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1. Introduction

Strategic trade policy aims at raising national welfare by extracting monopolistic rents from foreign producers or consumers. It is the central hypothesis of this paper that such attempts of international rent shifting are most likely to fail in a competitive environment with multinational enterprises. The ever increasing potential for an internationalization of production makes national policy programs targeted at national firms more and more obsolete.

The paper addresses two major questions:

- How does industrial policy influence the investment decisions of multinational firms (section 2)?

- Why is the internationalization of production most pronounced in high-tech industries (section 3)?

In the traditional theory of international trade, where market imperfections and international investment flows were simply defined away, there would have been no room for such questions. Hence, the starting point of our analysis must be the "new trade theories".

2. Exports versus foreign direct investment and industrial policy

The theory of strategic trade policy was born in the early eighties, when Spencer and Brander (1983) published their first article on this subject. This theory - a child of the marriage between trade theory and industrial economics - has demonstrated that trade-related government intervention in imperfect markets may shift rents from foreign countries to the home country. In the past ten years, the literature on this topic has grown rapidly.[1] Its main results are that the prospects for successful rent-shifting are most promising

- if scale economies are high, resulting either from static fixed costs or dynamic learning curve effects,
- if barriers to entry are high, i.e. if potential entrants do not compete the rents away,
- if governments are able to predict the competitive behaviour of firms (Cournot versus Bertrand),
- if the ex ante commitment of governments to support their home industries is credible,
- if foreign governments do not retaliate,
- if the internal efficiency of domestic firms is not affected by government protection,

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[1] For a comprehensive and up-to-date survey see Bletschacher (1991).

- if rent-seeking activities are of minor importance, i.e. if national rents are not dissipated by interest groups striving for government protection.

In view of all these 'ifs', governments are facing a severe information problem in designing an optimal strategic trade policy. Most academic observers agree, therefore, that free trade - like honesty - is still the best choice. An ill-designed approach to rent-shifting may well result in welfare losses for all participants.

Despite these considerations politicians all over the world feel increasingly attrated by the theory of strategic trade policy. In some cases, it simply serves as a new intellectual clothing for old protectionistic practices. In others, in particular in the realm of microelectronics and information technology, several European governments in cooperation with the EC commission seem determined to develop a strategic European industrial policy in order to break the dominance of Japanese firms.[1]

It may well be doubted that politicians are really aware of all the above-mentioned caveats raised in the literature. But it is almost certain, that they tend to neglect another aspect that may be even more important for the success of

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[1] See, e.g., Commission of the European Communities (1990).

trade interventions - the increasing importance of multinational enterprises (MNEs). In both the political concepts and the theoretical literature on strategic trade policy MNEs are almost non-existent. They still adhere to the assumption that shifting production from one country to another will more or less automatically result in corresponding international shifts of rents. The possibility of a mere profit transfer between headquarters and foreign affiliates is simply ignored.

For an assessment of the impact of strategic policy measures on the decisions of MNEs to relocate production it is necessary to analyze the reasons for foreign direct investment between industrial countries. In contrast to direct investment from industrial countries in less developed countries, it can reasonably be assumed that international factor price differences or the availability of natural resources are only of minor importance. Instead, investment flows between industrial countries are most likely to be determined by firm-specific economies of scale.[1]

The existence of economies of scale explains the regional concentration of production. The existence of firm-specific economies of scale explains why firm concentration is higher

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[1] The terms firm-specific and plant-specific economies of scale were introduced by Markusen (1984). According to Helpman (1984), firm-specific economies of scale result from so-called headquarter services that exhibit certain public good properties for all plants within an MNE.

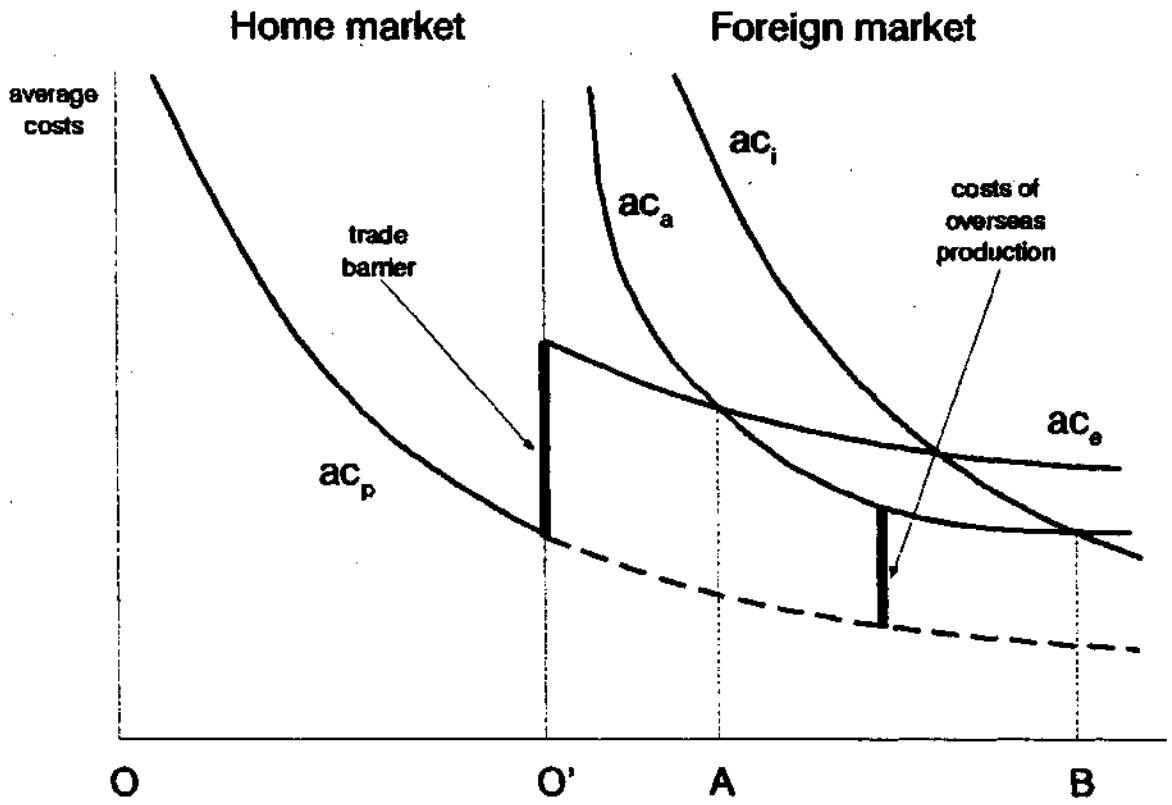
than plant concentration. The existence of barriers to trade (artificial or non-artificial) explains why multiplant firms of industrial countries may prefer to establish production facilities in other industrial countries instead of exporting their products to the foreign market, i.e. it explains why multiplant firms go multinational.

The situation of a firm facing a decision whether to export or to establish a foreign affiliate can be illustrated by the average cost curves that correspond to these options (Figure 1). The two parts of the figure represent two markets for one specific good. Factor prices and production technology of the two countries are assumed to be identical.

It is assumed that total production costs consist of constant marginal costs, plant-specific fixed costs, and some additional fixed costs that are firm-specific but not plant-specific (brand name, R&D etc.). ac_p represents the cost curve of the parent company in its home market. Total sales in the home market, depending on domestic demand and the competitive behaviour of the parent company, are given by 00'. The dotted part of ac_p would denote average costs of exports to the foreign market if there were no trade barriers. In the presence of barriers to trade, export costs of the parent company are given by ac_e.

The parent company may also choose to establish a foreign affiliate. The cost curve of the affiliate ac_a is determined

Figure 1 - Average Cost Curves with Firm-Specific and Plant-Specific Economies of Scale



by plant-specific fixed costs that are lower than the fixed costs incorporated in ac_p, by constant marginal costs that are identical to those of ac_p, and by additional marginal costs that arise from supervising and monitoring production abroad.[1]

An independent foreign competitor faces the same conditions as the parent company. Its cost curve ac_i is identical to ac_p but with its origin in O' and not in O. If total demand

[1] Similar "costs of overseas production" occur in the MNE-model of Krugman (1983).

in the foreign country exceeds O'B, the independent firm has a cost advantage, otherwise it cannot compete with exports of the parent company or production of the affiliate. With foreign demand below O'A the foreign market will be completely furnished by exports from the parent company. When foreign demand lies in the range between O'A and O'B, the parent company will replace its exports by foreign production of an affiliate.[1]

Under different assumptions about trade barriers and the relative size of fixed and marginal costs, it is also possible that ac_i cuts ac_e left of ac_a. In that case, establishing a foreign affiliate would not be profitable under any demand conditions. Thus, high firm-specific fixed costs, low plant-specific fixed costs, low additional costs of

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[1] Of course, it must be explained why the independent firm from the foreign country does not decide to set up an affiliate in the home country and to drive the parent company out of the market. The answer to this question given by Krugmann (1983) is the assumption that there are many multinational firms producing differentiated products, some of them located in the home country, others in the foreign country. Firm-specific fixed costs prevent either country from producing the whole range of products, and transport costs or other trade barriers induce foreign direct investment. - If it is further assumed (deviating from the Krugman model) that scale economies relative to market size are high enough to preclude monopolistic competition, each firm posesses some monopolistic power and is able to earn rents. With this interpretation in mind, ac_i can be regarded as the cost curve of a potential competitor which is actually engaged in producing a different product but which would immediately enter the market of the parent company if rents would be higher than in its own market.

producing in foreign countries and high barriers to trade are favourable to foreign direct investment.

Industrial policy can directly influence these cost curves. External protection by increased trade barriers (tariffs for instance) affects ac_p, and internal protection by subsidies affects ac_i. If there was no foreign direct investment, both external and internal protection from the foreign government would strenghten the position of the independent firm. Apparently, this is the mode of action that politicians have in mind when adopting protective policy measures.

Under the conditions described in Figure 1, however, the impact of industrial policy is quite different. An increase of trade barriers still shifts ac_e upward, but leaves ac_a unchanged. Now, the competitiveness of the independent firm is not improved. Instead, foreign direct investment is promoted at the expense of export activities by the parent company.

The same applies to production subsidies. If the government of the foreign country is not able to discriminate against the affiliate of the parent company, a subsidy on production in the foreign country will shift ac_i and ac_a by the same amount. In the EC, for instance, such a discrimination is not only hampered for practical reasons but also by legal constraints. According to Article 58 of the EEC treaty

European companies and foreign-based companies that are producing in the EC area must be treated on equal terms.

The only way to improve the competitiveness of the independent firm would be to pay a subsidy on firm-specific fixed costs by the foreign government. This would shift ac_i downward and leave the other cost curves unchanged. It must be recognized, however, that this effect could easily be offset by retaliating subsidies to the parent company from the government in the home country. Moreover, in the absence of retaliation the parent company may choose to relocate the subsidised firm-specific activity to the foreign country. If this is the case, it is virtually impossible to give domestic firms a competitive edge by industrial policy measures.

3. The significance of multinational activities in high-tech industries

In the past, the existence of MNEs was largely ignored in the design of industrial policy. Trade-related measures and subsidy programs were mainly trageted at national enterprises, and the possibility of by-passing protectionist barriers by foreign direct investment was not taken into account. In the course of the eighties, however, European policy makers have increasingly been confronted with internationalization strategies of firms.

The first case were photocopiers, where the European Commission imposed an anti-dumping duty on imports from Japan in order to protect the Italian producer Olivetti. The affected Japanese company, Olympus, reacted by shifting its production to the United States - correctly assuming that the Commission would not run the risk of trade conflicts with the U.S. government.

The most prominent case was that of the Japanese car-maker Nissan, which was suffering from "voluntary" export restraint agreements with the EC. Nissan went directly into the lion's den and installed a "screw-driver" factory for assembling its Bluebird in Great Britain. The British government highly welcomed this investment within its territory, not for the sake of rents but for the sake of jobs. The French and the Italian governments grumbled but were unable to drive Nissan back. The recent agreement between the EC and Japan explicitly takes into account the existence of Japanese affiliates producing cars within the EC.[1]

The limited scope of national industrial policy in an interdependent world economy has also been demonstrated in the case of JESSI - the EUREKA project that aims at developing an European 64-megabit chip. JESSI is mainly intended to break the dominant position of Japanese firms in the chip

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[1] For further details on the trade negotiations in the motorcar industry see Bletschacher, Klodt (1991).

market by establishing an own European technology base in this area. JESSI is somewhat open for participation of U.S. firms, but - of course - it does not want to share technical knowledge with Japanese firms.

One participant in the JESSI project is the British company International Computers Ltd. (ICL). In spring 1990, it was bought up by Fujitsu from Japan. This acquisition threw the JESSI board into deep trouble. A complete exclusion of ICL from the project was not feasible - mainly for political reasons. Instead, the JESSI board decided to restrict participation of ICL to some rather unimportant sub-projects. Perhaps, Fujitsu should have waited until ICL would have been deeper involved in the whole project.

It can be expected that the interference from foreign direct investment on the effectiveness of protection will be an issue of increased importance in the years to come. Kravis and Lipsey (1989) have reported a continuously rising share of U.S.-owned foreign affiliates in world trade. Since 1986 the share of overseas affiliates in world exports of manufactured goods even exceeds the corresponding share of their parent companies.

The position of U.S. multinationals is most distinct in high-tech industries (Table 1). Moreover, their market share in the high-tech sector is rising, whereas it is declining in other sectors. In their regression analyses, Kravis and

Lipsey found that R&D is a better predictor of market success of multinationals than, say, advertising expenditures or international wage differentials.

Table 1 - World Market Share of U.S. Multinationals by Technology Classes of Products 1977-1986

Industry	1977	1986	1977-86
	per cent		percentage points
Total manufacturing	17.5	16.7	-0.8
High technology	25.6	26.4	+0.8
Medium technology	23.1	19.6	-3.5
Low technology	7.4	6.8	-0.6

Source: Kravis, Lipsey (1989).

This development is not a U.S.-specific phenomenon. The statistics on the world's largest industrial enterprises gathered by John Dunning and his team from the University of Reading show that the ratio of sales by overseas affiliates to total sales of MNEs increased by more than six percentage points in the high-tech sector as compared to an increase of less than four percentage points for manufacturing on average (Table 2).

What are the driving forces behind the ongoing internationalization of production and why is it most pronounced in high-tech industries? The public good character of technical knowledge only explains why firm specific economies of scale

are most significant in R&D-intensive industries. It does not explain, however, why the companies did not fully take advantage of these opportunities in earlier times.

Table 2 - Overseas Production Ratio (a) of MNEs by Industry 1972-1982

Industry	1972	1977	1982	1972-82
	per cent			percentage points
Total manufacturing	24.4	28.3	29.0	3.6
High technology	24.2	27.6	30.4	6.2
Medium technology	24.2	25.3	25.6	1.4
Low technology	32.8	34.8	34.3	1.5

(a) Sales of overseas affiliates and associate companies (excluding goods imported from parent for resale) divided by total worldwide sales of group.

Source: Dunning, Pearce (1985).

The crucial point seems to be the relative size of transaction cost disadvantages of overseas production. Some costs of supervising and monitoring production in a foreign country such as language and cultural barriers or the lack of experience with a different legal system are by and large identical for all industries. Others that are related to intrafirm communication between headquarters and plants depend on the sophistication of production. In general, high-tech goods require more sophisticated production techniques than low-tech goods. As a consequence, the in-

tensity of intrafirm communication can be expected to increase with R&D intensity.

Replacing exports by foreign direct investment basically means replacing trade in goods by trade in information. High costs of transmitting information across national borders prevent R&D intensive firms from becoming MNEs despite an above-average potential for exploiting firm-specific economies of scale. This probably explains why the overseas production ratio in high-tech industries was even lower than in manufacturing as a whole in the seventies (see above Table 2).

The situation significantly changed with the rapid diffusion of modern information and communication technologies. New developments in microelectronics facilitated communication across long distances by providing a variety of new techniques and by substantially reducing the costs of transmitting information. Hence, internationalization of production was increasingly attractive for research-intensive industries. Speaking in the language of Figure 1, the microelectronics revolution led to a sizable downward shift of the cost curve ac_a.

Due to the reduced costs of international flows of information, some multinationals are even able to shift part of their headquarter services to foreign countries. The

research laboratories of IBM at Rüschlikon (Switzerland) are no longer an outstanding exception but just another example for an international research strategy that has been adopted by other MNEs as well. All in all, the research intensity of foreign affiliates in high-tech industries is already more than half as high as the research intensity of their parent companies (Table 3). As a consequence, MNEs are more and more able to participate in those subsidy programs of foreign countries that are intended to promote domestic production of headquarter services.

Table 3 - R&D Intensity(a) of Parent Companies and Overseas Affiliates by Industry, 1982

Industry	Parent company	Overseas affiliate
Total manufacturing	3.3	1.2
High technology	5.6	3.0
Medium technology	2.4	0.9
Low technology	1.0	0.7

(a) R&D expenditures as a percentage of corresponding sales.

Source: Dunning, Pearce (1985).

Presumably, the costs of information and communication will continue to decline in the years to come. This change in relative prices will foster communication-intensive activities. It will be increasingly difficult, therefore, to

ignore the existence of MNEs in the design of rent-shifting industrial policy.[1]

4. Where do the rents go?

The transfer of profits between headquarters and foreign affiliates appears to be not very difficult. The internal prices charged for headquarter services or the transfer prices in intrafirm trade cannot effectively be controlled from outside the company. Hence, attracting a highly profitable industry to the home country does not ensure an attraction of rents if that industry is dominated by MNEs.

Very little is known about the distribution of rents within multinational firms. A profit maximising textbook firm would surely choose to transfer as much profits as possible to low-tax countries. The reality seems to be more complex. It has repeatedly been reported that U.S.-based multinationals are shifting the bulk of their profits to the United States even if they are running affiliates in foreign tax havens.[2]

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[1] The increased potential for international technology transfer seems also to play a major role in the rapid catch-up of South-East Asian NICs. Those countries raised exports in particular in those R&D intensive industries where technical knowledge is not incorporated in people and can easily be transferred across national borders (Klodt, 1990).

[2] For the structure of MNE profits disaggregated by parent company and foreign affiliate see Stopford, Dunning (1983).

Interregional profit transfers are crucial for the question which country will be able to skim part of MNE profits by taxation. It is rather irrelevant, however, for the distribution of after-tax profits. In the end, monopoly rents improve the value of the whole enterprise and add to the wealth of the shareholders. A geographical redistribution of rents would require a redistribution of shareholders. In the presence of multinational enterprises industrial policy can only influence the total amount of rents by providing more or less subsidies, but not the international distribution of rents.

If the internationalisation of production proceeds (as it probably will), the only realistic objective of industrial policy is to attract investment and jobs in particular industries to the home country. Sector-specific trade barriers and subsidies will raise the share of the protected industries in domestic output and employment at the expense of other industries. Thus, industrial policy may still work, but it does not work in the sense of strategic policy any longer, i.e. in the sense of international rent shifting.

It might be objected that monopoly rents may also acrue to the workers of MNEs. If this were true, an international shift of production could lead to at least partial rent shifting. Empirical labour market research has indicated, however, that the inter-industry wage structure is surprisingly stable over time and across countries (Thaler,

1989). In the light of this evidence it seems rather unlikely that a successful attraction of highly profitable enterprises from abroad by industrial policy measures will result in higher wages for domestic workers in the respective industry.

Industial policy makers must recognize that the "microelectronics revolution" has facilitated the internationalization of production and makes trade barries more and more look like porous Swiss cheese. Despite the increasing political concern about strategic trade policy there is an underlying trend towards free trade which is fed by modern information and communication technologies. To put it in the words of Bhagwati (1988), the dog still barks but does not bite any more.

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