

Chapter 21

INTERNATIONAL DIFFERENCES IN INDUSTRIAL ORGANIZATION

RICHARD E. CAVES*

Harvard University

Contents

1. Introduction	1226
2. Agency and organization of enterprise	1227
3. Sizes of markets, plants, and firms	1230
4. International trade and market structure	1235
5. International differences in efficiency	1238
6. Determinants of profitability	1242
7. The want list	1244
7.1. International oligopoly	1244
7.2. Advertising and market power	1244
7.3. Research and international diffusion of technology	1245
7.4. Effects of public policies	1245
7.5. State-owned enterprises	1246
References	1246

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1. Introduction

This chapter focuses not on a body of theory or its empirical testing but on a method of inference: international differences in industrial organization, behavior, and performance as bases for testing hypotheses or as sources of new ones. Such a focus can make a substantial although indirect contribution to the ongoing dialogue between the formulation and testing of theories. It provides the intellectual analog of Winter's (1971) "innovating remnant" – an inductive check into the possibility that important phenomena or behavior patterns may be missed by both those who formulate and those who test theoretical models. Thanks to its successes, modern analytical economics is treated by its practitioners as institution-free – exposing the consequences of fundamental human motives and technological opportunities unclouded by any detritus of law, culture, language, custom, or history. Institutions can be dismissed with a wave of the hand: they would not emerge, were they not efficient.

Yet this transparency of the institutional context of economic behavior is an assumption, not a tested hypothesis. Paying attention to international differences is particularly warranted, because much of industrial organization's formal development has taken place in the English-speaking countries, with the United States serving as the dominant firm (if not the monopolist). As a result, the search for interesting questions has focused on the industrial sector of the United States and on the normative issues that have been defined or emphasized by U.S. public policy. One goal of this chapter accordingly is to identify analytically significant differences among national institutions.

As a corollary, the distribution of research effort – both theoretical and applied – might have looked substantially different if the institutional structures of other countries had been generating the agenda. We may hope, therefore, that a review of lines of research on questions arising outside the anglocentric core, or of comparative research involving the industrial sectors of differently situated countries, can reveal analytical possibilities that will otherwise elude the professional research agenda. This chapter seeks to provide a selective survey of these lines of research. Both for exposing variations in the structural influences on market decision-makers and for controlling unwanted variance in their environments, international differences hold promise that has been only lightly realized. A review of the empirical leverage that international differences have yielded may prime the pump for new lines of inquiry – especially as data grow more abundant and training in modern research methods more widespread. Another goal of this chapter is to survey research that has utilized this strategy.

It is important to stipulate what is *not* being attempted in this chapter. Traditions of research in industrial organization exist outside of the English-speaking area. For example, in continental Europe considerable interest attaches to informal analyses of dynamic processes or “life cycles” of industries, and to competition as a process rather than a structural condition or equilibrium state. That this tradition of research responds to institutional features specific to the European economies seems doubtful. In any case, it will not be addressed here.¹ There is also a good deal of empirical research dealing with economies other than the United States that takes the form of replications or near-replications of research that has originated in the anglocentric tradition. These studies are important but will be neglected except insofar as they ring analytical changes on the original designs:² this chapter addresses differences, not similarities.

The goals of testing for institutional influences and revealing the leverage of international or comparative research designs lead us into a number of substantive areas of industrial organization. These are taken up selectively, with the following discussion grouped around three questions: (1) What determines the boundaries of the firm, and indeed are the firm’s boundaries equally well-defined in all industrial countries? (2) What are the effective boundaries of the market, and what consequences do they have in economies smaller and generally more open to international influences than that of the United States? (3) What insights do international differences provide concerning the determinants of market performance?

2. Agency and organization of enterprise

Some of the most conspicuous and intriguing international differences in institutions lie in the control, ownership, and integration of enterprises. It is widely accepted that Coase’s classic question – Why does the boundary between the firm and the market fall where it does? – is answered by identifying the transaction-cost advantages that may attach to either the market or the firm as allocators of resources. The actual boundaries are drawn in a Darwinian process by which the more efficient institution displaces the less efficient one. If this Darwinian competition worked the same way in every country and the transaction-cost efficiencies of firms and markets were independent of laws, cultural traits, and other distinguishing traits of nationhood, then we should expect the allocation between firms and markets to differ only inessentially from country to country.

¹This research tradition has been surveyed elsewhere [de Jong (1986)].

²Selective reports on these replications can be found in Caves and Uekusa (1976), Jacquemin and de Jong (1977), and Curry and George (1983).

Yet one's eye falls upon certain national institutions that seem quite distinctive – the close control of industrial enterprises by banks in Germany, the extensive linkages effected through holding companies in Belgium and enterprise groups in France, the enterprise clubs found in Japan, and the networks of subcontracting relationships observed in Japan and France. Each of these institutions calls into question an assumption that is standard in much of our theoretical and empirical work: that a clean boundary separates the purely administrative allocations made within the firm from purely market transactions that the firm undertakes with other agents. Rather, these institutions imply that the firm's internal allocations can be shaped by important forms of quasi-integration with ostensibly independent legal entities.

A certain amount of analytical research is now available on these institutions, and it tends to show that they represent parallel organizational responses to common underlying problems with the organization of transactions through spot markets. For example, Encaoua and Jacquemin (1982) investigated the incidence in French industry of corporate groupings that resemble diversified firms, yet the subsidiaries (separate legal entities) are only partially owned by the parent and controlled through loose links such as interlocking directorates rather than strict administrative hierarchies. The prevalence of group-affiliated firms in French manufacturing industries increases, they found, with the extent of plant scale economies and multiplant operations, the scale of the firm's fixed capital, and the importance of research and development outlays. The groups are more prevalent among intermediate- and capital-good industries, where transaction-specific capital is likely to be shared among firms. They do not appear to serve the function of coordinating direct market competitors.

Somewhat resembling the French groups in both incidence and organization are the Japanese *keiretsu*, loose groupings that are in part the descendents of pre-World War II *zaibatsu* holding companies. In their present-day form their member companies are linked through regular contacts among executives, limited intercorporate shareholdings (insufficient to convey control), and stable patterns of lender–borrower arrangements and other transactions. No systematic study of their incidence parallels Encaoua and Jacquemin, but casual evidence suggests a close resemblance: Large-scale, heavily capitalized producer-good industries with a substantial research orientation [Caves and Uekusa (1976, pp. 59–68), Goto (1982)]. The groups' principal activities seem associated with the mutual pursuit of opportunities (e.g. mobilizing resources to overcome barriers to entry into an industry) or assistance in the face of unexpected reverses. They might seem merely to substitute for the highly diversified large firms found in the United States. However, Japanese firms do diversify in response to the same structural opportunities as U.S. firms, if not so extensively [Yoshihara et al. (1981)]. Corporate organizational structures have also been adjusted to the requirements of the diversified formal business organization. The Japanese groups clearly are

not just substitutes for the practice of corporate diversification found in other nations [Imai and Itami (1984)].

Yet another distinctive intercorporate institution is the holding companies that control about 24 percent of Belgian operating companies' share capital [Daems (1978)]. Also prevalent in producers' and intermediate goods sectors and capital-intensive industries, they similarly effect lender-borrower links and loose forms of coordination through interlocking directorates and interchanged personnel; but they lack close administrative coordination.³

These findings about the incidence and behavior of French, Japanese, and Belgian enterprise groupings suggest both their similarity to each other and their affinity for the factors that explain diversification. In both Canada [Lemelin (1982)] and the United States [MacDonald (1985)], researchers have found interindustry patterns of corporate diversification to depend on similar factors – notably the importance of research and other intangibles and the role of large-scale or “lumpy” facilities that are usable in several industries. However, diversified corporations are at least capable of substantially higher levels of internal coordination than the Japanese or European groups can attain. The question that stands unanswered is whether the latter forgo some economies of coordination or (instead) large, diversified firms exist only in part to mitigate transaction costs.

If industrial groups' roles are related to diversification and internalization, they also show affinity for the problem of agency in the ownership and control of firms. The concept of agency provides the tool needed to analyze the “split between ownership and control” in the large, public corporation, and it suggests the sort of device that might be expected to emerge in order to avert the slippage in diffuse agency relationships. Again, selected evidence identifies significant institutions in several countries. In a careful examination of large industrial holding companies in Belgium, Daems (1978), after ruling out several other possible explanations, marked their role as centralizing control over operating companies that would otherwise have been subject to diffuse ownership of equity shares. Implicitly, the ultimate owners of Belgian industrial shares pay the net cost of the intervening holding companies (which Daems estimated to be 1.46 percent of their portfolio revenues) in order to enjoy the gains from averting the agency problem associated with diffuse shareholding.⁴

The close relationships between banks and industrial firms in the Federal Republic of Germany support an interpretation similar to the one that Daems offered for Belgium's holding companies. German banks, voting shares that they

³ Relevant to these intercountry differences in the institutions of corporate control is Adams' (1977) finding that liabilities structures differ systematically among large firms based in different countries, but their production structures and profitability tend not to differ significantly.

⁴ Daems (1978, ch. 6) emphasized not the problem of agency but rather the potential ex ante gains from forming controlling coalitions when shareholders have divergent expectations.

own or hold in custody, account for 36 percent of the shares of the top 100 industrial companies and thus a substantial consolidation of control. Cable (1985) tested the influence on these companies' profits of several links through which banks (individually or jointly) may be able to monitor and shape their policies – shareholdings, direct lending, and representation on supervisory boards. His data reject none of these as without effect. Nor do they reject the hypothesis that the profit increments could be monopoly rents, although they are inconsistent with that as the sole explanation.

As a corollary of this analysis, the superior performance of owner-controlled over manager-controlled firms found in some U.S. studies should fail to appear where other institutions of control are dominant. This corollary confirmed by Thonet and Poensgen (1979) for Germany and Cable and Yasuki (1985) for Japan. In the Japanese case profits are also unrelated to group affiliation, although some evidence suggests that rents pass to financial institutions within the group, whose holdings of affiliates' debt conveys more control than it would in Western countries. As another corollary, the close influence exerted by debt-holders on nonfinancial corporations in these countries may account for the high debt–equity ratios that prevail there. As Adams (1985) pointed out, in countries whose tax systems create a preference for debt over equity, a privately efficient solution is high debt–equity ratios coupled with close supervision by concentrated debt-holders to prevent companies from undertaking risky investments that would transfer wealth from debt- to equity-holders.

That enterprise groupings apparently represent responses to transaction costs and agency problems whets one's appetite for additional data points. For example, what about developing countries, in which imperfections of both financial and commodity markets might amplify the motive to internalize transactions through industrial groupings? White (1974) noted the inclusion of banks and insurance companies in Pakistan's family-based industrial groups and suggested an important role for arbitraging around an underdeveloped capital market. However, his other evidence (chapters 6, 7) associates pecuniary gains to these groups largely with successful rent-seeking through the public sector.⁵ Leff (1978), drawing on various studies, urged that groups function to allocate inputs such as “honesty and trustworthy competence on the part of high-level managers” that are otherwise poorly allocated in some LDCs.

3. Sizes of markets, plants, and firms

Economies of scale pose the question whether efficient-scale production trades off against numbers of competitors adequate to align price with marginal cost. Empirical research on scale economies in the United States has emphasized the

⁵Also see Lindsay (1979) on the Philippines and Jones and Sakong (1980, chs. 6, 8) on Korea.

excess of actual concentration over the minimum needed to satisfy the constraint. In the smaller industrial economies, where this trade-off may be tightly constraining, the problem for public policy is often regarded as the likely failure of market processes to assure plant and company scales large enough to minimize costs. A number of theoretical and empirical questions arise. If minimum efficient scale is indeed large relative to the market's size, under what conditions will profit-maximizing producers select suboptimal scales? Does the empirical evidence confirm that national market size constrains the scales of plants and firms? Is it indeed appropriate to assume, as the conjecture does, that the national boundary is the operative perimeter for determining the effective size of the market?

Scherer et al. (1975) provided much of the foundation for analyzing the relation between market sizes and sizes of plants and firms. Assuming that plant-cost curves show increasing returns up to some minimum efficient scale, followed by constant returns, they modeled the dependence of actual plant-size distributions on outbound transportation costs interacted with the density of demand, the cost penalties of suboptimal scale, and other factors (including the structural differentiation of the product). Their empirical analysis [Scherer et al. (1975, ch. 3)] of a panel of twelve industries observed in six countries both confirmed that the basic model could explain the variance of actual plant sizes relative to minimum efficient scale and concluded that the mechanism seems to operate the same way in the European countries in the panel as in North America.⁶

Scherer et al. also investigated the complementary question of how much the sizes of leading firms diverge from the sizes of efficient plants due to multiplant operation. Again, the size of the market (relative to the capacity of the minimum-efficient-scale plant) appears in the model, which also embraces controls for multiplant economies of coordinating production and distribution in geographically fragmented markets or of a heterogeneous line of related products. They expected its positive influence to stem from an "opportunity to multiply plants" or the pursuit of monopoly via horizontal mergers. However, it could be looked at more broadly as limiting the attainment of advantages of size to the firm – both nonproduction scale economies and pecuniary benefits from market dominance. Whatever the causal mechanism, they found domestic disappearance in the national market strongly to influence the extent of multiplant operations. Although they concluded that North America and the sampled European nations could be regarded statistically as a homogeneous population, the elasticity of multiplant operations with respect to market size proved about twice as large in the United States as in the other countries. The interpretation of this difference seems problematical, because differences in public policy toward

⁶The analysis of Scherer et al. (1975) has substantial antecedents in Eastman and Stykolt (1967) and Bain (1966). However, Eastman and Stykolt employed a less complete model, and some of Bain's findings are qualified by an unfortunate choice in research procedure (as Scherer et al. pointed out).

horizontal mergers and the marginal advantages of multiplant operations to obtain nonproduction scale economies to the firm would both point to stronger effects outside the United States. However, the difference is consistent with a random-process model: the firm that obtains a favorable random drawing while operating in a large market finds its expansion less constrained by diminishing marginal net revenue.⁷

Scherer et al. (1975) and Eastman and Stykolt (1967) held an advantage over many other studies touching on these questions in that they employed explicit estimates of minimum efficient plant scales rather than proxies. However, other investigators have reported qualitatively very similar findings concerning the sensitivity of both plant and firm sizes to national market size. Saving's (1961) demonstration that plant sizes vary with market sizes among industries in the United States was picked up by Gorecki (n.d., pp. 43–44), who pointed out that the same relation holds in Canada and that the estimated elasticities of typical plant size to market size seem to land in the same range (roughly 0.5) regardless of the country studied. Broadly consistent results for other countries can be found in other papers that were summarized by Curry and George (1983). Because industries' technologies are free to vary in these interindustry analyses (compare Scherer's intercountry dimension), the thought arises that technologies themselves are devised with an eye to market size, and that the stock of usable technologies may thus depend on market size (and perhaps other economic characteristics).⁸ Pryor (1972b) confirmed the intercountry correlation of plant size with market size in a sample of 23 nations, and the coefficients of his different plant-size indexes suggest that absolutely large plants increase more than proportionately with market size – another hint of random processes at work.

One link between plant and market size has been explored in research on Canadian manufacturing. Plant scale economies presumably depend partly on the technology of the particular product, partly on the overhead of plant and its general-purpose systems. If the market for a particular product limits a specialized plant to suboptimal scale, a possible response for the manager is to diversify the plant's output mix. Thus, producers respond to market-size constraints partly by selecting smaller plant sizes, partly by including more product lines in a plant of any given size. Caves (1975) found evidence of this mechanism in a comparison of scales and degrees of output diversity of Canadian and U.S. plants. Baldwin and Gorecki (1986) pursued the relation farther, showing that Canadian plants are larger relative to minimum efficient scale in industries that afford greater scope for the in-plant diversification of outputs.

⁷For empirical evidence of the explanatory value of a random-process model for the size distributions of firms that are larger than minimum efficient scale, see Mansfield (1962) on the United States and Davies and Lyons (1982) on the United Kingdom.

⁸Scherer et al. (1975) concluded, however, that effective minimum efficient production scale does not vary among industrial countries for manufacturing industries in their sample.

The relation between the size of a company and the market it serves has been explored in several international contexts, notably in the comparison of concentration ratios. Any standard measure of concentration reflects the number and relative sizes of firms in some combination. If firm sizes increased proportionally with market sizes, then the concentration ratio for a given industry should be independent of the size of the country in which we observe it. With firm size responsive to market size but inelastic, concentration should decrease with market size but less than proportionally – if also firm-size distributions are uncorrelated with market size. However, the latter condition is unlikely to hold. Rosenbluth (1957, ch. 4) first established that the concentration of Canadian industries regularly exceeds their U.S. counterparts. The smaller Canadian market makes room for substantially fewer firms, but their sizes are less unequal, and Canadian concentration thus appears higher because the former effect outweighs the latter. Caves, Porter and Spence (1980, ch. 3) confirmed this finding and showed that both plant- and firm-size inequalities increase with market size.⁹

The concept of market size has been used loosely in its relation to the scale of the national economy. The central idea is simply that the position of the national-market demand curve facing a selling industry depends on gross national product or some related parameter of the scale of the national economy. Connections between the size of the national economy and the production units it contains are not, however, confined to the demand side. The scales of business organizations may depend on the relative cost of labor, and thus on national income per capita. In Lucas's (1978) formulation, any person can be either an employee or a manager, but managerial talent is distributed unevenly among individuals. As the price of labor services rises, the opportunity cost of using labor services in the entrepreneurial rather than the employee role increases, and the implication follows that the sizes of production units (both plants and firms, presumably) should be larger in countries with higher incomes per capita. Caves and Uekusa (1976, pp. 101–106) confirmed this in a simple cross-country statistical analysis and also showed that the substantial small-enterprise population remaining in Japan is consistent with this model on the assumption that the process of enterprise consolidation proceeds with a lag in fast-growing countries, where the rising opportunity cost of labor services has not yet had its full effect of reallocating marginal entrepreneurs. Kirkpatrick, Lee and Nixon (1984, ch. 3) reviewed the data on small-enterprise populations in developing countries,¹⁰ and some interesting evidence on the role of small business in Italy's modernization is summarized by Brusco (1982) and Fua (1983).

The broadest treatment of international differences in concentration was provided by Pryor (1972a), who found that concentration levels of given in-

⁹ Also see Hart and Clarke (1980, ch. 4) on Great Britain.

¹⁰ Banerji (1978) demonstrated that plant sizes are pervasively smaller in developing countries, but he did not distinguish between the two obvious causes – small market sizes and underdevelopment *per se*.

dustries do not differ significantly among the larger industrial countries, but they do increase as one proceeds to smaller and smaller industrial markets.¹¹ Pryor emphasized how well an industry's concentration in one country predicts that same industry's concentration in another country, which implies that the factors determining an industry's concentration are strongly rooted in its production technology and the use of its product, and relatively independent of influences specific to the nation [see also Horowitz (1970) and Meller (1978)]. Caves and Uekusa (1976, pp. 19–26) showed that the shapes of cumulative concentration curves of matched Japanese and U.S. manufacturing industries tend to be very similar, so that marginal concentration ratios of the U.S. industries are good predictors for their Japanese counterparts.

These findings about the role of national market size and the similarity of given industries' concentration patterns from country to country seem to ignore the role of international trade. While these findings clearly indicate that the nation is a good first approximation to the geographic span of "the market" in manufacturing industries, however small and open its economy, they leave to be established the role of international commerce in shaping the structures as well as the overall scales of various national producer groups. We take up this issue in the following section.

A further influence on market structures revealed in international studies is that of competition policy, particularly policies toward cartel agreements and horizontal mergers. Particularly striking is the experience of the United Kingdom after horizontal price-fixing and similar collusive arrangements became illegal in the late 1950s. What changes should ensue depends on how collusion is modeled and what consequences are imputed to it. Elliott and Gribbin (1977) noted the conclusion of Swann et al. (1974, ch. 4) that the abandonment of restrictive practices was typically followed by substantial removals of capacity from the industries in question. Given that prices declined substantially and demand presumably increased, excess capacity under collusion must have been substantial indeed. Apparently collusion either attracted inefficient entrants who could earn normal profits at collusion-inflated margins or induced incumbents to maintain excess capacity in order to capture high-margin sales at times when (stochastic) demand was strong. Either way, the abandonment of collusion should have been associated with the removal of capacity and a reduction in the number of firms, and Elliott and Gribbin concluded that it did.¹²

¹¹ Philips (1971, p. 148) found median concentration to be higher in smaller nations, and George and Ward (1975, p. 56) reported the excess of company over plant concentration to increase with the size of the national market. That concentration does not vary more sensitively with country size suggests that the sizes of companies also vary with that of the national market, as we shall see below.

¹² Scherer et al. (1975, pp. 110–112) obtained an incidental result that was interpretable as indicating a greater mutual respect for market shares in concentrated European industries than in their U.S. counterparts—consistent with the findings about the consequences of explicit collusive arrangements in Britain.

Horizontal mergers are strongly discouraged by U.S. antitrust laws but lightly restricted under the competition policies of most other countries. Whatever the motives for such mergers (market control or efficiency), we would accordingly expect them to account for more of changes in producer concentration outside the United States. Utton (1971) among others [see Curry and George (1983, pp. 238–247)]¹³ confirmed this hypothesis for Britain, as did Müller (1976) for West Germany.

4. International trade and market structure

The research summarized so far has been surprisingly unanimous in assigning a significant role to national market size in determining the structure and performance of industrial markets.¹⁴ Apparently, no nation is so small and open that we may simply regard it as a corner of a competitive world market. But that leaves the question of how strongly international links do influence the market's structure and performance – one appropriately investigated by comparing countries that differ in size and openness.

Theory deals rather awkwardly with the effect of international influences on market structure and performance unless that influence takes an all-or-nothing form. Assume that a country is “small” relative to the world market, but that national producers can obtain access to export markets (comparative advantage permitting) only by incurring substantial transaction costs; assume also that similar access costs significantly insulate domestic producers by elevating the delivered price of imports above their world price. Then domestic disappearance (production minus exports plus imports) becomes an appropriate primary measure of the market's size, but with its influence cancelled where substantial export opportunities are seized or import competition is effective. (Product differentiation complicates the picture, especially for import-competing sectors.)

The empirical evidence from several countries confirms the distinction between trade-exposed and trade-sheltered sectors. In their six-country sample Scherer et al. (1975) found sizes of plants relative to minimum efficient scale to increase significantly with industries' access to export markets. Gorecki (n.d.) obtained the same result for Canada. Prais (1981, ch. 3) noticed a strong correlation between

¹³Hart and Clarke (1980, ch. 5) concluded that mergers had been responsible for half of the U.K.'s increase in concentration over 1958–68. They did not confirm the tendency found in the United States for much larger increases in concentration to occur in those consumer-good industries that (in the United States) make heavy use of network television as an advertising medium.

¹⁴A substantial number of studies have found the incidence of excess profits in small, open economies to depend on national market structures in the same way as in larger and more self-sufficient ones – so long as the model controls properly for industries' international linkages. Notable in this regard is the research on Belgium, such as Jacquemin, de Ghellinck and Huveneers (1980).

plant size and exporting activity in a sample of 33 industries observed in Britain, West Germany, and the United States. Caves, Porter and Spence (1980, ch. 3) found that concentration in Canadian manufacturing industries with significant exports bore no net relation to the size of the Canadian market itself.

If export markets affect entrepreneurial decisions about plants' and firms' scales, then micro data should indicate an association between the sizes of production units and the extent to which their outputs flow to foreign buyers. That exporting tends to be concentrated in the larger production units in an industry has been found for several countries – Japan [Rapp (1976)], Belgium [Glejser, Jacquemin and Petit (1980)], France [Auquier (1980)], Great Britain [Hannah and Kay (1977, pp. 21–22), Utton and Morgan (1983, pp. 8–9), compare Kumar (1984, chs. 8, 9)], and Austria [Stankovsky (1982)], as well as the United States [Caves (1986)]. These studies suggest and selectively confirm several mechanisms that may be at work. The obvious one is that access to export markets increases the chances that producers will fully attain the available economies of scale (which constraints of demand and rivals' reactions in the domestic market might otherwise deter). The existence of high fixed costs of exporting is confirmed by the evidence that smaller units, if they export at all, tend to export large proportions of their outputs.

The differential effect of export markets on scales of production has been exposed in the formation of the European Community – an experiment in the effective enlargement of market sizes through the permanent elimination of intra-Community tariffs. In a hypothetical long run, reduced trade barriers increase producers' preferred scales of plants or firms by increasing the elasticity of the derived demands that they face (derived on Cournot assumptions, for example). In the short run, with plant costs of both domestic and foreign competitors sunk in place, the question becomes whether a given suboptimal-scale producer can profitably expand to or replace with an efficient-scale facility. To utilize an efficient-scale unit, output must be expanded, depressing price until a sufficient number of inefficient-scale producers exit. Enlarging a market through, say, forming a customs union brings a larger number of inefficient producers under the gun of the entrepreneur who expands capacity, lowering the present value of negative cash-flow components due to the competing down of incumbent capacity [Scitovsky (1958, ch. 3), Owen (1983, ch. 2)].

Empirically, Owen (1983, ch. 3) found a positive correlation across industries in three pairs of Community nations between plant sizes and relative net-export positions. The direction of causality in this relation, however, is unclear, and his industry case studies (chs. 4–6) give the impression that product or process innovations were also strongly involved: national producer groups in the Community that substantially increased their scales and exports were typically riding on successful innovations as well as claiming previously unutilized economies of scale. Similarly, Müller and Owen (1985) concluded that due to increasing

exposure to trade plant sizes were enlarged relative to MES by more than 100 percent in a sample of German industries between 1965 and 1978.

If the product is homogeneous, the effect of import competition on domestic market structure should be symmetrical with that of export opportunities. The same holds for a differentiated product with all of its varieties subject to the same production technology and entering symmetrically into demand, and some corollaries of the Chamberlinian models of international trade are confirmed by research on the determinants of intraindustry trade and of the distribution of exporting activities among an industry's producers.¹⁵ However, empirical research on import competition in countries with highly exposed manufacturing sectors has tended to reject both sets of theoretical considerations and to emphasize two different sets of conditions. First, not all varieties of a product have equally large minimum efficient scales of production, so that an improvement in an import-competing industry's comparative advantage or an increase in its tariff protection can actually lower the average scales of its production units.¹⁶ Second, where import-competing producers can collude effectively, the world price plus the domestic tariff becomes a natural focal point for price-setting, and (depending on entry barriers) domestic producers "crowd in" to the market at suboptimal scales until further entry produces negative profits. Evidence confirming the performance implications of this model is summarized in the next section.

Market structures depend on international transactions other than merchandise trade – foreign direct investment and arm's length transactions in proprietary information (licenses of technologies, patents, trademarks, designs, etc.). The extensive research on the bases for multinational enterprises (MNEs) has been able to explain their interindustry distributions in most settings by the importance of the industry's investments in or holdings of intangible assets – research and development, media advertising outlays, managerial skills.¹⁷ The prevalence of MNEs is highly correlated with industries' levels of producer concentration, because the factors just mentioned are sources of scale economies or first-mover advantages to the firm and thus of barriers to entry. Some observers have inferred one causality or the other from this correlation, but joint dependence on common underlying factors seems the more prudent conclusion to draw. The force of the

¹⁵Caves (1981) confirmed the positive association between product differentiation and intraindustry trade, while Carlson (1974) found that structural differentiation also affects the speeds of adjustment in international trade. Regarding differentiation's effect on the relation between firms' sizes and exporting activities, evidence for France [Auquier (1980)] and the United States [Caves (1985)] supports different hypotheses.

¹⁶Perhaps for this reason, investigations of the relation between import competition and production-unit scale (mainly for Canada) have found no significant relationship.

¹⁷These conclusions flow from studies that control for the choice made by the firm possessing the intangibles between exporting the services of its intangibles and exporting goods that embody them. For surveys see Dunning (1981) and Caves (1982).

relation for industrial structures is illustrated by some research findings on Canada. Multinationals serve as favored potential entrants, as reflected in concentration levels of Canadian producers (relative to U.S. counterpart industries) that are lower in sectors strongly prone to foreign investment. Also, Canadian concentration levels are more highly correlated with those of their U.S. counterparts in these industries, consistent with the hypothesis that the intangible assets utilized through a company's foreign investments will command for it similar shares in different national markets [Caves, Porter and Spence (1980, pp. 53–54)].¹⁸

5. International differences in efficiency

A line of research that has gained substantially from international and transnational comparative research is the analysis of efficiency. The concept of efficiency is used here in an omnibus way. We shall refer both to specific failures of cost minimization within the national industry – usually called technical inefficiency or “*X*-inefficiency” – and to efficiency in the sense of comparative advantage taken from the field of international economics. Although theoretically we distinguish between an industry that suffers a comparative disadvantage due to the national factor endowment and input costs and one that fails to attain minimum costs, a disadvantaged industry that we actually observe may be suffering from any combination of these.¹⁹

We start with a line of research that is distinguished by a strategy of experimental design rather than a model or hypothesis. Suppose that one wishes to test a hypothesis about determinants of productivity or efficiency in some national economy. If that national economy is a unique entity, there is no way to perform a direct test. However, if the hypothesized factor affects productivity or efficiency differently in that economy's various industries, then a feasible strategy is to express each industry's efficiency level relative to some external standard and test the hypothesis on the resulting interindustry differences in relative efficiency. The external efficiency standard may be an empirical one: for coun-

¹⁸Two related conclusions are interesting but may be specific to the close propinquity and common culture of the Canadian and U.S. economies. Meredith (1984) showed that Canadian industries with large populations of foreign subsidiaries seem to economize on media advertising, consistent with the MNEs benefiting from spillovers from the United States. Also, U.S. foreign investment in Canada is significantly related to economies of coordinating multiplant operation (reflected by its extent among leading U.S. firms), whereas foreign investment in distant and insular Britain is not [Caves (1974a)].

¹⁹Accordingly, empirical investigations of the determinants of countries' patterns of international trade have found the core general-equilibrium models based on national factor endowments to possess rather limited explanatory power and have turned instead to hypotheses and explanatory variables that are more the province of industrial organization. See, for example, Hufbauer (1970) and Baumann (1976).

tries with productivity levels below those of the United States, productivity in the counterpart U.S. industry has been assumed to fill this reference function. Or a standard may be inferred from best practice within the national industry using the measures of technical efficiency that have evolved following Farrell (1957).

The international-comparative line of research comprises a number of studies that have used the United States as a reference point for evaluating the efficiency (or productivity growth) in counterpart industries of such countries as Canada, Japan, Australia, Great Britain, and France.²⁰ Their diverse hypotheses have devolved from constraints on efficiency observed directly in the respective economies. Investigators of both Canada [West (1971), Bloch (1974), Caves, Porter and Spence (1980, ch. 10), Saunders (1980), Bernhardt (1981)] and Australia [Caves (1984)] have been principally concerned with the response of domestic import-competing producers to a conjunction of small-size domestic market and substantial protection from foreign competitors and its implications for industry structures and productivity levels. Bloch (1974) observed that those Canadian industries charging high prices (relative to their U.S. counterparts) were marked by a conjunction of high concentration and substantial tariff protection. Yet these industries did not report correspondingly abnormal profits, implying that the elevation of prices was due to some systematic form of inefficiency. The later Canadian studies imputed this pattern to a conjunction of scale economies in production, tariff protection, and cost disadvantages to suboptimal-scale production that were not large enough to preclude the survival of many inefficient-scale producers behind the tariff wall. In Australia [Caves (1984)] as well as Canada [Caves, Porter and Spence (1980)], this conjunction of forces was found to reduce the scales of domestic production units as well as the productivity of their resource inputs.²¹

In the case of Great Britain [Davies and Caves (1987)], the emphasis of the hypotheses was shifted from specific market equilibria to the consequences of social attitudes and priorities, apparently reflected in a highly suboptimal effort bargain within the plant or firm – in plain language, the consequences of bloody-minded labor interacting with inept management. Because the complexity of

²⁰ Davies and Caves (1987, ch. 2) discussed the methodology in some detail and set forth a way to base the research design on a consistent model of production functions. At best the studies cited rest on comparisons of total factor productivity with corrections for factor-quality differences and some allowance for interindustry differences in production functions; some studies lack some of these refinements.

²¹ Baldwin and Gorecki (1983a, 1983b) closely investigated the constraining influence of market size on Canadian plant scales, the exacerbation of the market-size constraint when tariffs are high and domestic producers concentrated, and the way in which plant-level output diversity (lengths of production runs) adjust jointly with plant scales in response to these factors. They showed that import-competing Canadian producers responded to trade liberalization by more specialized production rather than more efficient plant scales. On the other hand, de Melo and Urata (1986) concluded that Chilean trade liberalization, which led to concentration rising just as profits fell, resulted in substantial closings of small production units.

managerial tasks and the environment of the workplace (scale, skill mix, etc.) both vary substantially from one manufacturing industry to the next, it was possible to test these hypotheses on a matched panel of British and U.S. industries studied in cross-section for 1968 and 1977. The hypotheses were broadly confirmed: although blame for low relative productivity cannot be neatly apportioned between management and labor, their interaction in large-size plants clearly is an important negative effect on productivity. Although the core hypotheses may lie outside of industrial organization, Davies and Caves showed that the effect of Britain's managerial capacity and the effort bargain with labor interact strongly with economic elements of market structure.²²

The rates of productivity growth in British industries (relative to their U.S. counterparts) were also affected – increased by Britain's managerial input (despite the managerial drag on the historic level) but retarded by trade-union organization. Also, the interindustry variance of productivity growth rates proved greater in Britain than in the United States, with the improvement of productivity strongly curbed where it would involve the reduction in an industry's labor force.²³ This finding touches on a larger issue that could be investigated with this methodology. European industrial countries are said to exhibit large interindustry differences in total factor productivity due to policy constraints on plant closings, industrial subsidies, large intersectoral wage differentials, and similar factors that inhibit the equalization of returns to factors among sectors [Carlsson (1983)]. These factors should enlarge the variance of a country's sectoral productivity levels, a hypothesis that could be tested using transnational comparisons of productivity in matched industries.

This method of analyzing relative productivity might find application to developing countries, where the determinants of industrial productivity are a major concern of policy. Indeed, a great deal of emphasis has been given to productivity-depressing but rational responses of producers to various restrictive and protective policies. Only a few researchers have made use comparative productivity analyses in this research. Diaz-Alejandro (1965) and Clague (1967) concluded that the efficiency of Argentine and Peruvian industries (respectively) is higher relative to the United States the more capital-intensive are the U.S.

²² Because the studies of industrial productivity in Canada and Australia (on the one hand) and Britain (on the other) have emphasized such different interindustry determinants, we should note evidence that warrants this disjoint treatment. The extensive case studies developed by Prais (1981) on matched industries in Germany, Britain, and America assigned plant-scale differences a surprisingly small role in explaining productivity differences, which seemed due to much more diverse organizational factors. The result calls into question the normative importance of the relationship between production-unit size and market size summarized above.

²³ We note Houseman's (1985) analysis of job security as an acknowledgement of nonmarketed satisfactions that employees obtain as adjuncts of their jobs or job locations. She showed that the European Community's plans for rationalizing its various integrated steel mills were influenced both by the differing relative efficiencies of these mills and the varying degrees to which their closures would have impaired job property rights.

counterparts, confirming the maintained hypothesis that in the setting of a less-developed economy frontier levels of productivity are more easily attained in machine-paced than in operator-paced technologies [also see Arrow et al. (1961) on Japan]. White (1976) concluded that manufacturing industries in Pakistan exhibit inefficiently high levels of capital-intensity in the presence of high concentration and absence of exporting opportunities.

Perhaps the most thorough application of this research strategy to a developing economy is Lee's (1986) study of technical and allocative efficiency in Korea. He found that Korean industries' productivity levels (adjusted to world prices) increase with their attained scale efficiencies and exporting successes and decrease with Korea's rates of effective protection and an indicator of the extent of rent-seeking activities; technical and allocative efficiency are related in the expected way (technical inefficiency dissipates the profits that market structures might otherwise permit).²⁴

Research on technical efficiency has also employed Farrell-type efficiency measures that evaluate the efficiency of the average plant in an industry against "best practice" observed within the country. Such measurements have been made using linear programming techniques [Carlsson (1972)] and, more recently, stochastic frontier production functions.²⁵ Once again, interest attaches to those traits of an industry that serve to predict its level of technical efficiency. Carlsson (1972) found the technical efficiency of Swedish industries to be depressed by tariff protection and to increase with the concentration of domestic producers and (not quite significantly) with actual exposure to international trade. Meller (1976), proceeding less formally with his interindustry analysis, concluded that public-sector protectionism contributes to inefficiency in Chilean manufacturing. Several single-sector studies [for example, Albach (1980)] concluded that the identities of efficient and inefficient firms tend to remain stable over time, although they did not identify the conditions that preserve the dispersion.

Other investigations of technical efficiency have pursued particular experiments of public policy, such as the abrupt outlawing of price-fixing and related cartel activities in Britain in the late 1950s. Downie (1958), using a simple measure of the dispersion of price-cost margins of firms within individual U.K. manufacturing industries, had found that firms' efficiency levels were previously more scattered in industries that maintained price-fixing agreements and were sufficiently concentrated to make the collusive agreements effective. As mentioned above, Swann et al. (1974, ch. 4) found that abandonment of these agreements was followed by substantial exit of excess capacity, despite price reductions on the order of 20 percent that should have raised the utilization of capacity;

²⁴ Technical inefficiency, he found, also impairs industries' responses to export incentives.

²⁵ We neglect here a number of interesting applications of stochastic frontier production functions to individual industries [for example, Førsund and Hjalmarsson (1979)].

therefore, incomplete collusive arrangements must have promoted the holding or retention of excess capacity and depressed technical efficiency.

6. Determinants of profitability

A final area of research in industrial organization that has benefited from international and comparative study is the determinants of allocative efficiency (measured inversely by profitability) and the effects of policies seeking to improve it. Many investigators apply roughly the same cross-section model of the determinants of allocative efficiency without reference to distinctive national institutional conditions or use of international leverage. However, a number of exceptions do shed light on this central question of research on industrial organization. Schwartzman (1959) early confirmed that industries which are unconcentrated in the United States but concentrated in Canada (and not heavily involved in export markets) exhibit significantly higher price-cost margins in Canada than in the United States. This method of testing the standard hypotheses about allocative efficiency offers a way to control for structural differences among industries that are otherwise difficult to handle, and has been used in a few other investigations. Khalilzadeh-Shirazi (1976) evaluated the statistical similarity of the interindustry models of allocative efficiency that have been fitted for different countries. He accepted the hypothesis that the same regression plane overall applies to his sample of matched British and American manufacturing industries. We are left uncertain whether to rejoice because the model's power is unaffected by the major economic, cultural, and legal differences between the two countries, or to despair because it fails to indicate any of the effects that we might expect them to have.

A few national studies of allocative inefficiency have nonetheless indicated roles for specific national differences. Adams (1976) argued that differences in the concentration-profits relationship for large firms based in different industrial countries were roughly consistent with differences in those countries' competition policies. Caves and Uekusa (1976, pp. 92-96) noted that, relative to other countries, producer concentration has much more power to explain monopoly rents in Japan and structural entry barriers much less. They attributed this to the relatively unsolidified state of entry barriers in the fast-growing Japanese economy and to the presence of institutions that get around capital-cost barriers.²⁶ Caves, Porter and Spence (1980, ch. 9) concluded that domestic research and development yields no systematic rents to Canadian manufacturing industries but that R & D in the United States does generate rents counted in the profits of

²⁶ However, other (later) studies of profit determinants in Japan such as Yamawaki (1986) get results more in line with those for Western industrial countries.

foreign subsidiaries operating in Canada. Williamson (1984) was able to investigate the effect of foreign subsidiaries on the pricing of domestic output and competing imports in Australia; as expected, extensive foreign control reduces the sensitivity of the domestic price markup over costs to import prices because of the role of captive imports and perhaps other effects.

An international difference commonly conjectured is the “softer” competition alleged to prevail in industrial markets outside the United States. Although tests of technical efficiency (reviewed above) give some support to the conjecture, investigations of allocative efficiency have not grappled with it directly. Suggestive results appear in an international investigation of the persistence of large firms’ profits directed by Dennis Mueller [see Odagiri and Yamawaki (1986)]. It concludes that rent differentials among large manufacturing firms are persistent in all countries studied; implied steady-state profit rates are actually more dispersed for the United States than for France, Germany, or Japan – not less, as “hard competition” would imply. However, the typical U.S. firm’s profits track its estimated steady-state profit rate less closely (i.e. converge on its steady state less rapidly), leaving one doubtful that “conventional wisdom” has been upended.²⁷

Although international competition significantly affects allocative efficiency in all countries that have been studied closely, interesting variations appear for some nations. Williamson (1984)²⁸ broke with the tradition of characterizing imports as a competitive excess supply to any given country, showing that the pricing response to disturbances of Australian imports is affected by producer concentration in the regions that are leading exporters to Australia.²⁹ Yamawaki (1986) uncovered specific evidence of the interdependence of Japanese and U.S. producers, in that the profit margin on Japanese exports increases with the structural bases for monopoly rents in the corresponding U.S. industry. And Auquier (1977, ch. 3) concluded that the margins of French manufacturing industries were affected more sensitively by rival imports from neighboring Economic Community countries than by those from other sources. And Sleuwaegen, Weiss, and Yamawaki (1986) showed that, over the period of the Common Market’s formation (1963–78), Community-wide producer concentration came to have more influence on national price–cost margins and national concentration correspondingly less. Overseas studies have shed much light on the sensitivity of the determinants of allocative efficiency to macroeconomic disturbances. Studies of allocative efficiency in Japan fail to confirm the usual

²⁷Another study of indirect relevance is Encaoua (1983), whose investigation of short-run price adjustments found contrasts between (e.g.) Japan and Britain that are consistent with softer competition in the latter.

²⁸Reported in Caves and Williamson (1985).

²⁹Several statistical tests of the “law of one price” suggest the presence of strategic behavior in pricing imports in the face of short-run impediments to trade. See Norman (1975) on British imports.

mechanism during periods of explosive growth,³⁰ and Neumann, Böbel and Haid (1985) found the determinants of German industries' price-cost margins to vary over the business cycle in ways consistent with the breakdown of oligopolistic consensus in recessions.

7. The want list

One could extend this survey to cover scattered contributions addressed to other issues in industrial organization. At this point, however, it seems appropriate to turn from collecting what exists to contemplating what might be. In this concluding section we list a short selection of topics that might benefit from substantially more use of the modes of international and comparative analysis surveyed above.

7.1. *International oligopoly*

Much concern has been expressed in the realm of public policy about the ability of national firms to "stand up" to foreign competition, and theoretical research has revealed many possibilities for governments to deploy profit-shifting policies in order to manoeuvre global oligopoly rents into the pockets of its citizens. Discussions in the field of business strategy have focused on "global competition" in which international rivals pursue strategies that treat the world's submarkets as interdependent. Yet systematic empirical research on international oligopolistic behavior is quite limited. Could the international recognition of mutual dependence be an empty box? Case studies (many musty with age) and Yamawaki (1986) assert that it is not. Yet economists' current interest in tightly formulated empirical models of strategic interaction has not penetrated strongly into the international sphere. One possibility is the study of market-value changes for international competitors to determine whether oligopolistic disturbances redistribute value among rivals as one might expect [Luehrman (1986)]. The many studies of short-run adjustments of trade to restrictions and exchange-rate changes have never given serious attention to the role of oligopolistic rivalry.

7.2. *Advertising and market power*

A vigorous debate has proceeded in the United States over the question whether high levels of advertising expenditures, chiefly on television, have given rise to entry barriers in some industries. The industrial countries have employed very different policies on advertisers' access to television, limiting it in different

³⁰The relevant papers were summarized by Caves and Uekusa (1976, pp. 35–37, 88–89).

degrees and permitting its introduction at different times. International comparisons therefore provide controlled experiments that might resolve this debate.

7.3. Research and international diffusion of technology

A major gap is the international diffusion and appropriation of technological knowledge. Most research on the determinants of research and development spending and of productivity growth assumes that the technology that the nation uses is what it produces. This assumption is dubious for the United States and wrong for the rest of the world. A few studies of R & D determinants in countries that are heavy importers of technology have observed the influence of this openness [Caves, Porter and Spence (1980, ch. 7), Antonelli (1985)]. The multinational corporation has been identified as one conduit for the international transfer of technology [Caves (1974b), Globerman (1979)], and national competitors have been found to imitate or match the multinational's innovations [Mansfield and Romeo (1980)]. The little systematic evidence on the international market for technology licenses confirms the expected imperfections but suggests that it is nonetheless large and important. How closely rates of technical progress of the various national branches of a given industry are kept in line by international diffusion and what channels contribute most to the alignment are largely unknown. We do have evidence, though, that process innovations diffuse more rapidly within the country of their discovery than internationally [Nabseth and Ray (1974), Benvignati (1982)].³¹ The shortcomings of research here extend to its normative side: the classic market failures in the production of knowledge interact with discrepancies between national and global interests in ways that have been little explored.

7.4. Effects of public policies

Industrial countries have made diverse choices about the scope and intensity of their public policies toward market structure and behavior. Vertical restraints between manufacturers and distributors, horizontal mergers, and various collusive arrangements have been legal in some countries but illegal or lightly restricted in others.³² Some case studies [Bianchi (1982)] are suggestive of the

³¹The case studies in Nabseth and Ray also suggest that determinants of international diffusion generally match those (such as extent of the cost saving) found significant in statistical studies of diffusion within national economies. Davidson and McPetridge (1984) found that newer and less routine technologies tend to be transferred within multinational firms rather than through arm's length licensing.

³²Mueller (1980) paid some attention to the prevalence of horizontal mergers. They were more common abroad, but their prevalence did not mitigate the uniformly poor post-merger profit performance of acquiring firms found in all the countries studied.

consequences, and the effects of diverse tolerances of horizontal mergers have gained some attention. Differing access of advertisers to large-scale sales promotion through nationwide television seems a natural way to approach the issue of policy toward seller-supplied information.

7.5. State-owned enterprises

Countries have embraced the state-owned enterprise (SOE) as a policy device to sharply differing degrees and have embedded it in diverse market structures. The net effects of SOEs' operations on market performance is another question susceptible to empirical treatment through international differences. We know that the sectoral distribution of SOEs is quite similar among the industrial countries, where it seems to cluster in "heavy industries" that are highly capital-intensive, potentially monopolistic, and subject to extensive forward linkages [Pryor (1976), Levy (1988)]. Some approaches have been made to applying the theory of public choice in order to formulate objective functions for SOEs [Baldwin (1975)]. A great deal of descriptive material addresses the SOEs' relationship to the general national government and the shifting mixture of particular SOEs' objectives. But systematic research on SOEs' net effect on market performance is lacking.

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