

CONVERGENCE – DIVERGENCE IN CAPITALISM REVISITED

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Recently, there has been a surge of interest in analyzing the market as a social structure. One of the major issues is whether the industrialization paths in various countries have become divergent or convergent. In this paper, we attempt to compare South Korea and the United States. Research questions raised are: first, what are the main characteristics of the structural change in the market; and second, whether the evolving Korean industrial structure is converging toward the structure exhibited by advanced economies such as the United States? Because of active interventions of the Korean government in industrial development, we originally expected that the Korean Industrial Input/Output structures would differ from those of the United States. However, we found that Korean I/O structures are moving towards the U.S. structure as the Korean economy develops. We interpreted that the convergent path may have resulted from technological imperatives of inter-industry relations. During the market's evolutionary process, however, we found that the government participated in the evolution of such a market structure by selectively supporting key industries with its policy loans.

Key Words: *industrialization, market, Input/Output structure, Korea, the US*

INTRODUCTION

In the face of global capitalism, scholars have begun to examine how national institutions of production and distribution change in response to external changes in the international political economy. Some argue that competition, imitation, and diffusion due to trade and the flow of capital and technology have all contributed to a convergence among nations. Others are skeptical, insisting that different historical legacies and different paths of industrialization due to economic policies or state intervention in the market have acted to prevent the convergence

of economic institutions. In particular, the trajectory of the latecomers to industrialization (e.g., South Korea and other newly developing countries in the late 20th century) is very different from that of advanced Western industrialized nations (Biggart and Hamilton, 1992; Biggart, 1991). They argue that convergence fails to materialize.

This debate is closely related to the effects of globalization: is globalization resulting in homogenization or heterogenization? Some feel that globalization's basic tendency is toward a convergence of not only political economy but also culture. Globalization through many factors — technological and cultural exchange, and the emergence of transnational corporations — accelerate the linkage of diverse markets into a unified global market. In particular, they emphasize the impact of financial integration (Dornbusch, 1998).

The role of transnational capital in the global market is particularly important in promoting the convergence of national markets. As Berger summarized, at the macro-economic level, neo-classical theory predicts that interest rates, profits, wages and incomes in general would begin to converge along with rates of growth and productivity (Berger and Dore, 1996: 8).

Meanwhile, in spite of the pressure for convergence resulting from globalization, some are keenly opposed to this interpretation, pointing out the limits of globalization and increasing diversity of national systems (Wade, 1990; Boyer, 1996). Despite increasing integration of financial and production markets, discrepancies still remain in foreign exchange policies and government intervention still influences the domestic sector. Variations in policy making, social classes, and national ideology can all be viewed as the "national context," functioning to limit convergence. As Garrett insists, the effects of globalization are mediated by domestic policies and considerable diversity of national policies (Wade, 1990).¹ For example, in terms of manufacturing methods, Japan's emphasis on lean production, Germany's on technical skill, and the U.S.'s on flexible mass production are all distinct approaches. This debate tends to focus, however, only on advanced countries. The effects of globalization are not limited to just those nations, and the convergence/divergence debate needs to include other countries, particularly the Newly Industrialized Countries [NIC] or nations at the periphery. Here, we

¹ See Gold (1986), and Appelbaum and Henderson (1992) as well. For differing views, see Landsberg (1979) and Warren (1973).

would like to focus on a case in the *NICs*. Are they following the same steps of converging towards advanced nations with a time lag? Or do they have different mechanisms from industrialized nations that lead to divergence?

Many experts on high-speed economic growth posited the existence of an “Asian Model” that differed from the advanced Western nations’ developmental path (Gereffi and Wyman, 1990; Haggard, 1990; Cumings, 1987).²

In this paper, we examine the case of South Korea. South Korea achieved noteworthy economic growth in the past thirty years after a take-off stage in the 1970s and has secured a place in the semi-periphery of the world economic system. In spite of its financial crisis in 1997, South Korea recovered very rapidly and is now a member of the OECD.

As a newly industrializing country which has been heralded by some as an economic miracle, the Korean model has been highlighted by many theorists as well as politicians. Briefly speaking, the South Korean model is characterized by strong but selectively imposed state intervention in the market, state discipline on the *chaebol* (large conglomerates), and strong state control over labor unions similar to some other Asian nations but quite different from Western industrialized countries (Amsden, 1989; Johnson, 1982; Wade, 1990).

However, some insist that the Korean market is growing similar to the market in the advanced industrialized nations despite a different pattern of industrialization with a time gap. Because of its trajectory, South Korea is often discussed in terms of social development theories such as modernization theory or dependency theory. Most examinations take a macro approach. In this paper, we have chosen to investigate the tendencies toward convergence or divergence, using a social network methodology to explore the market structure among industrial sectors. Based on this analysis, we also predict the future of industrialization in Korea.

THEORETICAL ISSUES

The convergence and divergence debate has arisen relatively recently, however the origins are deeply rooted in the social science of the

² See Gold (1986), and Appelbaum and Henderson (1992) as well. For differing views, see Landsberg (1979) and Warren (1973).

1950s. Modernization theory, predominant over the last several decades, assumes implicitly or explicitly that the path of modernization is similar across nations, emphasizing that underdeveloped countries will follow the same modernization process of their predecessors.

Modernization theorists, instead of diversity (that is, the multiple directions of different countries in modernization processes), basically take the position that pre-modern countries will modernize through the diffusion of technology or institutions from core to periphery, and that underdeveloped countries are able to take advantage of this diffusion. Neo-classical theories of free markets among nations are an important cornerstone of this view.

All modernization perspectives do not argue for the same or similar tendencies in the process of modernization. Some recognize a multi-linear trajectory of modernization. For example, state-led industrialization in the modernization process of Asian countries leads to divergence in political economic systems. But in spite of different paths, the ultimate outcome may be similar for both early and late industrializing nations.

Based on dependency theory, some theorists tend to emphasize the diversity of industrialization paths. They argue that we have witnessed a widening gap between the core and periphery due to the international division of labor. They find differences in organization, infrastructure, and values everywhere.

The neo-classical economic paradigm, which has a strong affinity with modernization theory, tends to have difficulties in explaining the Asian Miracle. The neo-classical model maintains that a free market and freedom from state intervention are necessary conditions for economic development. However, the rapid economic growth of Asian countries coupled with powerful state intervention or market distortions would seem to contradict this postulate.

A number of scholars have studied the Asian Miracle not only in terms of institutional factors, including economic policies, but also cultural ones (Berger and Hsiao, 1988). It is ironic that Confucianism, which has been considered a barrier to economic growth, provided those Asian countries with a dynamic for economic development by emphasizing self-discipline, a this-world oriented attitude, and group loyalties.³ The industrialization of Asian nations must be seen as a case

³ See Cho (1989) and Lee (1992) for a discussion of the relationship of culture to industrialization in South Korea.

of “different paths but like results”. The process of industrialization was very different from the Western one. How, in particular, did the process work in South Korea, which achieved remarkable economic growth in the last three decades and also recovered very rapidly from the Asian financial crisis of 1997?

South Korean development was state-initiated and export-led, relying on cheap labor and the *chaebols*. Various economic policies which made up the Korean development model adapted to changes in both domestic and world economic systems. In the 1960s, development was focused on light industry and took advantage of cheap labor. South Korea produced textiles or assembled electronic parts imported from Japan or the U.S. In the 1970s, the Korean government made the decision to move from light to heavy industry. Besides the growing domestic need for heavy industry, South Korea was also playing a role in the world system by taking over some of the chemical and heavy industry which was becoming increasingly uncompetitive in advanced capitalist countries because of relatively high labor intensity. This has been described as the “triad system” in the commodity chain.⁴ Simply put, Korea took advantage of its comparatively lower labor costs within the world system.⁵

With the restructuring of the world political economy since the mid-1980s, however, Korea began to lose the competitive advantage of labor costs which had sustained its export-led industrialization. Broadly speaking, the crisis of Fordism and the emergence of new modes of accumulation (e.g., post-Fordism, flexible accumulation, etc.) resulted in a reformulation of the world economy (Lash and Urry, 1987). This structural chain had an impact on Korea’s place in the export chain of the world economy as well.

China and new Asian NICs such as Thailand and Indonesia have taken away the competitive advantage of low cost labor from South Korea. As a result, Korea entered into a new period of competition in the world economy. The Korean economy adjusted to a new world economy. The state pursued a number of restructuring policies that

⁴ See Gereffi and Wyman (1990) for the concept of a commodity chain.

⁵ Needless to say, the Korean economic model relied on low labor costs to achieve rapid economic growth. In the 1970s, Korean workers’ wages were about 1/10th that of American workers (Deyo, 1989). The great quantity of low cost labor was crucial fuel for rapid economic growth during the period of state-led export-oriented industrialization. During this time, Korean workers mainly assembled products, using imported technology and capital from Japan, and exported them to the U.S. market.

included privatization of commercial banks, deregulation or lessening of state intervention, and closing down some industrial sectors such as mining and textiles that had lost competitiveness with other countries. The state also shifted subsidies from labor-intensive industries to technology-intensive ones.

Since the 1990s, information technology related industries such as semi-conductors, internet-based firms, and venture firms producing high-value products and services have occupied leading positions. South Korea started to experience labor shortages due to rapidly increasing labor costs.

Korea's rapid industrialization has been crucially shaped by the chaebols and their pursuit of "economies of agglomeration" or "economies of size". *Chaebols* have historically pursued market share at the expense of profit and have in turn been rewarded by the government with favorable loans and policies based on their market rank.

To understand Korea's banking system, it may be helpful to distinguish between capital market-based and credit-based systems (Wade, 1990). In a capital market system, securities (stocks and bonds) are the main source of long-term business financing. Prices are determined in large part through the interplay of supply and demand. In a credit-based system, the capital market is weak and firms depend heavily on credit for raising finances beyond retained earnings. Firms, therefore, heavily depend on whoever controls credit (Wade, 1990). South Korea's banking system is predominantly credit-based, and it is heavily dependent on its controllers. The main controller has been the Korean government, which has played a pivotal role in initiating industrialization through tightly controlling the allocation of resources. The government has not only supplied big business with enormous capital, but also has been able to discipline big business through control of the banks. This kind of banking system is very different from a capital-based one based on market principles. According to this understanding, South Korea has pursued industrialization differently from its Western counterparts. If we take a look at both the outcome and stages of development, however, we can see that South Korea's path of industrialization seems to approach the structure of the U.S. despite a time lag. It is not obvious that this gap results in diversity: if underdeveloped countries follow a similar path, it is just a matter of a time lag, and not diversity. In spite of state-led industrialization, the South Korean government selectively intervened in the market, and

might have followed the directions of a market. For example, after the financial crisis, not only were the *chaebols* reorganized, but the banking system was also reformed to create a more competitive market system. Globalization seems to have accelerated these efforts.

Briefly speaking, we may observe the phenomenon of “different paths, but like results” in the Korean case. The discussion below focuses on such a possibility of a converging path toward industrialization.

The emergence of neo-institutionalism in the social sciences reminds us of the importance of the market structure. Replacing the conventional concept of a *universal free market* with the *market as a form of social structure*, neo-institutional theorists attempt to explain different forms of the market in terms of social, cultural, and political processes (Hodgson, 1994; Swedberg, 1994; Zukin and DiMaggio, 1990; Biggart and Hamilton, 1992; Biggart, 1990). They highlight path-dependent development patterns of the market in regional economies (Gereffi and Wyman, 1990).

Influenced by neo-institutional theories, but not necessarily neo-institutional theorists themselves, a few sociologists have attempted to analyze market transaction patterns, an area previously monopolized by economists, with the concepts and tools of social network analysis (Scott, 1991; Borgatti and Freeman, 1991; Burt, 1991). Unlike conventional neo-classical economic studies of industrial development that assume that market transactions among different industrial sectors merely reflect technological links among industries, network analysts tried to show explicitly the ways in which the market is structured. A pioneer of this approach is Ronald Burt (Burt, 1988; Burt and Carlton, 1989). Relying on Input-Output (IO) Table data from the U.S., he showed that the American market was stable during the 1970s and 1980s, and that the boundaries and market positions in the transaction network had effect on the profit margin of firms in the market.

Students of Burt applied similar techniques to Korean data to explain profit margins of firms or subcontracting relationships in different markets (Chang, 1999). Others used IO network transactions to analyze *chaebol* diversification strategies and to explain the survival of *chaebols* during the 1997 economic crisis (Kim, Park, and Lee, 1998). All these analyses focused either on the stability of markets in advanced economies or on structural characteristics of the market in a given year, neglecting the evolutionary process of market structuration. In this paper, we explore the evolution of market structure in a rapidly

developing economy (the South Korean economy). Even though we rely on social network analysis, we do not assume divergent market structures as neo-institutional theorists do. Here, market structure is demonstrated through the patterns of selling and buying among industries. The key questions are the following: 1) Is the Korean market as stable as the American market? 2) Is the Korean economy evolving toward the structure of an advanced economy? 3) What is the role of the government in structuring transaction markets?

NETWORK MARKET ANALYSIS

In the national economy of a society, industries are directly and indirectly linked with one another through processes in which commodities and services produced by one industry flow into other industries as raw materials. Network analysis of input-output tables (hereafter, IO tables) provides a new analytical method by which to examine inter-industry relationships quantitatively.

An inter-industry network is defined as the network of transactions of commodities and services between industries as represented by an IO table during a fixed period in a given national economy. Transforming an IO table into an adjacency matrix where cells are dichotomized into 0's and 1's has certain advantages. First, it allows us to depict the global market structure of direct links graphically and to calculate various network indices such as centrality or constraints. It also has the conceptual advantage in that one can introduce socio-metric notions of strategy and competition. For instance, when a company chooses its transaction partners, its relations are constrained by other relations its competitors choose to make. Suppose that x chooses y as its partner, and all others choose y as their partner as well, the power of y increases (since, in resource dependency theory, power is the inverse of dependence). In this situation, the intensity of x 's relationship with y is weakened unless x devotes more time and energy to y (Burt and Carlton, 1989). By applying a similar logic to market networks, one can study input-output from a different angle, as each industry is seen as rationally choosing its transaction partners and allocating resources proportionally to these partners as a result.

DATA AND METHODS

The South Korean IO tables are compiled by the *Bank of Korea* every

five years. In the present research, to examine changing patterns, we used data from 1970, 1980, and 1990, during which time the Korean economy has developed most rapidly. The U.S. data used in comparison are from the 1990 IO table compiled by the U.S. Department of Commerce.

Conventionally, an inter-industry network as represented by the IO table is measured in terms of structural equivalence. Burt's pioneering work (Burt, 1998; Burt and Carlton, 1989) is a typical example. He defines two industries to be structurally equivalent within a network to the extent that they have identical patterns of interactions with other industries in the network (1988: 359). He uses Euclidean distance to measure the degree of structural equivalence, where perfectly equivalent network nodes equal zero and increase with the extent that the two nodes being evaluated are engaged in different patterns of relations with other industrial sectors. Larger values of Euclidean distance between nodes mean that they lie farther apart in the social typology of the network (Burt, 1988: 359). On the other hand, two industries are close together to the extent that they involve "identical proportions of purchases" from the same sector as supplier and "identical proportions of sales" to each sector as consumer. Consequently, for example, if the iron ore mining industry and nonferrous ore mining industry are close together, those two industries buy from and sell to the same set of industries.

In this paper, instead of relying on the concept of structural equivalence, we propose a digraph index of inter-industry relationships, which indicates if a pair of industries shares a strong relationship of direct transactions. If structural equivalence emphasizes the patterns of interactions, a digraph-based index focuses on whether or not two industries are directly connected beyond a certain level. Consequently, an adjacency matrix was created from the IO table⁶ to calculate the path distances for each pair of industries, i.e., the smallest number of steps needed to connect the paired industries. When we input this path distance matrix in a multi-dimensional scaling algorithm (MDS), we can display a map of inter-industry distances. Here, the relative position of an industry is determined by its path

⁶ If 10% or more of an industry's total resources flow to industry *j*, we recoded cell (*i*, *j*) to 1, and 0 otherwise. This dichotomization loses information, but we wanted to highlight which industry is linked directly with which industries, and to identify which industries are the most central in the network. In a structural equivalence approach, centrality is almost meaningless.

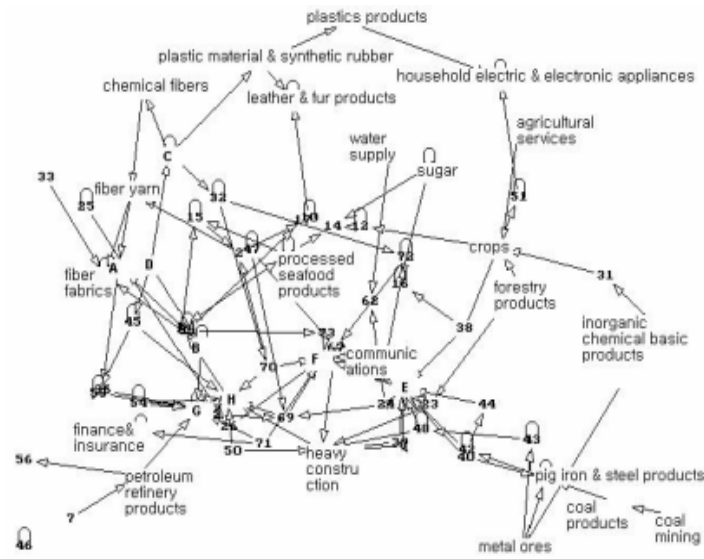


FIGURE 2. IO STRUCTURE IN 1980



FIGURE 3. IO STRUCTURE IN 1990

semi-periphery, but moved to the periphery by the 1990s. Retail and Wholesale, and Finance and Insurance, the tertiary sector, occupied the periphery in the 1960s, but moved to the center by the 1990s, while raw materials such as the metal, iron, gas, and petroleum industries remained at the margins.

Eyeballing observations has a certain advantage in depicting the global structure, but it has limitations in that it does not provide statistics that summarize the structure. Thus, we examined the network structure using various network analysis techniques.

Comparing the evolution of the market structure over a twenty-year period entailed serious methodological problems because the Standard Industrial Classification (SIC) codes have changed with time.⁷ Some changes are negligible at the level of aggregation because only distinctions among commodities have changed without affecting the grouping of commodities as such. Other changes affected the grouping of industries by reclassifying commodities. As a result, it can be problematic to compare IO tables in different years. Fortunately, the Bank of Korea provided IO tables for 1980 and 1990 with the size (75 by 75) and commodity classification, which is the same with those of the 1970 IO table. We focus on these tables to examine the change over the ten-year period during which the market grew the most rapidly: the average transaction amount between industries grew from 13,121 million Won in 1980 to 34,962 million Won in 1990, a 270% increase.

The overall correlation coefficient between the 1980 and 1990 matrices is .82. This means that 68 percent of the variance of the 1990 IO table is explained by the 1980 table. The magnitude of change appears much greater than the overall changes in the American market during the fifteen year period from 1963 to 1977 (Burt, 1988). When Burt claimed that the U.S. market was stable, he reported that 92 percent of variance was explained.⁸

To investigate the stability of each industry, we calculated the correlation between paired vectors of the 1980 and 1990 inputs, and paired vectors of the 1980 and 1990 outputs respectively.⁹ In Figure 4,

⁷ The SIC code is a four-digit coding scheme that identifies industries and sub-industries.

⁸ He used somewhat different methods that make an exact comparison difficult. He calculated Euclidean distances between pairs of industries from 1963, 1967, 1972, and 1977 IO tables and used a principal component analysis to explain the variances between years.

⁹ Correlation between a pair of inputs is calculated as $(C80_{ik}, C90_{ik})$ for $k = 1$ to 75,

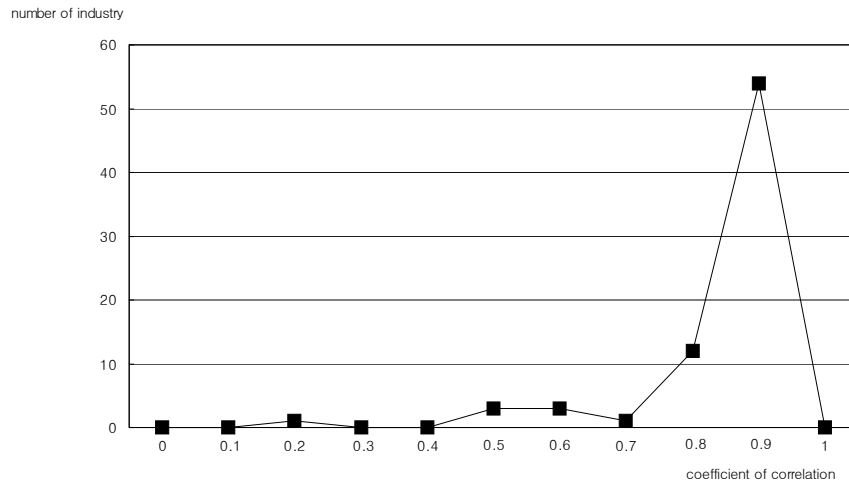


FIGURE 4. THE DISTRIBUTION OF CORRELATION COEFFICIENTS BETWEEN PAIRS OF 1980 AND 1990 INPUT VECTORS

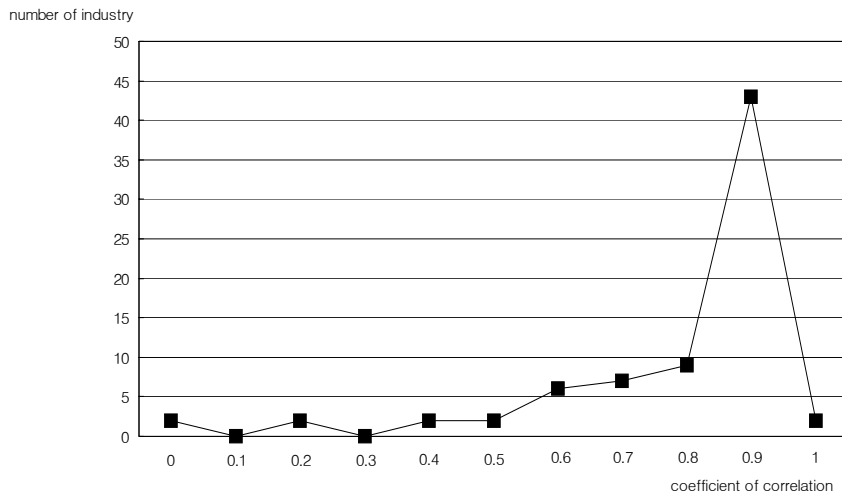


FIGURE 5. THE DISTRIBUTION OF CORRELATION COEFFICIENTS BETWEEN PAIRS OF 1980 AND 1990 OUTPUT VECTORS

more than 70% of input correlation coefficients and 60% of output correlation coefficients are greater than .90, indicating stability. In

where $C80_{ik}$ is i industry's transaction with k industry in 1980, and $C90_{ik}$ is i industry's transaction magnitude with k industry in 1990).

TABLE 1. INDUSTRIES WITH THE HIGHEST STABILITY

| Output | Correlation | Input | Correlation |
|---|-------------|--|-------------|
| Heavy construction | 1.000 | Coal products | 1.000 |
| Eating and drinking places, and hotels and other lodging places | 1.000 | Petroleum refinery products | 1.000 |
| Bakery and confectionery products, and noodles | 0.999 | Sugar | 0.999 |
| Other food preparations | 0.998 | Wearing apparels and apparel accessories | 0.999 |
| Chemical fibers | 0.998 | Primary iron and steel products | 0.998 |
| Chemical fertilizers and agricultural chemicals | 0.998 | Pulp and paper | 0.998 |
| Crude petroleum and natural gas | 0.998 | Fiber fabrics | 0.998 |
| Leather and fur products | 0.998 | Meat and dairy products | 0.997 |
| Fiber yarn | 0.997 | Polished grains, flour and milled cereals | 0.997 |
| Pig iron and crude steel | 0.997 | Printing and publishing | 0.996 |
| Forestry products | 0.996 | Household electric and electronic appliances | 0.994 |
| Tobacco products | 0.996 | Fabricated metal products | 0.994 |
| Livestock breeding and sericulture | 0.993 | Plastic material and synthetic rubber | 0.992 |
| Agricultural services | 0.992 | Wood furniture | 0.991 |
| Coal products | 0.989 | Pig iron and crude steel | 0.989 |

Figure 5, output vectors, however, were relatively unstable as correlation coefficients of 17 out of 75 industries were smaller than .7. This means that the input side changes slower than the output side. We argue that this result arises from export-led industrialization, where a large chunk of the output goes for export rather than for the domestic market, and the main export commodities have changed over time (for example, electronics and apparel in the 1980s to semiconductors in the 1990s).

Table 1 shows the top ten industries with the highest input and output stability. As it turns out, industries belonging to the primary sector (coal, iron, agriculture, gas, forest products, tobacco, etc.) and related industries (food, fertilizer, pulp) were the most stable in both input and output sectors. As shown in Figures 1 to 3, the location of these industries remained at the periphery of the market during the entire period.

In Table 2, we present the industries that changed most rapidly over

TABLE 2. INDUSTRIES WITH THE LOWEST STABILITY

| Output | Correlation | Input | Correlation |
|---|-------------|--------------------------------------|-------------|
| Gas, steam, and hot water supply | 0.0 | Gas, steam, and hot water supply | 0.215 |
| Water supply | 0.269 | Communications | 0.530 |
| Polished grains, flour and milled cereals | 0.471 | Drugs, cosmetics, and soap | 0.561 |
| Processed seafood products | 0.484 | Cement and concrete products | 0.580 |
| Wearing apparels and apparel accessories | 0.543 | Electric services | 0.606 |
| Plastics products | 0.579 | Inorganic chemical basic products | 0.671 |
| Nonmetallic minerals | 0.609 | Forestry products | 0.699 |
| Electric services | 0.611 | Nonmetallic minerals | 0.723 |
| Business services | 0.613 | Water supply | 0.802 |
| Computer and office equipment | 0.614 | Heavy construction | 0.817 |
| Educational and research services | 0.661 | Rubber products | 0.832 |
| Wood furniture | 0.685 | Building construction and repair | 0.848 |
| Miscellaneous manufacturing products | 0.731 | Miscellaneous manufacturing products | 0.874 |
| Electrical machinery, equipment, and supplies | 0.745 | Business services | 0.884 |
| Glass, pottery and related products | 0.751 | Business consumption expenditures | 0.888 |
| Social services | 0.782 | Educational and research services | 0.891 |

the ten year period in terms of input and output constituents. It is interesting to note that service sectors (Business Services, Social Services, Education/Research Services, etc.) and newly emerging industries (Computers, Plastic Products) changed their partners most extensively. Some manufacturing industries such as Communications, Drugs, Glass, and Electrical Machinery also changed the patterns of their transactions. It seems that newly emerging commodity markets with new technological developments have changes in the pattern of input-output transactions.

COMPARISON WITH U.S. MARKET STRUCTURE

To answer the question we posed earlier regarding possible convergence of the South Korean market to that of the U.S., we compare the 1980 and 1990 Korean IO tables with the U.S. 1990 table. Because Korea uses a different classification from the U.S., we had to

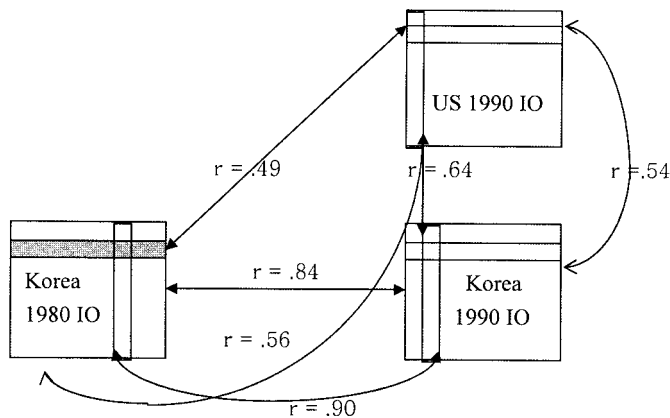


FIGURE 6. AVERAGE CORRELATION COEFFICIENTS BETWEEN INPUT OUTPUT VECTOR

reclassify industrial boundaries based on the primary commodities produced by each industry. By collapsing the codes, we reclassified the IO tables to 61 by 61 IO tables. A diagram in Figure 6 summarizes the pattern of average correlation coefficients between inputs and outputs as well as between years.

We can see that the Korean market has moved toward the 1990 American market structure as the average correlation coefficients increased from 1980 to 1990. The correlation for input vectors rose from .56 to .64 and for output vectors rose from .49 to .54. Since we do not have 1980 U.S. data, our finding is somewhat inconclusive, but one can safely say that the 1990 Korean market is more similar to the 1990 U.S. market than the 1980 Korean market. This may indicate a narrowing technological gap and rate of market saturation between the two countries.

From Figure 6, we can see that the input vector correlation between South Korea and the U.S. is higher than the output vector correlation. Again, we attribute this result to the fact that Korea's heavy reliance on export-oriented industrialization causes output resources to flow to the export sector, rather than to domestic industrial sectors. The composition of exports also changed between 1980 and 1990.

CHANGES IN THE STRUCTURES OF CENTER AND PERIPHERY

A pairwise comparison of 1980 and 1990 IO vectors does not,

TABLE 3. MOVEMENT OF INDUSTRIES BETWEEN THE CENTER AND PERIPHERY, MEASURED BY THEIR CENTRALITY RANKING

| Top 10 Industries moved to the center | | Top 10 Industries moved to the periphery | |
|---|-----------------|---|-----------------|
| Name of industry | Rank difference | Name of industry | Rank difference |
| Computer and office equipment | 42 | Polished grains, flour and milled cereals | -36 |
| General industrial machinery and equipment | 24 | Coal products | -29 |
| Special industry machinery and metalworking machinery | 20 | Wearing apparels and apparel accessories | -23 |
| Communications equipment | 15 | Fiber yarn | -19 |
| Communications | 14 | Fiber fabrics | -17 |
| Finance and insurance | 14 | Chemical fertilizers and agricultural chemicals | -16 |
| Processed seafood products | 13 | Rubber products | -16 |
| Motor vehicles | 12 | Petroleum refinery products | -15 |
| Fishery products | 12 | Beverages | -15 |
| Drugs, cosmetics, and soap | 12 | Crops | -13 |

however, capture the overall changing patterns of transaction networks. Therefore, we calculated centrality scores for each industry in the 1980s and compared them with the 1990s. According to the centrality measure, an industry is central to the extent that most other industries send output to that industry, while the sending industries concentrate their interactions on that industry. The rationale is similar to the power structure in sociometric relations: if more actors choose you as a friend, and those actors do not choose any other friends, your power increases within the system.

As expected, the Computer, Communications, Finance, and Insurance industries became more central in 1990, and the industries in the primary sector (Coal, Grain and Flour, Crops, and Beverages) moved to the periphery. The movement of industries between center and periphery reflects technological associations. For instance, as the market grows through deepening industrialization, the relative importance of the primary sector declines due to the technical development. However, one may speculate that such changes may be facilitated by political processes, especially when the developmental state actively intervenes in the market. Consequently, we explore the role of the Korean government in determining the market structure.

ROLE OF THE GOVERNMENT IN MARKET STRUCTURATION

When the government wishes to guide and discipline economic development, some of its most important policy measures are tariffs, tax policy, and targeted policy and bank loans through a tightly regulated financial system. In this section, we analyze whether the government allocated targeted policy loans or bank loans rationally. If loans are made on a rational basis, there should be a strong relationship between the amount of the loans and industry importance as measured by the centrality scores.

Table 4 shows the government's policy loans were allocated to different industries between the 1960s and 1990s, while the inter-correlation between years gets much smaller as the time gap increases. This means that the targeted industries changed over time. For example, apparel and light manufacturing were targeted in the 1960s and 1970s, and heavy manufacturing industries in the 1980s and 1990s.

Table 5 shows the correlation between the industry centrality scores and the amount of policy and bank loans distributed to those industries from 1963 to 1990. The results suggest that the government indeed chose central industries to boost development.¹⁰ It is also interesting to note that the correlation was strongest ($r = .603$) in 1980 when market transactions were expanding most rapidly, and became weaker in 1990. This supports the view that the state learned to allocate resources rationally in the early industrialization phase, and then lost its tight grip on rational economic planning as it gradually became vulnerable to rent-seekers (Haggard, Lee, and Maxfield,

TABLE 4. CORRELATION OF AMOUNT OF POLICY LOANS ALLOCATED TO INDUSTRIES ACROSS THE YEARS

| Year | 1963 | 1970 | 1980 | 1990 |
|------|--------|--------|--------|------|
| 1963 | 1.00 | | | |
| 1970 | 0.968* | 1.00 | | |
| 1980 | 0.631* | 0.73* | 1.00 | |
| 1990 | 0.212* | 0.339* | 0.821* | 1.00 |

¹⁰ To examine the unique causal effects of policy loans on the movement of industries in the network, one must model a cross-lagged regression: $C_t = aC_{t-1} + bPL_{t-1} + e$, where C is centrality and PL is policy loans and e is the error term. Unfortunately, our data is too limited to run such a lagged regression.

TABLE 5. CORRELATION BETWEEN INDUSTRY CENTRALITY AND AMOUNT OF POLICY LOANS DISTRIBUTED TO THOSE INDUSTRIES

| Year | Correlation | N |
|------|-------------|----|
| 1963 | .322** | 34 |
| 1970 | .287** | 44 |
| 1980 | .603** | 49 |
| 1990 | .380** | 62 |

1993).¹¹

DISCUSSION

To summarize our major findings: 1) the South Korean market seems to have evolved toward the structure of an advanced economy, and the market structure has changed more rapidly than its American counterpart; 2) the selling patterns change more rapidly than the buying patterns, due to a heavy reliance on export-led industrialization; 3) the government allocated targeted policy loans to industries that occupied central locations in the transaction network, especially in the 1980s, and such correspondence between network centrality and allocation seems to diminish in the 1990s.

We believe the first two findings simply represent market processes. That is, as the market expands with technological development, it must reflect the technological associations that exist between industries. For instance, if an automobile manufacturing industry develops, then its buying and selling pattern would reflect technological division of labor in the industry, thus increasing resemblance between the Korean market structure and that of its American counterpart. The last finding, however, needs theoretical elaboration in terms of the developmental state theory.

There has been a heated debate between neo-classical economic theories and the developmental state paradigm (White and Wade, 1998; Islam, 1994). The former rejects the role of an active interventionist state in promoting economic growth for three reasons. First, the state does not have an informational advantage over the private sector; thus, its active involvement only harms the economy by distorting market

¹¹ An alternative explanation is that the state was not able to predict winning industries as a new phase of industrialization is more complicated due to fast technological progress and ever-increasing globalization.

signals. Second, politicians and bureaucrats pursue their own goals rather than the national interest and often become predatory. Third, state intervention produces rents. The state is often held captive by rent-seekers, making the economy inefficient. The role of the state, therefore, must be limited to developing policy environments that are favorable to a free market. Those who hold neo-classical views argue that South Korea developed because the government successfully implemented market-friendly strategies to achieve high savings rates, relatively low inflation rates, and large investments in human capital, etc. (World Bank, 1993; Balassa, 1998).

The developmental state paradigm, on the other hand, argues that the economic performance of Korea can be explained by the active intervention of the state in the private sector (Amsden, 1989; Evans, 1995). The state guides, disciplines, and coordinates the private market actors through strategic allocation of diverse policy instruments (Johnson, 1982; Wade, 1990). The bureaucrats, who are capable of developing and implementing such instruments based on technical expertise, are insulated from social pressures of rent-seekers so that they can pursue the national interest (Dornbush, 1998).

Our findings suggest that we must take a synthesized view, given that the active intervention of the developmental state relied, at least during the late 1970s and early 1980s, on market-friendly policy measures in which the state promoted the most central industries by allocating financial resources to the firms in such industries.

CONCLUSION

Our findings demonstrate that based on its industrial markets, South Korea tends to move towards the industrial structure of the U.S., despite its very different pattern of state-led industrialization in the last several decades. But it would be hasty to say that convergence extends to organizational and institutional aspects, as this analysis only examines industrial sectors. Furthermore, it does not explore the inner dynamics of industrialization, which can be different between South Korea and the U.S. Further research is required to prove a tendency toward convergence in other domains of the economy.

The debate on the benefits of convergence versus divergence remains to be examined. The trend toward globalization, where nations that followed different paths of industrialization gradually converge through increasingly integrated markets, has faced increasing resistance

in the past few years. National ideology and cultural values also function as barriers to homogenization.

The debate is not limited simply to economic trends within the world market system. There are also political implications in the discussion of convergence and divergence. If the economy of South Korea is converging towards that of the U.S., the Korean economy may ultimately become a free-market system despite its state-led industrialization in its early phase. Because social policies cannot be entirely separated from the market, this growing similarity in market structure may lead to growing similarity in other areas as well. For example, we may witness similar changes in the area of welfare programs, budget allocation, and industrial policies that advanced economies currently experience in the age of economic and political globalization. This will certainly affect the future of the Korean economy and its political system.

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