Interaction between Regional and Industrial Policies: Evidence from Four Countries

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After World War II, policies to promote industrialization—both to substitute for manufactured imports and to encourage exports based on unskilled labor—often successfully complemented regional policies to better distribute economic activity. The recent shift toward high technology, however, has strongly favored major urban areas, undermining efforts at regional decentralization and stabilization. Furthermore, countries are increasingly abandoning top-down regional policy and passing on responsibility for development to provincial and local levels, setting off vigorous interregional competition for economic activity and often favoring a few, relatively well-endowed regions. Evidence from Brazil, Japan, the Republic of Korea, and the United States shows how the recent emphasis on high-tech exports and decentralized regional policy may reinforce polarization and slow progress toward eliminating regional growth and income differentials.

Since the end of World War II most industrial and developing countries have devoted considerable resources to industrial and regional policies. The goal of industrial policy is to create capacity in key industries, to develop domestic markets, and to reduce imports and build export capacity. Regional policies are designed to moderate regional growth rate differentials, ameliorate regional differences in per capita income, integrate stalled regions into the national economy, and spread urbanization from a single metropolis to multiple sites. The sometimes conflicting goals of long-term growth, efficiency, equity, and political peace motivate both sets of policies.

This article explores the compatibility and tension between industrial and regional policies in four countries since World War II. Industrial policy can influence the location of economic activity, either directly through government siting or indirectly through subsidies and support for industry.
through incentives to the private sector. Governments can use industrial investment to promote development of laggard regions or to favor a more decentralized pattern of capacity distribution in the sector. On the other hand regional policy priorities can hamper the effectiveness of industrial policy design. Agglomeration economies may be lost by placing new industrial activity away from major industrial cities, while opting for more rather than fewer new centers risks missing out on economies of scale.

Policymakers acknowledge short- and medium-term efficiency losses to their regional policies, but argue that increased equity compensates. In the long term well-executed regional policies may also enhance growth and efficiency. With sufficient early aid, industrial complexes anchored far from existing centers of activity can become new growth poles, with their own internal dynamism. Furthermore, a flatter urban hierarchy with more medium-size cities may protect the national economy against diseconomies in its dominant city by offering lower-cost sites for cost-sensitive firms. Finally, dispersed growth centers can improve income distribution and fuel growth through both savings and demand effects.

Postwar Industrial and Regional Policies

Economists believe that both economies of scale (increasing returns to size of plant) and agglomeration economies (cost savings from the co-location of complementary economic activity) are positively associated with city size over a sustained period of development, although they may ultimately be reversed. These economies discourage government efforts to redirect industrial and economic activity away from congested, high-income regions. Industries subject to increasing returns to scale, which also benefit from the neighboring presence of complementary industries or shared labor, resource, and information pools, are particularly poor targets, since they are generally drawn into a process of “cumulative causation” biased toward the more prosperous regions (Myrdal 1957; Kaldor 1970; Krugman 1992).

Recent increases in international trade and new export-oriented policies affect regional development in contradictory ways. A location central to a regional or national market may lose advantage to peripheral or coastal locations. But international markets permit larger-scale industries, whose reliance on agglomeration economies may solidify their commitment to existing metropolitan centers while displacing smaller, regionally oriented units. As high-tech industries expand, investments are drawn to nationally dominant cities where skilled labor, information, and business services are more available. The increased importance of legal and political issues such as trade barriers, technology transfer, market access, and intellectual property rights favor national capital cities.

Working in the opposite direction, diseconomies of scale from hyperurbanization encourage regional decentralization of capacity (Richardson 1980). Congestion and high input costs encourage firms to accept government directives or incentives to relocate. Economists and geographers studying industrial culture also suggest that large and powerful oligopolistic industries, especially in mature or declining sectors, discourage entrepreneurship and restrict the supply of land, labor, and capital to other industries within the region (Chinitz 1960; Markusen 1985). Such sectors will
not act as seedbeds of innovation as Friedmann (1972) envisioned but may instead repel newer industries, which then take root in underdeveloped regions (Markusen and McCurdy 1988; Hall and Preston 1988).

This article argues that the compatibility of industrial and regional policy depends on the sectors targeted and their requirements for scale and agglomeration economies. The greater the economies of scale and agglomeration for targeted sectors in a centralized location, the less likely that industrial policy will further regional policy goals and the more costly imposed regional priorities may be to industrial goals.

Industries vary both in factors such as capital intensity and minimum efficient scale of production and in agglomeration potential depending on their market orientation (domestic or export) and their degree of maturation. For domestic-oriented industries replacing manufactured imports, regional goals may be achievable when industries are linked to adequate infrastructure for domestic distribution. Export-oriented industries with standardized mass production processes can also locate away from major urban centers—particularly coastal areas—without much disadvantage. Innovative industries that demand skilled labor, business services, and access to information will be less successful in remote locations. Even when inputs and information can be procured over distance, the uncertainty and risk introduced by rapid change in product and technology keeps these industries rooted in major urban centers.

Many industrial countries have begun to shift their industrial policies from sectors such as textiles, apparel, chemicals, machinery, and consumer electronics to high-tech, innovative sectors such as computers, aircraft, producer electronics, communications equipment, and pharmaceuticals. As standardized manufacturing capacity moves to lower-cost countries, industrial countries focus on sectors requiring innovation and human capital investment. But despite the “technopolises” created to house new technology, industrial development, and government research and development, regional goals may be sacrificed.

Regional policy approaches also are changing. Regional policies used to be common, often centrally planned and implemented through agencies devoted to regional matters. But political difficulties in implementation of regional policy and mixed results have encouraged a decentralized approach to economic development in the past decade. The power of agglomerative forces, central government fiscal pressures, and political conflict over the regional deployment of resources have contributed to disillusionment with regional policy. A federal model in which provincial and local governments wield greater discretion over infrastructure provision and economic development incentives is currently in vogue. This shift may decentralize economic activity, but it may do so in an uneven and costly manner without achieving regional policy goals.

The relations among changing growth, industrial policies, and regional policies are complex. Comparative studies that identify contributing and contextual factors lend insight. The remainder of this article analyzes the industrial and regional strategies of four countries—the Republic of Korea, Brazil, Japan, and the United States—since World War II. These countries vary by size, development experience, political structure, and natural resource endowment. Results are gauged for sectoral efficiency and interregional equity and stability.
Republic of Korea: Regional Industrial Enclaves

Over the past four decades Korea has vigorously pursued industrial policy by selecting key sectors and working with and developing the dominant chaebol, or large-firm conglomerates (Song 1990; Amsden 1989). Tax incentives, import controls, access to finance, training subsidies, and export-promotion policies were used to build capacity in industries deemed to have export potential. Three eras can be identified: labor-intensive industries such as textiles and apparel in the 1960s and early 1970s; chemicals and heavy industries including automobiles, shipbuilding, petrochemical, machinery, and consumer electronics in the 1970s (Park 1990; Y. S. Lee 1988); and high-tech industries such as semiconductors since the 1980s.

Simultaneously, the Korean government addressed lopsided regional development patterns by exercising its command powers over the private sector. Early industrial policy disregarded spatial array, and thus activity concentrated in Seoul, creating congestion and pollution. Beginning in the late 1960s the government encouraged industries to locate outside of Seoul. Political concerns also favored decentralization since Seoul lies close to the northern border. In the 1970s the government aggressively seeded new industrial complexes outside the Seoul region, building each of them around one or more key industries. With the rise of high-tech activity in the 1980s the Korean Institute of Technology and other government research institutes were built near Taegon. In theory this strategy blended regional with industrial policies in a complementary way (Park 1990).

The Korean government used powerful instruments not unlike the command structures that built new industrial cities in China and the Soviet Union. The Local Industrial Development Law of 1970, the Free Export Zone Establishment Law of 1970, and the Industrial Distribution Law of 1977 all promoted industrial dispersion. Some firms were issued relocation orders—a number of small, polluting industries were forcibly ejected from Seoul to an industrial park in Ansan expressly for polluters (Choe and Song 1984). In other cases the government built the necessary infrastructure for new complexes and invited the chaebol to participate. In the early 1970s the chaebol were ordered by the military government to manufacture machinery for military purposes in Changwon (Markusen and Park 1993).

The strategy successfully created new industrial enclaves and slowed the growth of employment in Seoul. The traditional Korean industrial cities—Seoul, Pusan, and Taegon—remain the largest in the 1990s, but by the early 1980s their employment growth rates were below the national average, most conspicuously in Seoul (Republic of Korea 1981, 1984, 1986, 1987). Inchon, the satellite port of Seoul, continued to grow rapidly, but six other industrial cities experienced faster than average job growth over the past two decades (Markusen 1994b). Each has a specialization: Ulsan, chemicals and automobiles; Pohang, steel; Changwon, military and defense; Kumi, electronics and textiles; Ansan, polluting industries such as chemicals, soaps, dyes, and metal finishing; and Taegon, traditional manufacturing and high-tech, research-oriented activity.

Although locational directives and incentives successfully dispersed heavy industries like steel, automobiles, and chemicals from Seoul, they have been less successful
with high technology (Park 1991). Because Seoul has better schools and more corporate headquarters, business services, and government offices and institutes, firms outside the region are handicapped. Strong agglomeration economies anchor leading-edge activities to the Seoul area. The current emphasis on high-tech industry and government research and development is likely to enhance centripetal tendencies.

The industrial enclaves may not continue to grow. Their location separates them from major service and supplier functions in Seoul (although no city is more than five hours by car). Each consists of a collection of branch plants of major Korean and multinational corporations, and indigenous entrepreneurship and interindustry linkages are often lacking (Park and Markusen forthcoming). Most plants are linked with external parent firms, suppliers, and export markets but not with other units in the complex. Taejon may be best positioned because of its proximity to Seoul and its role as host of Taeduk Science Park and the Korea Institute of Technology. The auto-based complex at Ulsan also shows promise with good linkage potential and growth prospects since it serves both export and domestic markets. But Changwon and Kumi are specialized, landlocked districts. In Changwon military machinery plants were constructed far from Seoul's electronics and optical industries, which provide important inputs, and the automobile assembly industry around Ulsan, a growing market for Changwon. Some critics believe that Korea could more efficiently purchase its defense equipment abroad (Lee 1991). Korean textiles must move upscale to gain an edge over lower-cost Asian countries, but textile production in Kumi is separated from the design and fashion center in Seoul.

Nor do these new industrial cities represent an unqualified regional policy victory. One, Ansan, is close to Seoul; another, Taejon is in the middle of the country; and the other four are concentrated in the southeast. The southeast region was favored because it was the home of President Park and military leaders of the 1970s. The southwest, the poorest region in the country and the base of political opposition to the military government, received no industrial investment until after the military regime was displaced by the restoration of democracy in the late 1980s.

Growth and income differentials among regions are still large. Regional policy slowed the growth of industrial employment in the Seoul region after 1975, but only modestly (Republic of Korea 1963, 1975, 1984; M.W. Lee 1991). The Young Nam region increased its share of employment, but two other major regions—Choongchung and Honam—lost shares. By 1984 the Seoul region still accounted for 47 percent of the nation's manufacturing employment, down only 1 percent over the previous decade. The new industrial cities had little effect on regional employment shares—Young Nam, host of Pohang, Kumi, and Changwon, increased its employment share by only 3 percent over forty years.

The Korean government now plans two new sets of initiatives: the transfer of responsibility for economic development to the provinces and new investment in the southwest. Although local autonomy measures to be implemented in 1995 will increase local power and revenue, this power will still be less than that of the central government. Provincial governments will borrow to build infrastructure to attract firms to high-tech industrial parks. Of course, the provinces will lack the agglomeration economies of Seoul.
The Korean government also plans to construct three large industrial complexes on the southwest coast, two to manufacture and export automobiles to China (only a short distance by sea) and one heavy-industry complex. The government is also building a high-tech industrial park and a government institute of technology in Kwangju, the largest city in the southwest. Regional policy concerns impel these commitments, although the automobile complexes complement export-oriented industrial policy. The viability of a Kwangju high-tech complex is not clear, and its remoteness from Seoul may mean it will remain a disadvantaged enclave.

In Korea regional and industrial policies appear to have worked in concert during the early era of emphasis on heavy industries, but this was less the case once policy shifted to high-tech industries. The transfer of authority and revenue for economic development to the provincial level will disperse new infrastructure investments but may cause inefficient use of resources and high rates of failure without achieving the goals of regional policy.

Brazil: The Relative Failure of Regional Policy

Brazil spans much of South America and many climate zones, making economic integration difficult. Mineral extraction and cultivation of sugar in the colonial period left skewed patterns of land ownership and resource depletion that generated ongoing poverty and inequality. Poverty increased in areas such as the northeast, but robust growth and industrialization occurred in the triangle formed by the three largest cities of São Paulo, Rio de Janeiro, and Belo Horizonte.

Brazilian development policy after the 1930s shifted from an emphasis on primary exports to encouraging industry to substitute for imported goods. The business structure of Brazil at the time was more complex than that of Korea in a later period. While some key industries were publicly owned (especially minerals, metals, petrochemicals, and utilities), Brazilian development depended on the activities of private firms—both national and international. The government encouraged industrial development with far less force than in Korea. It provided infrastructure and subsidies and operated state-owned enterprises.

Through the early 1970s import-substitution policies favored the São Paulo area (Cano 1977). Entrepreneurs in coffee-related industries moved upstream into the production of machinery and downstream into processing. The state of São Paulo increased its share of the nation's industrial production from 16 percent in 1907 to 58 percent in 1970, at the expense of other regions (Diniz 1994). Not until later in the 1970s did marked differentials in costs and congestion begin to slow the growth of São Paulo (Diniz 1994; Cano 1985).

In the 1970s the Brazilian government invested heavily in resource-based and capital goods industries and simultaneously adopted regional initiatives to decentralize economic activity. Since the largest investments took place in state-run enterprises—steel, oil, petrochemicals, chlorochemicals, coal, mining, and paper—and because these industries were noxious and land-extensive, the state located these activities in outlying regions. It proved more difficult to entice private firms to outlying regions. A government effort to regulate decentralization failed in the mid-
1970s because of bureaucratic bungling, insufficient resources, and political pressures from interest groups in São Paulo. Turning to less intrusive methods, the government offered tax incentives through special agencies set up to encourage projects in the northeast, the north, and the city of Manaus. The government also invested in infrastructure to integrate the national economy and to lower business costs in peripheral regions (Diniz 1994).

Despite these efforts—one study estimates that 60 percent of gross capital formation in Brazil in the 1960s and 1970s was accounted for by investment in state companies and public infrastructure (Baer 1978)—regional decentralization of economic activity has been modest at best. Regions rich in natural resources fared best from direct government investment. For example, Espiritu Santu, a coastal state near the mineral-rich Minas Gerais, benefited from investments in iron ore and steel for export, and Manaus grew explosively with the development of Amazonia.

But incentives to attract industry to resource-poor regions have been disappointing (Cavalcanti 1981; Guimaraes-Neto 1986). The northeast, a highly visible target area, increased its share of industrial production from 5.7 percent to 8.7 percent between 1970 and 1989; most of the growth occurred in Bahia, around the publicly built petrochemical pole of Camacari. Incentives available within the more prosperous states, such as São Paulo, counteracted national subsidies.

While investments in communications and highway infrastructure integrated the national economy, they had perverse effects. Companies in and around São Paulo achieved greater economies of scale by reaching distant markets. Some plants formerly serving isolated regional markets closed because they could no longer compete with national firms in São Paulo (Diniz and Razavi 1993).

São Paulo metropolitan and state shares of population and industrial output have declined since 1970. Some people have welcomed this decline as evidence of rising costs in São Paulo and the efficacy of regional policy (Townroe and Keen 1984; Richardson 1980). But Azzoni (1986), Storper (1991), and Diniz (1994) point to robust growth in metropolitan centers within a São Paulo “agglomerative field” of 150 kilometers. Areas outside of the São Paulo metropolitan area but within the state increased their share of national production from 14 percent to 20 percent since 1970. Diniz (1994) demonstrates that most new economic activity has located within a polygon defined by Belo Horizonte, Uberlandia, Londrina-Maringa, Porto Alegre, Florianópolis, and São Jose dos Campos, all arrayed around São Paulo. This region increased its share of national industrial production from 32 percent to 45 percent between 1970 and 1990, more than compensating for São Paulo’s loss of share. Diniz argues that state government resources for infrastructure and incentives furthered this growth and that national market integration and concentration of purchasing power around São Paulo anchored industry within the polygon.

Other municipalities also posted higher than average growth rates over the past twenty years, exceeding those of São Paulo and Rio de Janeiro (Diniz 1994). Resource-related industries (metals, fertilizer, cement, agroindustry), which still account for more than one-third of industrial production in Brazil and have been targeted by government programs over the postwar period, explain growth in
some of these municipalities. Some (Salvador, Manaus) owe their prosperity to government investments and incentive programs, and others (Porto Alegre, Caxias, Blumenau) to a tradition of diversified agriculture, crafts, and industry (Diniz 1994).

Diniz and Razavi (1993) and Storper (1991) argue that diseconomies associated with higher land, labor, and congestion costs have created pressure for decentralization, but that unless agglomeration economies are achievable elsewhere, decentralization will not occur. In their view, the government—at both national and state levels—has been essential in creating minimal conditions for new growth poles. The cities of Campinas and São Jose dos Campos, for instance, experienced employment growth of 127 and 187 percent between 1970 and 1985. Each received major public investment. Campinas received UNICAMP, the top research university in Brazil; the research and development facility of the national telecommunications company, Telebras; and the Central Foundation for Information Technology. São Jose dos Campos hosts the Aeronautical Technical Center and its five research and teaching institutes, the Institute for Space Research, and EMBRAER, Brazil’s public-private joint venture in aircraft. Spinoff businesses generated new growth, and accumulated labor pools and infrastructure proved attractive to foreign and national capital. Although these agglomerations are close enough to enjoy many of the benefits of São Paulo, they are criticized for being overly specialized, vulnerable to downturns, and prone to rather rigid strategies with respect to technological and market potential (Diniz and Razavi 1993; Granovetter 1985).

Industrial policy in Brazil from the 1930s through the 1970s concentrated economic activity in the São Paulo area. Beginning in the 1970s investments in heavy, high-tech, and resource-related industry decentralized activity somewhat. However, four factors diminished the effectiveness of regional policy. First, subsidies and incentives proved to be relatively weak tools. Second, infrastructure investments to integrate the national economy allowed core-area plants to expand their markets and outcompete smaller regional plants. Third, prosperous states such as São Paulo counteracted national commitments to decentralization. Finally, public investments in education, research institutes, and high-tech industries continued in the state of São Paulo, ensuring a concentration of leading-edge economic activity in the dominant region.

Regional decentralization in the 1990s may be slowing as agglomeration economies increase. National industrial policy is increasingly export-oriented, with an emphasis on high-tech sectors like aeronautics, electronics, and information technology. Although knowledge-intensive industries create what Storper (1991) calls “windows of locational opportunity,” their requirements for skilled labor and specialized business services often tie them to large urban centers. Government investment in universities, research institutes, and industries such as aerospace and telecommunications have overwhelmingly favored core metropolitan areas (Haddad 1989). In addition, slow growth, budget shortfalls, and the debt crisis that began in the 1980s have cut deeply into private sector investment and public funds for infrastructure, incentives, and state investments. These may be reversed under the
new administration. Finally, a reliance on foreign capital for new investment has favored better-known cities and regions (Schoenberger 1985).

Democratization has also weakened central government resolve in regional policy. The influence of elites from São Paulo has grown, making the dispersion of new industrial complexes less likely. The system of municipal taxation currently under discussion would shift power even more decisively to the states. Leaders of São Paulo state in particular argue for retention of a greater share of the taxes their citizens pay.

Brazil's integration into the Latin American and world economies will also affect the future compatibility of industrial and regional policy. The Mercosul proposal for an integrated market in the southern cone favors the neighboring São Paulo polygon. Export-oriented growth favors resource-rich regions, port cities, and urban concentrations with comparative advantages in key industries. If income distribution does not improve, the market advantages of locating in the polygon will persist. Furthermore, under current liberalization policies, protected markets will face stiffer competition and some will fail. To the extent that weak firms are located in outlying regions, their demise will increase concentration.

Japan: Dominance of Industrial over Regional Policy

Industrial policy in Japan since World War II has pursued export strength in automobiles, electronics, and other high-income-elasticity commodities (Howes and Markusen 1994). As in Korea the central government worked with large corporations and mobilized considerable financial resources to provide incentives, import protection, and public infrastructure to encourage exports. Also like Korea, Japan is poor in natural resources and found a comparative advantage in industry beginning with textiles, apparel, and toys, later moving into steel, chemicals, and automobiles, and then into consumer electronics, semiconductors, and other sophisticated equipment.3

After the war Japan reconstructed industry at prewar sites: Tokyo, Yokohama, Nagoya, Osaka, Kobe, and Hiroshima. In the 1950s steel, oil, and petrochemical plants were added on the outskirts of these regions. Industrial policy sought economies of scale in plant size and start-up costs. Industries concentrated in the axis between Tokyo and Osaka drew immigrants from surrounding regions (Kitayama 1993; Friedman 1988). By the end of the 1950s political, financial, educational, cultural, administrative, and industrial functions were centered in Tokyo.

This centripetal pattern continued. The population of the three largest metropolitan areas—Tokyo, Osaka, and Nagoya—increased by more than 11 million during the 1960s, while the total population in the other nine regions of the country fell. Net migration slowed in the 1970s, but by 1985 more than half the nation's population lived in these agglomerations. The Tokyo area accounted for most of this growth, adding 17 million people in just thirty-five years (Tsuya and Kuroda 1989). The greater Tokyo region still grows disproportionately even in manufacturing, and regional income disparities worsened in the 1980s (Takeuchi 1991; Abe and Alden 1988).
Criticism has come from outlying regions. The National Income Doubling Plan of 1960 targeted sites within the corridor between Osaka, Nagoya, and Tokyo for new and relocated plants. The Liberal Democratic Party, with representation from rural advocates and local governments, protested. The subsequent National Development Plan of 1962 addressed regional imbalances. Fifteen new industrial cities, built around heavy industry, were designed to become growth poles. Revenue sharing with local governments and the public provision of infrastructure encouraged firms to locate in these cities (Kitayama 1993).

Tokyo remained dominant, but per capita income differentials diminished. In 1955 twenty-five prefectures (or districts) had average per capita incomes of less than one-half that of Tokyo; by 1975 only four districts did (Igarashi 1991, cited in Kitayama 1993). But the peripheral industrial complexes depended on imported oil and raw materials and were hit by the oil crisis of the early 1970s. Asian competition in everything from textiles to shipbuilding challenged the mature industries in these complexes. New research- and design-intensive industries developed around Tokyo. By 1980 the number of prefectures with per capita income lagging Tokyo by more than 50 percent had again risen to twelve.

In the early 1980s, to counteract this widening gap, the Ministry of International Trade and Industry planned technopolises in dispersed locations (Tatsuno 1986; Morris-Suzuki 1991). Like Silicon Valley and Research Triangle Park in the United States, these growth centers of high-tech activities in production and research were to take pressure off of Tokyo, where land prices and congestion costs were soaring. Planners hoped to improve local human capital and to transfer technology to indigenous firms. In a process reminiscent of the new industrial cities effort twenty years earlier, politics expanded the number of cities designated by the ministry from the one or two first envisioned to a dozen and then to twenty-six. The central government ultimately awarded a technopolis designation to virtually every city with a population of more than 150,000 (Glasmeier 1988).

Unlike the earlier effort, responsibility for the development of these cities rested with local governments (Stohr 1985). The central government contributed principally with tax incentives to attract firms to the technopolises. Some analysts believe that the ministry intentionally leveraged local public sector resources by creating competition among prefectures, similar to that between U.S. states and localities (Glasmeier 1988). Many prefectural governments responded to the challenge by creating full-scale economic development organizations and borrowing heavily to provide infrastructure and develop land.

Results to date are disappointing (Markusen, Sasaki, and Funaba 1995; Sasaki 1991; Morris-Suzuki 1991). Some technopolises have barely gotten off the ground. Others are drawing economic activity from city centers to suburbs (Higashi-Hiroshima). Some attracted branch plants of large corporations, but largely in routine production rather than leading-edge research with growth potential (Markusen and Sasaki 1995). A few have built new industrial concentrations with indigenous businesses and entrepreneurship (Masser 1990; Tatsuno 1986). But cities not awarded technopolis status have restructured based on small- and medium-size businesses (Sasaki 1989; Kitayama 1993).
Some companies that might have left Japan altogether, however, did not. Companies that considered offshore sites for the manufacture of integrated circuits in the 1980s found in the technopolises—temporarily at least—alternatives to the high-cost Tokyo region (Fujita 1991; Sasaki 1991). The policy also spread the burden of infrastructure creation from central to local government (Glasmeier 1988). And because technopolises are located principally in suburbs, the strategy furthers national goals to expand domestic demand by increasing housing and automobile consumption (Markusen, Sasaki, and Funaba 1995).

Still, Tokyo dominates. Through the 1980s the greater Tokyo region generated a disproportionate share of new employment. Japan’s fastest-growing industrial cities are concentrated in the corridor from Osaka to Tokyo (Funaba 1993). And new plants in the technopolises closest to Tokyo have grown faster than those farther away (Stohr and Ponighaus 1992).

Several causes explain the weak impact of Japanese regional policies. First, resources have been insufficient. Unlike Korea, Japan has not built and operated dispersed industrial complexes nor forced companies to locate in them (Glickman 1979; Samuels 1983). Second, both major efforts were diminished because politics spread resources thinly over too many areas. Third, the government sent mixed messages to the private sector. The construction of Tsukuba Science City close to Tokyo eliminated the possibility of a stand-alone research growth pole like the U.S. Silicon Valley (Takeuchi 1991). By the end of the 1980s Tsukuba hosted forty-six national research organizations (32 percent of the national total), accounted for 45 percent of the national research budget, and had attracted a sizable share of corporate research and development labs (Sasaki 1991). Thus public, quasi-public, and private research and development organizations remain concentrated in the greater Tokyo region (Toda 1987).

Furthermore, the Japanese government also sought to establish Tokyo as a cosmopolitan city in the 1980s, with investments and regulations centering financial, cultural, and political functions in Tokyo. This showcasing of Tokyo hampered other cities from competing for international business and financial services (Kano 1991).

Finally, the efficiency concerns of industrial policy have dominated public investment allocation. The current commitment to high technology, emphasizing innovation and human capital, is hardly compatible with decentralization. The lack of resources for regional development may reflect a government belief that dispersal would reduce the efficiency and performance of Japanese industry, and Japanese companies appear to agree based on their decisions to locate. Mera (1986) found central government investment to be geographically correlated with private sector investment, with only a slight bias toward spatial redistribution over much of the postwar period.

Despite these centripetal forces economic activity in Japan may disperse somewhat over the next few decades. Congestion and costs have increased in Tokyo, and communications technologies may reduce the need for face-to-face business and eliminate the handicap of firms in the provinces. Whether this will encourage the growth of suburbs around urban areas, as in the past two decades, or spur growth by more distant Japanese cities remains to be seen.
The United States: Informal Industrial Policy as Regional Policy

The United States has had little formal industrial or regional policy and might at first glance be considered a test case of the distribution resulting from private forces. In the United States diseconomies of scale appear to have reversed centripetal forces. Over the past several decades economic activity has shifted away from the major industrial regions—the bipolar manufacturing belt stretched around New York and Chicago—toward the south and west. Los Angeles has overtaken Chicago as the nation's "second city," and by 1990 metropolitan employment in Los Angeles exceeded that of New York (Markusen and Gwiasda 1994). Large cities lost ground to medium-size cities. Of the thirty-six metropolitan areas that added manufacturing employment at rates of 50 percent or more between 1970 and 1990, only two were in the old industrial belt. Since the late nineteenth century, moreover, regional per capita income differentials have diminished dramatically as southern incomes have risen and midwestern incomes have fallen toward the national norm (Markusen 1987).

But the United States has practiced both regional and industrial policy under different names, and these policies have affected the spatial distribution of economic activity, helping to create the fluid, multipolar system that now exists. Formal regional policy has promoted industry in underdeveloped but populated regions with exhausted mining or agricultural resources. The New Deal of the 1930s developed river basins, such as the Tennessee River Authority experiment, combining resource management (flood control and soil conservation) with power development to create conditions for industrialization. In the 1960s area redevelopment programs, such as the Appalachian Regional Commission effort, invested in infrastructure and human resources to create urban growth poles. Recent evaluations found the efforts of both the 1930s and the 1960s to be successful (Isserman and Rephann 1993; Gray and Johnson 1991).

More important, informal regional policy embedded in the U.S. federal structure has helped to disperse national development resources (Markusen 1990, 1994a; Friedmann and Bloch 1990). First, Congress allocates resources for infrastructure and other public investments, and representation is strongly territorialized. Regional caucuses work together for their states and regions, regardless of party distinction. Some have spun off research institutes such as the Northeast-Midwest Institute. Congressional committees distribute funds for highways, education, public works, urban and rural development, and defense installations and contracts, preempting the functions of a central regional planning bureaucracy.

Second, state and local governments have the responsibility and tax power to be active agents for economic development. Local groups with a stake in the regional economy levy demands on the national government through congressional representatives and mobilize local resources for infrastructure, business incentives, and human capital development. As cities and regions compete for business, increased resources are devoted to these efforts, redistributing resources from local taxpayers to business investment and income, potentially resulting in excess capacity.
The urban hierarchy remains flatter in the United States than in other countries because major urban functions are not concentrated in a single primate city but are distributed among several of the largest cities. New York is the financial capital of the country; Washington, D.C., the political capital; Chicago, the industrial capital; Boston, the educational capital; Los Angeles, the military industrial capital; and San Jose, the high-tech capital. New York is thus not a global city in the same sense that Tokyo or London is (Markusen and Gwiasda 1994). The decentralization of major urban functions in this national system of cities has contributed significantly to amelioration of regional income differentials, but it may also be inefficient in an increasingly integrated world economy.

Competition among urban areas also offers would-be entrepreneurs and youthful industries a choice among locations. When large monopolies or oligopolies encumber the resource markets of urban agglomerations, other sites are available. Pittsburgh and Detroit declined because their steel and auto companies dominated regional business culture, wages, labor practices, land-use patterns, and the supply of capital for small business. This repelled new, diversified business activity (Chinitz 1960; Markusen 1985).

The informal regional policy in the United States may have enhanced efficiency, offered extraordinarily good channels for democratic participation, and shifted economic activity to peripheral regions. It has not, however, facilitated long-term regional planning or interregional equity (Markusen 1994a).

Informal industrial policy has been a more powerful regional developer in the postwar United States. Since World War II the U.S. government has devoted 5 to 7 percent of gross national product (GNP) to military preparedness. The cold war shifted priorities toward a set of capabilities—airborne, nuclear, automated, remote control—that nurtured the aircraft, communications, computing, and electronics industries (Markusen 1991b). Preparedness policy, organized in the Pentagon, encompassed every aspect of industrial policy as practiced in Japan and Europe: research and development commitments, long-term procurement contracts, investment guarantees, and bailouts for failing corporations (Markusen 1986).

Although the policy was undoubtedly inefficient, it created top-performing export industries. Sectors like computers and semiconductors depended on federal dollars for research and development support through the late 1950s, and government sales made up more than 70 percent of their revenues, though commercial sales later dwarfed military sales. Others, such as aircraft and communications equipment, depend on the public sector for more than half their sales, as well for the lion's share of their research and development funds (Markusen and Yudken 1992).

For complex reasons, these high peacetime military commitments encouraged a dramatic spatial restructuring of U.S. industry. First, the military-industrial capacity initiated during World War II expanded with aircraft and missile production during the cold war. Fears of vulnerability to long-range bombers brought military production to interior cities like Wichita, St. Louis, Dallas, and Fort Collins both during the war and through the 1950s. Second, military officers responsible for siting military installations and awarding contracts had discretionary power to favor cities and
regions. The Air Force, for example, has favored the west. Third, local business
groups, especially from California and other parts of the west, lobbied successfully
to obtain a disproportionate share of military plants, bases, and contracts. The
mature manufacturing belt—the nation's military outfitter for tanks, trucks, guns,
ordinance, and ammunition—lost share. The outstanding exception is New
England, whose decline in traditional industries began in the 1950s. New England
successfully reoriented existing capacity to serve the cold war (Markusen 1991a;
Markusen and others 1991).

The "gunbelt" rose, to some extent, because the business culture in the industrial
heartland was dedicated to commercial markets and antagonistic to government
oversight, repelling cold war–related military industrial activity. Furthermore, when
military contracts shifted toward the gunbelt in the 1950s after the Korean war,
industrial belt firms enjoyed vigorous demand both from pent-up consumers savings
and from Japan and Europe for industrial goods to be used in reconstruction
(Markusen and others 1991).

The informal industrial policy practiced by the Pentagon thus acted as a power-
ful regional policy, revitalizing New England and shifting population and manufac-
turing activity toward the south and west. Social goals showed mixed results. First,
regional differentials in per capita income narrowed as high-wage employment came
to enclaves in the south and southwest, and incomes in the industrial belt fell.
However, the west, the mountain states, and New England continued to enjoy per
capita incomes about 20 percent above the national average (Markusen and others
1991). Furthermore, prosperity from military-industrial activity in the south and
southwest concentrated in enclaves (Huntsville, Titusville-Melbourne, Colorado
Springs, and Albuquerque), doing little for the vast regions of rural poverty in those
states (Glickman and Glaebe 1989).

Second, military industrial expenditures helped to seed new government-oriented
industrial complexes removed from the heartland region, where business cultures
and practices had been shaped by oligopolistic Fordism. As a result, places like Los
Angeles, Colorado Springs, Orange County, Seattle, and Silicon Valley remain highly
dependent on defense spending, although Seattle and Silicon Valley have sprouted
commercial businesses from military industries that are higher-tech, more flexible,
and better positioned on the international market. What would have happened in
the absence of cold war spending is unclear, but at least two caveats apply. High-tech
industries in European countries did not require spatial separation from older indus-
tries for success. And the spatial separation of high-tech industries from older com-
mercial sectors leaves both regions more vulnerable to political and business cycles.

Third, the buildup of the gunbelt created an internal brain drain from industrial
states with better educational systems to outlying areas (Ellis, Barff, and Markusen
1993; Campbell 1993). The regions of exit, like Chicago, Boston, and New York, suf-
fere the loss of technical labor and innovative capacity (Markusen and McCurdy
1988). Moreover, the separation of scientists and engineers in military centers from
their business counterparts reduced cross-fertilization (Markusen and Yudken 1992).

For the nation as a whole, scarce resources were used on infrastructure in new
centers, while infrastructure in some older industrial cities was underutilized.
Other public investments forgone because of military spending could have enhanced private sector productivity. Furthermore, the regional bias in defense expenditures created constituencies determined to maintain military-industrial complexes and high levels of expenditure even though the cold war is over (Markusen and others 1991).

Conclusion

Industrial policy has shown compatibility with regional policy in the four countries under review, though this is less the case for innovation-intensive export sectors. In the 1960s and 1970s Brazil, Korea, and Japan invested in smaller cities and underdeveloped regions when possible. Most successful were industries based on resources and traditional manufactured goods for either the domestic or export market. In the United States military strategy replaced formal industrial and regional policy, encouraging the development of high-tech enclaves remote from existing industrial regions.

Regional policy achievements of the 1960s and 1970s were modest in all countries but the United States. The dominant national cities of São Paulo, Seoul, and Tokyo essentially maintained their shares of employment and industrial output. In each country, however, a number of smaller industrial cities—typically beneficiaries of industrial and regional policy efforts—have grown faster than the dominant national cities. But many of these smaller cities are close to the dominant city. And in each country many outlying regions remain well below national standards of per capita income, though the gaps diminished in all four countries and regional growth rate differentials lessened. Urban hierarchies flattened somewhat, offering more options to firms searching for locations.

Over the past fifteen years, tensions have increased between industrial and regional policy efforts in all four countries. World markets have integrated, world economic growth has slowed, and government resources have diminished. Trade integration has both heightened the tendency toward larger within-nation growth differentials and prompted increased specialization (Markusen, Noponen, and Driessen 1991; Howes and Markusen 1994). All four nations have turned to high-tech industrial policies. Because high-tech industries are youthful, reliant on external services, and subject to rapid rates of innovation, they tend to locate in the major centers of innovation and diversified economic activity where agglomeration economies can be realized (Markusen, Hall, and Glasmieier 1986). Government investments are reinforcing this tendency, and per capita income gaps between regions are widening.

As the tension between industrial and regional policies grows, governments have favored industrial policy and have increasingly left responsibility for development with local and provincial governments. This is the case in all four countries. Although some localities and regions will succeed and economic activity will disperse, the more well-endowed regions and those closer to national core regions are likely to be the most successful.

Decentralized regional policy may be more efficient in determining industrial location. It is not easy for central governments to gauge scale and agglomeration
economies or diseconomies as they try to balance regional and industrial policies. Letting provincial and local governments deploy infrastructure and incentives creates a quasi market, but the efficiency gains may be only short term. Central government commitment to building detached complexes—taking into account optimal complex size, interindustry economies, and public infrastructure utilization rates—is a more far-sighted policy. Substituting decentralization for centrally designed regional policy is apt to neglect equity goals as uneven development occurs.

Continued reliance on high-tech industrial policy and decentralized regional economic development appears inevitable, however, as long as slower growth, fiscal constraints, and pressure for public sector austerity restrict available resources. Brazil is the only country poised for a resurgence of growth. Nonetheless, for political and economic reasons regional policy remains a legitimate sphere of action for central government in all four countries. Politically strong democratic institutions demand regional inclusiveness. Equity and long-term efficiency considerations argue for a dispersed and robust system of cities. Policies that stabilize communities are also important. Bolton (1988) finds welfare and efficiency gains from respecting a "sense of place," which he argues is an economic asset. Yet as world market integration proceeds, all cities and regions must specialize and trade to maintain employment and grow (Howes and Markusen 1993). Major shake-ups in national urban systems and regional fortunes may generate new pressures for centrally designed regional policies.

Improving regional equity while minimizing costs to industrial policies will be the challenge for regional policy. Success will require more research on agglomeration economies disaggregated by sector. Empirical attempts to determine optimal city size have failed by operating on too aggregate a scale. Good policy requires knowledge of the number of national automobile (or computer or aircraft) plants the world market can support. Planners should take into account the degree to which capacity can be decentralized in each industry without sacrificing efficiency.

Notes

1. An empirical test of this proposition failed to confirm that coastal cities in the United States benefited disproportionately from heightened international trade activity (Noonen, Driessen, and Markusen 1995).

2. This is also true in the European case, not discussed in this article. See Bachtler and Michie (1993); Peschel (1992); and Vanhove and Klassen (1987).

3. For the debate on the efficacy of Japanese industrial policy, see Friedman (1988), Johnson (1982), and Samuels (1987).

4. A number of scholars have argued that large cities are efficient (Alonso 1991; Mera 1977), but few sector-specific studies have been done to assess the significance of agglomeration economies.

References


296 Interaction between Regional and Industrial Policies: Evidence from Four Countries


