



# Brookings Trade Forum 2007

## **How to Investigate the Impact of Foreign Direct Investment on Development, and Use the Results to Guide Policy**

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### **Abstract**

This paper examines three topics: how to investigate the impact of manufacturing FDI on a developing country host economy, how to search for externalities and spillovers (and identify the channels and mechanisms through which spillovers take place), and how to evaluate the question of whether host governments should devote public sector resources to attracting FDI in manufacturing. In each area, the paper shows how multiple kinds of evidence (including industry or sectoral studies, business cases, management interviews, firm survey data, and cost/benefit analysis of individual projects, as well as statistical regressions) can be useful – and are often indispensable – to carry out accurate appraisals, to avoid miscalculations, and to design appropriate policies for developed and developing countries.

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**How to Investigate the Impact of Foreign Direct Investment on  
Development, and Use the Results to Guide Policy**

**What Methodologies Are Needed to Determine the Relationship  
between Manufacturing FDI and Development, Avoid the Mistakes of  
Earlier Research, and Evaluate Contemporary Policy Alternatives?**

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I am grateful to comments from Laura Alfaro, Garrick Blalock, Marc Busch, Beata Smarzynska Javorcik, Wolfgang Keller, Cheryl Long and Anders Olofsgard. The weaknesses that remain come despite their help.

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“One dollar of FDI is worth no more (and no less) than a dollar of any other kind of investment.” --Dani Rodrik 2003

“Survey articles have found inconclusive evidence in the literature regarding the most important effects of inward FDI, especially with respect to spillovers... No universal relationships are evident.” --Robert Lipsey 2005

“There are good reasons to liberalize capital markets, but an abundance of evidence that FDI generates positive spillovers does not exist. So far, researchers have yet to uncover robust empirical support for the kinds of subsidies that many countries have begun to offer multinational enterprises.” --Gordon Hanson 2005

**Introduction**

My mentors in graduate school were Raymond Vernon, Charles Kindleberger, and Albert Hirschman. They established their reputations by selecting the most important issues and policy dilemmas on the horizon, getting to know the actors and the settings involved as thoroughly as possible, and deriving insights from intensive investigation of (often) small numbers of cases. They then had to persuade their audience that what they discovered was not idiosyncratic, atypical, or ephemeral.

Their contributions came at the beginning of the revolution in using regressions on large data sets as the preeminent investigative technique in economics, and their own work would have had more lasting impact if they had been able to combine -- as I urge here -- statistical analysis with a dedication to understanding how things worked by looking into innards of the relationships they were trying to understand.

This paper will argue that the investigation of the impact of manufacturing FDI on development would be much more valid, more convincing -- and less prone to error -- if multiple techniques of investigation are used to reinforce (or refute) each other.<sup>1</sup> Such techniques include -- in addition to statistical regressions -- industry and sector studies, business cases, management interviews, firm survey data, and cost/benefit analysis of individual projects, carefully arrayed to avoid selection bias and ensure generalizability.

This argument is, I believe, unexceptional and should not even be controversial. The value of making this assertion arises, alas, because the use of multiple contrasting methodological approaches is quite uncommon – nay, vanishingly rare -- among economists in the contemporary period. The weaknesses of this self-imposed narrowness plague current policy debates even among informed practitioners.

This paper examines three topics: how to investigate the impact of manufacturing FDI on a developing country host economy, how to search for externalities and spillovers (and identify the channels and mechanisms through which spillovers take place), and how to evaluate the question of whether host governments should devote public sector resources to attracting FDI in manufacturing.

In each area, the paper shows how overlapping kinds of evidence can be useful – and are often indispensable – to carry out accurate investigations, to avoid analytical miscalculations, and to design appropriate policies for developed and developing countries.

## **I. How to Evaluate the Impact of Manufacturing FDI on a Developing Country Host Economy**

The history of efforts to investigate the outcome from multinational manufacturing investment in developing countries begins with cost-benefit analysis of individual FDI projects, industry studies, multinational business cases, management interviews, and firm surveys.

Do these approaches lead to reasonably robust general propositions about the impact of manufacturing FDI on the host economy, or are they no more than impressionistic observations – anecdotal in the pejorative sense – that have a significant probability of being overturned by one or two subsequent observations?

Can the results from these kinds of investigations be useful in shaping the design of large-N econometric investigations that use plant-level data, and in steering clear of mistakes that have spoiled earlier efforts?

### *Early assessments using cost-benefit analysis*

The earliest systematic attempts to assess the impact of manufacturing FDI on development were carried out by contemporaries of Vernon, Kindleberger, and Hirschman. The investigators used variations of cost-benefit analysis to measure the effect of MNC operations on the host economy.

One of the first was conducted by Sanjaya Lall and Paul Streeten under the auspices of the UN Conference on Trade and Development (UNCTAD).<sup>2</sup> Lall and Streeten analyzed the contribution to the host economy of 147 foreign investor operations in six developing countries. For approximately sixty percent of the 147 (92 projects), the effect of foreign investment on national income was positive; for the remaining forty percent (55 projects), it was negative. The key determinant of whether the social rate of return was positive or negative was the extent of effective protection granted to the investors, across all industries and all countries in the sample.

A second – an OECD-sponsored study under the direction of Grant Reuber with data from approximately the same time period – uncovered a similar contrast in outcomes, drawing on a slightly different set of comparisons.<sup>3</sup> The Reuber group investigated 80 foreign investment projects within 30 developing host countries. For 45 of these they were able to compare the production costs of the subsidiaries to the production costs of the parent companies.<sup>4</sup> They found that approximately one-quarter of the subsidiaries had production costs that were equal to or lower than those of the parent; the rest -- nearly three-quarters of the 45 – had higher production costs.

The Reuber team separated their sample according to whether the output of the project was destined primarily for the domestic market, or for export. For the 14 export projects they identified, more than three-quarters had production costs that were equal to or lower than the parent. For the 31 remaining projects, twenty-nine (93 percent) had production

costs higher than the parent. These higher production costs were attributable to three interrelated factors: 1) high levels of protection extended against imports; 2) uneconomic scale of production; and 3) high local cost of doing business. They concluded that, even under a relatively wide range of shadow exchange rate calculations, these projects resulted in a substantial real resource cost to the host countries.

These rudimentary attempts at cost-benefit analysis were given more rigor, a decade later, by Dennis Encarnation and Louis T. Wells, Jr.<sup>5</sup> Using detailed data from fifty foreign manufacturing projects submitted by prospective foreign investors to the FDI screening board of a large developing country, they calculated the contribution that each would make to national income minus the costs to the national economy, at world market prices, using shadow prices for energy, foreign exchange, labor, and domestic capital to account for the opportunity cost of the resources to the host. They found that a majority of the 50 projects (55-75 percent, depending upon the shadow price assumptions) would increase national income, while the remainder (25-45 percent) would subtract from national income even though the projects were profitable to the foreign multinationals themselves.

The Encarnation and Wells data exhibited a perfect rank-order correlation between the impact of the project on the host and the amount of trade protection afforded to the investor.<sup>6</sup> When trade protection was high, projects subtracted from national income. When trade protection was low, the reverse was true. For eight export-oriented projects, all were beneficial to the host economy.

Subsequent cost-benefit appraisals show similar outcomes. Using data from Kenya during the country's import substitution period, Bernard Wasow found that of 35 goods produced by 14 foreign-owned firms, only three generated benefits to the host economy that exceeded their costs.<sup>7</sup> Under the umbrella of trade protection, more than half of the 35 allowed the foreign affiliates to siphon foreign exchange from the host economy, rather than saving or earning hard currency. In the protected host market, there was a multiplication of foreign plants with excess capacity – had they been able to expand production, however, the negative impact on host welfare would have increased as well.

*Business Case Studies and Industry Analyses: The Discovery of Distinctive Investor Operations*

Business case studies and sectoral analyses not only corroborate these findings, but provide a clearer understanding of how multinational companies alter their production processes and business strategies in response to international competition, on the one hand, or domestic protection, on the other. The most detailed research comes from the three sectors where the largest amounts of manufacturing FDI have taken place – the automotive, electronics, and petrochemical industries.

Anne Krueger provided an early model for these industry studies, with a microeconomic analysis of India's import substitution policies in the auto sector.<sup>8</sup> She showed that the Indian approach led foreign investors to build facilities much smaller and less efficient

than plants designed to compete in world markets. All thirty-four participants in the industry produced at prices above the comparable foreign price, ranging from 18 percent over the foreign price to three times the foreign price.<sup>9</sup> The differential for firms engaged in domestic content generation -- metal fabrication, chemical supply, and other components -- was even worse (prices 123 percent to 309 percent higher) than for assemblers (prices 118 percent to 197 percent higher). Her estimates suggested that twenty-seven of thirty-four operators would not remain in business if levels of effective protection dropped below 50 percent.

Auto industry studies from other regions, and later periods, reported results similar to Krueger.<sup>10</sup> Protected FDI assembly operations in Latin America, Southeast Asia, and Eastern Europe had typically less than half the capacity of parent operations in developed countries. The combination of subscale size, requirement to meet domestic content requirements, and trade protection generated prices 150-200% higher than comparable imports – except the studies revealed that domestic output was *not comparable* to imports. To meet domestic content requirements, often with mandatory local partners, international automobile companies standardized the practice of delivering Semi-Knocked-Down (SKD) or Completely-Knocked-Down (CKD) “kits” to be welded and screwed together by hand in miniature assembly plants, without benefit of large-scale automotive production and quality-control characteristics found in all cutting-edge factories.<sup>11</sup>

Factories in protected developing country markets turned out earlier style autos – called “repeat models” -- with previous-generation performance characteristics. Even well-run plants were not designed to be – or to become – internationally competitive. General Motor’s otherwise exemplary kit-assembly joint venture in Hungary achieved a maximum output of 8 vehicles per hour – in contrast to 90 vehicles per hour in the parent’s full-scale operations – before the prospective loss of trade protection associated with entry into the EU led GM to buy out its Hungarian partner and shut down the plant entirely in 1999.<sup>12</sup>

Industry executives admitted – or explained – that when host countries required them to operate with indigenous joint venture partners the parent corporation withheld the most advanced technology so as to avoid “leakage” in a horizontal direction to potential rivals.<sup>13</sup> In China, product characteristics were ten years behind the industry frontier; in Latin America, sometimes even farther back.<sup>14</sup> The investors’ reluctance to deploy the latest technology to China was not merely precautionary. Audi’s Chinese partner in the First Automobile Works “expropriated” the production technology after the European multinational’s license expired in 1997.

When host countries required them to meet explicit domestic content requirements, they subtracted from their “kits” the most simple fixtures and components -- designating these for local procurement in the host economy.

In the electronics industry, William Cline's dissection of Brazil's informatics policy mirrors what Anne Kreuger found in the Indian auto sector.<sup>15</sup> A strategy of restricting computer imports and limiting foreign ownership to 30 percent allowed international companies to sell less-capable models for 2-3 times world prices. Cline estimates the cost to consumers to have been about \$500 million per year in the mid-1980s, not including the competitive disadvantage suffered by user-companies like Embraer (aerospace) and Petrobras (petroleum exploration and development) whose international rivals could enjoy cutting-edge products with no price penalty.

To meet import substitution goals, international computer companies – sometimes using the same knocked-down “kit” assembly pattern as the automotive sector – shipped previous generation components and technologies to generate a second round of oligopoly rents from production in protected markets. Operating in Mexico with a mandatory local partner and 25-35 percent domestic content requirement, Hewlett Packard charged prices 160% higher for locally-assembled computers at least one technology-cycle (2-to-4 years) behind the United States.<sup>16</sup> The HP factory was approximately one-tenth minimum efficient scale for computer assembly – this small size precluded the introduction of automated, computerized production lines or large-batch quality control procedures that were being perfected in Southeast Asian export plants. The kit for the previous-generation computer brought all sophisticated inputs in from elsewhere; the domestic content requirements were filled with purchases of simple coils, wires, and packaging.

Thus -- besides documenting the inefficiency of using FDI for import substitution -- firm-level data studies showed that the plants were *not miniature replicas* of what could be found along the industry frontier. The production lines were physically constructed differently. The workers did not receive training in the same skills as needed for large-scale automated plants. The operations did not generate the dynamic learning that was essential for infant industries to mature into competitive adulthood.

In the petrochemical industry -- a sector known for high fixed costs and low variable costs -- the competitiveness of foreign-owned facilities in the developing world was acutely dependent upon capturing all economies of scale. In a study of 15 foreign direct investment projects in petrochemicals, Peter Gray and Ingo Walter found that, from an engineering point of view, all six boutique plants built to serve protected local markets were not only high-cost but ill-designed to be used as building blocks in an infant industry strategy.<sup>17</sup> Two of the six were considered outright failures by the parent investors. The remaining four survived only with on-going protection in the host market.

These industry studies show that the MNC reaction to trade protection in developing countries was *noticeably different from what was coming to be called tariff jumping FDI* among the developed countries. Confronted by US tariff and non-tariff barriers, Japanese auto companies began building plants in the United States that reproduced the most advanced high quality-control production techniques available in the Japanese home market. In protected developing country markets, in contrast, manufacturing MNCs were

not able to reproduce plants with size and sophistication similar to home country facilities.

*Parent-Affiliate Relationships: Fragmentation versus Integration*

At the same time industry studies revealed that the relationship between multinational parent and subsidiary was becoming increasingly fragmented within the import substitution framework, they also showed that the parent-subsidiary relationship was growing ever more closely integrated when the former relied on the latter to secure the firm's position in international markets. Rather than merely searching for low-wage assembly sites, MNC headquarters began to orchestrate their developing country affiliates into a coherent supply network within which latest improvements in production technology and quality control procedures could be transmitted on a real-time basis, within days or hours.<sup>18</sup>

Volkswagen designed the facilities producing the inputs for its "basic vehicle platform" (engines, axles, chassis, and gear boxes) in Brazil, Mexico, Argentina, and Eastern Europe to incorporate engineering upgrades online within sixteen hours of each other. General Motors placed cylinder head equipment in its high-performance engine export plant at Szentgotthard in Hungary that could accept continuous changes without rebuilding the production line. Ford designated its new export assembly facility in Hermosillo as the site to teach managers worldwide quality-control techniques that could

rival the Japanese. The output of this Mexican plant achieved higher scores for reliability (according to independent tracking agencies) than Ford plants in the United States.<sup>19</sup>

International electronics firms synchronized production changes in their Asian supply chains with the pace of the new product introduction in the home market.<sup>20</sup>

Telecommunications and semiconductor multinationals assigned high precision manufacturing and quality-control procedures to their plants in Malaysia as soon as they appeared: “as far as assembly and testing are concerned,” observed a Texas Instruments executive, “we have more expertise here than we have in the US.”<sup>21</sup>

Using plant-level data from the disk drive industry, David G. McKendrick, Richard F. Donner, and Stephan Haggard trace the organization of “new product transfer teams” within Seagate and Read-Rite for each new generation of magnetic platters and associated high performance motors.<sup>22</sup> Product developers at headquarters meet with fifteen process engineers and managers brought in from wholly-owned affiliates in Singapore, Malaysia, or Thailand some fifty days prior to launch, followed two weeks later by twenty-four production supervisors to be trained on the pilot line. When the assemblers return to Southeast Asia, they are accompanied by eleven managers and engineers from headquarters to perform tests on the new production line. After the official launch, ten more US supervisors oversee local operations to trouble-shoot problems until high volume high reliability output is achieved, with minimal downtime or rejection rates.

It became a “trick question” in business school literature to ask whether would-be consultants in the classroom would advise a particular host to provide a tax break to an investor who would promise to introduce the very latest techniques into the local export plant – the correct answer was “no, of course not” because it would be clearly in the self-interest of the parent to incorporate such latest techniques on its own since the parent’s competitive position in global markets depended upon highest performance from the affiliate.

*Avoiding Selection Bias: From ‘Anecdotal’ Observations to Robust  
Generalizations*

To what extent might these observations about the differential impact of manufacturing FDI on the host economy -- drawn from the international automotive, electronics, and petrochemical industries -- be generalizable about manufacturing FDI more broadly?

Business cases – and even industry studies – are routinely referred to as “anecdotal”, suggesting that generalizations based on them may be discredited with no more than a handful of additional observations, and that there is a high probability that such additional observations will differ.<sup>23</sup>

The fact that the automotive, electronics, and petrochemical sectors show a similar divergence between production for protected domestic markets in developing countries

and production for export in competitive international markets -- across time periods and across geographical regions -- provides some confidence, however, about further observations within these industries.

But might there be some kind of selection bias that renders the results from these industries different from manufacturing FDI more generally? Or does evidence from FDI in manufacturing in other sectors point in the same direction?

Already, the cost-benefit analyses that recorded negative host country economic effects from FDI in protected domestic markets and positive host country economic effects from export-oriented FDI included data from industrial equipment, agribusiness, textiles, canned goods and juices, pharmaceuticals, chemicals, and petrochemicals, as well as automotive equipment and electrical equipment.

And, dating from the period of the earliest cost-benefit investigations, there emerged solid theoretical backing for the expectation that domestic content requirements and other forms of trade protection are likely to lead to a proliferation of subscale and inefficient plants.<sup>24</sup>

With regard to the quality of the relationship between parent and developing country affiliate, firm survey data from two separate studies some sixteen years apart by Edwin Mansfield, Anthony Romeo Lee, and J.-Y. Lee show systematic differences as a function of whole- or shared-ownership.<sup>25</sup> Parent firms deploy new technology and production

processes more rapidly within wholly-owned MNC supply channels than among joint ventures or licensees. The data show a mean lag of three to four years for technology transferred to joint ventures or licenses in developing countries. The sample of 65 cases includes chemicals, drugs, electrical equipment and electronics, machinery, instruments, glass, food, and rubber.

Across a broad array of sectors, the potency of the interaction between headquarters and affiliate – operationalized by Vijaya Ramachandran as the number of parent company employees sent to a given host country to bring a given technology on line and the number of host country employees sent to the parent country for training – is significantly higher within wholly-owned networks across all 14 sectors in her sample than for joint venture or licensees.<sup>26</sup> The results came from industries as diverse as metal products, chemicals, rubber, food, textiles, and medical products, as well as transport equipment and electronics.

Contemporary data from China exhibit the same contrast in plant operations, notwithstanding the Chinese success in attracting extraordinary large numbers of foreign investors. Drawing on a sample of 442 multinational investors, Long Guoqiang shows that wholly-owned or majority-owned foreign affiliates are much more likely to be using the most advanced technology available to the parent than ventures with 50-50 ownership or majority domestic ownership.<sup>27</sup> Thirty-two percent of the wholly-owned foreign affiliates and 40 percent of the majority foreign-owned foreign affiliates use technology as advanced as in the parent firm, whereas only 23 percent of the 50-50 shared ownership

firms and 6 percent of the majority indigenous Chinese-owned firms use technology as advanced as in the parent firm.

Business strategy literature provides ample testimony from senior MNC managers that control over ownership is used to limit opportunistic behavior, prevent appropriation of proprietary assets, and minimize transaction costs in dealing with host country partners.<sup>28</sup> Supporting such testimony, Magnus Blomstrom, Ari Kokko, and Mario Zejan find a negative correlation between host country policies that foreign firms provide access to the parent's patents, perform research and development onsite, or transfer skills to local personnel and technology inflows from headquarters to affiliate.<sup>29</sup> Japanese MNCs display a negative coefficient for intrafirm technology transfer – according to Shujiro Urata and Hiroki Kawai -- when host authorities impose technology sharing requirements as a condition for international investors to set up a local affiliate.<sup>30</sup>

Using BEA benchmark survey data of US multinationals from 1982, 1989, and 1994, and from non-benchmark year 1997, Mihir A. Desai, C. Fritz Foley, and James R. Hines, Jr., note that whole or majority ownership occurs most frequently when parent firms coordinate production among different offshore sites, when parent firms transfer technology and other intangible property among affiliates, and when parent firms manage tax planning on an international basis.<sup>31</sup> Their data suggest that lifting local ownership restrictions provides a clear payoff to host governments in terms of expanded trade within multinational sourcing networks: each 4 percent increase in sole ownership of affiliates is associated with 3 percent higher intra-firm trade volumes.

Thus, evidence showing a contrast in firm behavior, and in impact on the host economy, as a function of inward-orientation toward a protected market (often with performance requirements like domestic content and joint venture mandates) and outward-orientation toward international markets (typically free of performance requirements) emerges across industries, regions, and time periods. This evidence from affiliate operations is backed by consistent management testimony about the motivation for the contrasting investor behavior, and supported by theoretical models to explain the “favorable” and the “unfavorable” consequences for the host economy.

*An Exception in Korea, or Taiwan?*

Recent reevaluation of Korean performance in high performance electronics demonstrates that that country’s experience with FDI is not so much a bona fide exception, as an “*exception that proves the rule*.”<sup>32</sup> In industries where technology was stable and could be replicated via licenses and for-hire foreign engineers – namely, shipbuilding and steel – Korea followed a model of excluding FDI, requiring domestic production of inputs, and creating national champion companies via public support. In industries where the international technological frontier was continuously pushed outward – especially computers, semiconductors, telecommunications, and high performance consumer electronics – Korea followed a script much closer to Hong Kong or Singapore than conventional wisdom has suggested.

Foreign multinationals built the industrial base for electronics in Korea in the decade from the mid-1960s to the mid-1970s; foreign-owned production accounted for one-third of the domestic market and more than half of all exports. Korean companies grew up as suppliers to the foreign investors, and gradually entered export markets via Original Equipment Manufacturer (OEM) relationships with the foreign assemblers. They credited technology acquisition via contract manufacturing three times more often than licenses or joint venture partnerships.<sup>33</sup>

In the 1980s nationalistic policies pushed most foreign electronics assemblers out of Korea, but the OEM channel nonetheless remained the crucible that shaped the performance of Korean-owned firms. At the turn of the decade fifty to sixty percent of all color TVs and VCRs were still exported via OEM contracts to assemblers who provided the specifications for contract manufacturing, including Sony, Panasonic, Mitsubishi, Zenith, Toshiba, Philips, Zenith, RCA, and Hitachi.

All three of the companies that became Korean “national champions” – Samsung, Lucky Goldstar, and Hyundai – grew up as contract manufacturers for multinationals, and after three decades still relied on OEM contracts for sixty percent of their electronics exports. They expanded their own design expertise via learning-by-doing for foreign purchasers, not via mandatory joint venture partnerships. They depended upon duty free imports of inputs for their own assembly, not domestic content requirements.

The Taiwan experience shows a similar same pattern. Indigenous electronics firms began by selling components for calculators, clocks, and VCRs to the local affiliates of IBM, Hitachi, and Philips; the more successful graduated to contract manufacturing of printed circuit boards, monitors, and power supplies. All the major Taiwanese computer makers – including ACER, Tatung, and Mitac – entered export markets as OEM suppliers to foreign multinationals, learning advanced design and own-brand marketing as they went. Not one became successful via forced joint-ownership with a multinational. All eschewed government obligations on domestic content.

Thus – as discussed in the final section of this paper -- the argument that developing countries need more “policy space” to impose domestic content, joint venture, or other performance requirements on FDI – “like Korea and Taiwan did” – is simply not well-informed by the facts.<sup>34</sup>

#### *A First Look at Backward Linkages*

Sectoral studies and business cases also showed a stark contrast in the spread of backward linkages from multinational affiliates to indigenous suppliers in the host economy.

With FDI oriented toward protected local markets, the smaller size and less advanced production techniques of the multinational affiliates not only penalized the efficiency of

their own plants but also hindered local companies from becoming competitive suppliers. In the automotive sector, the multinational kit assemblers fulfilled their domestic content obligations with parts where economies of scale were least evident. The opportunities for local firms were concentrated in stamped or molded plastics, windows, simple electrical fixtures. Domestic companies were virtually precluded from becoming cost-effective producers of transmissions, axles, even exhaust systems. In the electronics sector, local suppliers had to fabricate computer casing from fiberglass or aluminum because their operations were not large enough to support use of newer composite materials that were becoming the norm in international markets. Transistor wiring was hand-soldered, with predictable consequences for (un)reliability.

For export-oriented FDI, on the other hand, MNCs began to farm out procurement contracts in a vertical direction to low cost local suppliers. In the automotive industry, certification as an Original Equipment Manufacturer (OEM) or Replacement Equipment Manufacturer (REM) emerged as the principal channel for creation of a host country auto parts industry. In the electronics industry, “contract manufacturing” of printed circuit boards (PCBs) and other subassemblies became a major source of domestic industrial growth first in Southeast Asia, including Korean and Taiwan (above), and later -- after the trade-and-investment liberalization of the 1990s -- in Latin America

This contrast plays an important role in the search for externalities.

## **II. How to Investigate for Externalities from Manufacturing FDI in the Developing Country Host Economy**

The first generation of econometric analysis, examining data from the 1980s and 1990s, failed to demonstrate the existence of externalities.

Industry or sector studies, business school cases, management interviews, and firm surveys, looking at evidence from the same period – and from more recent periods -- show multiple kinds and types of externalities.

What is the reality? Why has the search for externalities produced such disparate outcomes? How can investigative methods be improved to provide more thorough and rigorous identification of externalities, and better understanding of when and how beneficial spillovers might occur?

Positive externalities – spillovers from the presence of foreign investors that do good for the host economy without having to be paid for, so to speak -- come in various forms.

Executives, managers, engineers, and workers may leave foreign-owned plants and take with them acquired skills and expertise. Non-related firms may observe MNC strategies, duplicate their purchases of equipment, replicate their production or management practices, or copy their quality-control practices. Foreign investors may provide advice,

designs, direct production assistance, or marketing contacts to suppliers which the latter then deploy more broadly than simply providing cheaper or more reliable inputs to the foreigners.

It is possible to imagine-- in the abstract -- a world in which executives, managers, engineers, and workers never leave the foreign plants where they have obtained on-the-job training, in which indigenous firms do not imitate production processes or marketing techniques introduced by foreigners, in which foreigner affiliates do not provide advice and assistance to help suppliers reduce costs, improve quality, or penetrate new markets, or in which those suppliers fail to improve their operations in ways that cannot be fully captured by the foreign purchasers.

This is not a world that emerges from the testimony of participants, whether in international corporations or indigenous companies. The evidence from the actors themselves, however, makes a clear distinction between the spread of externalities in the vertical as opposed to the horizontal direction.

*Horizontal Externalities: Industry and Business Case Study Evidence*

In the horizontal direction, international companies report diligent efforts to avoid “leakage” of technology and know-how to potential rivals.<sup>35</sup> The preoccupation with maintaining whole- or majority-ownership, as outlined in section I (above), is largely

driven by a desire to prevent host country entrepreneurs from becoming competitors. The decision to “internalize” corporate operations across borders, as opposed to licensing technology or exporting goods and services, is motivated by a strategy to prevent erosion of market position.

The evidence suggests, however, that these self-protective efforts on the part of multinationals are not perfectly successful - especially where the technology and management skills needed to launch a successful business are relatively simple, stable, and can be learned on-the-job. Multinational corporations have a long history as incubators of senior managers for the industrial sectors of Latin America and Southeast Asia.<sup>36</sup> Local banks and financial sector institutions in both regions are filled with “alumni” of Citibank and BNP.<sup>37</sup> Within six years of the beginnings of FDI-led export growth in Mauritius, 50% percent of all EPZ firms were indigenously-owned – founded, managed, and staffed, in many cases, by employees who had received on-the-job training in foreign enterprises and left to set up their own companies.<sup>38</sup>

Contemporary survey data provide details about the spread of production techniques and management practices in the horizontal direction. One quarter of the managers of Czech firms and fifteen percent of the managers of Latvian firms -- in the 2003 sample of Beata Smarzynska Javorcik and Mariana Spatareanu – report that they learned about new technologies by observing foreign firms as the latter entered their industry.<sup>39</sup> Twelve percent of the Czech managers and nine percent of the Latvian managers indicate that

they discovered new marketing procedures and outlets from watching the performance of foreigners.

Nonetheless, in general – in a horizontal direction – the transfer of production and management skills appears to take place despite the best efforts of foreign investors to prevent it. Along this axis, the popular phrase “technology transfer” can legitimately be considered an oxymoron, as far as the wishes and efforts of the multinational corporations are concerned.

In a vertical direction, however, the story is far different. The surprise in the data comes from where it is least expected, in export-oriented MNC manufacturing plants.

*Vertical Externalities: Industry and Business Case Study Evidence*

Those developing country governments that imposed performance requirements like domestic content and joint venture mandates on foreign manufacturing investors justified their actions with the fear that otherwise the foreigners would engage in no more than “screw driver” operations that had few backward linkages into the host economy.

Confirming their worst apprehensions, early export-oriented MNC plants – often set up in Export Processing Zones (EPZs) or Free Trade Zones, with wholly-owned subsidiaries free to procure inputs from wherever they wished – were largely self-contained operations that assembled imported components with minimal local purchases.

Beginning in the first half of the 1980s, however, plant-level studies showed growing amounts of purchases from local suppliers. These local suppliers included foreign-owned component producers from the home country, induced by the original MNCs to follow them to the host. But they also consisted of growing numbers of indigenous firms. As discussed below, the spread of backward linkages to locally-owned firms varied as a function of the sophistication of the local corporate community, the business-friendly character of the local investment environment, the access of indigenous firms to duty-free imports themselves, and the length of stay of the foreign investors in the host economy.

With firm-based research in Singapore, Lisa Lim and Pang Eng Fong trace the path of backward linkages from individual foreign electronics exporters into the host economy, and document the forms of assistance explicitly provided to locally-owned firms.<sup>40</sup>

“Company A” – the subsidiary of a US semiconductor manufacturer – bought goods and services from 200 local companies. Six of the top ten suppliers, by value of sales to the MNC, were local component affiliates of US, Japanese or European investors from the home market; four were indigenous Singapore firms. To ensure quality and reliability of components, the US semiconductor investor provided detailed specifications and engineering help to the latter. For “Company B” – the subsidiary of a European consumer electronics manufacturer – four of the eight largest suppliers were foreign-owned, and four were indigenous. For the latter, the European purchaser provided assistance in quality-control procedures, and helped automate their production lines. In both cases, the local firms became sellers to unaffiliated buyers. For “Company B”, the foreign affiliate

introduced the Singapore producers to regional sister plants, following which the Singaporeans began to sell in international markets more generally.

In Malaysia, Rajah Rasiah's study of international telecommunications and semiconductor investors -- which included two months of factory-floor residency -- followed the foreigners as they assigned technicians to suppliers' plants to help set up and oversee large-volume production and testing procedures.<sup>41</sup> In some instances, the multinational firms sent engineers to participate in joint design of subassemblies and components with supplier personnel. Over time, in short, the "contract manufacturing" phenomenon became *more intimate than mere shopping around for cheap inputs*.

Of particular note is Rasiah's account of the development of a vertical supplier group in a separate industrial sector, machine tools.<sup>42</sup> The founders of seven of the nine leading Malaysian machine tool firms started as workers in the semiconductor and telecommunications MNCs, then struck out on their own. Ten percent of the workforce in these seven companies was also drawn from the MNCs. Initially, the foreigners supplied molds and dies to their former employees, for products that required simple machining and stamping. As in the case of components for telecommunications and semiconductor assembly, over time engineers from both sides worked together to design specialized machine tool equipment for the mounting of semiconductor wafers.

Duplicating what Lim and Fong discovered in Singapore, the foreigner investors opened a channel for the machine tool suppliers to export to affiliated buyers abroad. All seven

machine tool firms began to sell to unrelated parties, moving from the status of “captive producer” for the multinational to independent player in the marketplace.

In the automotive sector, the indigenous auto part industry in Mexico ramped up production quite rapidly after the automotive multinationals shifted from import substitution to using Mexican sites as export platforms. Wilson Perez Nunez estimates that more than one hundred and fifteen local component firms surpassed the \$1 million mark in sales within five years after the foreigners began to build world-scale plants.<sup>43</sup> Indigenous Mexican firms constituted more than half of the thirty largest auto part exporters (excluding engines). US, Japanese, and European investors provided production audits and “zero-defect” procedures to help improve quality control among the suppliers. Once those suppliers qualified as Original Equipment Manufacturers (OEM) or Replacement Equipment Manufacturers (REM) they were certified for sales throughout the industry.

To reduce unit costs and lower defect rates in Thailand, Archanun Kohpaiboon reports that foreign auto companies assigned technicians who “ate and slept with local workers” in the factories of their local suppliers.<sup>44</sup> By 2003, according to the Thai Automotive Industry Association, the fourteen largest US, Japanese, and European automotive multinationals had certified 709 host country firms for OEM status (287 foreign-owned, 68 joint ventures, and 354 Thai-owned), followed by 1,100 second and third tier suppliers.<sup>45</sup>

Contemporary business surveys provide details about deliberate coaching for suppliers across many industry segments as part of the effort of foreign investors to acquire inputs in the host economy. The survey data of Javorcik and Spatareanu – cited earlier – showed that ninety percent of 119 majority-owned multinational investors in the Czech Republic purchased inputs from at least one Czech supplier.<sup>46</sup> The median affiliate acquired inputs from 10 local firms; an affiliate in the top quartile acquired inputs from at least 30 Czech firms. One tenth of those surveyed acquired all of their intermediates from local suppliers. The MNC affiliates in the Czech Republic did business in sectors ranging from electrical machinery, communications equipment, motor vehicles and other transport equipment, to fabricated metals, rubber, non-metallic mineral products, pulp and paper wood products, furniture, printing, chemicals, food products, and textiles.

Evidence like this provides a reminder, however, that great care must be taken to identify with rigor what constitute genuine externalities.

In the view of Javorcik and Spatareanu the vertical relationships between foreign affiliates and indigenous suppliers take three distinctive forms. First, the multinationals may simply identify the cheapest and most reliable host country suppliers and purchase growing amounts of inputs from them – that is, the foreigners are “cherry picking” from among Czech firms that are already fully-equipped to produce goods and services needed by the foreigners. Second, the multinationals may provide explicit assistance to potential suppliers to help them improve their performance to meet acceptable standards of cost and reliability. Third, the multinationals may announce certain criteria that potential

suppliers must meet that act as a stimulus for local firms to upgrade their activities, on their own. A common example of this latter phenomenon is the decision of Czech firms to obtain ISO 9000 (quality-control) certification, once foreigners stipulate this as a precondition to qualify to bid on procurement contracts.

Using statistical analysis alone, all three types of relationship would show a positive correlation between the presence of foreign investors and higher than average productivity among local suppliers. But the first scenario – the “cherry picking” scenario (where firms supplying multinationals have higher productivity than others) -- would not merit the “externality” label, whereas the second – in which the foreigner provided explicit assistance to the supplier – would so qualify, if the benefits were not all exclusively captured by the purchaser. One fifth of the 119 multinationals reported that they did provide some kind of clearly defined assistance. Most frequently this took the form of financing and advance payment; next was training of employees; next was help with quality control. Other forms of assistance included lending/leasing equipment, supplying production technology and organizing production lines, aid with financial planning and management strategy, and initiation to exporting.

More tricky to label is the third relationship (which Javorcik and Spatareanu call a “positive productivity shock”) in which the foreign presence provides the incentive for the local firm to acquire ISO 9000 certification. Forty percent of the Czech firms that underwent the arduous ISO qualification process in the Javorcik-Spatareanu sample reported that their motivation was to gain access to the advance payments, production

help, and external marketing assistance that came with being a supplier to multinational corporations. Javorcik and Spatareanu leave unresolved the question of whether imparting stimulus for self-improvement might be eligible to be considered a genuine “externality”.

The build-up of indigenous supplier networks depends upon important preconditions. The extent of backward linkages, spillovers, and possible externalities differs according to the duration of the foreign investor residence in the host country, the sophistication of the local business community, and the business climate within which indigenous firms operate.

The early data from Singapore and Malaysia show much lower levels of local procurement than data from later years. Rene Belderbos, Biovanni Capanelli, and Kyoji Fukao find that the proportion of local content (from both foreign-owned and indigenous suppliers) is directly related to the length of Japanese multinationals’ operating experience any given Asian host economy.<sup>47</sup> One additional year of local operating experience, in their estimation, increases the local content ratio by 0.6 percentage points.

Ari Kokko shows that spillovers between foreign affiliates and local firms in Mexico differ depending upon the productivity difference between the two – when the local firms had much lower productivity, there are few signs of spillovers. Kokko, Ruben Tansini, and Mario Zejan find the same difference among Uruguayan manufacturing investors.

Nonetheless, even in relatively poorer developing countries, there is evidence that some managers and workers do move from foreign affiliates to set up parallel operations in low-skill operations like garments and toys, as the data cited earlier from EPZs in Mauritius demonstrates. Mauritius was not alone: within two decades of export-led growth, the proportion of EPZ firms in the Dominican Republic that were locally-owned had grown to 35 percent, in the Dominican Republic to 20 percent. Local procurement, however, appears to depend directly upon the business conditions surrounding the domestic business community. International firms in Mauritius engage in more subcontracting with indigenous firms, for example, than takes place in other African countries, such as Madagascar, Senegal, or Tanzania. Mauritian firms also engage in more subcontracting with each other than is common in these other countries as well. Manju Kedia Shah suggests that both outcomes quite likely may be explained by the fact that business operating conditions for all firms in Mauritius enjoy a higher rating than in other countries, including favorable tax rates and tax administration, superior access to finance, lower economic and regulatory policy uncertainty, better customs and trade regulations, and more reliable electricity and telecommunications.<sup>48</sup>

#### *Weaknesses in Early Statistical Studies*

Why did the first generation of econometric studies fail to show that FDI generated externalities for the host economy?

The discovery that FDI in manufacturing and assembly comes in two distinct forms, with far different impacts on the host economy if the plants are fully-controlled by the parent and oriented toward export markets in comparison to plants oriented toward protected domestic markets and required to meet domestic content requirements and operate with majority-ownership on the part of host nationals, helps explain why the first generation of econometric studies showed such jumbled results.

In the oft-cited study of manufacturing FDI in Venezuela, Brian Aitken and Ann Harrison asked whether foreign equity participation raised the productivity of the recipient plants, and found a robust positive correlation only for small enterprises.<sup>49</sup> Searching for productivity spillovers from foreign investors to domestically-owned plants in the same industry (the horizontal direction only), they found a negative correlation. They concluded that the impact of manufacturing FDI in Venezuela was neither clearly positive nor clearly negative, and surmised that the net effect was quite small. This study is frequently cited to cast doubt on the benefits from foreign direct investment and to refute the contention that the presence of foreign firms generates externalities for a host economy.

But the data on industrial plants they used comes from a period (1976 through 1989) when Venezuela followed a dedicated import substitution strategy, and the Venezuelan Superintendencia de Inversiones Extranjeras imposed a heavy layer of controls of foreign firms.<sup>50</sup> Business International reported that the country's policy toward foreign ownership during this era involved "strict joint venture requirements/only foreign minority position tolerated and this on a limited basis"; host country policy toward domestic content included "general requirements for specified percentage of local

content/strictly enforced requirements for fully utilizing local components and materials”. Foreign firms faced restrictions on repatriation of profits and were obliged to exchange bolivares at the official rate rather than the free market rate; they were forbidden from exercising confidentiality and exclusive-use-of-trade-secrets in their mandatory joint ventures. Only with discretionary authorization from the Superintendencia could foreigners undertake majority-owned FDI, but how frequently majority-owned operations might be reflected in the industrial plant data base is impossible to ascertain.

In short, the trade-and-investment regime in Venezuela during the period of this study replicates rather faithfully those anti-competitive conditions under which Lall and Streetan, Reuber, Encarnation and Wells, and Wasow, found foreign direct investment subtracting from host country welfare, when all inputs and outputs were valued at world market prices. Indeed the most interesting discovery is that Aitken and Harrison uncovered any favorable impact whatsoever.

On the basis of the cost-benefit studies of FDI projects in such a highly distorted setting, cited earlier, one would be justified in supposing that Venezuela was quite probably experiencing a large dose of negative as well as (perhaps) some positive contributions to the host economy. But this is impossible to know because of the way the investigation is designed. What would be needed would be to separate out export-oriented FDI (if any) from import-substitution FDI, to separate out foreign investors free to source from wherever they wish (if any) from foreign investors operating with domestic content

requirements, and to separate out foreign investors obliged to operate as minority shareholders from foreign investors with whole- or majority-ownership.

Data from FDI in Morocco might appear to offer a clearer picture of the relationship between foreign investment and development. Between 1983 and 1985 Moroccan regulations governing FDI allowed foreign manufacturing firms for the first time to take an ownership position of more than 49 percent, and trade restrictions were eased. Mona Haddad and Ann Harrison propose that data from 1985 through 1989 will show the impact of FDI under conditions of trade and investment liberalization.<sup>51</sup>

They found that there was no significant relationship between higher productivity growth in domestic firms and greater foreign presence in the sector, suggesting that foreign investment did not bring positive spillovers to the host economy. Firms with foreign ownership demonstrated higher levels of total factor productivity than their domestic counterparts, but the rate of growth of productivity was higher for the latter.<sup>52</sup>

Controlling for firm size, they found that foreign investors did not exhibit higher levels of labor productivity. As in the Venezuelan case, Haddad and Harrison concluded that the evidence did not show foreign investors making a large and dynamic contribution to the development of the Moroccan economy.

When Haddad and Harrison varied measures of relative trade protection, technology spillovers from foreign investors to domestic firms remained insignificant and generally negative.<sup>53</sup> Morocco's "trade reform" during this period, however, was limited to

phasing out quantitative restrictions while leaving in place a complicated tariff system, with nominal rates ranging from 17% to 44% by sector, and effective rates rising for each stage of processing. Other researchers continued to place Morocco in the “import substitution” category during this period.<sup>54</sup> Indeed, Haddad and Harrison attribute the higher rate of total factor productivity growth for indigenous firms to their superior ability to cope with the continuing distortions in the protected local market.

As for foreign direct investment, the data do not show how much new FDI might have flowed into Morocco in the four year period 1985 to 1989 to take advantage of the new-found freedom to enjoy majority ownership, but the aggregate changes in share of foreign ownership by sector were small: five percentage points in leather, four percentage points in scientific instruments, three percentage points in machinery, textiles, and apparel. Only in a non-manufacturing category (mining of phosphates) was there a more substantial FDI inflow, with the foreign share rising by seven percentage points. Most of the FDI stock in manufacturing was left over from the previous period where strict FDI regulations oriented production toward the protected domestic market.

Genuine liberalization of the Moroccan economy did not occur until the mid-1990s, following which FDI exports of electronics and other manufactures rose from \$ 4 million dollars to some \$633 million, with overall EPZ exports approaching \$3 billion, by 2006. It would be enlightening to undertake a re-evaluation of the impact of FDI on Morocco in the contemporary period, following procedures as outlined next, which avoid mixing the distinctively different forms of inward- and outward-oriented FDI.

*Improving Current Econometric Methodology: Horizontal Externalities*

How can contemporary econometric investigations be strengthened to provide a more accurate assessment of whether manufacturing FDI generates externalities in the host economy? How can such research be designed to identify those channels through which externalities are created when they occur?

Looking first at the impact of FDI on the performance of indigenous firms in the horizontal direction, the standard econometric methodology has been to examine the relationship between the presence of foreign firms and the total factor productivity of indigenous firms in the same sector.<sup>55</sup> Perhaps the foreign firms demonstrate superior technologies or management techniques that the local firms can then imitate, or generate competitive pressures that push local firms to upgrade their practices, or train managers, workers, and engineers who move from foreign to locally-owned plants. But a positive correlation alone cannot be taken to prove that FDI is responsible for raising the performance of local firms – it could be that the foreign firms are simply settling in sectors where standards of productivity are already high.

So, the next step might be to trace how the total factor productivity of local firms changes when levels of FDI in the sector increase. Once again, however, a positive correlation between the two might arise because there is some “external” reason that causes both more foreign investment to arrive and total factor productivity of local firms to rise, such as changes in host country tax legislation or contract enforcement. These business-friendly reforms might simultaneously act as an inducement to foreign investment while

also allowing domestic firms to operate more efficiently. To infer that the arrival of foreign investors causes domestic firm productivity to rise would be mistaken.

Furthermore, as Beata Smarzynska Javorcik and Mariana Spatareanu point out, the arrival of foreign firms is likely to produce two contradictory impacts simultaneously in the horizontal direction – raising the performance of indigenous firms through the demonstration of technology and management techniques and through the spread of foreign-trained workers, managers, and engineers, while, at the same time, damaging the performance of indigenous firms through shrinking their market share and draining off their workers, managers, and engineers.<sup>56</sup>

Econometric studies that merely try to establish a horizontal correlation between changes in total factor productivity of indigenous firms with rising numbers of foreign investors in the same industry, Javorcik and Spatareanu argue, are not going to be able to disentangle these two contrary impacts. To measure spillovers and externalities in the horizontal direction, researchers using econometric techniques will have to figure out how to control for the level of competition, and for the movement of personnel, technology, and management practices between foreign investors and indigenous firms.

This constitutes a major challenge for future research on horizontal externalities.

Research on developing countries can benefit from efforts to separate true spillovers from competitive effects using developed country FDI data, by Haskel, Pereira, and Slaughter,

and Keller and Yeaple.<sup>57</sup> The latter use data on the mark-up rate among firms, for example, to control for change-in-degree-of-competition effects.

*Improving Current Econometric Methodology: Vertical Externalities*

Shifting from the horizontal to the vertical, the use of econometric techniques to investigate when foreign investors create externalities in their relations with local suppliers is fraught with similar difficulties. As before, a positive correlation between a foreign investor presence and higher total factor productivity in upstream or downstream local firms might occur because the foreigners were attracted to regions or sectors where indigenous investors would be able to operate more efficiently. A positive correlation between a growing number of foreign investors and improvement in total factor productivity in upstream or downstream local firms might be due to “other” factors that both attract foreign firms and also increase the efficiency with which domestic companies can operate, so that inferring a causal connection would be unjustified.

The challenges of introducing controls that enable the researcher to separate out the foreign investor impact on indigenous firms are not insurmountable, however, as the work of Garrick Blalock and Paul Gertler reveals.<sup>58</sup> They use data on manufacturing establishments in Indonesia, collected by region since 1988, with some seventy percent having export-oriented operations.

First, to deal with the possibility that multinationals might make their investments in locations that are near to the most efficient suppliers but not make those suppliers any more efficient after the foreigners enter, they include establishment fixed effects in the production function. This controls for unobserved firm-specific productivity factors such as managerial capabilities and local characteristics. As a result, only changes around suppliers' average productivity enter the estimation. Multinationals may very well locate their plants where suppliers are most efficient but the technique employed by Blalock-Gertler investigates whether the performance of suppliers gets even better after the foreign firms enter.

Second, to deal with the possibility that multinationals might make their investments in locations that are near to suppliers whose productivity is growing or expected to grow, they include industry- year fixed effects in the production function. This controls for changes over time in factors common to all firms in the same industry such as regulation and terms of trade. This allows them to look at the overall growth of productivity in a particular sector over a given year, and then compare the growth in productivity in that particular sector in a region where there was a large inflow of FDI with another region where the inflow of FDI was noticeably less.

Third, to deal with the possibility that multinationals might make their investments in regions where area conditions themselves are allowing suppliers' productivity to grow, they include region-year fixed effects in the production function (they call these "island-year" fixed effects, as in the island of Java versus the island of Sumatra). This controls

for changes in location specific factors that are common to all firms in the same region and might affect firm productivity, such as local regulation, infrastructure, and labor markets. They thereby isolate the overall productivity of the particular region (e.g. Java) and are enabled to compare suppliers to a sector in that region where FDI is growing in a particular time period with a sector where FDI is stagnant.

Marching through these three steps, Blalock and Gertler find that the productivity of Indonesian supplier firms increases when the share of output purchased by foreign investors rises.

What these three steps of investigation cannot rule out, however, is that foreign investors expected that the productivity of some specific suppliers in a particular sector in a particular region would grow over time – that is, the foreign firms chose to locate their operations in a particular place because they anticipated that suppliers there would undergo some idiosyncratic positive transformation that was not part of an industry-wide or region-wide changes promoting greater productivity growth.

To address this potential concern, they employ a simultaneity correction for the estimation of production functions that uses capital investment or energy consumption as a proxy for idiosyncratic shocks.<sup>59</sup> They find that the effect of downstream FDI is statistically identical to that measured without the simultaneity correction.

These steps give increasingly solid confidence that the higher productivity of local suppliers that they observe originates from the presence of FDI and not from some other unobserved factor. Their calculation of the chain of welfare effects is that rising numbers of foreign investors lead to improvement in the performance of local suppliers, resulting in lower prices, increased output, higher profitability, and increased entry at the supplier level. The lower prices in the supplier market, in turn, result in lower prices, increased output, higher profitability, and increased competition throughout the Indonesian host economy, benefiting other final goods producers as well as consumers.

But – regression analysts must always wonder – does correlation (even overlapping layers of correlation) demonstrate causation? Do foreign investors actually “bring about” higher level of indigenous productivity, and if so, how and why?

Here – unusual for econometricians – Blalock and Gertler took the logical additional investigative step, and interviewed the foreign investors and Indonesian suppliers about their relationships with each other.<sup>60</sup> From both directions the companies affirmed that concrete transfer of technology and management did take place in the vertical direction, and identified the mechanisms through which this transfer occurred.

An American MNC described a step-by-step program to find and qualify indigenous suppliers. Affiliate engineers would first visit the target factories to survey their operations and suggest modification. Next, the MNC would send sample output from a selected domestic factory for appraisal at home in the United States. If the product

passed inspection, the American investor would send managers from the would-be local supplier to overseas training classes to learn the parent's systems for inventory control, quality control, and cost accounting. This would be followed by small-scale orders from the MNC, building to regular purchases in large quantities as the supplier established a record of delivering on time and within specification.

The managers of an affiliate from a Japanese MNC reported a similar certification process, adding that their usual procedure – as Lisa Lim and Pang Eng Fong, and Raja Rasiah earlier discovered -- was to introduce qualified suppliers to sister affiliates of their industrial group within Indonesia and abroad. Since other members of the Japanese MNC corporate network did the same, the Japanese managers in Indonesia became acquainted with Malaysian and Thai suppliers from whom they procured inputs for Indonesian operations. This strategy reduced search costs for the network, and enabled suppliers to achieve economies of scale. Many candidates, the Japanese managers noted, did not survive the certification ordeal.

From the perspective of Indonesian suppliers, Indonesia firms identified visits from engineers, efficiency specialists, and product design experts as channels for assistance. Not all MNCs provided usable advice, however, and one Indonesian firm broke off a relationship with an American buyer who demanded cost reductions but offered no technical support for achieving them.

These interviews provide a real-life picture of the diffusion of technology and management techniques between foreigners and local firms that is reflected in the econometric analysis, and give comfort in accepting the link between the presence of foreign investors and the improvement in supplier productivity. But the interviews originate from a very small number of observations, and the collection methods do not pretend to offer a representative sample of replies. More valuable results would emerge if the individual accounts could be derived from a large well-structured randomized survey, accompanied by details about the characteristics of the respondents that would allow other tests to determine when diffusion was more or less likely, and larger or smaller.

The combination of econometric analysis and sophisticated survey techniques offers great promise for future research, an observation given added resonance from looking at export externalities.

*Improving Current Econometric Methodology: Export Externalities*

A particularly valuable opportunity in which multiple investigative techniques would lead to greater value-added might be a study like the one in which Brian Aitken, Gordon Hanson, and Ann Harrison investigate whether there are spillovers from multinational corporations to domestic firms that lead the latter to export.<sup>61</sup> They use panel data on 2104 Mexican manufacturing plants from the period 1986-1990, following the country's liberalization of trade and investment in 1985.

Their task is particularly challenging since the more intuitive hypothesis is that firms are especially likely to export from wherever the overall concentration of export activity is larger -- because the accumulation of exporters may allow construction of specialized transportation infrastructure, perhaps, or because access to information about the tastes of foreign purchasers may be more widespread, or because there may be some other local comparative advantage that benefits all exporters.

For each location, therefore, they independently measure the overall concentration of economic activity, the concentration of export activity in general, and the concentration of MNC export activity. By controlling for the overall concentration of activity in a region, they eliminate the impact of unobserved fixed factors that might affect the export behavior of all firms. By treating local export activity and local MNC activity as endogenous variables, moreover, they control for the existence of region-industry specific shocks that might make all of the firms in a particular region and industry more likely to export.

In the end, after taking account of other factors that affect the decision to export (as might be the case for Mexican states with port facilities, or Mexican states located near the US border, or Mexican states located near the capital city), they find that the probability of doing “more-than-expected” exporting is positively correlated with the local concentration of MNC activity but uncorrelated with the local concentration of overall export activity.

Despite this careful, powerful demonstration that the presence of MNCs leads to exports on the part of local firms, the demonstration-processes, learning-procedures, or other mechanisms – the concrete “spillovers” they feature in the title of their article -- by which the foreign investors engender higher levels of exports remain totally opaque.

Is the stimulus to local exporters direct or indirect? Do the MNCs themselves provide coaching in external marketing, introduction to specific foreign buyers, or information about overseas demand? Or, alternatively, does MNC behavior simply demonstrate (without coaching) the processes through which penetration of foreign markets can be achieved, processes which can be copied and imitated by local companies?

Is the transfer of export-related skills and knowledge horizontal or vertical? What is the relative likelihood of Mexican seafood-packing exporters growing up along side US and Japanese seafood-packing exporters (horizontal spillovers), in comparison to Mexican auto parts companies transforming themselves from suppliers to US and Japanese auto plants in Mexico into OEM exporters to the international automotive industry (vertical spillovers)?

Do the FDI-stimulated local exporters experience larger returns to scale, acquire new learning-by-doing skills, or gain reputational effects as they enter international markets (as Lisa Lim, Pang Eng Fong, Rajah Rasiah, and Michael Hobday find), or not (as Clerides et al., Bernard and Jensen, and Delgado et al. suggest)?<sup>62</sup>

Industry studies, business cases, management interviews, and firm surveys could provide answers at the same time they boost confidence about the inference of causation. To move in this direction, the leading economics journals would have to begin to accept – indeed reward – research that combines multiple kinds of investigation.

*Improving Current Econometric Methodology: Labor Market Externalities*

The investigation of possible labor market externalities similarly demonstrates that the introduction of ever greater statistical controls – ever more narrow constrictions -- on large plant-level data sets is valuable and often indispensable, but with diminishing returns in comparison to what the simultaneous use of other investigative techniques might impart.

How do wages paid by foreign investors to workers compare with wages paid by local firms? What accounts for the differences? Are there spillovers from labor payment practices of MNCs to labor payment practices of indigenous firms?

Survey data collected by the International Labor Organization regularly show that wages paid by foreign firms are higher than those provided by domestic companies. Responses to World Bank questionnaires suggest that international companies offer permanent contracts (at higher rates than temporary hires) to a larger share of their workers than local firms.

But, as in the case of productivity comparisons, the higher compensation paid by foreigners might arise solely because multinationals are located in higher wage sectors or attracted to higher wage regions of the host country, or because the foreign-owned plants are larger or newer than the average plant.

To investigate the determinants of payments to labor, Robert Lipsey and Fredrik Sjöholm availed themselves of the same detailed information from the Indonesia Central Statistical Office as Blalock and Gertler.<sup>63</sup> Drawing on 18,642 plant observations from 1996, they found that foreigners paid 33 percent more for blue-collar workers and 70 percent more for white-collar workers than domestic companies. The information for each of the plant observations included industry details, type of ownership, value added, energy consumption, and geographical location, as well as labor characteristics (number of employees, gender, distribution by level of education, and wages) separately for white-collar and blue-collar employees.

First introducing controls for region and industry sector, the premium paid by foreign-owned firms remained at 25 percent for blue-collar workers and 50 percent for white-collar workers. Next, adding controls for plant size, energy inputs per worker, other inputs per worker, and the proportion that were female, the foreign firm wage premium remained at 12 percent for blue-collar and 22 percent for white-collar workers. Their analysis thus suggested that approximately one-third of the premium paid by foreigners was explained by region and sector and one-third by plant size and use of other inputs. But their data indicated that multinational investors were paying wages to their blue-

collar and white-collar workforce above and beyond what might be due to superior productivity arising from greater scale of production and more inputs per worker, and the origins of this final one-third of the wage premium were left unaccounted for.

Turning to labor market spillovers, their analysis of the data showed that the higher wages paid by foreign firms did lead to payment of higher wages in domestically-owned plants. Holding labor force quality constant, they found a positive spillover within broad industry groups at the national level, and a smaller – but still positive and significant – spillover within narrower industry groups and at the province level.

These results introduce a puzzle quite at variance with popular discourse – rather than engaging in “exploitation” of workers, why do foreign investors pay more than they “have to” in developing country markets, and what are the dynamics that makes this wage premium turn up among local firms as well? Labor market literature introduces a complicating reverse-causality hypothesis, that higher MNC wages might derive from team-spirit, pride, or enhanced dedication, in which higher pay generates higher productivity instead of the opposite. Could this be the explanation?

Further investigation of this puzzle would be especially helpful, given the common allegation that multinational firms use their power to drive down worker wages, and generate a race to the bottom among all firms in the host economy.

Here a well-structured survey of the determinants of human resource practices within foreign affiliates and their host country counterparts could be a particularly valuable complement to the econometric analysis. The initiative to use survey data as a complement to econometric investigation would probably have to originate among senior scholars since such an approach would be too risky for pre-tenure academics to hazard.

### **III. How to Assess the Need for Public Sector Support – Including Subsidies and Incentives – to Attract FDI**

A key question faced by every developing country is whether host authorities should expend public funds – offering special support, providing subsidies, bestowing incentives -- to attract manufacturing FDI.

Economists are rightly skeptical about the desirability of showering multinational corporations with tax breaks and other subsidies. But standard economist reasoning follows an unimaginative script – not inaccurate, but unimaginative -- that short-circuits analysis of where the real problems lie and what practical policy responses might be available. The decision-tree is simple: Does FDI generate externalities? If not, don't subsidize FDI. If so, subsidize FDI up to the social value of the externalities.

As shown next, what is needed is more thorough investigation of what are the obstacles – including market failures – that impede flows of FDI that are potentially laden with externalities, and what are the most appropriate methods to overcome those obstacles?

Once again, it is useful to begin – Albert Hirschman-like -- by looking closely at a complicated real-life case study, to investigate what generalizable insights might emerge of use to analysts and policy makers alike.

The most thoroughly-researched case study of the challenges of attracting manufacturing FDI – and of the role of public expenditures as part of the host country investment promotion strategy -- is the effort of Costa Rica to persuade Intel to build a semiconductor plant in Belen County, Herida.<sup>64</sup> This case, from 1996, is held up as a model by the Foreign Investment Advisory Service (FIAS) of the World Bank Group, and used as a training tool by other multilateral agencies.<sup>65</sup> Close examination of this experience offers insights both more subtle and more useful for general-purpose design of investment promotion policies, however, than conventional treatment indicates.

Prior to approaching potential semiconductor investors, Costa Rico had undertaken micro- and macroeconomic reforms in the 1980s that offered investors low inflation, a realistic exchange rate, sensible fiscal policy, and a reasonable business environment. Unusual in Central America, the country had a long history of political stability, with well-respected legal and regulatory institutions. Drawing on these favorable traits, Costa Rica had managed to attract FDI in garments and footwear.

As domestic wage rates rose, Costa Rican authorities feared competition from cheaper production sites, and turned their attention to trying to diversify the FDI base with more

sophisticated manufacturing operations. With backing from USAID, the government reorganized its investment promotion agency – CINDE (la Coalicion Costaricense de Iniciativas para el Desarrollo), in 1992, and staffed it with well-trained and well-compensated professionals able to decipher the concerns of the semiconductor, biotech, and other advanced sectors, and prepare customized investment feasibility studies.

CINDE identified Intel -- which was looking for a site to build a new semiconductor plant -- as the country's preeminent target. But when CINDE approached Intel with carefully crafted proposals, the agency discovered that Costa Rica was not even on Intel's "long list" of possible sites, let alone the short list (Indonesia, Thailand, Brazil, Chile, and Mexico). It took two years of what Debra Spar characterizes as "assiduous" campaigning to obtain the first invitation to visit Intel headquarters.<sup>66</sup>

CINDE persisted, and with a high-intensity effort – drawing the President of the Republic in to order Ministries to make special expenditures from their budgets to support Intel's proposed operations – secured the largest foreign investment (\$300 million) in the history of Central America. The final item that Costa Rica agreed to, to get Intel's signature on the investment contract, was provision of twelve years of tax holidays for the multinational's operations.

The conventional lesson that this case is used to illustrate is that markets do not supply relevant and timely information on their own, that search on the part of multinationals is costly and incomplete, and that would-be hosts have to take active steps – the term of art is *pro-active* steps – to "market the country". FIAS uses this case study to urge hosts to keep investment promotion agency websites up to date, with current economic and

legislative materials and real-time contacts to key ministries, agencies, and Presidential assistants.

While this is sensible advice, the Intel case study provides more profound insight into the challenges facing would-be host governments. What kind of “information” is most crucial to help a multinational investor decide to commit massive resources to a plant in a new locale that will play a central role in the company’s global strategy (22-25% of company output in the Intel case)? And when can high-level host leaders, including perhaps the President, weigh in and deploy their clout in allocating domestic resources most effectively? Is the answer, in providing tax breaks and subsidies to the new investor?

The Intel case does show that improving the functioning of information markets on even the most rudimentary level – positioning the country on Intel’s horizon – is not easy, and requires prior expenditure of public funds for a well-staffed investment promotion agency. But a closer look at the details reveals – as common sense would suggest --that the doubts and hesitations that a multinational investor faces when considering a new investment derive from more than a paucity of general information, like economic statistics, relative wage information, or legislative texts.

The doubts and hesitations derive from paucity of information of a particular kind: a multinational investor like Intel (especially the first investor in given sector) cannot know for sure whether this might be a profitable investment site – indeed, cannot even reduce

most of uncertainty involved in site-selection – without “test driving” it. The challenge for the would-be host is to overcome the anxieties of a risk-averse investor who has to make an irreversible commitment in a plant upon which headquarters will depend for the success of its international competitive position without the investor being able to know until the company “tries out” the proposed facility whether the MNC will – in George Akerloff’s famous phrase -- be “stuck with a lemon”?<sup>67</sup>

When quality uncertainty hinders market functioning, as Akerloff points out, outcomes can be improved when the seller takes measures to *reassure* the buyer about the reliability of his purchase. This is most straightforward when there is asymmetric information (the used car dealer knows which used cars are “ok” and which are not), and the reassurance can take the form of some guarantee (such as a warranty, or promise to fix or replace). For a host country like Costa Rica trying to attract an investor like Intel, however, the *obstacle to market functioning is not information asymmetry*, strictly speaking, since the host government itself does not know for sure that the local economy will be a suitable site for semiconductor assembly. The best the host can do is to try to reassure the party considering a new plant in a novel sector by taking steps to reduce the most significant sources of risk and uncertainty.

Intel executives told CINDE that their principal concerns were obstacles that might reduce the corporation’s “lead time over rivals”.<sup>68</sup> The first obstacle was the possibility of power shortages or electrical failures. The second obstacle was potential bottlenecks

in service via the national airport. The third obstacle was possible shortages in workers trained appropriately for the new semiconductor plant.

Here is where CINDE deployed Presidential power, to direct the state utility to dedicate a new substation in the electrical grid to supply the Intel plant, to instruct the Ministry of Transportation to speed construction of a new air cargo terminal for Intel's use, and to create a special cooperative program between Intel's manpower experts, the national vocational training institutes, and the Ministry of Education.

The provision of tax breaks was more pro forma. Once Costa Rica addressed the multinational's principal concerns, Intel negotiators notified CINDE that their country had gained a place on the company's "short list". All other finalists, the Intel negotiators then pointed out, had agreed to a tax holiday for the first eight years of operation, and a 50 percent exemption for the next four. Costa Rica assented to the same conditions, without fanfare.

The structure of Costa Rica's negotiations with Intel is not unusual.<sup>69</sup> Multinational investors frequently demand public expenditures to reduce the most questionable aspects of project feasibility – measures to ensure the reliability of infrastructure and the availability of skilled manpower are often high on the list. Rather than advising against public sector intervention in the abstract, FIAS and other multilateral agencies typically urge that the host try to provide support in a form that benefits investors in the economy more generally, not just the MNC in question. In the Intel case, CINDE argued that air cargo and electrical capacity were fungible, that the new facilities would not subtract

from what was available to other firms, and that the services were being offered to Intel at commercial rates (a subject of some domestic debate). With regard to manpower training, the Ministry of Education managed to ensure that the new cooperative training program would turn out workers whose skills could be used throughout the IT and electronics sector.

As for the tax breaks, other business cases reveal that the standard MNC negotiating technique is to line up several approximately equivalent production sites for headquarters scrutiny, and then require the host authorities at the sites to bid against each other, with packages of locational subsidies acting – in the words of one veteran negotiator – as a “tie breaker”.<sup>70</sup>

How is expenditure of public funds to attract multinational investors related to confirmation that externalities will justify such expenditure?

Here again the Intel case study throws a snag into standard economic reasoning, obvious as soon as pointed out.

Once Intel built its plant, backward linkages and externalities began to appear. Two years after Intel’s arrival a survey of 80 indigenous Intel suppliers in 2000 (37 suppliers of services, 43 suppliers of goods) indicated that 35% of the former and 17% of the latter received training from Intel.<sup>71</sup> The largest local suppliers concentrated on metalwork, plastic injecting molding, packaging, and engineering services. More important for

upgrading the FDI base, Intel's choice of Costa Rica had a large *demonstration effect* on other multinationals. Within three years of the Intel investment, the country tripled its stock of FDI, to \$1.3 billion, with an annual export level of more than \$3 billion.

Seventy-two percent of 61 multinationals with operations in Costa Rica said that the Intel investment played an important "signaling role" in their own decision to invest (36 in electronics, 13 in medical devices, 3 in business services, and 9 in other sectors).<sup>72</sup>

The electronics sector became the largest export cluster in the country, with 55 companies (42 foreign, 13 indigenous) employing some 12,000 workers with exports of \$1.65 billion.<sup>73</sup> Management interviews indicated that success with "clean rooms" in the electronics industry attracted the interest of medical companies: Baxter Healthcare preceded Intel, Abbot Laboratories (now Hospira), and Boston Scientific came afterwards. The quality of the workforce played the same role with business services: Proctor & Gamble made Costa Rica the center for "shared services back office", followed by Western Union's technical support center, and Sykes' call center for hire. Overall, by 2006, Costa Rican FDI exports of manufactured products and business services exceeded \$5 billion.

More than access to capital, FDI provided access to the international industry frontier in increasingly sophisticated activities. Costa Rica became a model of "dynamic comparative advantage" in which a host economy whose leading industries initially comprised coffee and bananas, moved (via FDI) to low-skilled labor-intensive exports

like garments and footwear, then upgraded foreign investor operations to a broad spectrum of medium-to-higher skilled endeavors.

The catch was that during the period when the decision was made to refurbish Costa Rica's Investment Promotion Agency and launch the drive to attract Intel, however – according to CINDE officials<sup>74</sup> – the prospect of spillovers and demonstration effects was largely *wishful thinking*. Only the likelihood of above-average wage rates for Intel employees appeared to be a sure thing (2900 workers with a premium of approximately 50% over other manufacturing jobs), and estimates of other positive benefits were purely hypothetical.

The idea that host authorities are going to know with much certainty when externalities will be delivered from FDI operations, or be able to calibrate how much to subsidize their provision, is farfetched. Perhaps the most reasonable fashion to deal with the quandary of not knowing what the payoff from incentives will be is to direct investment promotion efforts toward FDI sectors that common sense suggests might be relatively externality-laden -- sectors that are higher skill-intensive, higher value-added, promise more local R&D, or have demonstrated records of extensive local procurement in other developing countries, for example. Moreover, as suggested above, the host will be well advised to provide incentives in forms that are most likely to benefit investors more broadly than the specific MNC in question, such as upgrading worker skills and improving infrastructure reliability across-the-board.

#### **IV. Implications for Developed and Developing Country Policies**

The implications of the preceding analysis are rather simple and straightforward. The puzzle is why they are missing from the learned body of economic literature on foreign direct investment and development.<sup>75</sup>

The inability to find one single “universal” relationship between manufacturing FDI and host country development represents not an investigative failure, but an important discovery, crucial for both analytical and policy conclusions.

Manufacturing FDI is most likely to make a positive contribution to national income under reasonably competitive conditions. The willingness of a multinational firm to place an affiliate along the frontier of best practices in the industry, and keep it there with continuous improvements and updates, depends upon the ability of the parent to control that affiliate with minimal risk of technology leakage or external interference in operations.

Manufacturing FDI in a distorted economic environment -- in particular a host economy using trade protection to substitute local production for imports and imposing domestic

content, joint venture, or other technology-shifting requirements on multinational investors -- is likely to result in inefficient plants that subtract from national income.

Developing countries should note, therefore, that *their interests are not served by weakening the TRIMS Agreement within the WTO* – which had banned imposing domestic content or trade-balance mandates on FDI – or by restoring the host country practice of levying performance requirements on manufacturing multinationals. For this reason, the allegedly “pro-development” agenda advanced at the Hong Kong Trade Ministerial in 2005 – affording developing countries greater leeway to place domestic content requirements upon foreign investors, and to maintain them until 2020 – represents a *dramatic step backwards*.<sup>76</sup> Developing countries would advance their own “development agenda” more effectively, in fact, if they tightened the TRIMS Agreement – bringing joint venture requirements under multilateral discipline – rather than loosening it.

Contrary to the prescription of Nancy Birdsall, Dani Rodrik, and Arvind Subramanian, regulation of manufacturing FDI – leaving aside the complicated issue of intellectual property rights – is not a sphere where developing countries need more “policy space”.<sup>77</sup> In the roster of areas where host country policies toward multinational corporations (not just manufacturing multinationals) might be given more or less freedom of maneuver, imposition of performance requirements is a prime candidate for less, rather than more, policy space.<sup>78</sup>

The analysis in section I of this paper is particularly important for least developed countries. Contradicting the justification given for the attack on the TRIMS Agreement in Hong Kong, the counterproductive impact of performance requirements holds for poorer developing countries as well as more advanced developing countries. There is no evidence that least developed economies gain from placing greater restraints on manufacturing investors, or from undergoing longer, slower periods of transition for trade-and-investment liberalization.

To be sure -- to help poorer countries take full advantage of trade-and-investment liberalization -- the developed world may want to redouble both the provision of aid-for-trade, and the provision of aid-for-investment (including aid for investment promotion, and aid for regulatory- and institutional-reform). But the observation that the liberalization of trade-and-investment does not produce maximum benefits in a vacuum does not imply that least developed countries are served by placing greater restrictions on multinational investors than middle-income developing countries.

Despite rich country rhetoric about wanting to assist the development of poor countries through encouragement of FDI, it is a scandal to find that eighteen of the nineteen official political risk insurance agencies within the OECD -- including the United Kingdom, Canada, France, Germany, Japan, and the United States -- provide coverage for multinational manufacturing projects that rely upon trade restraints to survive.<sup>79</sup> Worst of these, the US Overseas Private Investment Corporation insures foreign investors against the "threat" the host authorities may remove anti-competitive barriers they have

used to confer high profits upon the policy holder, and pays the claim when the host reneges on its promise of on-going protection by liberalizing the economy!<sup>80</sup>

Nor have the developed countries exercised their responsibility to require that the Multilateral Investment Guarantee Agency (MIGA) of the World Bank group – or the multilateral financial agencies like the Inter-American Development Bank, Asian Development Bank, and EBRD – screen out welfare-reducing import substitution projects from their FDI guarantee portfolios. As long as manufacturing FDI projects show a positive commercial rate of return they are eligible for official guarantees even if the broader economic impact on the host economy is negative.

Designing policies to best capture externalities is likely to remain vexing.

From an analytic point of view, identifying and measuring externalities – in both horizontal and vertical directions – will always be difficult, although earlier sections of this paper show that great strides are already being taken, and new multi-disciplinary breakthroughs are within grasp.

From a host policy point of view, the unfortunate truth is that attracting foreign direct investment in the hope of securing externalities costs money. The evidence introduced above suggests that would-be hosts are unlikely to have the luxury of basing policy on the pristine principle, improve the overall business climate and MNCs will show up. Just to improve the functioning of information markets alone, the annual budget for CINDE is \$11 million, for the Dominican Republic's Investment Promotion Agency \$9 million, for the IPA in Mauritius \$3 million. The bigger ticket expenditures associated with meeting

infrastructure and human resource needs of international firms require much more. The combination of “marketing the country” and securing specific commitments from MNCs to fill ready-made industrial parks and export zones with new plants, moreover, requires *up-front* outlays that must be expended well before the generation of externalities is anything more than a gleam in the eye of host authorities.

Complicating the task for would-be hosts, the allocation of public dollars to promote investment, in a world of scarce resources, requires targeting – more effort to attract FDI in software development, less in garments; more effort to attract FDI in frozen shrimp, less in bananas; more effort to attract FDI in call centers, less in tourism, or vice versa -- and subjects the allocators to the political and economic challenges of picking winners and losers among sectors and even firms. Contemporary advice to host authorities exhibits a distinctly *schizophrenic* quality, switching back and forth abruptly from the interventionist urgings of Joseph Stiglitz, Ricardo Hausmann, and Dani Rodrik to the industrial policy skepticisms of Marc Noland and Howard Pack.<sup>81</sup> As suggested above, host country authorities may have no more than common sense to guide them, trying to keep the allocation of public expenditures as free from political contamination as possible, aimed at sectors where spill-overs appear most likely to emerge, without discrimination between foreign-owned and indigenous-owned recipients.<sup>82</sup>

With regard to tax breaks and direct subsidies, the predicament for developing countries springs from *prisoner dilemma dynamics*, not from the failure of host authorities to comprehend the misgivings of economists. The host that refuses to provide generous

locational incentives is undermined by others who will. Complicating any solution is the unpleasant detection of growing competition between developed- and developing-country plant sites. Conventional wisdom held that multinationals corporations do not compare rich country and poor country locales in deciding where to set up operations. But contemporary research is showing otherwise: Mexico, Thailand, and Slovakia do compete with Ireland, Canada, and North Carolina.<sup>83</sup> John Mutti has uncovered a particularly high elasticity for alternative sites for internationally traded goods – tax breaks that reduce the cost of capital by one percent raise MNC production in the manufacturing sector of the host by approximately three percent.

“Just Say No” is not a realistic approach for controlling give-aways to multinational corporations. What is needed (as indicated in the roster of areas where developing country policy-space needs to be narrowed, above) is an international agreement to cap and roll-back locational incentives. To be effective, alas, sub-national as well as national authorities – from Alabama to Minas Gerais -- will be have to brought under the new disciplines, an undertaking that will be formidable indeed.

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<sup>1</sup> The analysis in this paper is limited to foreign direct investment in manufacturing in developing countries. Foreign direct investment in extractive industries, and in infrastructure, involve distinctive corporate strategies, and pose distinctive public policy challenges for host authorities. See Moran (2006, chapter 3). Foreign direct investment in services – potentially of great value for increasing the competitiveness of indigenous firms -- is still in early stages of investigation.

<sup>2</sup> Lall and Streetan (1977). The data collection 1970-1973 overlaps with the data used in the Reuber report.

<sup>3</sup> Reuber with Crookell, Emerson, and Gallias-Hamonno (1973).

<sup>4</sup> Table, p. 179 and Appendix C.

<sup>5</sup> Encarnation and Wells, Jr., in Moran, ed. (1986).

<sup>6</sup> Subsidized energy prices also led to project outcomes that reduced national welfare.

<sup>7</sup> Wasow (2003).

<sup>8</sup> Krueger (1975).

<sup>9</sup> *Ibid.*, Table V-1, (p. 89)

<sup>10</sup> Bale, Jr., and Walters (1986); United Nations Center on Transnational Corporations (UNCTC) (1991); Samuels II (1990).

<sup>11</sup> For an engineering comparison of CKD and SKD auto plants with standard full-scale assembly operations, see Ngo and Conklin (1998) Appendix 3: Note on the Automobile Assembly Process of Mekong Corporation and the Viet Nam Motor Vehicle Industry.

<sup>12</sup> Klein, (1995). Kalotay (2002, pp. 1042-1049).

<sup>13</sup> Beamish (1988). Multinational investors show a marked difference in behavior between freely choosing a local partner to help penetrate a host country market, and being required to form a joint venture as a condition of entry. They frequently partner with a local firm to set up domestic operations, but then take full control if they decide to incorporate the host site into the parent's internal sourcing network.

<sup>14</sup> Wang in Brooks and Hill, eds. (2004).

<sup>15</sup> Cline (1987).

<sup>16</sup> Harvard Business School (1990).

<sup>17</sup> Gray and Walter (1984, 283-307).

<sup>18</sup> For a more extensive review of evidence of this intimate parent-affiliate relationship, see Moran (2001).

<sup>19</sup> Womack, Jones, and Roos (1991, ch. 10).

<sup>20</sup> Borrus, Ernst, and Haggard, eds.(1999).

<sup>21</sup> Lim and Fong (1991, p. 115).

- <sup>22</sup>McKendrick, Donner, and Haggard (2000).
- <sup>23</sup> King, Keohane, and Verba, (1994); George and Bennett (2004).
- <sup>24</sup>Cf. Eastman and Stykolt (1970, pp. 336-47).
- <sup>25</sup> Mansfield and Romeo (1980); Lee and Mansfield (1996)
- <sup>26</sup> Ramachandran (1993, pp.664-70).
- <sup>27</sup> Long. (2005).
- <sup>28</sup> Gomes-Casseres (1989 pp. 1-25);. Beamish and Delios (1997).
- <sup>29</sup>Blomstrom, Kokko, and Zejan (1992).
- <sup>30</sup> Urata and Kawai (2000)in Takatoshi Ito and Anne O. Krueger, eds.
- <sup>31</sup> Desai, Foley, and Hines, Jr. (2002).
- <sup>32</sup> Hobday (1995). Hobday (2000) in Linsu Kim & Richard Nelson, eds.
- <sup>33</sup> Rhee, Ross-Larson, and Pursell (1984).
- <sup>34</sup> For the argument that more “policy space” is needed for developing countries to regulate FDI, using Korea as an alleged model, see Birdsall, Rodrik, and Subramanian (2005, pp. 136-152).
- <sup>35</sup>Vernon, Wells, and Rangan (1995).
- <sup>36</sup> Katz, ed. (1987).
- <sup>37</sup> McKendrick (1994, pp. 513-535).
- <sup>38</sup> Rhee, Katterback, and White (1990 p. 39). The 50% represents the share of all EPZ equity capital. The authors report that indigenous firms were founded by employees of the foreign multinationals, but do not provide exact data.
- <sup>39</sup> Javorcik and Spatareanu. *Op. cit.* .
- <sup>40</sup>LLim and Fong (1982 pp. 585-95).

<sup>41</sup> Rasiah (1995).

<sup>42</sup> Rasiah (1994, pp. 279-298).

<sup>43</sup> Nunez (1990, ch. 6).

<sup>44</sup> Kohpaiboon (2005).

<sup>45</sup> *Ibid.*

<sup>46</sup> Javorcik and Spatareanu , *op. cit.*.

<sup>47</sup> Belderbos, Capanelli, and Fukao (2000).. in Ito and Krueger, eds.

<sup>48</sup> Shah (2006, Figure 1, p. 2); Shah, Habyarimana, Cotton, Ramachandran, and Rossignol (2005, table 3-2, p. 29).

<sup>49</sup> Aitken and Harrison, (1999, pp. 605-18).

<sup>50</sup> Balasubramanyam, Salisu, and Sapsford, (January, 1996, pp. 92-105, appendix.),

Wheeler and Mody, (1992, pp. 57-76, Tables A-1 and A-2. )

<sup>51</sup> Haddad and Harrison (October 1993, pp. 51-74).

<sup>52</sup> The data from Morocco show a positive and statistically significant relationship between the extent of foreign ownership of a firm's assets and firm-level productivity: each increase by one standard deviation in the extent of foreign ownership of a given firm brought that firm 4 percent closer to best practices in the industry. This test of the Moroccan data comes from a later analysis by Harrison (1996, pp. 163-187) in Roberts and Tybout. "Determinants and Effects of Direct Foreign Investment in Cote d'Ivoire, Morocco, and Venezuela". In the original article on Morocco, Haddad and Harrison had suggested that firms with majority foreign ownership behaved generally in the same way as firms with minority foreign ownership.

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<sup>53</sup> Once again, Haddad and Harrison tested only for horizontal spillovers, not vertical spillovers.

<sup>54</sup> Balasubramanyam, Salisu, and Sapsford (1996).

<sup>55</sup> Hanson (2005, Comment, pp. 175-178) in Moran, Graham, and Blomstrom, eds.

<sup>56</sup> Javorcik and Spatareanu. *Op. cit.*.

<sup>57</sup> J. Haskel, Pereira, and Slaughter (2002); Keller and Yeaple (2007).

<sup>58</sup> Blalock and Gertler (Forthcoming). Similar research sophistication and similar results are found in Javorcik (2004).

<sup>59</sup> Olley and Pakes (1996, pp. 1263-1297).

<sup>60</sup> Blalock and Gertler. in Moran, *Op. cit.*

<sup>61</sup> Aitken, Hanson, and Harrison, (August 1997, pp. 103-32).

<sup>62</sup> In addition to Lim, Fong, and Rasiah, *op. cit.*, Garrick Blalock and Paul Gertler (2004 pp. 397-416), find strong evidence that firms experience an increase in productivity of 2%-5% following the initiation of exporting. The timing of the increase points to learning from exporting rather than self-selection of higher performing firms into export markets. In interviews, the foreign investors indicated that they help their suppliers export precisely because exporting keeps the suppliers current with best practice, and also because exporting expands and smoothes suppliers' demand so they can justify investment in the latest capital equipment. For the contrary view, see Clerides, Lach, and Tybout (1998, pp. 903-947); Bernard and Jensen (1999, pp. 1-25); Delgado, Farinas, and Ruano (2002 pp. 397-422)

<sup>63</sup> Lipsey and Sjöholm (2004a, pp. 287-310).and (2004b, pp. 415-422).

<sup>64</sup> Spar (1998).

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<sup>65</sup> Multilateral Investment Guarantee Agency.(2006).

<sup>66</sup> Spar, *op. cit.*

<sup>67</sup> Akerloff (August 1970, pp. 488-500).. For investments as irreversible commitments, see Dixit and Pindyck (1994).

<sup>68</sup> Spar, *op. cit.*

<sup>69</sup>Cf. Hausmann and Rodrik. (2003). In an earlier work I posed the hypothesis that the market failure in attracting FDI in a novel sector sprang from appropriability problems: the first mover takes all the risks but (if successful) does not enjoy a period of market exclusivity long enough to compensate for this exposure. This is the market failure that is proposed by Hausmann and Rodrik (2006). The Costa Rica case does not support this interpretation, however: 1) senior executive testimony pointed to the parent's uncertainty about efficient, reliable production as the binding constraint, not fear of follow-the-leader behavior by others; 2) other semiconductor investors did not rush into Costa Rica after the Intel plant proved successful. As noted *infra*, the Intel decision to invest did have a demonstration effect on other multinational investors, but not investors whose entry would reduce the profitability of Intel. For my earlier hypothesis, see Moran (1998).

<sup>70</sup> Harvard Business School. *Adam Opel AG*. Case 9-392-100 (1993, pp. 101, 127).

<sup>71</sup> Larrain, Lopez-Calva, and Rodriguez-Clare. (2001)..

<sup>72</sup> *Ibid.*

<sup>73</sup> Multilateral Investment Guarantee Agency (2006). *Op. cit.*

<sup>74</sup> Alonso (2000); presentation at the Inter-American Development Bank, Washington, (September 18, 2001).

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<sup>75</sup>Or, worse, turned on their head into a complaint: “Policy making has come to ignore the ambiguous and inconclusive academic literature.” Lipsey (2006).

<sup>76</sup> World Trade Organization (2005).

<sup>77</sup> Birdsall, Rodrik, and Subramanian. *op. cit.*

<sup>78</sup> The TRIMS Agreement is one of three areas in which developing countries would actually benefit from *less* “policy space” -- 1) less policy space to impose performance requirements on foreign investors; 2) less policy space to participate in bribery, corrupt payments, and non-transparency; and – as indicated *infra* -- 3) less policy space to award tax breaks and locational incentives to attract foreign investors. In three other areas, they would benefit from *greater* “policy space” – 1) greater policy space to avoid multilateral trade sanctions to enforce labor standards; 2) greater policy space to establish health, safety, and environmental regulations without paying compensation to foreign investors; 3) greater policy space to engage in international arbitration procedures that emphasize conciliation with investors during cross-border financial crises (rather than mere commercial contract enforcement). Moran (Forthcoming 2007).

<sup>79</sup> *Foreign Policy*/Center for Global Development Commitment to Development Index (2006).

<sup>80</sup> O’Sullivan (2005). in Moran and West Eds; See Claim of Joseph Companies, Jamaica (1999).

<sup>81</sup> CF. The World Bank. (2006). United National Conference on Trade and Development (UNCTAD), (2005). *Investment Policy Review: Kenya*. The Noland-Pack reference is Noland and Pack (2003).

<sup>82</sup>The effort to attract FDI in new sectors must also be ready for surprises. As Ricardo Hausmann and Dani Rodrik point out, both salmon farming and fresh grape exports were “unexpected” successes that market forces in Chile alone might have overlooked.

<sup>83</sup>Mutti (2003); Altshuler, Grubert, and Newlong (1998).