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## FDI and Domestic-Content Requirements

Host governments have imposed domestic-content requirements on the subsidiaries of foreign investors to enhance “industrial deepening,” augment “supplier creation,” and multiply “backward linkages” in the hope of creating a reasonably vibrant, productive, and, ultimately, competitive indigenous industrial base. They frequently provide infant-industry rationales and sometimes offer sophisticated strategic-trade-policy justifications for these requirements. And almost always, they accompany domestic-content requirements with import restrictions. In spite of WTO obligations to phase out domestic-content requirements on FDI, the speed and transparency of compliance remain controversial and uncertain.

Are domestic-content requirements an effective developmental tool? Does the economic self-interest of host countries lie in prolonging their use?

### Evidence about Domestic-Content Requirements

The empirical record of the contribution of domestic-content requirements to the economic development of the host countries that have adopted them, whatever the aim and whatever the purported justification, is decidedly negative.

A survey conducted under the auspices of the United Nations Centre on Transnational Corporations (1991) found high inefficiency and a pronounced tendency toward stasis in industries where hosts imposed domestic-content requirements: effective rates of protection ranged from

50 percent to more than 600 percent, consequent prices were 200 percent to 300 percent higher than the cost for comparable products outside the host country, the intensity of use of those products was reduced to much less than half of what might be expected by international standards, the net social contribution of the investor activities was sometimes far in the negative column, and there was little evidence of dynamic-learning effects or movement toward competitive status. Evidence from the automotive, petrochemical, and electronics/computer sectors demonstrates the adverse consequences.

In the automotive industry, Bale and Walters (1986) found that 16 countries that mandated domestic content from 18 percent to 100 percent on foreign operations with less than 100,000 vehicle-per-year output had to support those operations with ad valorem import tariffs averaging nearly 100 percent. In a classic study of the Indian automobile industry's experience with domestic-content regulations, Krueger (1975) calculated that 27 of 34 assemblers and associated suppliers received effective rates of protection above 50 percent, with almost half of the firms enjoying more than 100 percent protection (the highest figure, for a metal fabricator, was 642 percent). If the effective rate of protection had been limited to no more than 50 percent, Krueger calculated, value added in production would have increased by more than one third; instead, increasing costs and economic losses spawned more protectionist trade and foreign-exchange practices to prop up the uncompetitive plants.

In the petrochemical industry, Gray and Walter (1984) examined 15 representative FDI projects subject to domestic content or export-performance requirements. Two of the projects (in South Korea and in Pakistan) required local production for domestic markets too small to capture all available economies of scale. In each case, the host government awarded import protection and quasi-monopoly status to try to launch the projects successfully; in neither case did the effort lead to efficient and competitive operations. Instead, in both instances, there was a vicious cycle of increasingly intrusive host-government interventions. In the South Korean case, the foreign company, Dow Chemical, finally gave up and sold out.

In the computer/infomatics industry, Frischtak (1986) estimated that foreign computer producers in Brazil, operating with stringent domestic-content regulations and high import protection, charged prices two to three times higher than those charged outside the country (these calculations excluded the area of "market reserve" in Brazil, where FDI was excluded). This price differential resulted in computer use in Brazil that was approximately one-fourth the intensity of comparable experience elsewhere, with a particularly heavy drag on high-tech sectors of the Brazilian economy (Cline 1987).<sup>1</sup> Similarly, in India, government

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1. Embraer, the aviation enterprise, became a vocal critic of the state's infomatics policies.

insistence on local production has a long history of hindering both the domestic expansion and export potential of foreign computer companies and other foreign investors in electronics.

Why are the results for host countries that try to use domestic-content requirements on foreign investors, backed by straightforward or hidden trade protection, so dismal in laying the base for internationally competitive industries?

## **Reasons for the Adverse Impact of Domestic-Content Requirements**

Domestic-content requirements have an adverse impact not because labor and capital markets in host economies in the developing countries and economies in transition already function perfectly on their own, but because attempts to “improve” the functioning of markets by imposing domestic-content requirements on foreign firms generate technical, economic, managerial, and political-economic problems for the investors and for the host country. These problems interact in a perverse manner and tend to reinforce each other toward inefficiency and stasis rather than lead to some new level of dynamic learning, enhanced efficiency, or accelerated growth.

Perhaps the most prominent reason that domestic-content requirements have an adverse impact is that it is difficult for projects that do not capture full economies of scale to become globally competitive.<sup>2</sup> In the automotive sector, estimates of the optimal scale for an integrated auto plant, or the point at which additional cost savings from increased production fall off, hover around 200,000 units per year. The principal components also have large economies of scale: in the range of 200,000 to 450,000 units per year for engines and for power trains (Shapiro 1993). A survey of 16 countries with subscale automobile assembly operations, compiled by Bale and Walters (1986), found that domestic-content levels as low as 18 to 20 percent generated price differentials 1.5 to 2 times as high as the cost of imports. In the General Motors plant in Hungary, which produced 15,000 cars per year, Hungarian workers managed to win EU-wide intrafirm quality awards but could not reach output-per-day levels as much as one-tenth of full-scale operations in Antwerp (Klein 1995).

In petrochemicals, the cost penalty for operating subscale plants varies: it is highest in primary products such as ethylene, propylene, and benzene and intermediate organic derivatives and lower in downstream products such as fertilizers, pesticides, paints, and pigments (although

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2. Eastman and Stykolt (1970) demonstrate that protection leads to excessive entry into a given industry and results in inefficient plant size.

scale factors in some synthetic fibers, synthetic rubber, and plastics are also large). In their survey of FDI in 15 petrochemical projects—involving primary, intermediate, and product plants—Gray and Walter (1984) found that scale of output was the decisive factor in the ultimate success of the operations.

Even in electronics/computers, where economies of scale are less important, Cline (1987) found that production of less than 50,000 microcomputers per year inflicted a penalty that accounted for some substantial portion of prices that were 2 to 3 times the international norm.

Besides the higher costs involved in subscale units, there are technical issues of whether boutique plants can become the building blocks for full-scale production facilities. In automobile assembly, plants that put together knock-down kits are sufficiently different from full-scale assembly as to require a completely new investment evaluation about whether to move to the latter rather than merely decide whether to add on. The prior existence of a small plant may actually constitute a hindrance in the selection process. Chemical and petrochemical plants can sometimes be installed in modular sequence to bring them up to full scale. Most often, this is an expensive way to expand in comparison to designing an operation that captures all economies of scale from the beginning. In the sample of Gray and Walter, the subscale plants did not transform themselves from infant-industry building blocks to a full grown competitive industry through dynamic learning. Two of the six projects came to be considered failures by the parent companies, and the prospects for the other four, absent on-going trade protection, were not favorable.

But failure to achieve economies of scale in production is only one aspect of the difficulties caused by domestic-content requirements. There is evidence of lags in the introduction of new technology to projects with high domestic-content mandates, independent of scale; that is, both for projects where economies of scale are large (autos) and where economies of scale are smaller (such as many segments of the electronics/computer industry), the pace of technological upgrading of local operations is slower than in countries/projects that lack domestic-content requirements.

Grieco (1984) found that the technological lag in the computer industry in India—measured as the interval between the introduction of a system in the developed countries and its adoption in the host country—was greatest when markets were highly protected, but fell steadily as authorities eased domestic-content requirements and import controls. Borrus (1994) found that Japanese electronics/computer firms met domestic-content requirements in East Asian markets with simple labor-intensive processes and lower-end assembly while US and European firms, more oriented toward production for external sale, upgraded both the products and the processes in their East Asian operations much more rapidly to match the pace of change in international markets (see also Guyton 1996).

Krause (1985) observed the same phenomenon in Latin America, where small-batch production of computers for the domestic market in Mexico involves hand soldering and old-fashioned (and more expensive) cabinets, while larger volume export operations utilize more automated, precise, and cheaper construction methods.

In the automotive sector, Doner (1995b) found similar delays in the introduction of new technology in the high-domestic-content (80 percent), highly protected Malaysian automotive market (although whether this was also due to the absence of the stimulus from international competition or to the requirement of operating with local Malaysian partners, is not clear).<sup>3</sup> There are similar reports from Latin America, where Ford, behind ad valorem tariff walls of more than 50 percent, produced the Falcon from the 1960s to the 1990s with 80 to 90 percent domestic content but very few design changes (*New York Times*, 16 May 1997).

In addition to delay in the introduction of more sophisticated technical processes, Ernst (forthcoming 1998) observes a lag in the utilization of more advanced management systems, including quality control circles and just-in-time inventory control.

Without economies of scale, cutting-edge technology, or best-practice management, the likelihood that there will be spillovers associated with the foreign investor's presence is not large. And, in marked contrast to cases in which domestic operations are part of the parent company's export-oriented, global sourcing strategy (introduced in chapter 5), the prospects for agglomeration effects of scope and specialization are not promising. In line with that, these FDI projects do not benefit from Krugman-Helpman interactions between final-goods and intermediate-goods suppliers that often form the basis for the construction of giant industrial complexes with abundant externalities for the rest of the economy.

The more clever strategic-trade negotiating strategies, which shift rents from foreign investors to host players, turn out in practice to be complex and arcane (Rodrik 1988; Davidson, Matusz, and Kreinin 1985; Richardson 1993). The end result is that foreign corporations, domestic firms, and a labor elite from the population at large receive trade rents created at great cost in terms of inefficiencies for the economy as a whole.

## **The Adverse Political Economy of Domestic-Content Requirements**

At the same time, domestic-content requirements on the local subsidiaries of foreign firms introduce an adverse political-economic dynamic into

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3. On lags in the introduction of new technology in joint ventures, see chapter 7.

the strategy of the external investors and open the door to fundamental conflicts with the host authorities.

The incentive structure for the foreign investor is skewed toward preserving a low-volume, high-profit position in the small protected market. The host authorities, having “captured” the foreign investor and “created” jobs, then try to correct the problem of high costs with further, more burdensome interventions. Gray and Walter (1984) found a vicious cycle in the 2 of 15 petrochemical cases that were oriented toward a protected domestic market rather than exports (in South Korea and Pakistan): foreign firms pushed for higher prices and higher profits while host authorities undertook increasingly intrusive countermeasures to fight inflation, monopoly, and “exploitation.” In the South Korean case, the foreign company, Dow Chemical, which had been the country’s largest single external investor, ultimately sold its holdings and withdrew (Schwendiman 1984). In the extreme, this “adverse” political economy may give foreign investors incentive to oppose a transition toward greater openness and economic liberalization rather than incentive to support such a transition.

As examined in detail in the next section, in the mid-1970s US automobile investors mobilized US government support to maintain their established positions in highly protected markets in Mexico and Brazil in the face of efforts by host authorities to push them toward a more global sourcing pattern. In East Asia, Japanese investors have routinely imposed export prohibitions on the operations of electronics and automobile companies set up to supply local markets, and, until the yen appreciation after 1985 forced a change in parent company strategy, these investors joined with domestic producers to preserve lucrative subscale operations oriented toward protected domestic markets. In Eastern Europe, a similar dynamic may be emerging as labor groups, political supporters, and, in some cases, foreign investors whose operations were originally oriented toward still-protected domestic markets, have pushed to delay reducing import barriers in the accession process with the European Union. In Hungary, Suzuki—intimating that it might call in a \$134 million loan if its small assembly operations were exposed to competition—demanded higher customs duties on cars and a prohibition on importing used cars in 1993. Budapest responded with a ban on imports of cars older than six years. In Poland, Fiat successfully lobbied Warsaw in 1994 to levy excise duties of 15 percent on imported cars and 10 percent on domestic cars costing more than \$12,000, leaving the under-\$10,000 Fiat automobile untaxed. (For another example of the impact of domestic-content requirements on foreign investors, see box 4.1.)

In short, the imposition of domestic-content requirements on foreign investors—far from generating a dynamic learning process in which foreign subsidiaries, local suppliers, labor, and host authorities work together to grow from infant industry status to internationally competitive operations—contains multiple sources of breakdown and stagnation.

#### **Box 4.1 Foreign investors, domestic content, and the political economy of protectionism: Apple and Hewlett-Packard versus IBM in Mexico**

Mexico's negotiations with IBM for a major export-oriented investment in Mexico in 1985 constituted a turning point in Mexican informatics policy. In place of the prior import-substitution strategy, which required domestic production of mini and microcomputers by joint-venture firms (in subscale plants) with 25-35 percent local content, IBM presented a proposal offering full-scale production of 100,000-180,000 microcomputers, 90 percent of which were destined for external markets, in return for the right to operate a wholly owned venture with much greater control over its sourcing of inputs.

The debate about the IBM proposal and the decision by the Mexican government to accept it helped to precipitate the reorientation of the country's entire approach to trade and investment in a more liberal direction. What is less well known is that Hewlett-Packard and Apple helped wage the fight within the upper tiers of the Mexican political establishment against the IBM proposal and the policy opening that it represented.

Prior to the IBM proposal, mini and microcomputers were protected by import quotas, with local content rising from 25 percent (for minis) and 35 percent (for micros) in the first year to 50 percent and 60 percent by the third or fourth year (respectively). Apple had a market share of 58 percent, selling the Apple lic-II with a markup 74 percent over the US price. Hewlett-Packard had a market share of 18 percent, selling the HP-150-II with a markup 61 percent over the US price. Production runs for computer assemblers ranged from a few thousand per year to perhaps as many as 15,000, all below minimum efficient scales that begin at 20,000 units annually.

The components produced in Mexico prior to the IBM venture included cables, resistors, keyboards, cabinets, and other passive components. Imported components included integrated circuits, hard disks, videos, and active components.

When the IBM proposal first surfaced, the domestic producers, including Hewlett-Packard and Apple, organized a special interest-group association, AMFABI, which took out ads in major newspapers and lobbied the Ministry of Commerce to block the IBM project. They argued that an investment of the size contemplated by IBM would crowd out existing producers and monopolize the market. They added that granting IBM wholly owned status was unfair to them, because they had complied with the requirement of minority foreign ownership. In a letter to President Miguel de la Madrid, AMFABI called for endorsement of the existing informatics regime.

Instead, President de la Madrid stood up to this opposition and approved the IBM proposal. Within a short period of time, both Hewlett-Packard and Apple, along with other foreign firms, reversed direction and approved investment-expansion packages large enough to meet three-to-one export-to-import requirements that qualified them to operate with wholly owned subsidiaries (Apple subsequently was unable to meet its commitments and had to withdraw). From this burst of new foreign investment, exports of computer parts, components, and finished equipment (including typewriters/printers by IBM) grew more than 10-fold over the next 4 years, from \$21

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#### **Box 4.1 (continued)**

million to \$252 million, with IBM and Hewlett-Packard accounting for shares of approximately 60 percent and 20 percent respectively.

Allaying fears that the informatics sector in Mexico might become merely a screwdriver industry, the degree of integration in the sector increased, imports as a percentage of production dropped (IBM's domestic-content levels rose), and the technological sophistication of the components industry increased as the scale of production of final producers expanded. Within the domestic industry, competition intensified (multiple full-scale-sized producers that were oriented toward external markets prevented the much-feared monopolization of the domestic market by IBM), prices moved toward world levels (although the Mexican government did maintain a system of tariffs and quotas in the sector), and the technological lag between the introduction of new models/upgrades in the United States and deployment in Mexico shortened appreciably (to about 12 to 18 months).

*Sources:* Harvard Business School (1990); Cline (1987); Peres Nuñez (1990).

The operations they spawn systematically lack what the next chapter will describe as a kind of externality that comes with FDI operations that are integrated into the larger strategy of the parent firm, exposed to competitive pressures in international markets, and backed by the parent firm's commitment to provide the technological upgrading and quality control needed to enhance the corporation's position in international or regional markets.

But it would be a mistake to conclude that, absent domestic-content requirements, the FDI process will provide a smooth and appropriate allocation of local value added, industrial deepening, and technological and managerial spillovers to the developing countries and economies in transition along the lines of international comparative advantage.

To understand why this is not so requires a more detailed analysis of export-performance requirements and the problems of breaking into international markets via FDI in manufacturing.