The New Production-Sharing Networks

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Production sharing is a strategy for conducting industrial operations in which certain procurement and manufacturing processes are restructured and shared, with firms in a developed country furnishing capital and technology-intensive components, while firms in a developing country furnish labor-intensive energy and other services. Such production-sharing partnerships achieve a variety of strategic benefits, including more flexible manufacturing and lower total costs – typically by 10 to 20 percent.

Since the early 1970s, as competition has intensified across national boundaries, many firms in the United States and other industrialized nations have recognized that the only way they can stay competitive is by transferring abroad some or all of their manufacturing, while continuing to manage the marketing of their products. Some firms have engaged in „offshore manufacture," transferring their production facilities abroad. Others have moved into a „sourcing abroad" mode in which foreign subcontractors have taken over their manufacturing entirely.

This response to competitive pressure has raised many issues. In the United States, for example, critics have worried that the country's industrial base is being „hollowed out" by low-wage countries. Some have argued for increased protectionism – either open, as in higher tariffs, or managed, as in „trade arrangements" intended to combat real or suspected subsidies on the part of developing countries. At the other extreme, defenders of the current approach have sometimes proposed that the industrialized nations accept a „post-industrial" way of life in which they retain only knowledge-based, high-tech industries, while allowing mature ones to migrate to the developing world.

The road to competitive failure is paved with such visceral reactions and over-simplifications. Fortunately, the leading industrial nations have embraced rather than stifled the advent of globalization. In the process, they have developed production sharing, a pragmatic and effective response to the foregoing issues. In this strategy, a firm becomes a carefully designed international network of operations. Rather than simply getting out of manufacturing or transferring its production capabilities abroad, the firm preserves, typically within its country of origin, the engineering and manufacture of key components, while operating in developing countries those parts of its procurement and manufacture that require lower-cost, labor-intensive, and highly flexible processes.

Normally, in this sharing of operations between home and developing countries, the firm *manages* the entire network, whether it owns outright all the facilities involved or subcontracts some volume to manufacturing partners who provide input under the day-to-day management of the firm. Thus, under production sharing, the firm makes the best possible use of the relative advantages of developed and developing countries in order to advance its own competitiveness.

Production sharing normally involves assembly abroad for export to home markets and, increasingly, to foreign markets; partial manufacture and finishing of components; and sourcing from offshore subcontractors who provide inputs and operate as parts of the firm's network. In recent years, production-sharing networks operating in developing countries that also represent large potential markets have expanded their activities to include distribution, again through owned or subcontracted facilities. As a result, firms that initially used developing countries merely as assembly points now use them as locations from which to export components and finished products back to the firms' home countries and to the world, as well as selling them in the developing countries' own growing markets.

Benefits to the Developed-Country Firm

Production sharing offers substantial benefits to the firms that practice it. In most cases, firms benefit from production sharing in the following ways:

Lower Cost of Labor. Wages in developing regions can be as low as $1 an hour. A manufacturer who has to pay $20 or more per hour to semiskilled workers in finishing or assembly processes is at a distinct disadvantage in the global economy.

Flexible Labor. Many firms have undertaken production sharing not only to avoid high labor costs, but, more importantly, because their workers were reluctant – despite ample rewards – to work overtime and weekends as needed to meet competitive pressures. Such flexibility is essential to coping with acute fluctuations in increasingly competitive international markets.

Flexible Manufacturing. Today's niche markets – both local and global – demand specialized products with highly differentiated configurations, frequent changes in product design, and short manufacturing runs. Short runs and highly variable product specifications create all manner of additional costs, which must be offset by lower-cost, flexible manufacturing.

High Service Levels. In many industries, the competitive demand for excellent service translates into rising levels of costly repairs, exchanges, and reworking. Again, these increments in cost must be offset by a highly cooperative, flexible labor force at relatively low wages.

Subcontractor Partnerships. Many firms need suppliers that can be managed virtually as part of the firm's network, without being owned by the firm. Frequently, this kind of partnership is more acceptable to subcontractors in the developing world than to those in the home country.

Other Cost Advantages. The costs of energy, some raw materials, and industrial services are often lower in developing countries than in developed ones. While these factors vary in importance from one product to another, they tend to be a significant source of benefit.

Benefits to the Developing Country Partners

From the point of view of the participants in developing countries, production sharing has become a major enhancement of international trade and a new avenue toward economic development. Production sharing – and the partnering networks to which it can lead – affords, at least for some developing countries, a means of joining the inexorable process of globalization in a modern way.

While production sharing is not a substitute for the traditional forms of trade and development, it certainly can be a powerful enhancement to development strategies that seem worn out – such as exporting raw materials to industries that use commodities in ever-declining amounts, or relying only on direct foreign investment aimed at serving self-contained domestic markets in a world that is rapidly becoming a global village. Furthermore, traditional, narrowly defined offshore operations are not likely to be as efficient, in terms of either technology transfer or economics, as international networks that deploy the competitive advantages generated by each link in the chain. Finally, it is worth noting that production-sharing networks generate export earnings and represent a short investment-and-harvest cycle, in contrast to relying on huge amounts of debt to finance mammoth projects that may produce visible benefit at best in the very long term.

Production Sharing in Action

Following are four examples of various ways that the production-sharing strategy works.

Flexible Manufacturers, Shared Profits. A U.S. manufacturer of structures for earth-moving and vehicle-carrying equipment found itself losing key accounts because it couldn't respond quickly enough to frequently changing product specifications. The firm solved the problem by splitting the manufacturing process so that engineering and component sourcing and fabrication remained in the United States, while welding and cutting were transferred to a Mexican plant. The latter was established as a joint venture with a local operator, under a profit-sharing scheme dependent on value added, overall cost reduction, and timeliness. The venture has successfully allowed the manufacturer to provide the wide range of product specifications that the market requires.

Shorter Lots, Broader Distribution. A German garment manufacturer began encountering lower-cost Turkish competitors in the European market. The German firm thought it would have to retrench into an upscale product line or watch its margins shrink. Rather than face this choice, the firm set up its own production-sharing operation in Turkey, expanded into garments that required very short lots, and went on to become the distributor in Europe of several Turkish manufacturers. The latter were able to stabilize their sales in Europe by using the German firm, which understood both Europe and Turkey, to sell more effectively than they would have with their own sales forces.

Retained Design, Exported Production. A Japanese manufacturer of ornamental pottery and ceramics originally performed all operations in Japan. In a first stage of production sharing, the firm retained artistic design and molding in Japan and transferred hand-painting and finishing to Taiwan. In a second stage, after considerable growth, new design offices and hand-painting facilities were established on the U.S.-Mexico border, using new types of raw material brought in from Mexico, the United Kingdom, and the United States, and employing Japanese molds and a U.S. sales force. Thanks to this firm's design sourcing and cost advantages, it has increased its global market share almost every year.

Cost Advantages, New Markets. A U.S. manufacturer of plumbing valves, pressured by lower-cost imports from Asia and Europe, transferred to Mexico a labor-intensive (but not unskilled) foundry operation in which U.S. as well as Mexican inputs are combined. The firm has achieved a lower cost structure while continuing to operate in tandem its two-nation network. In fact, some of its U.S. plants might have been shut down had it not been for the competitive edge gained through Mexican production sharing. Its increasing binational skills have also allowed the firm to establish a new distribution arrangement for another product's sales in the Mexican market.

Key Issues – and Opportunities

The production-sharing strategy is not without pitfalls. Several thousand U.S., Japanese, and European firms have been successful at production sharing, while several hundred others have attempted it and withdrawn. For many U.S. manufacturers who relied on simply „offshore sourcing" in East Asia, rather than more enduring manufacturing partnerships, the short-term move proved a blind alley. As time passed, their subcontractors – removed geographically and managerially – became competitors, and what had been a practical source of supply became new low-cost competitors in the U.S. market. Production sharing is worthwhile but not easy.

The transformation from a domestic company to a manufacturing and distribution network operating across national boundaries represents profound change. Management has to assess the complexity of that change and weigh its feasibility in order to translate the benefits into a real and durable competitive edge. Can the firm cope with the international logistics involved? Can the organization absorb new senior managers and partners of very different cultures? Can the firm's information and control systems deal with the new operational requirements? How will the firm ensure that additions to its labor force and new sources of supply maintain high levels of productivity and competitiveness?

It is important to understand the establishment of an initial production-sharing activity as a first and very major step in the process of evolving from an integrated domestic firm to a more competitive and flexible international network. It is most useful to visualize and explore from the outset the new strategic options that may be available after a first move into production sharing. For instance, a lower cost position may mean the ability to retrieve a position in products previously abandoned or to gain business in new market segments. Also, partnering in production sharing may also lead to selling in new markets in the partner's country or elsewhere.

The Outlook for Production Sharing

We expect production-sharing arrangements to proliferate rapidly in the next decade. Forces driving this growth are not only competitive but demographic. In the United States, Japan, Germany, and other industrial nations, the population structure is changing. The number of middle-aged and senior people is rising much faster than the number of young adults. Furthermore, in the United States, the proliferation of small-to-medium-sized firms and of service industries has meant that the number of jobs is growing faster than the supply of workers to fill them. Between 1966 and 1986, the working population between 16 and 65 years of age grew by more than 37 percent, while new jobs grew by about 45 percent. This combination of forces tends to steadily increase the cost of labor, ultimately placing a manufacturer at a disadvantage when facing new global competitors. Fore-sighted manufacturing firms in Japan, the United States, and Europe will continue to expand both the number and the sophistication of production-sharing arrangements.

Japan. Japan still leads in the use of production sharing as a major means of fueling its world trade networks. It is estimated that more than 30 percent of all Japanese manufacturers operate some sort of production-sharing arrangement in developing countries, a figure no other industrialized country even comes close to matching. Concerned by domestic labor demands and worried by international pressure to liberalize the home market, the Japanese will probably continue making heavy investments in production sharing throughout the 1990s.

We expect that Japan will diversify its partnerships, resorting more to countries such as Malaysia, the Philippines, and Mexico. While it will not exclude such current partners as Taiwan, Hong Kong, and Singapore, it is likely to make more selective use of them in the future.

From the outset, Japanese production-sharing arrangements, unlike those in the United States, have exported the products of overseas facilities to world markets rather than to the domestic market. For example, Japanese investment in production-sharing plants in Mexico – known on both sides of the U.S.-Mexico border as *maquiladoras* – is accelerating rapidly. In fact, the border region between San Diego and Mexico's Baja California is fast evolving into a huge Japanese-driven production-sharing zone. Components shipped in by sea from Japan and overland from Japanese factories in California are used in products for export to U.S. and world markets. This basic strategy can be expected to continue.

In establishing *maquiladoras,* Japanese firms not only take advantage of Mexico's plentiful labor and lower energy costs, but obtain greater penetration of the U.S. market, thanks to tariff provisions between the United States and Mexico. Furthermore, products from Japanese *maquiladoras* in Mexico are not counted in the United States-Japan trade balance.

The United States. While we anticipate a growing number of arrangements involving Caribbean and Central American countries, the great majority of U.S. production-sharing arrangements straddle the U.S.-Mexican border. Production sharing between the United States and Mexico continues to grow more than 15 percent per year, with 30 new plants established every month. While most of this growth remains along the border belt, there is increasing activity in the more industrialized regions of northern and central Mexico. U.S. border states, especially Texas, compete with the Mexican government and private-sector organizations in promoting develop-

ment of their respective economies by means of supplying and servicing the burgeoning production-sharing belt.

This extraordinary growth is being driven both by Japanese interest and by the opening of the Mexican economy to international competition fostered by President Carlos Salinas de Gortari. A key provision of this opening is that *maquiladora* plants can now sell as much as half their output in the Mexican domestic market. In addition, Mexican suppliers to the *maquiladora* industry will be stimulated by government promotional programs that count their sales to *maquiladoras* as direct exports. We expect incentives of this kind to spur both further growth and increasing industrial integration between the two countries through production-sharing networks.

The U.S.-Mexico region offers enormous untapped opportunity. Only a fraction of U.S. exporters have taken advantage of the Mexican partnership; indeed, only a few hundred medium-sized firms, of the type that need the arrangement most, have entered production sharing. On the Mexican side, the situation is similar: Only a handful of Mexican firms have exploited the opportunity to become production-sharing subcontractors to international networks – perhaps because most Mexican firms have only recently begun to surmount their traditional orientation toward a protected domestic market. In addition, the potential of production sharing as a market for Mexican suppliers of components and services remains a huge field of opportunity for Mexico.

The European Community. Production sharing on the part of the European Community (EC) is accelerating and offers a very large potential. In 1978, EC production-sharing volume amounted to only $250 million, of which two-thirds was accounted for by arrangements between West Germany or France and a few developing-country partners, principally Algeria, Hong Kong, Malaysia, Singapore, Taiwan, and Tunisia. Initially, the trend toward production sharing was slowed by several factors, including the complexity of the EC tariff structure and the practice of importing foreign laborers from Algeria, Spain, Turkey, and other nations. However, by 1987, production sharing in the EC had grown to more than $4 billion, of which almost half came from operations between Western and Eastern Europe, particularly Hungary, Poland, Romania, and Yugoslavia. Products for which production sharing is most common are textiles and apparel, footwear, furniture, and certain automotive components.

A survey conducted recently by the U.S. International Trade Commission reveals that EC industry officials enter into production-sharing arrangements for many of the same reasons that U.S. and Japanese firms typically mention. However, the Europeans cited certain additional factors, including the need to gain control over domestic marketing and distribution channels in order to compete against imports from countries with lower labor costs. This represents a market defense strategy, in contrast to the more aggressive network-for-export strategies of Japan.

EC firms have also established production-sharing activities as a means of overcoming nontariff barriers in countries such as Brazil, China, and Japan, which, in addition, present significant market opportunities. EC industry observers believe that EC production-sharing arrangements with lower-cost/high-market-potential developing countries, especially those in Eastern Europe, will increase substantially in the 1990s – provided the political situation permits. Factors driving this trend are the greater economic integration of the European Community, heightened competition with Japan and the newly industrialized countries of Asia, and expansion into Eastern Europe, which offers considerably underused labor and natural resources.

Implications for Management

Production sharing can be a productive and ambitious strategy, but only if planned and managed thoroughly. There are no shortcuts.

The choice of location is critical. The number of attractive locations for production sharing is growing, especially as Eastern Europe opens to the West. Each developing country offers a unique set of advantages. Countries that have strong specialties and trained work forces in given fields, such as Colombia in apparel and South Korea in metal fabrication, will continue to be sources of interesting partnerships in production sharing. Firms would do well to consider Mexico as a suitable location for production sharing involving heavy materials or as a first step toward positioning in the probable North American free trade zone of Canada, the United States, and Mexico. Some of the Eastern European countries offer unique advantages as partners for European firms that will face increasing competition with Japan and other Asian countries.

Setting up production sharing in developing countries is a complicated business that takes a great deal of time and attention on the part of senior management. It is therefore very much worth the effort to consider not just short-range cost-reduction needs, but also the longer-range future of the firm from the standpoint of international competitiveness. Production sharing is a first major step toward sustainable competitiveness. Planning for it should encompass more than that first step. The benefits of production sharing are greatest when a firm purposefully transforms itself into an international network with partners in the developing world.

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