Transnational corporations and industrial diversification: the case of the offshore oil-supply industry

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The offshore oil-supply industry is dominated by United States transnational corporations. While many countries have adopted a protectionist stance in order to protect their indigenous infant offshore oil-supply industries, whether such a policy is desirable is questionable. A main consideration is the extreme international mobility of the industry deriving from its dependence on a depletable natural resource. A conclusion drawn is that, in several other industries, better policy may be not to utilize ownership mechanisms, but to adopt competitive franchising arrangements aimed at restricting excess profitability.

This article concerns the offshore oil supply industry (OOSI), the private oil companies that are the purchasers of intermediate goods and services and their (mainly United States-based) suppliers of these goods and services — the offshore oil supply firms.[1] Virtually all of the oil companies and many of the leading firms in the offshore supply industry operate internationally. The two sides of the industry are connected to one another through a competitive-market relationship that has been adapted by the oil companies to yield competitive prices for the intermediate inputs they purchase. The economics of this market relationship is analyzed in Hallwood (1990a, 1990b, 1991, 1992). Interference from host Governments in this

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[1] To define terms, "offshore" refers to the location of oil reservoirs. World-wide production from such reservoirs has grown rapidly during the course of the last two decades. The "supply industry" provides intermediate inputs into the stages of offshore oil exploration, development and production. This article is *not* concerned with the more extensive research area of the relationship between host countries and oil companies, such as Shell or Exxon, that hold the licence to produce oil and are largely responsible for the marketing of crude oil. Examples of United States transnational supply firms include Halliburton, Dresser Industries, Smith International, Santa Fe, Zapata International, Weatherford and Baker International. Parts of this article draw on a large sample study undertaken in 1985 of the offshore industry of the United Kingdom. Judging from fragmentary reports, the structure of that industry has changed little, if at all, since then.

market, through protectionist policies that somehow direct or encourage oil companies to prefer indigenous suppliers, risks raising production costs or otherwise hindering offshore oil production.

Protectionism does offer some immediate benefits, for example, increased domestic employment and an increased domestic share of value-added created in offshore oil production. In pursuit of these benefits, some Governments of host countries have adopted protectionist economic policies towards their nascent indigenous offshore oil-supply industries. But others have chosen an open-door policy towards transnational corporations (TNCs). The relative merits of these opposite policies are considered. An important factor is the extreme international mobility of the industry. The transnational offshore oil-supplies firms are quintessential "global scanners", being among the first to establish operations wherever oil is found in commercial abundance (Hallwood, 1990b). Moreover, as is discussed below, barriers to entry into the technological core of the oil-supplies industry are acute. As protected indigenous industry may never become competitive in international markets, it is entirely possible that protectionism may be the wrong policy and that reliance on TNCs that possess commercially superior technology and methods may yield greater net benefits in the long run.

The thesis developed here may be generalized as a cost-benefit analysis of investment by a host country to gain entry into an internationalized industry. The larger the necessary initial investment, the higher the risk-adjusted discount rate, the smaller the future annual expected net benefits and the shorter the period over which these benefits are enjoyed, the smaller will be the return on an investment (and it may be negative). Entry costs into many industries are likely to be high because the existence of TNCs may be argued to depend upon the possession of firm-specific advantages. In the OOSI, positive net benefits are unlikely to materialize because of the impermanence of the domestic market and the (revealed) difficulty of penetrating export markets. Other industries in which net benefits may be small can be classified first as new products or services in which domestic demand is especially uncertain (translating into a high discount rate); secondly, as other depletable natural-resource industries, especially when deposits are small, or when international markets are difficult to penetrate; and, thirdly, as industries subject to rapid technological change, unless the new entrant can sustain high rates of expenditure on research and development — otherwise indigenous enterprises face near exclusion from international markets and even risk loss of the home market.

A predicament

When oil companies first begin exploration activities in a new oil province, they create a geographically distinct demand for the intermediate products and services provided by the supply industry. Oilfield services cannot be exported since they must be applied on-site. Thus, services companies are found in close proximity to oil companies in a service-base. Even when it is possible to provide services at a distance (e.g., with laboratory-based services), oil companies usually deal only with those suppliers who have facilities located close to them to facilitate cooperation and communication and to expedite turnaround. Licensing of know-how by dominant United States suppliers to local firms is not typically practiced. Indigenous companies with the requisite skills often do not exist and the potential licensor may fear that a licensee will (through poor performance) damage the licensor's reputation. With regard to oilfield equipment and machinery, the United States suppliers usually establish a non-manufacturing affiliate near the oil companies where the latter have set up a service-base. These affiliates act as sales offices, inventory holders, managers and providers of after-sales services while the parent companies usually retain their manufacturing capacity in the United States.[2]

The internationalization of the OOSI poses a dilemma for host Governments. An open-door (or *laissez-faire*) policy towards foreign supply companies risks the non-development of indigenous enterprises. Protectionism, however, risks high input costs that reduce the profits from oil production (in which host Governments share through taxation), as well as a loss of markets when domestic oil production begins to decline. There are two possible solutions. One is to accept the fact that reliance on foreign TNCs may make the entry by indigenous enterprises very difficult, but enjoy competitive prices and the advanced technological solutions provided by the international oil-supplies industry. The other is to develop indigenous interests in a way that will make them truly competitive in international markets. Unless competitiveness is achieved, foreign markets will not be won without subsidies, which are costly and, in any event, likely to be illegal under GATT rules. There would also have to be planning for the day when oil-production activities decline.

[2] A few United States manufacturers of oilfield equipment have set up additional manufacturing capacity in Aberdeen, Scotland — the United Kingdom's main service-base. These are Baker International, Combustion Engineering and Halliburton. However, the affiliates of those companies remain small within their ownership groups.

There are barriers to entry into the geographically mobile OOSI. The established TNCs possess firm-specific knowledge that has been created through long experience in the oil industry. This results from continued high expenditures on research and development and from the accumulated know-how that is sometimes protected by patents and trade marks. Firm-specific advantages also result from the possession of specialized capital equipment, employment of skilled or specialized labour and superior management techniques (including how to find and keep the most qualified labour and how best to interact with the customers, i.e., the oil companies). These factors enable the firms to win contracts under conditions of competitive tender bidding. And, in the manufacturing of oilfield equipment and machinery, concentration of production in plants in the United States brings whatever economies of scale are available.

Government policies towards the offshore oil-supply industry

Since barriers to entry exist, some form of special help is needed if indigenous firms are to penetrate the industry. Several methods have been used by Governments to discriminate in favour of indigenous companies with the objective of building a domestic production and export capability. These include:

- *legislation*: basic petroleum laws can, in principle, contain clauses on mandatory joint ventures, technology transfer and petroleum engineering and management training programmes for host-country personnel;
- *national oil companies* can be directed to make purchases from indigenous firms;[3] Brazil, Norway and Venezuela have been particularly adept in using this device;
- *production licensing* can require oil companies to discriminate in favour of indigenous sourcing, as in China and Norway, for example;[4]
- *import licensing, tariffs and limitation of foreign ownership* as practiced by Brazil and Venezuela and some other Latin American countries; the former two factors restrict competition and raise prices in

[3] Reference to these policies is made by Alleyne (1980) and Sherif (1980).

[4] Some examples are discussed by Dabinovic (1983), Mikesell (1984) and Warhurst (1991).

the domestic market, thus enabling indigenous suppliers to gain a foothold;

- *joint-ventures legislation*, in which foreign suppliers are required to enter into joint ventures with indigenous firms of host countries.

Protection of an indigenous OOSI, however, is not necessarily desirable. The infant-industry argument for protection admits that, in the short term, costs are likely to rise as production is shifted from internationally competitive foreign firms to protected indigenous companies. Only in the longer term might relative production costs equalize. Dynamic-economic arguments are also usually employed to justify the infant-industry argument. For example, for countries with narrow commodity (and services) export bases, entry into export markets of oil-field services and equipment might reduce the foreign-exchange constraint on economic growth, provide a market outlet for a nascent manufacturing sector, and jobs — directly or indirectly — for surplus labour. Be that as it may, the adoption of protectionist policies involves a trade-off: lower benefits today (due to the infant-industry's higher costs) in exchange for higher future welfare after the industry has become competitive. The choice depends both on the Government's attitude towards the risk that the "infant" will never mature and its preference for increased future welfare over the current cost.

The United Kingdom and China offer examples of these two different approaches. At the one extreme, the United Kingdom has followed an open-door policy. At the other, China has followed a policy that has progressed through technology transfer from the former Soviet Union (in the 1950s), foreign exclusion (during the cultural revolution), to the current policy in which TNCs are invited in but are, contrary to general international practice, contractually required to transfer technology to China.

Both Venezuela and Brazil have pursued protectionist policies. Both have set up national oil companies (Petroleos de Venezuela and Petrobras, respectively) that are statutory monopolies which, whenever possible, have directed orders to indigenous suppliers. The transnational OOSI companies have been allowed a presence, particularly in areas of specialized firm-specific technology. Tariffs, the tax system and other measures have been used to promote indigenous enterprises in the more peripheral or, at least, less

technically advanced sub-sectors.[5] Norway is following a more cautious protectionist course, intermediate between the United Kingdom's open-door policy and Latin American protectionist approaches. French policy is somewhat more protectionist than that of Norway.

The policy of the United Kingdom

Successive Governments of the United Kingdom have given priority to the speedy development of the oil and gas resources of the United Kingdom's continental shelf. This policy, however, has not been without its costs. P. Cameron (1986, p. 27) reflected the widely held impression that "although the UK industry probably ranks second or third among the world suppliers of offshore goods and services to oil companies, it has so far failed to become a large-scale exporter". This was because companies from the United Kingdom have been mainly restricted to the supply of locationally determined inputs, while TNCs have largely retained their share of production in the technological core.[6]

The policy of the Government of the United Kingdom towards the OOSI is embodied in the Memorandum of Understanding and Code of Practice (1975, modified in 1981), agreed upon with the member oil companies of the United Kingdom Offshore Operators Association. The policy is described as one of "full and fair opportunity" for suppliers from the United Kingdom, but amounts to an open-door for foreign suppliers.

The Memorandum of Understanding recognizes the objective of non-discrimination *against* suppliers from the United Kingdom and the Code of Practice enumerates the means through which discrimination is to be avoided. Central to the application of these arrangements is the Offshore Supplies Office, which has the role of ensuring that the agreements are applied in practice. Thus, the oil companies must inform the Offshore Supplies Office of purchases that will be made from overseas and that Office vets the bidding procedures and contract-award decisions. Companies from the United Kingdom have no more than an equal chance of being awarded supply contracts since there is no provision for positive discrimination in their favour.

[5] In Peru's onshore oil industry, the policy has been open-door, but foreign oil companies are contractually required to train local personnel in oil technology (Mayorga-Alba, 1985). The result has been a sharp decline in the proportion of foreign workers in that industry, but not in the most technologically sophisticated segments, such as logging implementation and various types of geological and geophysical analyses. Peru's dependence on inported machinery and equipment remains very high. With a less well-developed industrial base than Brazil, Peru has achieved much less penetration of the oil-supplies industry.

[6] For a more extensive description of these features see Hallwood (1990b).

There are pressures on leaseblock operators encouraging them to place contracts with the most competitive suppliers. Price-rigging with a favoured supplier is strongly discouraged both by law and by an operator's leaseblock partners. The latter stand in a type of principal-agent relationship with the operator and have a strong interest in seeing that production costs are minimized. They would not want to see an operator award a contract to one of its own subsidiaries (or, to a company related to it by some other way as, for example, by nationality) at anything more than the most competitive bid. However, there are provisions in the Memorandum of Understanding that might have some effectiveness. For example, operators are not allowed to write the bid documents in a way that excludes industrial specification standards of the United Kingdom, which would be discriminatory against United Kingdom firms.

An important provision of the Code of Practice is the target set for operators to place 70 per cent or more of purchases by value with companies from the United Kingdom. A "United Kingdom company", however, is defined with reference to its location (i.e., incorporated in the United Kingdom) rather than to the nationality of its ownership. The difference is by no means trivial: if nationality of ownership mattered, then the discriminatory effect in favour of indigenous United Kingdom companies would be enormous. As it stands, all a foreign supplier needs to do is to incorporate an affiliate in the United Kingdom and give it a minimal function, such as inventory management. The latter is of little use to the development of indigenous United Kingdom enterprises.

In fact, it is claimed by the Offshore Supplies Office that, by 1984, 74 per cent of the value of orders for offshore goods and services were placed with United Kingdom companies (the remaining 26 per cent being placed directly abroad). A much more interesting statistic, however, is the share of the value of orders placed with *indigenous* supply firms. There is no published information on that, but a sensible estimate can be made by using information gathered in a sample survey.[7] The 241 surveyed firms employed a total of 13,250 workers and 53 per cent of these were employed by indigenous companies. Assuming that sales and employment are related proportionately, only 39 per cent of sales must have been made by indigenous companies, with 26 per cent being placed overseas and 35 per cent with the

[7] For fuller information see Hallwood (1990b), chapter 6.

affiliates of foreign companies located in the United Kingdom.[8] Moreover, if we grant foreign affiliates a 10 per cent labour-productivity advantage over indigenous firms to allow for their greater experience in OOSI and for the fact that they share overhead facilities, the indigenous share falls to 36 per cent of purchases — or to just 32 per cent, allowing for a 20 per cent foreign-productivity advantage.

To take one example, in exploration drilling, the share of contracts going to United Kingdom companies is particulary poor: only about one third of contracts (by value) in the 1980s were going to companies that could be designated as "indigenous", and most of these were won by foreign affiliates (*Financial Times*, 9 March 1984). Commenting on the performance of indigenous companies in the international offshore industry, the chairperson of what is perhaps the most successful indigenous company of the United Kingdom, the John Wood Group, lamented the failure of these companies to win even 1 per cent of the total world market and described this performance as "miserable" (*The Scotsman*, 23 January 1984).

Successive Governments of the United Kingdom have ignored the recommendations of a report of the International Management and Engineering Group, which noted that:

> "In overcoming the severe technological and operational difficulties of the North Sea environment, non-British enterprise is becoming progressively more entrenched. The time for British firms to establish is *now or not at all*" (International Management and Engineering Group, 1972, p. 5, emphasis added).

An interventionist policy with the following elements was advised:

- the Department of Trade and Industry to assist in the development of a United Kingdom oilfield-equipment industry;
- transfer of technology to the United Kingdom through joint ventures;
- a United Kingdom contractor to be set up in offshore drilling;
- Government insurance of United Kingdom risk capital;

[8] In those estimates, the share of sales by indigenous companies (I) depends on the share of sales of companies located in the United Kingdom (L), the foreign share of employment (E) and the productivity advantages of the foreign companies (V). Thus, $I = L[1 - (E)(V)]$. Total purchases of goods and services by oil companies in the United Kingdom in 1984 amounted to £3.61 billions.

- the Government of the United Kingdom to lease equipment to United Kingdom contractors; and,
- governmental sponsorship of information services for United Kingdom suppliers, provision of subsidized credit, financial support for United Kingdom research and development and establishment of educational programmes in petroleum engineering.

This approach, had it been adopted, could be described as the spawning of internationally competitive indigenous enterprises. As such, it was not severely protectionist in the sense of reserving the offshore oil-supply market for high-cost indigenous industry. Rather, the policy rested on an infant-industry case for protection. The cost disadvantages faced by indigenous firms were seen as surmountable by investment in research and development through joint-venture arrangements.

As it has turned out, no Government of the United Kingdom accepted this infant-industry argument. By 1983, as the United Kingdom's North Sea oil production neared its peak, L. Cook and J. Surrey (1983, p. 7) concluded that it was by then too late to adopt "radically new nationalistic policies". Indeed, surveying the 1973-1977 period, M. Gaskin and D.I. McKay (1978) pointed out that failure of United Kingdom companies to penetrate the market at that time would have long-term adverse consequences.

At a much later date, in 1984, the Government of the United Kingdom began to shift its "full and fair opportunity" policy towards one of somewhat more active discrimination with the objective of promoting the United Kingdom supply industry as a major competitor in world markets (*Financial Times*, 12 February 1985). With the approval of the Government, the United Kingdom Offshore Operators Association set up the Quality Appraisal Service Company with the function of pre-qualifying United Kingdom companies. Pre-qualification can constitute a barrier to entry for a new firm, especially when it has to pre-qualify with each of several potential customers of the oil company. The Quality Appraisal Service Company may reduce these pre-qualification costs by investigating a potential new entrant on behalf of all members of the United Kingdom Offshore Operators Association.

Somewhat more significantly, the Government of the United Kingdom in the ninth round of licensing (1984/1985), adopted more stringent criteria with respect to oil company purchases from companies based in the United Kingdom. An oil company which failed to reach the 70 per cent target men-

tioned above would not be looked upon favourably in later licensing rounds. This policy may have affected the allocation of certain platform design contracts to United Kingdom companies and away from the leading United States suppliers, an act that provoked a protest of trade discrimination from the United States Secretary of State (Cameron, 1986; *Financial Times*, 19 October 1985). But, in view of the late start of the Government of the United Kingdom in favouring indigenous supply companies, combined with widespread protectionism in other countries, one can only be pessimistic about the long-term export prospects of the United Kingdom in the oil-supply industry.

The policies of France and Norway

Both France and Norway have adopted procurement and other rules aimed at promoting indigenous suppliers and/or have used their national oil companies' purchasing policies to the same end.

Norwegian procurement regulations (under the 1972 Decree and 1985 Act of Parliament) place an operator under an obligation to provide the Norwegian industry with opportunities to participate in supply and technological development, as well to train Norwegian personnel. Moreover, in the award of services contracts, the Ministry of Petroleum and Energy, which receives detailed information about all pending services contracts, favours contract awards to, in order of priority, wholly-owned Norwegian companies, joint-venture companies, foreign affiliates located in Norway and, as a last resort, foreign exporters. Foreign companies are also strongly encouraged by regulations to enter into joint ventures, thus affording technology transfer to the Norwegian partner.

Norway's national oil company, Statoil, has also played an important role in the "norwegianization" of Norway's offshore oil-supplies industry. It was granted by law an automatic 50 per cent share in all licence awards and has used this position to direct supply contracts to Norwegian suppliers. In an interesting development, Statoil has acquired exploration rights in other countries and, as Cameron states, "it would be unrealistic not to expect an international Statoil to function *vis-à-vis* the Norwegian supply industry in the same way as Elf and Total function *vis-à-vis* the French supply industry" (Cameron, 1986, p. 86), that is, to direct procurement contracts to home-country contractors.

France has been particularly assiduous in creating an environment suitable for the development of indigenous French companies in the OOSI. The

national oil company has discriminated strongly in favour of a "buy French" policy. Competition by TNCs in France has been restricted; money has been made available for research and development by French companies, and individual French companies have been promoted on a selective basis.

Indeed, the Governments of France and Norway have clashed over the matter of the protection of their offshore oil-supplies industries. Norway wished to develop, in the mid-1980s, the giant Troll and Sleipner offshore natural gas fields at a capital cost of $8 billion. That cost included building a pipeline of 682 miles to move gas to the markets of Belgium, France, Germany and the Netherlands. France, however, pointed to the negative effect that their gas purchases from Norway would have on their bilateral balance of payments with Norway and insisted upon a countervailing trade flow. France wanted this to take the form of a reservation for French offshore supply companies of construction and other supply contracts that would be needed on the offshore gas project, as well as some other trade concessions from Norway. Norway rebuffed the demands of France and drew up new plans to develop a smaller offshore gas project, leaving the French market out of consideration (*The Wall Street Journal*, 2 December 1986).

Policies of other countries

Considering other cases of policies of host Governments, L. Randall (1987) offered Venezuela as an example of a country that has promoted an indigenous oil-supplies industry through a comprehensive policy of import substitution. In 1977, foreign direct investment (FDI) was allowed only in the form of joint ventures, and a tax law in 1979 provided for heavier taxation of profits generated by foreign affiliates that provided services than profits earned from the provision of technical assistance. In 1981, new procurement standards eased the prohibition of contracting of foreign consultancy services when an indigenous alternative was available. Import tariffs of 30 per cent for non-consultancy services were introduced in 1982. As a result of these protectionist measures, Venezuelan enterprises increased their share of procurement contracts won.

However, the failure of Venezuelan enterprises to penetrate certain sectors of the oil-supplies industry (e.g., the collection and interpretation of seismic data, production of oilfield equipment and machinery and exploration and well production services) led to the authorization of FDI by United States TNCs. In other words, despite the introduction of strong pro-

tectionist measures over a period approaching ten years, Venezuela's reliance on the transnational offshore oil-supply firms was still clearly evident. It was also true that the cost of indigenously produced Venezuelan equipment and services remained high relative to what could be obtained from the foreign companies (Randall, 1987).

J. Surrey (1986) described how the "impressive" development of Brazil's OOSI has been used as a component of that country's import-substitution-based industrialization efforts. The national oil company, Petrobras, was given wide powers over the oil industry and has used those powers to direct procurement towards Brazilian suppliers. By 1985, Brazilian firms (including foreign affiliates in Brazil) received as much as 93 per cent of procurement expenditures and had established themselves in virtually all sub-sectors (except those of the highest technology), especially those sectors in which the transnational offshore supply companies dominated. Surrey, however, warned that the protected growth of indigenous supply-industry capacity might have compromised economic efficiency. Nevertheless, it is also true that Braspetro, Petrobras's export affiliate, has won export orders for oil exploration and development projects in a number of countries in Africa, Latin America and Western Asia. Those, however, have been under managed trade agreements rather than competitive tender. Moreover, Surrey states that there is no way of knowing the true opportunity cost of relying heavily on domestic firms, pointing to the large contribution that Petrobras's foreign borrowing has made to Brazil's burdensome foreign debt.

Several studies have appeared recently on China's oil industry and its relationship to Chinese industrialization, the foreign oil companies and the offshore transnational oil industry-supplies companies.[9] What is particularly interesting in this is that China had, for twenty years or so, excluded foreign enterprises and built a "comprehensive" onshore oil industry based on petroleum technology acquired in the 1950s from the former Soviet Union.

If this technology has been as efficient as that available from the transnational oil-supplies companies, China would have had no need to turn to the international oil industry in the late 1970s. The reason is readily apparent: China's indigenous oil technology was inferior to that which could be purchased from the international oil industry (so inferior, in fact, that offshore oil gathering in deeper waters could not be tackled). Chinese

[9] See Cameron (1986), Fridley and Christoffersen (1987), Oldham (1987), Kaempfer and Min (1988) and Warhurst (1991).

technology was also backward in the more technologically advanced area of secondary recovery. Moreover, as A. Warhurst's detailed study of technology transfer showed, TNCs refused to transfer to Chinese entities the very proprietary technology upon which their competitive advantage over rivals depends (Warhurst, 1991). Hence, the ability of Chinese enterprise to penetrate competitive international markets is still very much in doubt and is likely to remain so for many years. Furthermore, Warhurst pointed out that technology transfer is an expensive business and had to be scaled back from about 1986 when oil prices fell bringing increased cost-consciousness.[10]

In a similar vein, even when indigenous OOSI firms do exist, usually with some degree of protection, they often do not operate projects efficiently (Chevalier, 1987). J-M Chevalier noted that:

> "financial devices such as joint ventures appear clearly as an interesting means of transferring technologies and providing guarantees that the project will be well operated. For developing countries, it is probably the best way to build up local expertise. Moreover, it is also an opportunity to put the international companies in a position of qualitative competition. For a given project, the country may organize a tender offer which is not only in terms of price but also takes into account the type of training and transfer of technology which might be proposed by the bidders. *Transfer of technology becomes a challenge for competitiveness in the long run*" (Chevalier, 1987, p. 230, emphasis added).

Technology transfer

Technology transfer to indigenous companies is the single most urgent matter for the strength of a country's oil-supplies industry. Technology is known to be important to a country's economic growth, but it can make a difference whether that technology is owned locally or by foreign entities, a point that has been made in connection with the wider economy of Scotland (Forsyth, 1972), the economic performance of Latin America[11], as well as the dominance of the Canadian industry by the United States. This situation is especially true with the oil-supply industry, because its intermediate inputs in a given oil province are required for a finite period of time — the life of that province. Nor are the inputs of all supply-industry sub-sectors needed over the entire life of an offshore oil province.

[10] D. Lascelles, "Still plenty of North Sea life", *Financial Times*, 6/7 February 1993.

[11] See, for example, Barnet and Muller (1974) and Seidman (1975).

In the short term, tapping of foreign-owned technology through the conduit of TNCs enables a country to exploit an oil province quickly. In the long term, when TNCs close their affiliates, little is likely to be left behind, unless indigenous firms that have been in joint ventures with those affiliates (or have otherwise created firm-specific advantages) are able to supply foreign markets. But, for that export base to be created, indigenous firms must develop firm-specific advantages of their own. That longer-term problem is especially acute in oil-producing countries, such as Venezuela (Anez, 1978), which lacks a well developed manufacturing sector that could respond competitively to the opportunities provided by the large offshore and onshore oil-supplies market located within its national borders. What is more surprising, perhaps, is that the United Kingdom, a country that is both industrialized and experienced in the international oil industry, has also found it difficult to create a competitive presence in the technological core, internationally mobile segments of OOSI.

A picture of dependency

With over 1,000 oil-related companies located in the United Kingdom's main service-base, Aberdeen, it might seem to be churlish to challenge the view that Aberdeen is the "oil capital" of Europe. Nevertheless, the predominance of affiliates with their limited horizons points to the conclusion that Aberdeen is not so much an "oil capital" as an "oil satellite", that is, impulses for decision making on matters such as capital investments, research-and-development expenditures and the definition of market horizons come from outside the local area.

To illustrate: 90 per cent of affiliates were set up by their parent corporations specifically to service oil activity in the North Sea (rather than, for example, to service the OOSI over a broader export horizon). But, while 98 per cent of these affiliates had some decision-making power within the local area, only 18 per cent of wholly oil-related affiliates had decision-making powers that extended overseas, and most of these were just across the North Sea in Norway and, therefore, dependent upon essentially the same oil province. Secondly, Aberdeen-based affiliates are relatively unimportant within their ownership group, as measured by the affiliates' share of group employment or sales. For example, 30 per cent of affiliates accounted for less than 1 per cent of group employment while 31 per cent of affiliates accounted for less than 1 per cent of group sales. Strikingly, two thirds of affiliates in Aberdeen accounted for only 10 per cent or less of their respective group's total employment, while 55 per cent of affiliates accounted for

just 10 per cent or less of their groups' world-wide sales. Or, put another way, only 18 per cent of affiliates accounted for over one half of group employment and even fewer, 15 per cent, for group sales (Hallwood, 1990b).

Conclusions

Matters of ownership, industrial organization, and global relocation must all be taken into consideration when assessing the long-run prospects for a host country in the oil-supply industry. The progress that has been revealed in Aberdeen and surrounding areas is not at all encouraging. First, what local ownership has been established in the offshore oil-supply industry is mainly in the production of locationally determined inputs, so that penetration of export markets on a large scale is unlikely. Secondly, eventual global relocation by the oil companies will penalize locally owned suppliers, which will have to face increased transport costs and local competition. Third, even though the ownership structure of the offshore oil-supply industry favours penetration by local firms, barriers to entry to the geographically mobile sectors do exist; much the same can be said of several of the other countries that have been referred to earlier.

It may be that only little local net benefit is gained from owning a plant that will shortly lose its local market and be relocated, perhaps thousands of miles away, so as to be able to exploit some other local market. That argument is especially appropriate in the case of the oil-supply industry. Its spatial organization is broadly governed by the relocational decisions of international oil companies, and its industrial organization structure has been largely created in a foreign country (the United States). The supply firms work in markets whose global spread is vast, but the size of those markets varies a lot over time in any individual location, and the markets are cut off from one another by high transport costs. Accordingly, local ownership in one of the oil-supply industry's less-than-permanent locations will not necessarily raise the level of national autonomy. Local prosperity will remain conditioned by outside forces, in this case by both geological imperatives — as oil and gas begin to run out — and the retention of ownership in foreign hands of the crucial internationally mobile sectors of the industry.

The prosperity of a host country–owned supply industry in a given location may be extended if a presence in export markets can be created. The qualification "may" is important. Local manufacturing capacity is sustainable if export sales can be made to flourish, but provision of services inputs

to customers in foreign markets by locally owned firms by no means guarantees strong linkage(s) with the local economy. In the oil gathering business, services have to be applied on-site and/or the oil companies require that services-input facilities be located close to their own on-land facilities in each offshore oil province.

Whether the hands-off policy of the Government of the United Kingdom or the hands-on policies of other Governments will be more successful in the long run still remains an open question. The latter policies may create jobs in the short run but leave an uncompetitive indigenous supplies industry, vulnerable to the eventual run-down of local oil production. United States TNCs continue to retain dominance at the technological core of the global industry. The policy of the United Kingdom at least has the short-term benefit of tapping competitive sources of offshore oil-gathering technology and avoids over-investment in indigenous firms which are bound to find long-run survival most difficult. Moreover, as pointed out earlier, the case of the oil-supply industry is not unique. There are several classes of industries in which a careful cost-benefit analysis is likely to reveal that reliance on TNCs, rather than the encouragement of indigenous enterprise through protectionism, is likely to be the most desirable course of action.

An implication of the foregoing discussion is that host countries may benefit from a greater use of inventive market organizational arrangements, rather than investing scarce resources in an attempt to duplicate the firm-specific advantages possessed by foreign corporations. As described elsewhere (Hallwood, 1990b), oil companies rely on a competitive sealed-bid first-price auction approach which they have designed and operate to obtain intermediate inputs at competitive prices, rather than allocating resources to duplicate the sophisticated technologies already available from independent suppliers. That the sealed-bid auction is an efficient price-revelation arrangement is claimed, *inter alia*, by H. Demsetz (1968) and O. E. Williamson (1985), who argue their cases with reference, respectively, to the franchising of public utilities and cable television. The key advantage of the auction process is that, in a procurement auction, it encourages competitive bids, thereby revealing the low-price bidder.[12]

Similar price-revelation processes could, as a theoretical proposition opened to discussion, be used by any country that possesses a resource (e.g., a natural resource or a domestic market) that it wishes to exploit, but lacks

[12] There is a large literature on the theory of auctions. A recent survey is by McAfee and McMillan (1987).

indigenous firms with firm-specific advantages comparable to those possessed by TNCs. Rather than allocate scarce domestic resources to the promotion of indigenous enterprises—which, as we have seen in the case of the OOSI, does not guarantee success—franchises might be sold through some variant of the competitive auction arrangement. Thus, the right to develop, for example, a natural resource deposit, an airline route or a hotel catering to international travelers, may be franchised on a short-term basis (that is, 5- to 7-year) to companies with the best firm-specific advantages, regardless of their national origin. This may be preferable to granting TNCs long-term licences (that is, 25-year), as is typical in natural resources industries, or, even, outright ownership. It may also be noted that this argument in favour of the franchise arrangement is congruent with the observation made by T. H. Moran (1976), that TNC ownership is not necessarily the best vehicle for the exploitation of a host country's natural resources. He observed that relations between host Governments, TNCs and their Governments are subject to constant bargaining tension and, hence, political tension and dissatisfaction, as bargaining power typically shifts between the two sides as an industry passes through the various stages of its development. Thus, as a general proposition, it may be claimed that the franchise contract, apart from allowing a country access to best-technology or practices, also has the advantage of helping to resolve host country-TNC tensions in favour of the host country by requiring foreign suppliers to bid competitively at regular intervals for the right to continue exploiting a nation's resources. ■

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