Volume Title: Regionalism versus Multilateral Trade Arrangements, NBER-EASE Volume 6

Volume Author/Editor: Takatoshi Ito and Anne O. Krueger, Eds.

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-38672-4

Volume URL: http://www.nber.org/books/ito_97-1

Publication Date: January 1997

Chapter Title: Globalization and New Industrial Organization: Implications for Structural Adjustment Policies

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Chapter URL: http://www.nber.org/chapters/c8604

Chapter pages in book: (p. 313 - 344)

11 Globalization and New Industrial Organization: Implications for Structural Adjustment Policies

Sung Hee Jwa

11.1 Introduction

Today, globalization affects a full range of political as well as economic issues. Globalization is a phenomenon driven by the strategies and behaviors of individual economic agents, firms, banks, and people in the pursuit of profit and is usually identified with market deregulation, the spread of new information technologies, the intermeshing of financial markets, and innovations in industrial and production systems.[1]

Globalization is the most critical and difficult challenge for modern firms. It has been observed that the advent of the globalization phenomenon and a crisis of existing production systems are taking place simultaneously. In the increasingly interdependent, complex, and dynamic business environment created through globalization, the major industrial and production systems—the American Fordist system, the German Craft system, and even the Japanese flexible and lean production system—all seem to be breaking down and subject to reassessment. This is sparking uncertainty about how a successful, modern firm should be organized and managed.

The post-Fordist system, a new intra- and interfirm industrial organization that emphasizes innovation in work methods and product features, has brought the American Fordist mass production system into crisis with its competitive strength. The detailed compartmentalization of tasks and responsibilities in the Fordist system hinders application of new information technologies to the production process, integration of all levels of production and management,

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This paper won the 26th Economist prize (1996), awarded by the Maeil Business Newspaper to research on the Korean economy.

1. Recently, Oman (1993, 1994) endeavored to define the complex phenomenon of globalization along similar lines.

and long-term investment in multiskilled workers.[2] However, even the German Craft system, once praised as a critical factor in German economic development, now exhibits rigidities. Its fixed skill-identity limits the speed with which new products and technologies can be introduced, while the bureaucratic elements in the system separate production from the development and design lab, as well as isolating various parts of production from one another (Herrigel and Sabel 1994). Further, the Japanese flexible and lean production system, praised as an important potential alternative to the Fordist system, is beginning to show weakness in the new global competitive arena. Its central characteristic is a vertical network supported by lifetime and seniority-based employment. However, if employment practice or some other part of the business environment changes as the result of globalization, as many believe it must, the Japanese system will also be pressured to change (Westney 1994).

This study explores how globalization affects the structure of industrial organization in both individual economies and firms; searches for the optimal industrial organization, if any, in the globalized market; and examines future directions of structural adjustment in individual economies. However, to discuss systematically the implications of globalization for industrial organization, one has to conceptualize analytically "globalization." In this study, globalization is characterized as a parameter, similar to a market price. Globalization is driven by microeconomic forces but is taken by individual firms as a parameter in making economic decisions on the optimal structure of industrial organization. While the globalization phenomenon encompasses many diverse characteristics in general, this paper concentrates only on those aspects of globalization most relevant to the current context and simplifies the concept so it can be easily incorporated into the following economic analysis.[3]

First, we identify the globalization phenomenon with the integration of world economies into a single market, which in turn implies the following specific predictions for market environments: increase of potential market size and intensified competition for market share. In this sense, the challenge of globalization to individual firms is, on the one hand, how to deal with these larger markets. But as a corollary of the extended market size, globalization can also mean intensified competition in international as well as domestic markets, so that existing monopolistic producers may face the possibility of losing their market shares, on the other hand. Therefore, globalization gives access to greater market size in general but can also imply reduced market size for firms that have been enjoying unfair privileges under closed market environments.

Second, we identify the globalization phenomenon with the introduction and spread of microelectronics-based information technology. Improvements

2. See Oman (1993, 1994) for further discussion of this point.

3. See East-West Center (1994); lengthy discussions on various aspects of globalization and the structures of industrial organizations in major developed countries can be found in the volume compiled by the East-West Center of the University of Hawaii. However, to some extent this paper stems from my dissatisfaction with the approaches taken by the various authors in that volume.

in information technology contribute not only to economic integration through better telecommunications but also to changes in production technologies and managerial relationships among various economic activities. Specifically, it is expected that scope economies among various economic activities will be strengthened through improved information technology and computer and automation systems.[4] In addition, it may be the case that improved microelectronics-based information technology tends to create new synergistic managerial relationships among formerly unrelated economic activities and reinforces existing relationships by improving the information network system, making it increasingly difficult to isolate a particular economic activity from other activities. So, in this sense, the additional challenge of globalization may be how to respond to the enlarged economies of scope among various economic or industrial activities generated by the stronger technological and managerial synergy effects.

This study employs a theory of endogenous industrial organization in deriving the general implications of globalization for the optimal structure of industrial organization. This theory will be constructed based on the theory of specialization (Stigler 1968) and the theory of multiproduct firms (Baumol, Panzar, and Willig 1982; henceforth, BPW).

This study extends the discussion to the issue of Korea's industrial structure by applying the general theoretical implications to the Korean case. In Korea, economic concentration in large business groups, so-called *chaebols*, and the issue of the optimal structure of industrial organization have long been subjects of debate. Not only the evaluation of the current structure but also the future direction of optimal structural adjustment for Korea's *chaebol*-dominated industrial organization have continuously been given the highest priority on the industrial policy agenda. It is usually argued that Korean *chaebols* are excessively diversified and have grown too big, so that the Korean economy suffers from excessive ownership as well as industrial concentration. To curb the propensity of the *chaebols* to diversify and grow too big, many initiatives such as policies to promote business specialization and ownership diffusion have been undertaken. However, most of those policies have taken the form of regulating the business activities of *chaebols*, such as restrictions on entry, restrictions on ownership concentration and mutual assistance within the same business group, restrictions on bank borrowing, and measures to encourage business specialization, rather than directly attacking the sources or underlying reasons for the *chaebols*' undesirable behaviors. Those policies have generally been

4. In general, the source of scope economies is the existence of public inputs, which are similar to public goods in consumption. "Information" is intrinsically of a public-input nature; therefore, diversification across different industrial activities utilizing the same information will benefit from economies of scope. In addition, improvement in computer and automation technologies will help develop multifunctional machinery that will become a public input to various related industrial activities, thereby creating or increasing economies of scope among those activities. All these possibilities suggest that economies of scope among economic activities will be strengthened as the result of technological innovations in the information industry.

regarded as unsuccessful in achieving their stated goals, and a consensus seems to have been reached regarding the reformulation of industrial policies toward large business groups, especially in the emerging globalized economic environment.

The paper organized as follows. Section 11.2 proposes a theory of endogenous industrial organization in order to investigate systematically the issues raised.[5] Section 11.3 applies the theory in order to study the implications of globalization for industrial organization. Section 11.4 extends the discussion to the structure of Korea's industrial organization, adds empirical evidence to the discussion by estimating scale and scope economies of Korea's industrial activities, and speculates about future Korean industrial organization in a globalized market environment. Finally, section 11.5 provides concluding comments on industrial policy implications and the role of the government in industrial structural adjustment in the emerging globalized environment.

11.2 A Theory of the Scope of Industrial Activities

11.2.1 An Integrated Theory of Endogenous Economic Organization

Stigler (1968) proposed a theory of the multiproduct firm based on Adam Smith's theory of specialization. He suggested that a multiproduct firm's scope of activities is determined by the interaction of production technology and market size. The most important concept in his theory is the economies of scale that characterize the production technology of the relevant industry.

According to Stigler's theory, activities subject to economies of scale tend to become detached from the remaining set of activities as the size of the market grows large enough to support a scale of production that realizes these economies. Conversely, activities subject to diseconomies or weak economies of scale tend to be integrated in-house. Even activities with economies of scale become integrated if the size of the market is limited or the remaining set of activities exhibits particularly strong diseconomies of scale that dominate the concerned activity's economies of scale.[6] Therefore, the equilibrium in a multiproduct industry consists of firms that either integrate various activities in-house or specialize in a single activity or subset of activities, depending on market size and the degree of (dis)economies of scale of the different activities.

BPW developed a theory of the multiproduct firm, introducing the concept

5. The theory presented in this section was originally developed in Jwa (1994).

6. See Stigler (1968): "Certain processes are subject to increasing returns; why does the firm not exploit them further and in the process become a monopoly? Because there are other functions subject to diminishing returns, and these are, on balance, at least so costly that the average cost of the final product does not diminish with output. Then why does the firm not abandon the functions subject to increasing returns, allowing another firm (and industry) to specialize in them to take full advantage of increasing returns? At a given time these functions may be too small to support a specialized firm or firms. The sales of the product may be too small to support a specialized merchant" (133).

of economies of scope in addition to economies of scale. According to BPW, economies of scope are a necessary and sufficient condition for the existence of multiproduct firms (1982, 248–49, props. 9B1 and 9B2).

To facilitate discussion, we formally introduce the concepts of economies of scale and of scope through the following equations:

$$S_N = C(y) \Big/ \sum_{i=1}^{n} y_i \cdot C_i(y), \tag{1}$$

$$S_T = [C(y) - C(y_{N-T})] \Big/ \sum_{i=1}^{t} y_i \cdot C_i(y), \tag{2}$$

$$SC_N = \left[\sum_{I=1}^{n} C(y_I) - C(y) \right] \Big/ C(y), \tag{3}$$

$$SC_T = [C(y_T) + C(y_{N-T}) - C(y)] \Big/ C(y), \tag{4}$$

where S_N and S_T measure the economies of scale for the full set of all products N and a subset of products T, respectively. SC_N and SC_T measure the economies of scope among all products N and between the subset products T and $N - T$, respectively. $C(\cdot)$ is the cost function; y is the full set of products, $y = \{y_1, y_2, \ldots, y_n\}$; where y_i is the ith product; $y_T = \{y_1, \ldots, y_t, 0, \ldots, 0\}$, $y_{N-T} = \{0, \ldots, 0, y_{t+1}, \ldots, y_n\}$, and $y_I = \{0, \ldots, 0, y_i, 0, \ldots, 0\}$. $C_i(y)$ is the marginal cost of y_i and $[C(y) - C(y_{N-T})]$ measures the incremental cost of the subset T.

Now, we can formally define economies of scale and scope using equations (1)–(4). $S_N > 1$ implies overall economies of scale; $S_N = 1$ implies constant returns to scale; and $S_N < 1$ implies diseconomies of scale. Similarly, S_T measures the product-specific economies of scale for the subset of products T. If $t = 1$, S_T measures the economies of scale for a single product. Similarly, $SC_N > 0$ implies overall economies of scope; $SC_N = 0$ implies constant returns to scope; and $SC_N < 0$ implies diseconomies of scope. SC_T defines the product-specific economies of scope between the subset of products T and $N - T$. If $t = 1$, SC_T defines economies of scope between a single product and the set of all other products.

Using these concepts of economies of scale and of scope, BPW derived the following relationship (1982, 74):

$$S_N = [\alpha_T \cdot S_T + (1 - \alpha_T) \cdot S_{N-T}]/[1 - SC_T], \tag{5}$$

where

$$\alpha_T = \left[\sum_{i=1}^{t} y_i \cdot C_i(y) \Big/ \sum_{i=1}^{n} y_i \cdot C_i(y) \right] < 1$$

and S_{N-T} measures economies of scale for the subset of products $N - T$.

BPW (1982, chap. 9) then discussed the competitive equilibrium configuration of a multiproduct industry. As a necessary and sufficient condition for the existence of a multiproduct firm, there must exist economies of scope among the subsets of products T and $N - T$:

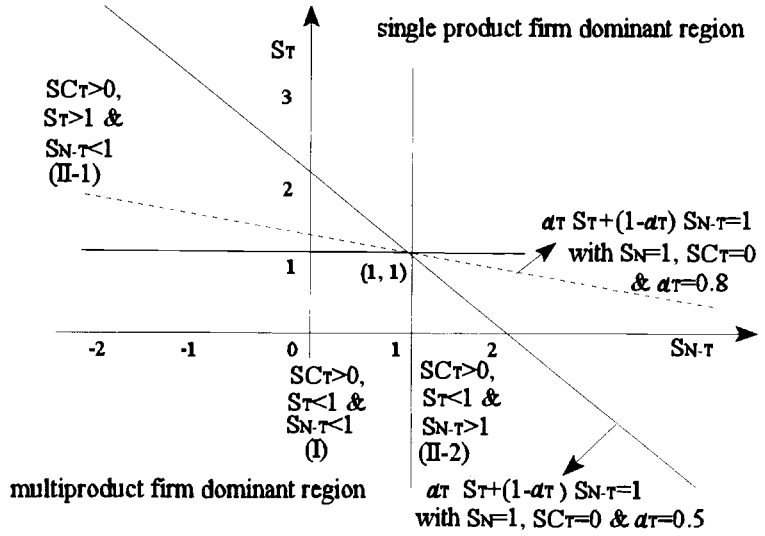

Fig. 11.1 Classification of multiproduct industry equilibria

(6) $$SC_T > 0.$$

To guarantee that potential economies of scale are fully exhausted in competitive equilibrium, the measure of overall economies of scale must show constant returns to scale in the neighborhood of the equilibrium:

(7) $$S_N = 1.$$

One can integrate Stigler's intuitive theory of specialization and BPW's formal multiproduct firm theory into an endogenous theory of economic organization. Equation (5) can formally be interpreted as the equilibrium relationship between S_T and S_{N-T}, given the equilibrium conditions $S_N = 1$ and $SC_T > 0$, and can therefore be used as a framework for determining the feasibility of various types of multiproduct industry equilibria.

Figure 11.1 shows a possible classification of various types of equilibria and associated ranges of S_T and S_{N-T}. The negatively sloped, solid line representing equation (5) with $S_N = 1$ and $SC_T = 0$ (α_T assumed to be 0.5 in this case) becomes an important reference line for classification.

The region on and below this line can be called the multiproduct-firm-dominant region. Stigler multiproduct firm equilibria, in which $SC_T = 0$ and $S_N = 1$, coincide with the line and imply three possible cases: $S_T = 1$ and $S_{N-T} = 1$, $S_T > 1$ and $S_{N-T} < 1$, and $S_T < 1$ and $S_{N-T} > 1$. At the same time, BPW multiproduct firm equilibria, in which $S_N = 1$ and $SC_T > 0$, fall below the line and can, therefore, have three different cases: $S_T < 1$ and $S_{N-T} < 1$ (Region I), $S_T > 1$ and $S_{N-T} < 1$ (Region II-1), and $S_T < 1$ and $S_{N-T} > 1$ (Region II-2). However, in no case are the simultaneous economies of scale $S_T > 1$ and $S_{N-T} > 1$ feasible in multiproduct firm equilibrium.

The region above the line, in which $SC_T < 0$, could be called the single-product-firm-dominant region in which the equilibrium conditions $S_N = 1$ and $SC_T > 0$ cannot be satisfied. If $t = 1$ in this region, there can simultaneously exist single-product firms specializing in T and multiproduct firms with activities $N - 1$, given the multiproduct industry defined as a total set of activities N.

The question of where the equilibrium points actually fall or what types of equilibria can emerge will be determined by the behavior of the industry cost surface (i.e., the production technology of the industry). BPW has shown that a multiproduct industry can have a representative firm competitive equilibrium only under very special assumptions about the cost surface. Otherwise, an equilibrium with a mixture of multiproduct and single-product firms will emerge.[7]

11.2.2 Comparative Statics Exercises

Changes in Market Size

One can utilize the framework presented in subsection 11.2.1 to trace out the effects of a change in the scale of production due to a change in market demand. In equation (5), α_T is defined as the share of output-weighted marginal costs of a subset of activities T in the total set of activities N. Since marginal cost is equal to price in competitive equilibrium, α_T can be interpreted as the ratio of the market values of y_T to y_N, an increasing function of y_T. Therefore, as market demand (size) for the set T of activities increases absolutely or relative to the set $N - T$ of activities, the negatively sloped solid line in figure 11.1 will rotate counterclockwise (i.e., the absolute slope will decline) to the dotted line where $\alpha_T = 0.8$, for example, and region II-1 defined by $S_T > 1$ and $S_{N-T} < 1$ will become smaller, implying that more activities in the set T of increasingly weaker economies of scale tend to become specialized. Under the same conditions, region II-2 defined by $S_T < 1$ and $S_{N-T} > 1$ becomes larger, implying that more activities in the set $N - T$ of increasingly stronger economies of scale tend to become integrated. Therefore, as market demand for specific activities increases, those activities are more likely to be specialized, and vice versa—exactly the implications of the Stigler theory.

Changes in Production Technology

In the case in which technological innovation creates greater degrees of economies of scope (SC_T), S_N becomes greater than 1 in equation (5). Therefore, the adjustment process will be analyzed depending on whether the newly created overall economies of scale can be easily exhausted.

If market size is unlimited or large enough to allow the newly created overall economies of scale to be fully exhausted by scale expansion, then a new equi-

7. See BPW (1982, chap. 9, sec. 9D) for discussions about the existence and structure of multiproduct competitive equilibria. Propositions 9D6 and 9D7 specify the formal conditions for a single representative firm equilibrium.

librium with $S_N = 1$ and a higher SC_T will be reestablished. As a result, under the new equilibrium, the activities will exhibit weaker scale economies, that is, lower S_T and S_{N-T}, than under the original equilibrium. In terms of figure 11.1, the line will undergo a parallel shift to the left, which in turn implies that only those activities subject to increasingly weaker scale economies remain feasible for integration.

Another possibility is the continuation of disequilibrium due to the limited size of the market, since in this case the newly created overall economies of scale, $S_N > 1$, cannot be fully exhausted. If this case is combined with the implication of the Changes in Market Size exercise above, one can draw the conclusion that an industry with relatively small market size undergoing active technological innovation that creates larger SC_T will tend to be subject to noncompetitive structure with excessive diversification or inadequate specialization.[8]

Therefore, as the degree of economies of scope among activities increases, the optimal scale of those multiactivity organizations and the potential to earn supranormal profits will increase, encouraging more multiactivity organizations. On the other hand, if activities that have not been part of multiactivity organizations experience a technological innovation that creates new economies of scope with the incumbent activities of those organizations, then they tend to be integrated within those organizations. In any case, the stronger or newly created economies of scope will imply the proliferation of multiactivity organizations.

11.3 New Industrial Organization under Globalized Markets

One can summarize the main implications of the theory in a more simplistic way. First, as the size of the market increases, the optimal structure of industrial organization will be one with more specialization of activities under economies of larger scale and therefore with more specialized larger-size firms. Second, as technological innovation increases the degree of economies of scope, more diversified (multiactivity) firms will be encouraged. One can combine these two simple implications to derive an interesting hypothesis about the relationship between globalization and new industrial organization.

Convergence of Industrial Organizations. Every economy will increasingly face identical potential market size and an identical set of available production technologies as the borderless global economy emerges. Therefore, as the world economy becomes more integrated and globalized, the optimal struc-

8. In fact, according to BPW (1982, chap. 7), overall economies of scale, $S_N > 1$, in the neighborhood of the initial equilibrium are neither necessary nor sufficient for cost subadditivity, which implies a natural monopoly. Therefore, while it is clear that the industry with $S_N > 1$ becomes a natural monopoly in the single-product case, we can only conjecture that a noncompetitive industrial structure exists for the multiproduct case.

tures of industrial organization will converge among individual economies. This is because basically every firm in the fully integrated and globalized economy will eventually face identical market size and production technologies, that is, identical market and production environments.[9]

Of course, individual firms may use their own business strategies, diverging from the optimal structure implied by and consistent with potential as well as existing market and technological opportunities, but those firms will ultimately be defeated by market conformists. However, there still exists the possibility that alternative structures targeting various markets could also survive, but only if they conform to the particular market aimed at—whether local, national, regional, or global.

Globalization and Large-Scale Production. Globalization is defined as an enlargement of potential market size, encouraging specialization of larger-scale production under strong economies of scale. According to this implication, one cannot definitively argue that the Fordist system will disappear, solely because of the largeness of production scale. Activities subject to strong scale economies will still survive in the large-scale production system in the globalized market environment.

Market Share Competition and Small-Scale, Multiproduct Production. The intensified market share competition generated by globalization may imply reduction of market size for firms that are not successful in global competition. At the same time, as already mentioned, innovation in information technology increases economies of scope or network economies among various economic activities. If technology that reduces the optimal scale of production is introduced into this situation, the optimal structure of industrial organization may be small-scale, multiactivity production, which has been regarded as typical of the new post-Fordist, lean and flexible production system.

Therefore, the background for the new system can be characterized as the following: As the market share of Fordist firms is reduced due to intensified market competition from new entrants, the large economies of scale that drove the old system become a burden, thereby motivating new efforts to amortize the large fixed costs associated with achieving the scale economies. These efforts will eventually help introduce multifunctional machinery, through auto-

9. This hypothesis may sound too strong if one insists that, for example, the nontradable sector will continue to be large and differences in resource endowments among economies will not easily disappear even in a fully globalized environment, as one of the commentators, Philip Lowe, suggested. Takatoshi Ito, the editor of this volume, also raised a similar point. However, what this hypothesis really intends to establish is that as firms in different economies face the same economic environment, the fittest survivors in these economies will be similar. In this sense, it can easily be understood that the persistent differences in economic environments will entail persistent differences in industrial organization. Therefore, the hypothesis amounts to assuming that economic environments, including such aspects as nontradable sector sizes and resource endowments, will converge among different economies as the economies become fully globalized.

mation and other technological innovation, and multifunctional workers, both of which will help reduce the optimal scale by redistributing the large fixed costs to various multiactivities and at the same time help create strong economies of scope among those activities. The outcome will be the so-called small-scale, multiproduct flexible system.

Globalization and the Choices between Large-Scale and Small-Scale Production. According to the arguments made thus far, as the world economy becomes globalized, two opposing forces will emerge. One is the pressure for specialization due to growing market size, which may provide an improved environment for large-scale (i.e., Fordist) production systems. The other is the pressure for small-scale production and business diversification due to technological innovations creating larger scope economies and intensified market share competition, which will continue to provide a favorable environment for the new system. Therefore, globalization does not guarantee the diffusion of the new system, as claimed by Oman (1993, 1994).

While the theory implies a convergence of industrial organization structures among national economies as globalization deepens, one cannot predict which system, Fordist or post-Fordist, will dominate. Depending on the size of a targeted market and the nature of technologies adopted by a particular industry, an optimal and efficient industrial and production system for that industry can be determined, however. One important result of this discussion is as follows: Private sector initiatives normally have a comparative advantage in determining the optimal structure for industrial organization in an increasingly globalized world economy. Because authorities are unable to sort out complicated implications or mixed signals from globalization phenomena and are unable to predict the exact optimal structure, deregulation or liberalization of the domestic economy may be an effective strategy in responding to globalization.

11.4 Globalization and Korea's Industrial Structure: Issues and Prospects

In this section, we provide a brief discussion of the Korean industrial structure. We theoretically investigate the underlying forces driving that structure and discuss future prospects for the structure by estimating scale and scope economies of various industrial activities conducted by Korean business groups.

11.4.1 Brief Introduction to the Korean Industrial Structure[10]

In Korea, large business groups called *chaebols* consist of few lead companies and many subsidiary firms in various business areas under the control of a single owner-manager and his family members. The Korean industrial struc-

10. This section benefits greatly from Yoo (1995).

Table 11.1 ***Chaebol* Concentration Ratio: 30 Largest, Mining and Manufacturing (percent)**

Ratio	1977	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Shipments	32.0	39.7	40.7	39.9	40.3	40.2	37.7	36.8	35.7	35.2	35.0
Value added	29.1	30.8	33.2	31.6	33.5	33.1	32.4	31.9	30.4	29.6	30.0
Fixed assets	–	36.7	37.2	37.1	40.3	39.6	39.1	37.9	37.3	35.3	32.2
Employment	20.5	19.8	18.6	17.9	18.1	17.6	17.2	17.6	16.9	16.6	16.0

Sources: Korea Bureau of Statistics; Korea Fair Trade Commission.

Table 11.2 **Aggregate Concentration Ratio: 100 Largest Firms (percent)**

Ratio	Korea (1990)	Japan (1984)	United States (1985)	West Germany (1984)	Canada (1983)
Shipments	37.7	27.3[a]	–	39.5	–
Value added	35.1	–	33.0[b]	24.8	47.1
Fixed assets	40.8	33.0	49.1	–	52.2

Source: Yoo (1995).

[a]1980.

[b]1982.

ture has been dominated by the excessive industrial and ownership concentration and business diversification of these *chaebols*.

Whether these observations are true is not clear. Nevertheless, Korean policy toward industrial organization has been framed on the premise that these observations are a true representation of the behavior of *chaebols* and that, furthermore, *chaebols* produce undesirable economic impacts on the efficiency of the national economy.

Table 11.1 reports the economic concentration ratios of the 30 largest *chaebols* in the mining and manufacturing sector. The numbers suggest that the *chaebols*' dominance has been declining since the mid-1980s, although the absolute degree of concentration seems still high indeed. To see whether the Korean case is exceptional by international standards, table 11.2 shows international data on aggregate concentration ratios that measure the weight of the 100 largest firms in the aggregate economy. This comparison shows that the Korean case is in fact not extraordinary. Korea's concentration ratios in 1990 are comparable to those of developed countries in the mid-1980s. In the case of shipments concentration ratio, Korea's value is higher than Japan's for 1980 but comparable to West Germany's. In the case of value-added concentration ratio, Korea's value is comparable to that for the United States but much lower than Canada's. Finally, the fixed assets concentration ratio suggests that Japan and Korea are low compared to the United States and Canada.

Table 11.3 reports on the diversification behavior of *chaebols*. It turns out

Table 11.3 **Number of Subsidiaries and Industries of *Chaebols***

Chaebol	Subsidiaries[a]	Financial Companies[b]	Industries Covered[c] (average)
Top 5	210	20	30.4
Hyundai	49	5	36
Samsung	50	5	34
Daewoo	25	2	27
LG	53	6	32
Sunkyung	33	2	23
Top 30	626	64	19.1

Source: Korea Fair Trade Commission.

[a]June 1994.

[b]April 1993. The numbers include only nonbank financial institutions because a *chaebol* cannot own more than 8 percent of the total outstanding stock of a commercial bank. In the manufacturing sector, *chaebol* companies are concentrated in KSIC 31, 32, 35, 37, 38 industries, although they are also present in other industries.

[c]1993. The numbers are counted by two-digit KSIC industries.

that, on average, each of the five largest *chaebols* owns 42 subsidiaries, runs businesses in 30.4 nonfinancial industries, and owns 4 financial institutions. These numbers suggest that the extent of diversification of the largest *chaebols* is indeed extraordinary.

In addition, table 11.4 is cited from Yang (1992) to investigate the nature of that diversification and to make an international comparison. According to this information, *chaebols,* compared to large firms in major developed countries, exhibit the highest weight of technologically unrelated diversification but the lowest weight of technologically related diversification. While Korea's degree of diversification is very high among the sample countries, it is slightly lower than that of the United States. In sum, this comparison suggests that the overall picture of Korea's diversification vis-à-vis developed countries could be characterized as a relatively high degree of diversification and an extraordinarily high degree of unrelated diversification. However, Yang (1992) observed that the overall degree of Korean diversification has been declining over time and that larger groups are consistently more diversified than smaller groups, implying that diversification has been the common *chaebol* strategy for business expansion. It is interesting, in this context, to note that in the United States from 1950 to 1975, the diversification behavior of large firms was much the same, with the major means of business expansion being diversification through mergers and acquisitions rather than internal growth (Scherer and Ravenscraft 1984).

The high degree of business diversification may itself be a reflection of diversified ownership expansion and so could be interpreted as evidence of overall ownership concentration among a small number of people in the national economy. Table 11.5 provides data on degree of ownership concentration

Table 11.4 **International Comparison of Degree of Business Diversification Based on the Rumelt Method (percent)**

Types of Diversification[a]	Korea (1989)	Japan (1973)	United States (1969)	United Kingdom (1970)	West Germany (1970)	France (1970)	Italy (1970)
Specialization	36.8	53.3	35.4	40.0	44.0	48.0	43.0
Complete specialization (SR > 0.95)	8.2	16.9	6.2	6.0	22.0	16.0	10.0
Partial specialization (0.95 > SR > 0.7)	28.6	36.4	29.2	34.0	22.0	32.0	33.0
Diversification	63.2	46.7	64.6	60.0	56.0	52.0	57.2
Related diversification (SR < 0.7, RR > 0.7)	6.1	39.9	45.2	54.0	38.0	42.0	52.0
Unrelated diversification (RR < 0.7)	57.1	6.8	19.4	6.0	18.0	10.0	5.0

Source: Yang (1992, 13). The estimates are obtained by the method suggested in Rumelt (1986).

Note: The number of business groups inclusive of vertical as well as horizontal business groups are 118 for Japan, 49 for Korea, and 100 for others.

[a]SR (specialization ratio) = total revenues of the largest single business / total revenues of a whole business group. RR (related ratio) = total revenues of the largest subgroup of related businesses / total revenues of a whole business group.

Table 11.5 **Within-Group Ownership Concentration: 30 Largest *Chaebols* (percent)**

Ownership	1983.9	1987.4	1989.4	1990.4	1991.4	1992.4	1993.4	1994.4
Within-group	57.2	56.2	47.2	45.4	46.9	46.1	43.4	42.7
Family	17.2	15.1	14.7	13.7	13.9	12.6	10.3	9.7
Subsidiary	40.0	41.1	32.5	31.7	33.0	33.5	33.1	33.0

Source: Korea Fair Trade Commission.

Note: The table includes 616 subsidiaries of the 30 largest *chaebols,* out of which 164 companies are listed on the stock market as of the end of 1993, accounting for 56.8 percent of the total equity capital.

within the business groups themselves. According to these data, within-group ownership concentration was, indeed, high but has been declining since the mid-1980s, which seems consistent with the trend of the *chaebol* concentration ratio observed in table 11.1. Looking at the composition, the family share has been steadily declining, but the share of subsidiaries through mutual stockholdings has been stable during the 1990s. These trends could be interpreted as a reflection of the following aspects: the rapid expansion of the capital market and the disincentive against individual share expansion in the case of family shares, and the general pattern of business expansion through diversification in the case of subsidiary shares.

In sum, the facts about the Korean industrial structure seem to confirm the popular concern that it is not only highly concentrated in business and ownership but also highly diversified over wide areas of business. However, recent trends suggest that some of the problematic aspects of the Korean industrial structure have been alleviated. Especially, industrial concentration and ownership concentration are observed to be on the decline, probably reflecting the rapid growth of the Korean economy and the increased availability of sources of equity capital such as the capital market. In addition, it seems that although diversification has been and is still common as means of business expansion, it is not growing disproportionately either. Of course, it cannot be denied that various government regulations have also played an important role in generating these trends.

Having discussed *chaebol* behavior, the corrective policies that have long been the subject of continuing controversy are now briefly discussed. One important problem with those policies has been the lack of attention paid to the substance, that is, the underlying causes, of *chaebol* problems and the measures needed to correct them. Rather, policies have tried to regulate the symptoms directly but without much success.

All concerns about the various symptoms of *chaebol* behavior seem to boil down to the single most important phenomenon of excessive, octopus-like diversification.[11] That is because industrial and ownership concentration will be achieved through or will eventually end in business diversification one way or the other, and economic concentration due to specialization seems to be regarded as relatively benign and efficiency improving as reflected in the government policy emphasis toward specialization.[12] Therefore, regulatory measures against diversification have been the major focus of anti-*chaebol* policy, as follows:

- Industrial policy instruments such as entry regulations (including a license and permit system, ownership regulations, etc.) and business area regulations
- Regulations based on the credit control system, including prior approval requirements for investment, regulations on the purchase of land, and restrictions on entry into a new line of business
- Investment regulations to rationalize industries and to curb excessive or duplicative investments in many similar industries
- Designation and protection of small and medium-sized firms
- Regulations on total ceilings, such as basket control of credit supply (credit control system) and equity investment regulations (Fair Trade Act)

11. In Korea, *chaebol* diversification behavior has been nicknamed "octopus-like business expansion," emphasizing the excessive degree of diversification.

12. Strangely enough, there is a widely held opinion among Korean policymakers that business expansion through specialization improves competitiveness but expansion through diversification does not. This is the background for the "industrial area specialization" policy, which is discussed below.

- Industrial area specialization policy (introduced in 1991 and reinforced in 1993): 30 largest *chaebols* advised to select their "core industries" and "core firms," which then are allowed exemptions or preferential treatment in regulations such as credit control system, equity investment regulations, and so forth

11.4.2 Underlying Determinants of Korea's Industrial Structure

One of the most intriguing aspects of Korean industrial policy, to begin with, is that it concentrates attention mainly on how to curb diversification without asking why *chaebols* tend to be so highly diversified. This aspect may explain why Korean *chaebol* policy has been of the symptom regulation type. However, why Korean firms are so "excessively" diversified is the most important question to be answered before any logically and empirically sound policy prescription can be made. Only in this way, can one rationally determine whether the current stance of the government's industrial policy, the industrial area specialization policy that is intended to reduce the degree of business diversification of firms, can work or is an optimal policy.

However, not much serious effort has yet been made to explain the diversification behavior of Korean business groups in a systematic way.[13] According to the theoretical discussions above, the following factors that form particular business environments for Korean business firms can explain the diversification behavior of *chaebols*.

First, market size can be a critical factor. If the market for products subject to strong economies of scale is too small for the potential benefits of large-scale production to be fully exploited, then a relatively high degree of diversification will result. Not only has the absolute size of Korea's domestic market been particularly limited, but also the market share of Korean firms in the international market has been low despite Korea's export promotion strategy from its early stage of development. Moreover, governmental support for industrial development in the form of easy policy loans gave major firms access to larger and larger resources. Therefore, in order to fully exhaust available resources, those firms pursued a diversification into various industrial activities that turned out to be individually underscaled.

Second, the degree of economies of scope among industrial activities can be an important factor. Technological innovation during the past 30 years, including information technology, can be argued to have strengthened economies of scope or network economies among various industrial activities. This trend also promoted the diversification drive among Korean firms by alleviating the burden of otherwise inefficient diversification.

13. Yang (1992) has tested an implication of portfolio theory on the behavior of business diversification—that the possibility of reducing the variance of total profits of a business group by diversifying business activities can be an incentive for diversification—but has found that the empirical evidence is not consistent with this implication.

Third, the business environment created by government policy can be an important factor. As shown in table 11.4, Korean firms diversify into technologically unrelated areas. This phenomenon cannot be easily analyzed within the theoretical framework of section 11.2. In order to explain this phenomenon, it seems necessary to grasp the nature of the business environment created by government industrial policy during the past 30 years. One salient feature of Korea's interventionistic industrial policy is the government's responsibility for a firm's survival once the firm enters a designated business area.[14] Therefore, the government has taken every possible measure to revive those firms whenever they became inefficient and in danger of insolvancy. In this environment, the best choice for any firm may have been to make a preemptive move into a business area that is subject to government entry regulation because, once allowed to enter, the firm's survival is guaranteed.

I believe these three factors, individually or jointly, can explain the behavioral patterns of Korean firms or groups of firms with regard to business diversification. Unless these aspects are fully understood, one cannot determine whether the degree of diversification is excessive or not, and further, it will be difficult to devise a sensible policy prescription to alleviate the degree of diversification if it is indeed excessive.

Judging from the above discussion, one may say that the current degree of diversification is rational given Korea's particular business environment, including the pattern of national industrial policy. In this sense, therefore, one cannot definitively conclude that the degree of Korean firms' diversification is excessive. Furthermore, even if the government judges the degree of diversification to be excessive for noneconomic reasons, rather the policy prescription would not directly set business boundaries for individual firms. One option is for the government to make an effort to change the business environment in order to induce the desired diversification level of firms.

For example, if more specialization is desired, then the domestic market can be fully opened, and thereby firms' efforts to globalize their business activities can be supported. Furthermore, the government's policy of guaranteeing the fortunes of selected firms could be changed so that every firm is responsible for its own success or failure. This will help discourage not only so-called technologically unrelated diversification but also technologically related diversification behavior.

14. During the 1970s, when Korea pursued the so-called heavy and chemical industry promotion policy, the government actively intervened in selecting the firms or entrepreneurs to do business in specific areas and in providing the means to support them. If those selected firms were in danger of going bankrupt, the government intervened in arranging additional financial assistance or merger and acquisition procedures to save them. Since the 1980s, this pattern of government intervention has been mitigated but remains effective to some extent in a weaker form. The government still has strong influence on who can enter the business in the case of important industries such as automobiles, steel, etc. Concerning exit policy, the government has become much more lenient in letting noncompetitive firms to go bankrupt in recent years but is still very reluctant to see big firms in important industries fail. Therefore, the perception that "once allowed to enter, then easy to survive" has lessened but is still around.

Therefore, any antidiversification policy directly limiting the realm or range of business activities without correcting the business environment may not be effective and will create serious resource misallocation.

11.4.3 Globalization and Prospects for Korea's Industrial Structure

In this section, we estimate the scale and scope economies of industrial activities conducted by Korean business groups and speculate on future prospects for industrial organization in a globalized market environment.

In order to estimate scale and scope economies, first, the following translog cost function of the 107 largest Korean business groups is estimated using 1992 and 1993 pooled data collected at the business group (firm) level:

$$(8) \qquad \ln C = \alpha_0 + \sum_{i=1}^{N} \alpha_i \ln y_i + \sum_{j=1}^{K} \beta_j \ln p_j + \frac{1}{2} \sum_{i=1}^{N} \sum_{h=1}^{N} \gamma_{ih} \ln y_i \ln y_h + \frac{1}{2} \sum_{j=1}^{K} \sum_{l=1}^{K} \delta_{jl} \ln p_j \ln p_l + \sum_{i=1}^{N} \sum_{j=1}^{K} g_{ij} \ln y_i \ln p_j + \varepsilon,$$

where C, y, and p represent total costs, output vector, and input price vector, respectively, and α_0, α_i, β_j, γ_{ih}, δ_{jl}, and g_{ij} are all parameters to be estimated; ε is a disturbance term. Equation (8) is estimated with the following sets of restrictions: symmetry restrictions

$$(9) \qquad \gamma_{ih} = \gamma_{hi} \quad \text{and} \quad \delta_{jl} = \delta_{lj}$$

and linear homogeneity restrictions with respect to input prices

$$(10) \qquad \sum_{j=1}^{K} \beta_j = 1; \quad \sum_{j=1}^{K} \delta_{jl} = 0, \; l = 1, \ldots, K; \quad \sum_{j=1}^{K} g_{ij} = 0, \; i = 1, \ldots, N,$$

and with the following input share equation:

$$(11) \qquad SH_j = \beta_j + \sum_{l=1}^{K} \delta_{jl} \ln p_l + \sum_{i=1}^{K} g_{ij} \ln y_i + \varepsilon_j,$$

where SH_j is the share of expenditure on the jth input in total cost and ε_j is a disturbance term. The seemingly unrelated regression method is utilized, but one of the share equations should be dropped to avoid linear dependence due to the identity $\sum_{j=1}^{K} SH_j = 1$. The joint estimation of equations (8) and (11) may help improve the efficiency of the estimates.

Business activities are aggregated into seven groups, which are regarded as firms' products, $N = 7$. The inputs are capital and labor, $K = 2$, but the capital share equation is dropped to avoid linear dependence. However, the rental price of capital input could not be measured and so has to be omitted. It is hoped that omitted-variables problems do not cause any serious bias in the estimation. Also, dropping the capital share equation in this case is hoped to alleviate possible problems due to the omission of capital input price. The list of product variables is reported in table 11.6. The estimation results for the cost function are reported in table 11.7.

Based on the estimated cost function, scale and scope economies defined in

Table 11.6 List of Variables

Variable	Content
Total cost	
C	Sum of production cost, operating expenses, and nonoperating expenses
Products	
y_1	Textiles and wearing apparel
y_2	Chemicals and chemical products
y_3	Assembling metal products, machinery, and outfits, n.e.c.
y_4	Other manufacturing
y_5	Construction services
y_6	Financial services
y_7	Other services
Input price	
p_1	Total wage fund/total number of employees

equations (1)–(4) are estimated and reported with respective Z-values in table 11.8. However, in the case of scale economies, instead of directly estimating the definitions given by equations (1) and (2), the inverse of those definitions are estimated because of the convenience in estimating Z-values in the latter case. Therefore, the interpretations given to the estimated scale economies should be appropriately changed.

In addition, to investigate whether Korea's industrial structure has a tendency toward natural monopoly, an estimation of the so-called concept of expansion path subadditivity is presented. Expansion path subadditivity (EPSUB), assuming two products, is given as follows:

$$(12) \quad \text{EPSUB} = [C(y_1^A, y_2^A) + C(y_1^B, y_2^B) - C(y_1, y_2)] / C(y_1, y_2),$$

where $y_1 = y_1^A + y_1^B$ and $y_2 = y_2^A + y_2^B$, but y_1^A/y_2^A, y_1^B/y_2^B, and y_1/y_2 are not necessarily identical. If EPSUB > 0, the industry tends to natural monopoly.[15] The estimates of EPSUB are also reported in table 11.8.

The estimation results for scale and scope economies are especially interesting and can be summarized and interpreted as follows:

1. Almost all products are individually subject to constant returns to scale, but overall economies of scale turn out to be very strong.

2. Not only product-specific economies of scope but also overall economies of scope turn out to be very strong.[16]

15. See Berger, Hanweck, and Humphrey (1987). They suggested, as a criterion for a natural monopoly, the concept of expansion path subadditivity (EPSUB), which is an improvement on the concept of cost subadditivity. EPSUB allows product composition and output scale to vary freely, whereas cost subadditivity can only be defined for a given composition and scale.

16. See n. 4 for a discussion of the general sources of scope economies. Figuring out the specific reasons for scope economies among various industrial activities in the current case would require highly technical investigation of various production technologies, which is beyond the scope of this paper.

Table 11.7 **Estimation Results of Trans-log Cost Function**

Independent Variable	Cost Function (eq. [8])		Expenditure Share Function of Labor Input (eq. [11])	
Constant	5.5841**	(45.3209)	0.1720**	(9.6800)
$\ln y_1$	−0.1026**	(−1.9124)	−0.0003	(−0.2961)
$\ln y_2$	−0.0751**	(−2.3191)	−0.0004	(−0.4062)
$\ln y_3$	−0.0259	(−0.9930)	−0.0011	(−1.3669)
$\ln y_4$	−0.0457	(−1.4427)	−0.0019**	(−2.1226)
$\ln y_5$	−0.0177	(−0.4503)	−0.0011	(−1.0597)
$\ln y_6$	0.1176**	(2.9018)	−0.0004	(−0.3918)
$\ln y_7$	0.0661**	(2.1738)	−0.0049**	(−5.1680)
$\ln p_1$	0.1720**	(9.6800)	0.0004	(0.0466)
$1/2\ (\ln y_1)^2$	0.0841**	(6.3163)		
$1/2\ (\ln y_2)^2$	0.0564**	(6.7785)		
$1/2\ (\ln y_3)^2$	0.0733**	(11.3061)		
$1/2\ (\ln y_4)^2$	0.0755**	(9.8209)		
$1/2\ (\ln y_5)^2$	0.0669**	(6.2187)		
$1/2\ (\ln y_6)^2$	0.0123	(1.1482)		
$1/2\ (\ln y_7)^2$	0.0329**	(4.0673)		
$1/2\ (\ln p_1)^2$	0.0004	(0.0466)		
$\ln y_1 \cdot \ln y_2$	−0.0081**	(−2.4796)		
$\ln y_1 \cdot \ln y_3$	−0.0017	(−0.6749)		
$\ln y_1 \cdot \ln y_4$	−0.0025	(−0.9510)		
$\ln y_1 \cdot \ln y_5$	−0.0028	(−0.8272)		
$\ln y_1 \cdot \ln y_6$	−0.0050	(−1.3874)		
$\ln y_1 \cdot \ln y_7$	−0.0092**	(−2.8799)		
$\ln y_2 \cdot \ln y_3$	−0.0021	(−0.8431)		
$\ln y_2 \cdot \ln y_4$	−0.0011	(−0.4173)		
$\ln y_2 \cdot \ln y_5$	−0.0054**	(−2.2057)		
$\ln y_2 \cdot \ln y_6$	−0.0125**	(−3.8346)		
$\ln y_2 \cdot \ln y_7$	−0.0010	(−0.3409)		
$\ln y_3 \cdot \ln y_4$	−0.0062**	(−2.8392)		
$\ln y_3 \cdot \ln y_5$	−0.0057**	(−2.5835)		
$\ln y_3 \cdot \ln y_6$	−0.0075**	(−2.3748)		
$\ln y_3 \cdot \ln y_7$	−0.0140**	(−5.8224)		
$\ln y_4 \cdot \ln y_5$	−0.0108**	(−4.6163)		
$\ln y_4 \cdot \ln y_6$	−0.0154**	(−5.2947)		
$\ln y_4 \cdot \ln y_7$	−0.0073**	(−2.8658)		
$\ln y_5 \cdot \ln y_6$	−0.0024	(−0.8665)		
$\ln y_5 \cdot \ln y_7$	−0.0116**	(−4.1005)		
$\ln y_6 \cdot \ln y_7$	0.0084**	(2.3167)		
$\ln p_1 \cdot \ln y_1$	−0.0003	(−0.2961)		
$\ln p_1 \cdot \ln y_2$	−0.0004	(−0.4062)		
$\ln p_1 \cdot \ln y_3$	−0.0011	(−1.3669)		
$\ln p_1 \cdot \ln y_4$	−0.0019**	(−2.1226)		
$\ln p_1 \cdot \ln y_5$	−0.0011	(−1.0597)		
$\ln p_1 \cdot \ln y_6$	−0.0004	(−0.3918)		
$\ln p_1 \cdot \ln y_7$	−0.0049**	(−5.1680)		
$\bar{R}^2$	0.9443		0.2099	
SEE	0.3580		0.0442	
D-W	1.8737		1.7491	

Note: Numbers in parentheses are t-values.

**Significant at the 5 percent level and above.

Table 11.8 Estimates of Economies of Scale and Scope

A. Economies of Scale[a]

	Overall Economies of Scale	Product-Specific Economies of Scale						
		y_1	y_2	y_3	y_4	y_5	y_6	y_7
Estimate	0.4426**	1.7949	0.3129	−25.0824	22.1624	−0.7157	7.2440	8.4100
S.E.[b]	0.1476	1.6054	2.0049	86.0283	56.3645	3.0766	10.9291	11.7893
Z	3.7776	0.4952	−0.3427	−0.3032	0.3755	−0.5577	0.5713	0.6285

B. Economies of Scope[c]

	Overall Economies of Scope	Product-Specific Economies of Scope						
		y_1	y_2	y_3	y_4	y_5	y_6	y_7
Estimate	2.7027*	0.5743**	0.5690**	0.6499**	0.6779*	0.6942**	0.4398*	0.6129
S.E.[b]	1.4472	0.2022	0.2166	0.3210	0.3977	0.2702	0.2440	0.4199
Z	1.8675	2.8402	2.6268	2.0248	1.7043	2.5692	1.8025	1.4595

C. EPSUB

	EPSUB I[d]	EPSUB II[e]
Estimate	0.0002	−0.9891**
S.E.[b]	0.0002	0.0068
Z	0.8779	−145.298

[a]A scale economy here is measured by the inverse of the scale economy defined in section 11.2. Therefore, economies of scale, constant returns to scale, and diseconomies of scale are present if the estimate is less than, equal to, or greater than 1, respectively, where Z is calculated as [(Estimate − 1)/S.E.].

[b]Asymptotic standard error.

[c]Economies of scope, constant returns to scope, and diseconomies of scope are present if the estimate is greater than, equal to, or less than zero, respectively.

[d]EPSUB I $= [C(y_1^m, y_2^m, y_3^m, y_4^m, y_5^m, y_6^m, y_7^m) + C(y_1^{l-m}, y_2^{l-m}, y_3^{l-m}, y_4^{l-m}, y_5^{l-m}, y_6^{l-m}, y_7^{l-m}) - C(y_1^l, y_2^l, y_3^l, y_4^l, y_5^l, y_6^l, y_7^l)]/C(y_1^l, y_2^l, y_3^l, y_4^l, y_5^l, y_6^l, y_7^l)$, where y_i^m represents the sample minimum, y_i^l represents the sample maximum, and $y_i^{l-m} = y_i^l - y_i^m$.

[e]In the case of EPSUB II, the sample mean is substituted for the sample minimum y_i^m in EPSUB I.

*Significant at the 5 percent level.

**Significant at the 2.5 percent level.

3. Strong overall economies of scale may be present even without product-specific economies of scale because strong product-specific economies of scope are present. This possibility can be confirmed by the relationship among the concepts of economies of scale and scope given by equation (5).

4. Korean business groups' incentive for diversification can be seen to stem from particularly strong economies of scope present among various business activities because strong economies of scope imply cost savings through diversification.

5. There does not seem to be a strong tendency toward natural monopoly in the Korean industrial structure since the estimated EPSUB is not significantly different from zero in one case (EPSUB I), implying no superiority of larger over smaller scale, or significantly less than zero in the other case (EPSUB II), implying the superiority of small over large scale.

6. Globalization may not be effective in driving industrial structure toward more specialization because (1) almost all industrial activities are individually subject to constant returns to scale, and so the scale of production and the degree of specialization will not be very much affected by globalization in the sense of increased market size,[17] and (2) the economies of scope among industrial activities that are already strongly present will be further strengthened by globalization in the sense of innovation in information technology and microelectronics. Therefore, there exists the possibility that globalization will further strengthen the incentive for diversification over existing industrial activities. Furthermore, if domestic-market-oriented *chaebols* become losers in the market share competition with foreign exporters, they will tend to retreat from their existing specializations and move toward more diversification as already discussed. However, it is also possible that if globalization brings forth technological innovations that create new economies of scale for certain industrial activities, the specialization of those activities will be encouraged as the size of the market expands.

The empirical evidence given in this section could be biased and misleading because the data are so highly aggregated that the estimated technological relationships among the seven groups of industrial activities could be particularly difficult to interpret sensibly. Furthermore, the omitted-variables problem due to the omission of capital input price could also be a cause for concern in this respect. However, having conceded those potential flaws, it is still interesting to observe that the actual diversification behavior of Korean business groups is not inconsistent with that implied by empirical measures of scale and scope economies. In other words, the empirical evidence suggests that *chaebols* in more technologically diverse business areas will dominate over specialized *chaebols* in limited lines of business, and the actual pattern of behavior seems to confirm this. Therefore, government efforts to reduce the degree of diversification may not be effective.

However, in terms of the types of diversification, the empirical evidence summarized in item 4, above, strongly implies that the majority of diversification by Korean firms will be technologically related and so this diversification behavior may not be as worrisome as politicians, the general public, and economists in Korea believe it to be. But this evidence and its implications are incon-

17. It could also be the case that sales increase along the horizontal supply curve even under constant returns to scale as the demand curve shifts out. I am indebted to Takatoshi Ito for reminding me of this possibility. However, it is still the case that a firm with constant returns to scale will have less incentive to expand when the demand curve shifts out than one with increasing returns to scale.

sistent with the evidence cited in table 11.4.[18] This empirical discrepancy could be an interesting issue to clarify in the future research.

11.5 Concluding Remarks

It seems to have become popular recently for governments to experiment with one form or another of an industrial policy that has been adopted by successful East Asian economies such as Japan, Taiwan, and Korea.[19] This tendency becomes even more conspicuous in discussions of possible policy responses to the "unlimited competition" forced by globalization. An increasingly common view seems to be that the government should help business firms successfully compete in the international market—in particular, that the government should intervene, to a large extent, in adjusting industrial structure to a globalized competitive environment.

The arguments made in this study suggest the following implications in relation to this new trend in industrial policy. Above all, globalization is a diversified and sometimes contradictory phenomenon that has different economic implications depending on the context. Therefore, it is especially difficult for a government to choose a particular industrial structure as optimal for its economy. One can further conjecture that economists' search for an alternative industrial organization to the American Fordist, German Craft, and even Japanese network production systems will not yield any definitive, single answer. Therefore, instead of adopting an industrial policy that requires a tremendous volume of information and does not easily produce the right solution, an effective response to globalization may be to let the market order prevail in discovering an optimal business structure and, for this, let the private sector freely make structural adjustments.

The basic viewpoint concerning the role of government economic policy taken in this paper is based on the Hayekian philosophy.[20] There exists a market order in the economy that arises endogenously and spontaneously, independent of outside intervention. Competition in the market order is a process of discovering the optimal outcome. Therefore, one cannot discover or dictate the market outcome in advance without going through the competition process.

According to this view, the government's role is confined to preserving the spontaneity and endogeneity of the market order and cultivating a better envi-

18. It may be the case that Korea's unrelated diversification is overstated in table 11.4 as the result of using a cutoff relation ratio (0.7) that is too high. Note that a cutoff point of 0.7 was recommended by Rumelt (1986), but without much justification. However, no one can tell a priori which cutoff number will be right.

19. A lengthy discussion of the nature and characteristics of industrial policies in those East Asian economies is found in World Bank (1993). This study suggests that while government intervention was helpful under certain conditions, the most important factors in the East Asian Miracle were macroeconomic stability and the market-conforming economic policies followed by these economies.

20. See Hayek (1984, 1989) for his philosophical position on economic policy making.

ronment for the working of the market order. To this end, the government may establish a regime of fair competition in the economic and social systems so that the discovery function of the market order can be cultivated to the maximum.

To put it concretely, the role of the government in this framework is limited to defining the economic and social environments—that is, determining the exogenous variables for the market order, while the determination of the endogenous variables is left to the market order. If the government wants to influence the endogenous variables, it must participate in the market order in the same manner as private economic agents, or change the environment or incentive structure of the market order in such a way as to influence the endogenous variables in the desired direction.

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Comment

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Sung Hee Jwa proposes that under the condition of globalization, governments can allow their private sectors to respond freely to structural change forces. Market expansion and improvement in information technology will induce endogenous organizational change through economies of scale and scope, and this change will determine firms' specialization and competitiveness. This proposal merits further examination, particularly in the context of developing countries.

In many developing countries, for example Malaysia, industrial structure is dualistic. The export sector is dominated by large multinational firms while small-scale firms concentrate on the domestic sector. In Malaysia, foreign direct investment (FDI) constitutes more than half of total investment, and in 1994, 80 percent of FDI flowed into the manufacturing sector, the largest contributor to exports. FDI is mainly in the electronics industry. In most cases, one could also associate economies of scale with this pattern; large firms usually enjoy increasing returns to scale while smaller ones experience constant returns. The effect of globalization on existing production and the subsequent reaction through industrial policy must be viewed in this light.

A large-scale production system will be able to take advantage of globalization conditions—its capital, skill, and technological capacity will be able to respond to competitive forces and its production system will develop increased specialization and scope of activities. It is possible that a Fordist system will not have to be reorganized into small-scale, multiactivity units but can instead become a large-scale specialized system with a very short product cycle. Small firms in developing countries, unlike those in developed countries, may be slower to respond. These firms usually engage in low-value-added activities, and many may lack full access to information technology and their unskilled labor may be incapable of moving to higher-skilled production processes. Furthermore, very few of these small firms operate or utilize R&D activities.

In developing countries, this duality can have far more serious implications

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than in developed ones, in terms of the convergence of industrial organizational structures. The presence of nonhomogeneous firms may mean that the increased integration of the world economy will not result in individual economies' moving toward the optimal industrial organizational structure. Those firms that can quickly compete and benefit from globalization and internationalization will grow much faster than those that need time to react. The duality will persist, and if convergence finally occurs it will be over a considerable adjustment period.

In addition, most of the activities of multinational corporations in developing countries are still at the lower end of the technology and skills range, while the industrial structure reorganization mainly requires changes at the top end of the value-added chain, namely, design and research. In such cases, competitive firms will be more likely to move production closer to design centers in order to minimize production time and cost. Unless developing countries upgrade their technology and skills, their industrial development will lag.

The above considerations suggest the need for industrial policy to take account of the growth of globalization. As Jwa states, industrial policy among newly industrialized economies of identifying sectors to be promoted as "exports stars" is most probably inappropriate for coping with globalization. Jwa's proposal, that the private sector determine the direction of structural adjustment, is thought to be most suitable to meet this challenge. A liberal environment is the best solution to rapid market change; policymakers and government take a longer time to respond to changes and should not be deeply involved. However, structural adjustments that result from private-sector-led industrial policy may not meet the broader needs of a developing economy. Any industrial policy has to balance these two objectives: to steer a well-founded industrial development that can also respond to rapid international reorganization. While old production systems aim at minimizing cost for a given product and process, the new ones should be geared to continuous improvement.

A primary objective of most, if not all, industrial policies is to promote competition. Thus, industrial policies must minimize intervention while strengthening economic foundations such as labor skills and technological capability. Laws and regulations that disallow free entry and withdrawal, such as antitrust laws, cartels, and overprotection of workers, will delay industrial reorganization. In fact, entry into any industry should be facilitated by the ready availability of credit, competitor information, business services, arrangements for sharing physical infrastructure, and the existence of a network of suppliers (Best 1990). In addition, liberalization of financial markets and the tax regime will reduce the cost of capital and, thereby, the cost of doing business.

The new industrial policy for both developed and developing countries should complement private sector efforts. It should not identify sectors (because governments may not have full information about which sectors to choose, and they are usually slow in reacting to market signals) but should provide an environment conducive to industrial growth. Yet, governments have

to ensure balanced industrial development that will benefit all sectors of the economy. In particular, in an internationally competitive scenario, new indigenous firms developing without any information technology network will be at a competitive disadvantage. The government could encourage and facilitate the relevant information technology R&D that will help these firms to extend their economies of scope. R&D work is often too expensive to be borne by individual firms, whereas the use of government resources for this purpose will benefit the whole country.

As mentioned earlier, one aspect of industrial development in developing countries that has raised concern is the overdependence on multinationals; can successful industrial development be achieved only by large firms? Here, the example of "Third Italy" is worthy of mention because it shows how small firms met the challenge and the positive role that can be played by the public sector. Developing countries should follow the example of a developed country (Italy) where globalization challenges can be met not only by large firms but also by small ones.

"Third Italy," located in the north central part of Italy, has many groups of small firms. Perhaps due to their small size, such firms have entrepreneurial tendencies and pursue a strategy of continuous innovation, deploy flexible production methods, and integrate planning and production work (Best 1990). Ninety percent of the manufacturing firms there employ under 100 persons, and they account for 58 percent of the total workforce. Over a third of the workforce is self-employed. This region accounts for approximately 10 percent of Italy's exports and is famous for racing cars (Ferrari and Maserati), ceramics (40 percent of the world's ceramic tile exports), and textiles and clothing (Benneton).

Two factors have helped to make this success story: firm organizational structure and extrafirm institutions. The lead firms that deal with external organizations are supported by two layers of internal firms. The first layer comprises traditional firms that produce for the local market. They supply high-quality products to the lead firms for centralized production. The second are design-dependent firms that carry out subcontract work for the lead firms. There are also design-independent firms that are not formally linked to the production chain. Although the success of "Third Italy" was achieved without creating the managerial hierarchy normally found in large organizations, it was supported by an interfirm association with public sector functions. These quasi-public, nonprofit associations (e.g., the Confederazione Nazionale dell' Artigionato) are formed to serve specific needs of member firms and are accountable to the government, but they are managed by the private sector. They supply administrative services and also lobby the government on behalf of their members.

Thus, the ability of industrial structures to meet globalization challenges may not lie just in themselves but in a network of supportive firms and a government industrial policy that promotes cooperation rather than intervention.

This paper has raised many very interesting and important issues about fu-

ture challenges for industrial organizations and about the optimal way to meet these challenges. Their implications are far-reaching, and these issues will surely be further debated and deliberated.

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Comment Philip Lowe

I found this a very interesting and stimulating paper. It addresses an issue that is bound to confront all governments that have run, or have a predilection to run, interventionist industrial policies. I think it also has some lessons for governments thinking about the implications of globalization for the formulation of domestic antitrust policy.

As I interpret it, the central argument of this paper is that attempts by the Korean authorities "to encourage" a greater degree of industrial specialization may be unwise because there is no reason to believe that government officials are in a better position than the private sector to determine what is the optimal structure of a firm. Instead, governments should be creating an environment that does not distort private decisions about organization structure. The conclusion that is drawn is that deregulation of the economy may be the best response to globalization and that the government should not be trying to engineer a particular form of industrial organization.

The paper argues that globalization will surely affect the optimal organizational structure of firms, but we are not sure in which way, and its impact will differ across industries depending on their cost structures. On the one hand, by allowing firms to exploit larger economies of scale, globalization might be expected to lead to fewer multiproduct firms, with more specialized large firms. On the other hand, the increased economies of scope that accompany the twin processes of globalization and improvements in information technology will lead to more multiproduct organizations. Either way, the prediction seems to be that globalization will lead to larger firms.

I find it difficult to disagree with the broad conclusions of the paper—dereg-

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ulation is a good idea, and globalization makes it an even better idea. However, like a good economist I have two hands—just as deregulation of the financial sectors in many countries led to a number of unexpected and unwelcome consequences, the same is possible here. This does not mean that it should not be done, but rather, it means that one needs to be careful.

The starting point from which deregulation occurs is important. Given that Korea starts with such a concentrated industrial structure, there is no guarantee that the private deregulated market will necessarily end up at the optimal industrial structure, whatever that is. The conglomerates may be able to use their market strength to protect their own position from changes that are in the best interests of the economy. Certainly, antitrust authorities in a number of countries do not see it as in their country's interest to leave the industrial structure to be determined completely by the "free market."

Suppose for the sake of argument that the optimal industrial structure for the production of intermediate goods is one like Taiwan's, with many small-scale horizontally integrated enterprises (see Rodrik 1988; Feenstra, Yang, and Hamilton 1993). Given that Korea is not starting with a clean slate in that large conglomerates already exist—and they exist not as the result of market outcomes but because of government intervention—would this optimal organizational structure come to exist in Korea if left solely to the free market? I do not know what the answer is, but there are reasons to suspect it is no! The conglomerates enjoy ready-made customer markets, contacts, and easier access to finance. This may make it harder for small firms producing innovative intermediate goods to establish themselves in the market.

The financial depth of the conglomerates also allows them to withstand market forces for structural change for a lengthy period of time. This may not be in the country's best interest. To my mind, the financial structure of the conglomerates is one of the areas where they have the greatest potential to cause difficulties—in a way, one can think about the problem as a negative economy of scope.

The relationships within the group allow individual enterprises to run with higher levels of debt than would otherwise have been the case. They also allow long-term planning so that investment decisions need not be influenced by short-term funding problems or fluctuations in demand. This is often seen, quite rightly, as a considerable advantage. However, it brings with it a danger, a danger that is probably increased with internationalization. The danger is an increased susceptibility to shocks. The high level of leverage makes it more difficult to deal with various types of shocks and thus poses a risk to economic stability. The financial arrangements also create the possibility of less than objective monitoring of firms' decisions. As the economy becomes increasingly integrated into the world economy, external shocks—for example, large changes in the exchange rate or a world recession—tend to become more important. High levels of debt can make it difficult to weather these macroeconomic shocks and can therefore increase the potential instability of the economy. What is going on now in Japan might have lessons in this regard.

In thinking about the role that the government should play in promoting the most advantageous industrial structure, the privatization debates and experiences in a number of countries are also instructive. Over the past decade and a half, numerous governments have decided that large state-owned monopolies were not providing efficient low-cost, high-quality services. While the principle that the relevant activities are best undertaken by the private sector was widely accepted, governments did not just simply privatize the existing government monopoly. In many cases, they broke down the monopoly directly or gave/sold licences to other private providers so that there were multiple firms providing the services or goods. Competition among the various firms has often been the key to gaining the large efficiency dividend.

I do not feel qualified to provide any prescriptions for the Korean situation. It is sufficient to say that governments do have a role to play in creating an environment in which the free market delivers the highest gains from globalization. If the government steps back and is agnostic about industrial structure, we may end up with the right answer, but there is a strong chance that we will not. Antitrust departments around the world are evidence that governments find it in their interest to at least set some of the parameters within which competition occurs.

The following comments relate to specific points made in the paper. The paper argues that the spread of information technologies and globalization are inextricably linked. While I am not sure which way the causation goes, the argument is surely right. Where I think there is more room for question is the next step in the argument; that is, improvements in information technology lead to stronger economies of scope between various economic activities and, thus, make it increasingly difficult to isolate a particular activity from other activities. I found this a thought-provoking proposition, but I would have liked to have seen a few examples and some more details of the type of economies of scope that Jwa has in mind. While the argument may well be right, it is possible that improvements in information technologies might actually reduce economies of scope.

Let me provide an example. The increased use of computerized information technology makes it easier for firms to prepare detailed information on their operations. This information is obviously useful internally but may also be useful to other firms and financial institutions with which one is dealing. If this is the case, it may reduce the need for the monitoring of firms to be done internally. By improving information flows, firms may have greater access to external funding from unrelated sources. Given the importance that the financing side has played in the development of the conglomerates, better information flows may weaken the rationale for the existence of the conglomerates.

One area where I think that globalization may actually increase economies of scope is unrelated to information technology. When firms enter foreign markets, brand or name recognition can sometimes be very important. If a firm is unknown, has no distribution network, and has limited information about the structure of the foreign market, entry can be quite difficult. On the other hand,

if a conglomerate has entered a market with a particular product and established name recognition, it may be easier for it to enter with an unrelated product later on. If, for example, Samsung develops a car for export, previous success in exporting consumer electronics may make it easier to establish a position in the auto market. People know and trust the brand name "Samsung." In a world where product differentiation within a product group is becoming more and more important, name recognition is also likely to become more important. There may also be economies of scope in terms of information collection by the firm. Conglomerates may be able to pass market intelligence information between divisions more easily and cheaply than could unrelated firms. To the extent that obtaining and assessing knowledge about foreign markets represents a substantial cost, information economies of scope may be quite important.

On the empirical work in the paper I have only a few minor comments. First, the only cost of production included in the estimated trans-log cost function is labor costs. I appreciate the difficulties of getting a good measure of the cost of capital. However, the paper does not discuss raw materials costs, which tend to account for a fair share of manufacturing costs. Given the importance of raw materials, a couple of price indexes for key raw material inputs might be usefully included in the estimated equation.

The second issue is whether all firms lie on the minimum cost curve. I know that in the finance industry differences in costs between firms of a given size and product mix are considerably larger than differences caused by scale economies. I do not know whether this is the case in Korean manufacturing, but it may be worth exploring. Having said that, in the finance industry, taking account of differences in "X-inefficiency" through using fixed effects estimation or other techniques makes little difference to conclusions about economies of scale and scope.

Third, in the discussion of the empirical results I would like to have seen a little more discussion of why there are such strong and consistent economies of scope. In which industries are these economies of scope strongest, and what is it about the production technology that gives rise to these economies? How does increasing globalization affect these economies of scope?

Finally, one minor point. In section 11.3 it is argued that as the world economy becomes more integrated, the optimal structure of industrial organization will converge across countries. I am not so sure about this for two reasons. First, despite the trend to globalization, many industries remain nontradable. In the nontraded industries, customs and institutions can be important. If these differ across countries or demand for various nontraded goods differs across counties, industrial structures may well also differ. A related point is that despite the growth in world trade, many industries in the economy are not subject to international competition. A consequence of this is that the existence of international competition should not be used to justify complacency about the degree of competition in nontraded industries where there are few domestic

firms providing goods or services. The second, and probably more important, reason that I am doubtful about the convergence of optimal industrial structures is that each country has a different set of resource endowments. Different resource endowments mean that countries produce different goods. The fact that the product mix is different may well mean that the optimal industrial structure is also different.

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