry, which can be targeted on the basis of criteria of externality and imperfect competition. It is a sector where nationalistic procurement by government owned firms allows countries to pursue protectionist policies without violating agreements on international trade. The result of such protectionist policies, however, is by most accounts harmful to all concerned. Each country tries to be largely self-sufficient in equipment. No country is able to realize the scale economies that would come from supplying the European market as a whole. The structure of the game between countries in telecommunications equipment is that of a prisoner's dilemma. Each country is better off intervening than being the only country not to intervene, but everyone would be better off if nobody intervened. See Paul R. Krugman, "Is Free Trade Passé?", *Economic Perspective*, Fall 1987: 131-44.

to work, they must be simple enough to be clearly defined. Free trade encompasses such simple rules. It can also assist in resisting the pressures of special interest politics. It lets the marketplace allocate resources, limiting intervention to clearly delineated instances of market failure and, perhaps, defensive reaction against predatory targeting by other governments in sectors where we are clearly competitive.

5. CONCLUSIONS

"After several years of theoretical and empirical investigation, ... it has become clear that the strategic trade argument, while ingenious, is probably of minor real importance."

—Paul R. Krugman⁴⁷

In theory, a role for strategic trade policy emerges in two situations: imperfect competition and economies of scale in production. Prices in imperfectly competitive world markets typically exceed incremental production costs. Consequently, companies can make above normal profits or *rents*. In some theoretical cases, a government, by supporting its companies in international competition, can raise national welfare at another country's expense. The basic idea is to shift rents from foreign rivals to domestic corporations. The strategic trade policy argument is linked to the industrial policy argument.

Industrial policy works by shifting resources from sectors that the government does not consider important to ones that are considered worth encouraging in the economy. There are many popular reasons for industrial targeting. However, the economic logic of industrial policy rests on appropriable monopoly rents and spillover benefits. It may be possible to point out industries of the future. In practice, nonetheless, it is not easy to decide which corporations should be on the government list to get taxpayers' money and which ones left off. Moreover, once the authorities have designated the winning sectors, the nature of competition among special interests is such that most of these subsidies will amount to transfers of funds from taxpayers to large corporations and to foreign consumers (if the goods are primarily for export).

Most importantly, a general property of strategic trade policy is that its usefulness depends on an exact reading of the situation. The large amount of information that governments would need before being able to operate a targeted industrial policy makes chances of its success highly remote. For instance, everyone appreciates that there are beneficial spillovers from the

⁴⁷ Paul R. Krugman, "The Narrow and Broad Arguments for Free Trade", *American Economic Review, Papers and Proceedings*, (83) May 1993: 362-66.

software industry to other industries in Canada. The logic of industrial policy would require the government to give money to the software industry. So let us think about the amount of an appropriate subsidy. Do authorities know the magnitude of the spillover to the PC industry? The wholesale industry? The banking industry? How many subsidy rates are we going to need? Or should the subsidy be a convenient 10%, 40%, 80%? Should the subsidy be a proportion of company profits? Sales? Or of salaries paid out to employees? Nobody knows the answers. We may, in fact, be wiser if we simply assume that the market-determined volume of business and prices in Canada's software industry are not much out of line with what is likely acceptable and socially optimal. With so little information to go on, why guess with industrial or strategic trade policies?

Strategic trade policy is a sophisticated mercantilist argument for protection. In theory, the government is led to subsidize large domestic corporations in pursuit of snatching rents from our trading partners. It promotes the subsidy game. The country that has the deepest pockets will subsidize its large corporations so long as countries with shallower pockets do not stop subsidizing their companies and abandon the market. One consequence of this subsidy war is that the targeted markets are more likely to be closed to small and medium size economies such as Canada. Moreover, if countries such as Canada pursue aggressive strategic trade and industrial policies, there is a distinct possibility of triggering reactions from our major trading partners—most of whom have deeper pockets than we do. This is a key limitation on the use of strategic trade and industrial policies in Canada.

Policy makers in Canada confront complex and growing problems of economic change in general and apparent loss of competitiveness in particular. The strategic trade and industrial policy school holds that the correct reaction is to adopt better, more coordinated interventionist policies. Policy makers may become attracted to this package at first blush. Yet for a trade dependent country such as Canada, ease of access to the markets of our trading partners is essential. The adoption of strategic trade policy by Canada would not go too far without inviting retaliation and the loss of access to vital markets. Consequently, we should continue to focus on international rule-making aimed at limiting predatory, beggar-thy-neighbour practices. The work can be tedious and frustrating. But such rule-making has served Canada well in the past, and is more likely to bring more permanent, optimal solutions than embarking on the essentially unchartable water of strategic trade policy.

ANNEX

1. Imperfect Competition and Strategic Trade Policy

The observation that in some international markets there are only a few firms in effective competition led to the theoretical thinking about strategic trade in the late 1970s with Kattrak⁴⁸, Svedberg⁴⁹, and Brander and Spencer⁵⁰. In concentrated markets, firms set prices in excess of the marginal cost of production, which results in firms typically making excess returns. There will be an international competition over who gets these profits. In theory, it is possible for a government to alter the rules of the game to shift these excess returns from foreign to domestic firms. In the simplest case, a subsidy to domestic firms, by deterring investment and production by foreign competitors, can raise the profits of domestic firms by more than the amount of the subsidy. Setting aside the effects on consumers—for example, when the firms are selling only in foreign markets—this capture of profits from foreign competitors would mean that the subsidy raises national income at other countries' expense. Originally proposed by the economists Barbara Spencer and James Brander, this argument locates the market failure that justifies government intervention in the lack of perfect competition.

● The Brander-Spencer Argument: An Example

Consider a situation in which only two firms compete, say Boeing from the U.S. and Airbus from Europe. Both firms are capable of making a new product, say a 150-seat aircraft. We require that each firm makes only a yes/no decision: either to produce 150-seat aircraft or not.

⁴⁸ Homi Kattrak, "Multinational Monopolies and Commercial Policy", *Oxford Economic Papers*, (29) 1977: 283-91.

⁴⁹ Peter Svedberg, "Optimal Tariff Policy on Imports from Multinationals", *Economic Record*, (55) 1979: 64-7.

⁵⁰ James A. Brander and Barbara J. Spencer, "Tariffs and the Extraction of Foreign Monopoly Rents Under Potential Entry", *Canadian Journal of Economics*, (14) 1981: 371-89.

Table 1: Two-Firm Competition

	Airbus	Produce	Don't Produce
Boeing			
Produce	-5	-5	0
Don't Produce	0	100	0

In Table 1, each row corresponds to a particular decision by Boeing; each column to a decision by Airbus. In each box are two entries: the entry on the lower left represents the profits of Boeing, while that on the upper right represents the profits of Airbus. Table 1 reflects the following assumption: either firm alone could earn profits making 150-seat aircraft, but if both firms try to produce them, both will lose. Which firm will actually get the profits? This depends on who gets there first. Suppose that Boeing is able to get a small head start and commits itself to produce 150-seat aircraft before Airbus can get going. Airbus will find that it has no incentive to enter. The outcome will be in the upper right of the table, with Boeing earning profits.

Now comes the Brander-Spencer point: the European government can reverse this situation. Suppose that the European government commits itself to pay its firm a subsidy of 25 if it enters. The result will be to change the table of payoffs to that represented in Table 2. It is now profitable for Airbus to produce 150-seat aircraft whatever Boeing does.

Table 2: Effects of a Subsidy to Airbus

	Airbus	Produce	Don't Produce
Boeing			
Produce	-5	20	0
Don't Produce	0	125	0

This shift means that Boeing now knows that whatever it does, it will have to compete with Airbus and will therefore lose money if it chooses to produce. So now it is Boeing that will be deterred from entering. In effect, the government subsidy has removed the advantage of a head start that we assumed was Boeing's and has conferred it on Airbus instead. The end result is that the equilibrium shifts from the upper right of Table 1 to the lower left of Table 2. Airbus ends up with profits of 125 instead of 0, profits that arise because of a government subsidy of only 25. That is, the subsidy raises profits by more than the amount of the subsidy itself, because of its deterrent effect on foreign competition. The subsidy has this effect because it creates an advantage for Airbus comparable with the strategic advantage it would have had if it, not Boeing, had had the head start in the industry. For this reason, the argument for industrial policy based on imperfect competition is often referred to as the strategic trade policy argument.

● **Problems with the Brander-Spencer Argument: Information Requirements**

This hypothetical example might seem to indicate that the strategic trade policy argument provides a compelling case for government activism. A subsidy by the European government sharply raises profits for a European firm at the expense of its foreign rivals. Leaving aside the interest of consumers, this clearly seems to raise European welfare (and reduce U.S. welfare).

In fact, the strategic justification for trade policy, while it has attracted a great deal of interest, has also come in for a great deal of criticism. The critics argue that to make practical use of the theory would require more information than is likely to be available. The problem of insufficient information has two aspects. The first is that even when looking at an industry in isolation, it may be difficult to fill in the entries in a table like Table 1 with any confidence. And if the government gets it wrong, a subsidy policy may turn out to be a costly misjudgment. To see this, suppose that instead of Table 1, the reality is represented by the seemingly similar payoffs in Table 3.

Table 3: Two-Firm Competition: an Alternative Case.

	Airbus	Produce	Don't Produce
Boeing			
Produce	5	-20	125
Don't Produce	0	100	0

The numbers are not much different, but the difference is crucial. In Table 3, Boeing is assumed to have some underlying advantage--maybe a better technology--so that even if Airbus enters, Boeing will still find it profitable to produce. Airbus, however, cannot produce profitably if Boeing enters.

In the absence of a subsidy, the outcome in Table 3 will be in the upper right corner. Boeing produces and Airbus does not. Now suppose that, as in the previous case, the European government provides a subsidy of 25, which is sufficient to induce Airbus to produce. The new table of payoffs is illustrated as Table 4.

Table 4: Effects of a Subsidy to Airbus.

	Airbus	Produce	Don't Produce
Boeing			
Produce	5	5	0
Don't Produce	0	125	0

The result is that both firms produce: the outcome is in the upper left. In this case, Airbus, which receives a subsidy of 25, earns profits of only 5. That is, we have reversed the result above, in which a subsidy raised profits by more than the amount of the subsidy. The reason for the difference in outcome is that this time the subsidy has failed to act as a deterrent to Boeing. Initially, the two cases look very similar. Yet in one case a subsidy looks like a very good idea, while in the other it looks like a terrible idea. *It seems to be a general property of strategic trade policies that their effectiveness depends on an exact reading of the situation.* This has led some economists to ask whether we are ever likely to have enough information to use the theory effectively.

The information requirement is complicated by the fact that we cannot consider industries in isolation. If one industry is subsidized, it will draw resources from other industries and lead to increases in their costs. Thus, even a policy that succeeds in giving Canadian firms a strategic advantage in one industry will tend to cause strategic disadvantage elsewhere. To ask whether the policy is justified, the Canadian government needs to weigh these offsetting effects. Even if the government has a precise understanding of one industry, this is not enough. It needs an equally precise understanding of those industries with which that industry competes for resources.

If a proposed strategic trade policy can overcome these criticisms, it still faces the problem of foreign retaliation. Strategic policies are beggar-thy-neighbour policies that increase our welfare at other countries' expense. These policies therefore risk a trade war that leaves everyone worse off. Few economists would advocate that Canada be the initiator of such policies. Instead, the most that is usually argued for is that Canada itself be prepared to retaliate when other countries appear to be using strategic policies aggressively.

2. Strategic Trade Policy to Promote Market Entry or Exit

The issues of entry and exit in designing optimal trade policies for oligopolies are also important. Dixit and Kyle argued that trade policies can be used strategically to deter or promote entry.⁵¹ As an example of their analysis, consider an industry in which a foreign-based firm has already borne the sunk cost of entry. Suppose a domestic rival contemplates entry but cannot cover its fixed cost in competition with the foreign incumbent.⁵² An import prohibition will drastically change this equation. The home country will benefit from an import prohibition as long as the domestic firm earns positive profits as a monopolist and its incremental cost is not too much greater than that of the foreign firm. The welfare benefit of the protectionist policy is readily seen from the fact that the consumer surplus is not much affected by the switch from one monopolist to another, but the producer surplus increases from zero when the policy-induced entry occurs. Of course, the survival of both firms would be preferred as this could induce competition beneficial to the consumer and to efficiency gains by the firms.

Next, consider an oligopolistic market with ease of entry. A new firm will enter the market and drive the profits of the marginal entrant to zero. In such a setting, Horstmann and Markusen model the home and foreign markets as integrated in the sense that each firm chooses an aggregate output level, and its goods command the same price no matter where in the world they are sold.⁵³ In this case, export subsidies and import tariffs that advantage domestic firms in the global competition induce inefficient entry at home. Any profits that are shifted strategically to domestic firms are dissipated in the cost of entry, and national welfare typically falls. By contrast, Venables found that import tariffs raise home welfare when national markets

⁵¹ Avinash K. Dixit and Albert S. Kyle, "The Use of Protection and Subsidies for Entry Promotion and Deterrence", *American Economic Review*, (75) 1985: 139-152.

⁵² That is, duopolistic competition.

⁵³ Ignatius J. Horstmann and James R. Markusen, "Up the Average Cost Curve: Inefficient Entry and the New Protectionism", *Journal of International Economics*, (20) 1986: 225-47.

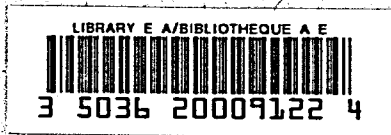
are segmented and intermarket transport costs are taken into account.⁵⁴ In this case, an expansion in the number of active domestic firms at the expense of the number of foreign firms benefits domestic consumers, because the home firms avoid the extra cost of transporting goods to the local market.

Brander and Spencer have shown the situation where a country's government can use research and development policy to give its firms an advantage in international competition.⁵⁵ Quite a different strategic use of trade restrictions is pointed out by Krishna.⁵⁶ Consider a situation where two large firms, one home and the other foreign, are unable to sustain collusion by themselves. Now let the home government impose an import quota. This makes it profitable for the home firm to raise its price somewhat, with the assurance that the foreign firm will not be able to sell more by undercutting. Then the foreign firm can sell its quota amount at a higher price. This can increase both firms' profits. The effect of the quota is to allow *de facto* collusion (that is, it is a "facilitating practice"). The losers are the home consumers who now pay a higher price. This model has special appeal from the viewpoint of the "new political economy", which views trade policy as an outcome of lobbying by concentrated special interest groups.

⁵⁴ Anthony J. Venables, "Trade and Trade Policy With Imperfect Competition: The Case of Identical Products and Free Entry", *Journal of International Economics*, (19) 1985: 1-20; and James R. Markusen and Anthony J. Venables, "Trade Policy with Increasing Returns and Imperfect Competition: Contradictory Results from Competing Assumptions", *Journal of International Economics*, (24) May 1988: 299-316.

⁵⁵ James A. Brander and Barbara J. Spencer, "International R&D Rivalry and Industrial Strategy", *Review of Economic Studies*, October 1983.

⁵⁶ Kala Krishna, "Trade Restrictions as Facilitating Practices", *Journal of International Economics*, (26) May 1989: 251-70.



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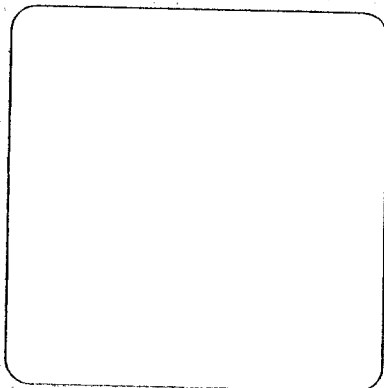
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