

Foreign Investment and Supply Chains in Emerging Markets: Recurring Problems and Demonstrated Solutions

Theodore H. Moran

Abstract

Multinational corporations account for 80 percent of all transfers of goods and services across borders, either within their own affiliate transactions or through networks with independent providers. As a result, the term *supply chains* is rapidly becoming the new norm in discussing the spread of trade and investment around the globe.

From the point of view of developing countries, however, the ability to link host economies into international supply chains is anything but normal. There are important market failures and tricky obstacles that inhibit creation of supply chains in emerging markets.

This working paper identifies the most important market failures and impediments that hinder the spread of supply chains in developing economies—with findings quite at variance with much conventional wisdom—and examines how some host governments have been successful in overcoming these obstructions. The evidence provides a useful perspective on the debate about the need for something that might be called *industrial policy* for countries that want to use foreign direct investment (FDI) to diversify and upgrade their production and export base. A sample of six diverse case studies—chosen because they offer detailed information about information asymmetries, market failures, and coordination externalities—shows clearly that developing country authorities should not merely sit back and wait to see what international market forces bring to them. The public sector “support” that is needed takes the form of creating effective investment promotion agencies and funding industrial parks, reliable infrastructure, and vocational training with curricula designed by companies that wish to employ the graduates. These interventions surely qualify as a kind of industrial policy, and definitely cost public money. This approach might be called *light-form industrial policy* to harness FDI to development and generate backward linkages as deep as possible into the host economy.

This light-form industrial policy contrasts with policies that target specific domestic industries for special government support and protection while excluding foreign investment altogether from the targeted industries or subjecting foreign firms therein to performance requirements in the form of domestic content mandates, joint venture mandates, and/or other technology-sharing pressures. This latter approach could be called *heavy-form industrial policy*. Country experiences, including evidence from China, reveal counterproductive outcomes from the imposition of explicit performance requirements on foreign investors.

To a certain extent, emerging market hosts can carry out policy interventions on their own. But the evidence presented here shows that external support is often crucial to success. Contemporary policy discourse often implies, indeed sometimes assumes, that with the explosion of international private sector investment flows there is less need for developed country donors and multilateral financial institutions to support growth and development programs—as opposed to pure poverty reduction programs—especially in middle-income emerging markets. But the evidence introduced in this working paper shows that there is a vital role for external donors, including the aid agencies of developed countries, the World Bank Group, and the regional development banks, to work with host country governments to improve the functioning of markets so that emerging countries can better harness FDI for development.

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INTRODUCTION

Developing countries that can diversify and upgrade their production and export profile enjoy greater welfare gains and more rapid growth rates than countries that simply do more of what they have always done. Foreign direct investment offers rich opportunities for emerging economies to attract middle- and higher-skill operations and to link into multinational corporate global supply chains.

But accomplishing this goal involves overcoming tricky imperfections in information markets, addressing coordination externalities, and surmounting other market failures. How have some countries accomplished this, and why have others failed?

This working paper identifies what kinds of policy interventions are necessary for success and shows what approaches have not worked or have proved counterproductive.

I. USING FOREIGN DIRECT INVESTMENT TO DIVERSIFY AND UPGRADE THE EXPORT BASE OF DEVELOPING COUNTRY ECONOMIES: NEW EVIDENCE

Development theory has shifted in recent years from preoccupation with simple export-led growth to examination of the composition of exports. Emerging economies benefit not simply from exporting ever larger amounts of what they have always produced but also from upgrading and diversifying their export base: those that manage to export a wider set of higher-quality (higher unit value) goods and services grow more rapidly and enjoy greater welfare gains than those that do not (Hausmann, Hwang, and Rodrik 2007). New exports to regional markets can offer valuable opportunities for export diversification. Penetrating developed country markets is particularly important (Mattoo and Subramanian 2010).

To a certain extent, emerging market nations can rely exclusively on their own indigenous entrepreneurs to accomplish the objective of upgrading and diversifying exports. But the evidence shows that the globalization of industry offers large and rapidly growing opportunities for developing countries to harness foreign direct investment to this task.

Popular discussion often portrays foreign direct investment (FDI) in manufacturing and assembly as flowing primarily to lowest-skill, lowest-wage activities in the developing world, such as garments and footwear. But a closer look at the data paints quite a different picture: by far the majority of manufacturing FDI in developing countries flows to more-advanced industrial sectors, and the weighting toward more skill-intensive investor operations is speeding up over time.

As table 1 shows, the flow of manufacturing FDI to medium-skilled activities (e.g., transportation equipment, industrial machinery, electronics and electrical products, scientific instruments, medical devices, chemicals, and rubber and plastic products¹) is nearly 10 times larger per year in the most recent period for which data are available than the flow to low-skilled, labor-intensive operations—and this flow

1. Sector-specific data are presented in appendix A.

has been growing. The ratio of higher- to lower-skill-intensive activities was roughly 6 times larger in 1990–92 and approximately 14 times larger in 2005–07.

The globalization of industry, then, offers great potential for developing economies to tap into the middle- and higher-skill-intensive supply chains of multinational corporate investors. (Limited but nonetheless real prospects for building supply chains around FDI in the extractive sector are discussed in section V.)

As a consequence of the deployment of middle-skill operations to emerging markets, most manufacturing FDI is not driven by a search for the very lowest-wage workers, even though differences in wage levels between home and host economies may be substantial. The International Labor Organization (ILO) and other organizations do not collect precise data on workers by job classification and compensation. But the evidence supports the proposition that as skill levels increase, so do wages. Survey data from industry sectors such as autos and auto equipment, electronics, chemicals, and industrial equipment—in comparison with garments and footwear—show that foreign investors in higher-skilled activities pay their workers two to three times as much for basic production jobs and perhaps 10 times as much for technical and supervisory positions as employees in comparable positions in lower-skilled multinational corporation (MNC) operations (ILO 2007).

Not only do foreign investors in middle-skill-intensive operations pay higher wages and offer more benefits to their employees than those received by workers in low-skill-intensive plants but also they typically pay a wage premium in comparison to comparable domestic firms, according to data on foreign investor wage premia from Asia, Latin America, and Africa (Aitken, Harrison, and Lipsey 1996; te Velde and Morrissey 2003). Indeed, Robert Lipsey characterizes as a “universal rule” that foreign-owned firms and plants pay higher wages than domestically owned ones (Lipsey 2006; also Hijzen 2008).

What accounts for this wage premium paid by foreign investors in the developing world? In one of the most detailed studies of this phenomenon, Lipsey and Fredrik Sjöholm (2004) draw on an extensive dataset of plant and worker characteristics from almost 20,000 firms in Indonesia to separate out the relative influences. They find that foreign investors paid 33 percent more for blue-collar workers and 70 percent more for white-collar workers than did locally owned firms. But they point out that foreign investor operations may have different characteristics from ostensibly similar domestic companies. Controlling for education, MNCs paid more for workers with a given education level than domestically owned firms. Controlling for region and sector, the foreign pay differential was 25 percent for blue-collar workers and 50 percent for white-collar workers. Controlling for plant size, energy inputs per worker, other inputs per worker, and proportion of employees who were female, the wage premium in foreign-owned establishments was 12 percent for blue-collar and 22 percent for white-collar workers. In short, foreign investors were paying their employees more than what might be explained by increased

productivity coming from greater inputs per worker and higher efficiency resulting from larger scale of production.

Lipsey and Sjöholm concluded that approximately one-third of the foreign investor wage premium could be attributed to region and sector, one-third to plant size and other inputs, and one-third was left unexplained. So, quite at variance with the widespread notion that most foreign investors travel to developing countries to exploit local workers, or that mobile capital takes advantage of inherently fixed labor, the pleasing puzzle in the data is why multinationals pay local workers more than they need to in order to keep their plants operating efficiently. Perhaps foreign investors provide skills training (unobserved by econometric analysis) that increases productivity, or perhaps they want to secure a more stable labor force by limiting turnover. Investigating these intriguing hypotheses requires further research.²

What measures should would-be developing country hosts take to attract investors to locate higher-skill-intensive activities and generate higher-skill-intensive jobs in their economies? Finding an answer requires a close look at the market failures and obstacles that impede the foreign investment decision process for such international companies.

II. MARKET FAILURES AND IMPEDIMENTS TO ATTRACTING HIGHER-SKILLED FDI IN MANUFACTURING: MISPERCEPTIONS AND CORRECTIONS

The launch of the World Bank's Doing Business indicators in 2004 institutionalized the widespread belief that the key to attracting foreign direct investment lies in improving the ease of doing business for all firms in a would-be host economy. As of 2014, the ease of doing business indicators include assessment of the requirements for starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors (including intellectual property rights), paying taxes, trading across borders, enforcing contracts, resolving insolvency, employing workers, and fostering entrepreneurship. To these should be added sound macroeconomic conditions such as low inflation rates, sustainable budget deficits, and realistic exchange rates.

But while attention to these microeconomic, macroeconomic, and institutional reforms may be a necessary condition to attract FDI, it likely will not prove sufficient. Research shows that the proactive efforts of an investment promotion agency (IPA) to market the country can provide an important boost in attracting FDI (Morriset and Andrews-Johnson 2003; Wells and Wint 2000).

Torfinn Harding and Beata Javorcik (2011) provide rigorous econometric backing for this proposition. Comparing data from 109 countries with an IPA and 31 without, they find that the presence of an IPA is correlated with higher FDI inflows, both overall and specifically to sectors targeted by the

2. For a useful summary of research on the FDI wage premia, see Beata Javorcik (2014); she explores the hypothesis of rent sharing between investors and their workers.

IPA. They compare FDI inflows to targeted sectors, before and after targeting, with those to nontargeted sectors during the same period and find that active IPA targeting doubles FDI inflows. They control for changes in host country business environment by including country-year fixed effects, for heterogeneity of sectors in different locations by including country-sector fixed effects, and for shocks to supply of FDI in particular sectors by adding sector-time fixed effects. In checking for reverse causality, they find no evidence that targeting took place in sectors with relatively high or low inflows in the years preceding targeting.

Even more important, Harding and Javorcik (2012) discover, in a separate study, that FDI targeting by IPAs can be used to raise the quality of exports from the host economy. Examining evidence from 105 countries in 1984–2000, they relate unit values of exports at the four-digit SITC level to data on sectors treated by investment promotion agencies as a priority in their efforts to attract FDI. They show that the sectors given priority by the host IPA have higher unit values of exports. These findings are robust to using two different datasets and to instrumenting for the choice of priority sectors. The authors' data suggest that hosts can use foreign investment to increase the quality of exports both in absolute terms and in terms of bridging the distance to the frontier of higher quality.

How can investment promotion agencies be most effective in attracting greater flows of FDI, especially to novel and more sophisticated activities? To a certain extent, a review of the large body of literature on investment promotion provides useful answers. But, as will become apparent below, there are also important mistakes and misconceptions in this conventional analysis.

The first desirable characteristic is for the IPA to provide on its website clear, relevant, and credible descriptive materials about the host economy and regulatory framework. The second desirable characteristic is for IPA staff to handle investment project inquiries in a timely and competent manner. These are not trivial undertakings: World Bank surveys show that many IPAs simply do not answer their phones or respond to email (World Bank Group 2009). Or, when they do IPA officers are unable to provide answers beyond what is posted on their websites. Across 156 countries in 2000–10, Harding and Javorcik (2013) find a statistically significant positive relationship between FDI inflows and superior World Bank ratings of IPA website materials and staff responsiveness.

In addition to responding to investor inquiries, the IPA has a central role to play in facilitating a potential investor's maneuvers through host regulatory requirements. Under ideal conditions, the IPA acts as a "one-stop shop" that helps secure permits and approvals from an array of ministries, dealing with taxation, immigration, land acquisition, environmental protection, and the like. In practice, however, many IPAs are simply a one-more-stop shop, another layer of bureaucracy.

Besides being a proactive and responsive marketing agency and a facilitator to secure permits and approvals, what does the IPA need to accomplish to attract mid- and higher-skill-intensive investors in

new and untried sectors? What further public sector interventions do would-be hosts need to take to induce more-sophisticated multinationals to undertake novel activities in the domestic economy?

The answer depends on how market failures and other obstacles to the investment decision-making processes are understood. Here the basic models and paradigms most widely used in the economics community turn out to be faulty or at best misleading.

Roberto Hausmann and Dani Rodrik (2003, 2005) have laid out the most widely used framework for understanding the difficulties of structural transformation from lower-skilled to new higher-skilled activities in a developing country market: the difficulties in attracting mid- and higher-skill-intensive investors to new and untried sectors spring from a combination of information asymmetries and the need for cost discovery in the midst of appropriation problems.³ This fatal combination can be overcome by providing subsidies to first movers and information that the host has but the investor is unaware of. The would-be host must then persuade the investor to reveal the exact production costs at a new site under conditions where, if the investor is successful, rivals are likely to rush in before the firm is able to be adequately compensated for taking the initial risk of making the first investment. The policy solution is to subsidize the first investor and entice him to take the risk. How much should the subsidy be? The amount should be based on the economic and social externalities derived from attracting the first and then subsequent firms into the new sector.

The evidence, however, shows that each of these concepts is significantly off-base, with important implications for host country policy design.

The literature on using IPAs to market a country, summarized above, shows that information markets are far from perfect and that there are significant payoffs from providing descriptive materials to potential investors. But the well-worn economic concept of information asymmetry does not capture what the true market failure consists of. Information asymmetry implies that one side (the would-be host) knows things the other side (the potential investor) does not. But examination of actual efforts to attract a first investor to a novel sector in an unfamiliar country reveals that neither side knows whether a prospective site will become a favorable location for the project.

The evidence shows that the uncertainty about which the middle- or higher-skill-intensive investor wants reassurance is whether the new production site can be seamlessly woven into the global network on which the parent's competitive position in international markets depends. The prospective host must therefore focus expenditures on ensuring smooth integration and reducing the likelihood of disruptions. When the first mover/investor's operations turn out to be successful they often create demonstration effects, signaling effects, and follow-the-leader behaviors. But the cases examined below exhibit scant

3. For a formal model of the cost discovery phenomenon, see Harrison and Rodríguez-Clare (2009).

indications of appropriation problems (indeed, successful first movers often undertake follow-on investments of their own in short order, even as other investors move in).

With regard to subsidizing first movers, host country measures to ensure smooth integration and reduce the likelihood of disruptions—such as infrastructure improvements, public-private partnerships in vocational education, labor market reforms—may or may not have a subsidy component. What is clear, however, is that the timing of host country expenditures to reassure first investors about smooth integration into global supply networks must be undertaken long before calculation of economic and social externalities is anything but a gleam in the eye of the IPA chairman, economic minister, or president of the would-be host.

A review of the most thoroughly researched case of a developing country's effort to attract a sophisticated international investor to an untried site in a novel economy—Costa Rica's struggle to persuade Intel to build a semiconductor plant near San José—offers an opportunity to identify the challenges for emerging market policymakers.

III. USING FDI TO UPGRADE AND DIVERSIFY THE EXPORT BASE: THE CASE OF COSTA RICA AND INTEL

From the earliest days of his administration, in 1994, President José Figueres was determined that Costa Rica would not remain stuck with a lowest-skill/lowest-wage foreign investment profile. In previous administrations Costa Rica had begun with the logical first steps to attract FDI, what today would qualify as fortifying the country's basic doing-business indicators. Building on the recognized tradition of democratic stability unique in Central America, Costa Rica had used a first round of economic reforms to attract FDI in labor-intensive export operations in the 1980s.

As labor costs rose in Costa Rica and international competition in garment and footwear sectors intensified, Figueres restructured the country's investment promotion agency, CINDE, and gave it a mandate to seek out more-advanced international investment, epitomized by the campaign to attract the semiconductor producer Intel (Spar 1998, 2006; Nelson 2009). A public-private agency originally funded by USAID, CINDE had a staff of 10 working in investment promotion—five had MBAs or equivalents (one had an MS in international finance from the University of London), three had law degrees, and two had bachelor's degrees in business administration (Nelson 2009, 45). All were fluent in English and had international experience either working with foreign firms or studying abroad. CINDE paid salaries higher than civil service positions.

“Campaign” is an apt description of Costa Rica's effort to overcome imperfections in information markets. On Intel's short list for its next semiconductor fabrication plant were Indonesia, Thailand, Brazil, Chile, and Mexico; for two years Intel headquarters would not even grant CINDE's request for

an appointment to make their case. The fact that Costa Rica was not and had not been at all considered by Intel might point to information asymmetry in the sense that the host knew facts about whether the proposed site was feasible for plant location that the investor side did not, and to remedy this CINDE had statistics on labor rates, land prices, electricity and other input costs, and political stability ready at hand.

CINDE discovered, however, that reducing imperfections in information markets means not only supplying data in a form that facilitates comparison among countries on the part of investors. Far more important than offering up facts and figures, CINDE had to commit Costa Rica to actions that would reduce uncertainty about smooth integration into Intel's international supply chains. Intel feared interruptions in production, slow time to market, and shortages of trained employees. The development of new measures to ensure seamless incorporation of Intel's new plant into the parent's global network dominated the 19 negotiating meetings. Costa Rica's commitment to concrete programs to reduce uncertainty about supplier integrity allowed the country to break into the ranks of credible alternative sites that the parent was willing to investigate.

As part of its global strategy, Intel feared work stoppages that might be associated with disputes with unions. While the company was willing—and expected—to pay higher wages than counterpart firms (it planned to pay more than one-and-a-half times the average manufacturing wage in Costa Rica), senior executives at headquarters did not want unions in its plants anywhere in the world (Nelson 2009). Costa Rican labor markets had a low rate of unionization—7 percent of the private sector workforce. Workers belonged instead to widespread company-based *solidarista* associations, which provided benefits such as low-interest loans to members and savings plans with contributions from employers as well as employees; they did not take part in collective bargaining (not surprisingly, they have been criticized by traditional labor leaders as being company-created alternatives to unions).

Beyond the labor market flexibility afforded by *solidarista* associations, Intel sought tangible measures blessed by President Figueres's office to ensure the smooth integration of the new plant into the parent's worldwide production and distribution network. The reassurance took the form of providing a new electrical substation on the public power grid dedicated to the prospective plant, modernizing the national airport to facilitate rapid shipments, and directing the country's Technological Institute (Instituto Tecnológico de Costa Rica) to with Intel's HR specialists to codesign a vocational training program for IT workers. By offering this package of expensive commitments, Costa Rica made it onto Intel's short list.

It is noteworthy that only at the very end of the negotiations, in 1996, did the words *incentive* or *subsidy* enter the dialogue, when Intel negotiators insisted that Costa Rica match the package of tax breaks

and locational benefits that other host governments had approved, or else lose the deal.⁴ Costa Rica acquiesced (although Roy Nelson points out that Costa Rica's minister of foreign trade did no more than promise to lobby the legislature for a change in tax law, and the new taxation formula did not pass until 1998, well after Intel had made its decision; 2009, 58–59).

Was there any evidence that Intel's investment decision-making process was shaped by appropriability problems? The data show that Costa Rica's attraction of Intel provided an important demonstration effect for investors in electronics and other nontraditional middle-skilled sectors and generated strong follow-the-leader behavior. Within three years of Intel's arrival, the country tripled its stock of FDI, to \$1.3 billion. Of 61 multinationals with operations in Costa Rica (36 in electronics, 13 in medical devices, 3 in business services, and 9 in other sectors), 72 percent reported that the Intel decision played an important signaling role in their decision to invest (Larraín, López-Calva, and Rodríguez-Clare 2001). But Intel's behavior since its original investment of \$115 million, in 1997, does not appear to have been slowed by inability to earn sufficient returns; if anything, the company benefited from cluster effects as other investors moved in. Intel followed its first plant with a second, then added a global distribution center. In the decade and a half since 1997, Intel has invested an additional \$900 million in Costa Rica and increased the number of local employees from 500 to 2,800. In 2013 the company exported more than \$2 billion in products per year, some 6 percent of Costa Rica's GDP.

Within 10 years of Intel's initial investment, CINDE managed to attract new investments from 56 electronics firms employing 11,000 workers. It also targeted medical device investors, bringing in 23 firms employing 6,000 workers, and developed a new focus on service investors—48 firms employing 5,000 people. Western Union chose Costa Rica for its technical support center. Procter & Gamble did the same for back-office services. Intel itself set up a shared services group, including a regional center for all of the company's financial services in the Americas.⁵

Alongside attraction of new investors, CINDE refocused its attention to aftercare and support for reinvestment by established investors (CINDE 2012). In conjunction with other government agencies, it has worked to reinforce the country's intellectual property protections, and it has expanded the sectors in which public-private partnerships for vocational training are available. Since 2005, CINDE company-worker programs have resulted in training and job placement for more than 10,000 applicants (UNCTAD 2014). As part of its aftercare responsibilities, CINDE visits some 120 investors each year,

4. Business school case studies show that MNC headquarters do not base international investment decisions simply on subsidies and tax breaks; rather, they typically instruct field negotiators to identify an array of sites with comparable basic operating conditions for a prospective FDI project and then induce incentive competition among them as a tiebreaker.

5. The Costa Rica case study offers one of the few substantive data pools where economies of scope ("cluster effects") might be rigorously measured.

selects 12–15 skills for development, and forms a working group of five or six companies to collaborate in creating the curricula for the company worker training programs.

Some 250 multinational corporations now have operations in Costa Rica. As part of worldwide retrenchment due to declining demand for PCs, Intel ended its assembly operations with a loss of 1500 jobs in Costa Rica in 2014, although at the same time it added about 250 high-value jobs in the R&D group in the country.

Does Costa Rica fit the conventional economist's paradigm of first calculating the externalities and then subsidizing FDI by a comparable amount? The takeaway for developing country policymakers from Costa Rica's experience is just the opposite. Refusing to make the expenditures until the presence of externalities can be demonstrated, and gauging the level of expenditures as a function of the externalities' value is simply not a plausible strategy for host governments that want to use FDI for structural transformation of their economy. Host authorities have to make costly upfront expenditures to improve business indicators, reform institutions, renovate investment promotion agencies, put expensive infrastructure and vocational training packages in place—and, alas, probably approve tax breaks and locational incentives—while spillovers and externalities are no more than a hopeful extrapolation on the part of the most optimistic public officials.

The best such officials may be able to manage is to structure as many expenditures as possible so as to benefit the economy as a whole, not just foreign investors. To the extent possible, Costa Rica designed the infrastructure improvements as public goods that could be enjoyed by all actors in the domestic economy. Public outlays to expedite Intel's freight shipments were part of the airport renovation. The vocational training program was designed to train workers and engineers who could be employed anywhere in the IT industry. The Figueres administration did offer Intel a special rate for electricity, designated as a discount for large-scale users. At the time Intel was the only such user in the country, but Costa Rican authorities argued that this was not a subsidy because later large-scale users would enjoy the same rate, as eventually came to pass.

To expand on the arguments made above, the case of Intel in Costa Rica recasts the conventional way economists typically think about providing subsidies. In particular, the simple notion of cost discovery on the part of first mover/investors—in the characterization of Hausmann and Rodrik—has to be refined to understand the challenges faced by both investor and host. As the evidence shows, the potential investor in a novel middle- or higher-skill-intensive operation wants to be reassured that the resulting goods or services can be integrated seamlessly into the global network on which the parent's competitive position in international markets depends. The would-be host wants to figure out how best to provide such reassurance by lessening the likelihood of interruption. This leads to such inducements as infrastructure

improvements, vocational training initiatives customized to the needs of the investor, and provisions for labor market flexibility (not lowest wage payments) that directly support such integration.⁶

To be sure, from the perspective of cost accounting, an electric power outage, a delay at the port or airport, a shortage of technical workers, or a labor walkout to protest layoffs can be entered into a spreadsheet that shows added costs of doing business. But reassuring the investor about the quality control in production, and the speed and reliability of incorporation into the firm's global network, cannot be addressed by simply providing a larger financial subsidy, lowering tax rates, or offering submarket input costs. Rather, the would-be host needs to address head-on the investor's concerns about seamless integration. This has direct implications for (1) the powers entrusted to the investment promotion agency or the interministerial investment promotion committee, (2) programs to support investment promotion offered by external donors, including by the World Bank Group or regional development banks, and (3) the debate about the role of industrial policy in developing countries.

IV. EVIDENCE FROM SUCCESSFUL CASES OF FDI USE TO UPGRADE AND DIVERSIFY EXPORTS: PENANG IN MALAYSIA AND CZECHINVEST IN THE CZECH REPUBLIC

It would be rewarding to undertake a broad survey, with a sample size large enough to conduct econometric testing, of developing country efforts to use FDI to upgrade and diversify the host export profile, with measures for imperfections in information markets, for appropriability problems, and for coordination externalities. Such a database does not exist, and the difficulties of capturing subtle market failures across a large sample of countries will be substantial, if even possible. But some insights and lessons can be gleaned for policy use by heading in the opposite direction, namely, by examining in detail some of the handful of well-studied country experiences where evidence of market externalities or failures does exist—comparing those that have been relatively successful with others that have not. The cases of the regional investment promotion of Penang in Malaysia and of CzechInvest in the Czech Republic fit into the relatively successful category, while the cases of Tanger Med in Morocco and of industrial development zones (IDZs) in South Africa exhibit more problematic outcomes.

Penang in Malaysia

If Costa Rica offers the most thoroughly studied case of a successful effort to attract higher-skilled FDI to a novel location, the investment promotion performance of the regional government of Penang in Malaysia provides perhaps the largest pre-China illustration of using FDI for structural transformation

6. Javorcik and Spatareanu (2005 a) find that greater flexibility in a host country's labor market in absolute terms or relative to the investor's home country is significantly associated with larger FDI inflows. Their study uses a variety of proxies for labor market regulations reflecting the flexibility of individual and collective dismissals, the length of the notice period, and the required severance payment, with controls for other business climate characteristics.

of the local economy. Over a mere four decades, beginning in the early 1970s, Malaysia shifted from being a resource-based economy, known throughout the world for rubber and tin, to a manufacturing powerhouse centered on large-scale electronics exports. Manufacturing's share of total exports rose from 6 percent in 1970 to over 70 percent 2013. Along with several other states, the regional authorities in Penang played a pivotal role in this transformation.

A principal difference between the experiences of Costa Rica and Malaysia lies in the fact that when the Penang Development Corporation (PDC) launched the initial investment-promotion-cum-infrastructure-buildout around Penang International Airport—consisting of phase one and phase two of construction of Bayan Lepas Free Industrial Zones from 1972 into the early 1980s—internationalization of the global electronics industry was driven by a search for low-wage labor-intensive production of components and final products. The process of industrial upgrading from simple hand assembly of such items as printed circuit boards to hand and automated assembly of more-complex subsystems to responsibility for process design and even product design in the affiliates of multinational investors began later in the 1980s, along with increased attention to the protection of intellectual property rights. So in Malaysia, use of FDI to achieve structural transformation came in a single industry rather than by shifting from one industry sector to others, as in Costa Rica.

To propel the movement of international electronics investors into more-sophisticated operations in Southeast Asia, Malaysia was helped in the early 1980s by the extraordinarily aggressive marketing efforts of the nearby Singapore Economic Development Board. Once higher-level activities had been launched in Singapore, the Penang Development Corporation—and other state agencies in Malaysia—began to make the case to US, European, and eventually Japanese multinationals that they might try out Malaysia as a cheaper but equally efficient location.

To attract established electronics investors to more-complex tasks, the PDC in 1989 conjoined its investment promotion functions with the creation of the Penang Skills Development Center (PSDC), a tripartite vocational training initiative combining government, academia, and industry. With a steering committee of representatives from Motorola, Hewlett-Packard, and Intel, PSDC persuaded 24 founder companies to contribute equipment for installation in buildings on a campus financed by PSDC, and to assign executives to teach technical and engineering skills immediately needed or forecast for the future of the electronics industry. Within seven years, a study funded by USAID identified PSDC as one of the 10 most highly recognized workforce development institutions in the world. Since 2000, students who complete the PSDC diploma in engineering at the high school level receive guidance to pursue studies at any of 12 affiliated universities to obtain a bachelor's or master's degree.

In 2004 PSDC's investment attraction efforts were spun off into an IPA called InvestPenang and life sciences were added to its FDI promotion repertoire (UNCTAD 2014). One of InvestPenang's mandates

therefore became to combine FDI in advanced electronics with FDI in biotechnology, including precision and tooling-based, electrical and electronics-based, and automation-based medical devices as well as diagnostic tools. To make sure that vocational training programs kept pace with the novel FDI promotion efforts, the PSDC created a Micro-Electronics Center of Excellence at Universiti Sains Malaysia. With the oldest school of pharmacology in Malaysia, the university has developed government-industry-academic partnerships in the pharmaceutical and nutraceutical sectors. InvestPenang, meanwhile, has targeted other electronics-related investment groups, including LED (light-emitting diodes) and photovoltaic design and development, and has attracted Hull University (UK) to build a satellite campus to train students in engineering, finance, and accounting, and Smith College (US) to create the Asian Women's Leadership University.

The completion of phases three and four of the Bayan Lepas Free Industrial Zones in the 1990s finished the infrastructure construction designed to facilitate access to Penang International Airport on three sides. After 2000 the PDC redirected its attention to IT infrastructure, and in 2005 the Malaysian central government chose Penang to launch the country's Multimedia Super Corridor IT platform for industries and businesses. Penang became the first location in the corridor to be awarded cybercity status. Keeping Penang at the cutting edge of IT infrastructure has been essential to inducing multinational electronics firms to build regional R&D hubs in Penang, and to ensuring expansion and reinvestment on the part of existing investors. Intel has one of its three global chip design centers there, and Motorola and Altera were early builders of R&D campuses. By 2013 Motorola Solutions employed 1,200 engineers, 95 percent of them locals, at its facilities, and as of early 2014 Altera had generated two to three dozen patents per year from its "bleeding edge" workplace.

As in the case of Costa Rica, there are no indications of appropriability problems as first mover electronics firms in Malaysia moved from low-wage assembly into higher-skill production and design activities. The US and European firms that led the upgrading of electronics operations—notably Motorola, Texas Instruments, Hewlett-Packard, Ericsson, and Philips—steadily added more complex operations and design functions. Firm-level microdata document Motorola's affiliate moving from rudimentary printed circuit board assembly for pagers and private radio systems to worldwide responsibility for design, development, and automated manufacture of double-sided six-layer printed circuit boards and for design and development of integrated circuits for disk drives and other peripherals (Rasiah 1995; Capanelli 1997). Hewlett-Packard progressed from assembly of calculators to manufacture, tooling development, process design, and even chip design for portable printers, desktop computers, and servers. Reflecting on the evolution of Texas Instruments, an executive observed, "We came for the cheap labor and the tax advantages, but we are staying because of the expertise we have built up here. As far as assembly and testing are concerned we have more expertise here than we have in the US. We sometimes

have to send our Malaysian engineers to the States to solve their problems” (Lim and Pang 1995, 111). By the late 1980s Japanese overseas investment assumed the famous flying-geese pattern with great electronics firms following each other in formation to Malaysia as well as other locations in Southeast Asia. Over the four years after the Plaza Accord of 1985, the number of offshore units of Japanese parents in Malaysia tripled, although Michael Borrus (1994) notes that Japanese multinationals are more likely than US or European firms to keep the highest-level design and production of more sophisticated products at home in Japan.

Before the worldwide recession of 2008, the electronics industry had become Malaysia’s leading manufacturing sector, accounting for 29 percent of gross domestic output, 56 percent of exports (\$75 billion), and 29 percent of total employment in the manufacturing sector (nearly 300,000 workers, supervisors, engineers, and managers). The economic downturn hit the Malaysian export sector particularly hard, but by 2012 Malaysian electronics exports had climbed back to \$55 billion.

In the electronics industry in Southeast Asia, Robert Lipsey (2000) notes an interesting evolution: foreign firms begin by being responsible for the early surge in exports but then find their proportion of exports, although still growing in absolute terms, being overtaken by exports from indigenous firms, evidence of spillovers and imitation. In the electrical machinery classification (primarily consumer electronics and parts), US and Japanese affiliates accounted for more than half of all exports in the late 1970s but only 22 percent by the mid-1990s. In contrast, in the nonelectrical machinery classification (primarily computers, accessories, and parts), where the pace of technological change remained high, the US and Japanese proportion of exports increased between the late 1970s and the mid-1990s.

Throughout the transition from a natural resource to a manufacturing exporter, Malaysia allowed foreign firms a substantial amount of labor market flexibility. At first, foreign investors insisted that unions be excluded from the new export zones, including in the Penang Bayan Lepas industrial parks. They also insisted that investors be freed from the requirement to have local partners or to participate in the *Bumiputra* (affirmative action) system. Beginning in 1989, the government allowed in-house unions to be set up and organize in the electronics industry. But the bias toward labor market flexibility has continued—issues relating to layoffs, retrenchments, transfers, and job assignments are deemed to be outside the scope of bargaining at the firm level in the private sector. Until 2012, there was no minimum wage. In the Global Competitiveness Index 2012–13, Malaysia ranked second out of 148 countries around the world in the relationship between pay and productivity, and 26th in ease of hiring and firing.

While the labor market flexibility in Malaysia has been criticized from some quarters, supporters point out that the country has managed to achieve an unusually successful record in combining employment creation and economic growth. Moreover, the incidence of absolute poverty has declined dramatically, from 52 percent in 1970 to below 5 percent in the contemporary period (CDE 2013).

CzechInvest in the Czech Republic

Founded in 1992, CzechInvest became the investment and business development agency of the Czech Republic, operating under the auspices of the Ministry of Industry and Trade.⁷ In 2001, in anticipation of Czech accession to the European Union, CzechInvest shifted its focus from light industry to the attraction of investors with higher engineering requirements. To accomplish this, it began to hire staff with expertise in the automotive, aerospace, IT, and electronics sectors and to promote R&D clusters with the country's major university facilities. In 2004 it set up representative agencies in the country's thirteen regional capitals to ensure coherence between the national investment promotion authority and regional/local site planning, and added life sciences, medical devices, software development, and business support services to its portfolio of sector specialists.

As part of its investment promotion efforts, CzechInvest provides grants to support the construction and development of business properties. Between 2004 and 2013 it provided infrastructure support to more than 100 industrial zones. The agency is also the direct conduit for the cofinancing of projects using EU structural funds, such as the EU Horizon 2020 program for information technology. CzechInvest reports that between 2000 and 2012 it “mediated” some 2,000 investment projects, worth approximately \$28 billion and generating 215,000 jobs (CzechInvest 2012).

The Czech Republic has traditionally been very strong in technical fields—approximately one-third of all university graduates have a degree in a technical field. CzechInvest has used the country's scientific and engineering base to encourage foreign companies to undertake research and development in conjunction with export operations. There are public-private training partnerships that incorporate foreign firms with the Czech Technical University in Prague and other engineering programs in Plzeň, Liberec, Pardubice, Brno, Zlín, and Ostrava.

As of 2013, the agency claims credit for more than 224 R&D projects, 37 in automotive and 52 in precision engineering. The Czech automotive sector includes R&D and engineering facilities run by Porsche, MBtech Bohemia, Ricardo, Idiada, Swell, Aufeer Design, Valeo, Visteon, Benet Automotive, Bosch, Continental, Faurecia, Hella, Honeywell, Horiba, Siemens, TRW, TÜV-Süd, and ZF Friedrichshafen. In electronics, Panasonic established an R&D center in Plzeň alongside its manufacturing facility, where the company conducts research in electrical design, mechanical design, and software development. Bang & Olufsen set up a 70-member R&D department as part of its manufacturing plant in Kopřivnice. ST Microelectronics runs one of the biggest individual informational technology design groups in Eastern Europe, with over 200 engineers in Prague dedicated to analog/mixed-signal research.

7. Information in this section is drawn from the 2012 CzechInvest annual report, available at www.czechinvest.org.

And ON Semiconductor runs a semiconductor fabrication plant and IT R&D center in Rožnov, and Brno hosts the design centers of Flextronics and AMI Semiconductor.

The Global Competitiveness Index 2012–13 portrays a more nuanced portrait of labor market flexibility in the Czech Republic than found in either Costa Rica or Malaysia. On the one hand, the ease of hiring and firing measurement places the Czech Republic 121st out of 148 countries, suggesting the presence of labor regulations and union strength in the tradition of counterpart economies in the European Union. On the other hand, there is a close relationship between pay and productivity, making the Czech Republic the 19th most competitive of 148 countries.

V. EVIDENCE FROM MORE PROBLEMATIC CASES OF USING FDI TO UPGRADE AND DIVERSIFY EXPORTS: TANGER MED IN MOROCCO AND IDZS IN SOUTH AFRICA

Many of the same lessons, in mirror-image form, emerge from the experiences of countries that have not had such successful outcomes.⁸

Tanger Med in Morocco

In Morocco, inward flows of FDI rose from less than 1 percent of GDP in the 1990s to an average around 4 percent of GDP during 2003–07—before the international financial crisis caused such flows to plummet around the globe.⁹ But the larger volume of precrisis flows into Morocco remained centered in low-skill, low-value activities, and Morocco’s export profile is still less sophisticated than that of the Philippines, El Salvador, China, India, Indonesia, and Thailand (IBRD and IFC 2006).

As countries on the periphery of the European Union prepare for renewed growth and recovery, the fundamentals in Morocco to attract higher-skill-intensive MNCs are favorable. Through the upheavals of the Arab Spring, the country has enjoyed relative political and economic stability, with widely noted progress in deepening Moroccan democratic institutions. The economic fundamentals are strong: the macroeconomic environment is stable, with low rates of inflation, a modest buildup of international reserves, and a moderate public-debt-to-GDP ratio (especially external debt). Besides enjoying a beneficial market access agreement with the European Union, the country completed a bilateral free trade agreement with the United States in 2006.

In recent years, Morocco has taken two major steps to prepare to attract more-sophisticated FDI. First, it has renovated and energized the country’s investment promotion agency. As late as 2009, Morocco’s *Investir au Maroc* campaign scored in the lowest, or “very weak,” ranking of the World

8. Full disclosure: I have been directly involved in on-the-ground efforts to upgrade investment promotion efforts and promote supply chain development in Morocco and South Africa.

9. This section draws heavily from World Bank (2006).

Bank Group global investment promotion benchmarking, well below Jordan and in the same category as Yemen. In 2010, the central government set up a new IPA (Agence marocaine de développement des investissements, AMDI) under capable and experienced leadership, with the mandate to go after sophisticated investors. This freshly designed agency provides a promising vehicle to move Morocco from the lower ranks in investment promotion toward the frontier of best practices around the world. AMDI is housed under the authority of the Ministry of Industry, Trade, and New Technologies, while enjoying considerable autonomy including the right to appeal decisions regarding FDI projects to the prime minister. Offering salaries higher than those for civil service, AMDI has enjoyed success in recruiting professional staff with private sector experience (at Procter and Gamble, for example, and at PricewaterhouseCoopers, PwC), organized into special industry teams.

Second, Morocco has undertaken a major effort to upgrade its infrastructure. While favorably located right on the periphery of the EU, the country nonetheless ranks in the Global Competitiveness Index at 69 of 142 countries. In mid-2009 the Kingdom launched Tanger Med II, a large expansion and renovation of the Tanger port facilities on the south coast of Gibraltar. Port construction is expected to reach full capacity by 2015, with the ability to move 8 million containers, 2 million vehicles, and 7 million passengers. The deepwater port facilities are surrounded by industrial parks and integrated with modernized rail lines to the interior of the country. The initial investment promotion priority is to try to turn Tanger into an automotive hub with the potential to reach a market of 8 million owners in Spain, Portugal, France, and Italy within three days of loading vehicles right off the production line onto ships. With Renault as an anchor investor, annual auto production in Tanger is expected to reach 340,000 vehicles when phase II of Renault's investment program is completed in 2015 (depending on the extent of economic recovery in the European Union). The French auto giant aims to bring in Nissan as an investor and hopes to induce a broad array of international parts suppliers to collocate in the Tanger complex. Renault and Moroccan authorities are working together to establish a center for vocational training in the automotive sector, with a curriculum to be designed by the private sector participants.

But this promising combination of aggressive investment promotion and massive infrastructure improvement, backed by vocational training initiatives, is taking place in a restrictive labor market regulatory structure. In Moroccan labor law, there is no distinction between laying off and firing workers, with a requirement of six months' notice plus a large but not authoritatively specified severance package. This latter ambiguity means that the size of any given package will probably be challenged in court, with the company having to continue to pay workers while the outcome is adjudicated. Labor market survey data show that severance costs are equal to 85 weeks of salary in Morocco versus 53 weeks on average elsewhere in the region. Morocco ranks 67th of 148 in the Global Competitiveness Index of the relationship between pay and productivity, and 93rd in ease of hiring and firing. Not only is the heavy-

handed labor market regulation a disincentive for prime investors and their international suppliers to set up operations in Morocco, it also hinders firms from moving easily into the supply chains of foreign companies that do decide to invest (a subject investigated in the next section). Hiring new workers resembles a decision to bring them into the company for life, which is difficult when entering into an international supplier arrangement, where demand may be highly cyclical.

Success in attracting greater amounts of middle-skill FDI should not be beyond Morocco's grasp, as the creation of the aerospace cluster around Casablanca shows. This initiative was launched by a Moroccan national named Seddik Belyamani, who was Boeing's executive president for worldwide sales in Seattle. Beginning in 1997, he led an internal search in Boeing for more than a year to identify what aerospace components might be reliably produced in Casablanca. He worked with his counterpart senior executive at Royal Air Maroc, Hamid Benbrahim El-Andaloussi, to create a joint venture between Boeing, Royal Air Maroc, and a Moroccan firm called Labinal—the joint venture took the name Matis—to outsource creation of wire harnesses in Morocco. Boeing managers in Seattle initially expected to achieve efficiency of only 30 percent of industry norms, but Matis reached 70 percent within two years. The partnership between the two men made up for an otherwise ineffectual investment promotion structure in Morocco at the time. In 2002, Belyamani left Boeing and returned to Casablanca to become chairman of Matis, which now builds wire bundles for the Boeing 737, 747, 757, 767, and 777 airplanes.

To ensure that current companies—and new investors—have access to an adequate supply of well-trained employees, the Organization of Moroccan Aeronautics Companies (Groupement des Industries Marocaines Aéronautiques et Spatiales, or GIMAS), the Union of Metallurgical Workers, and the Ministries of Labor, Industry, and Finance signed a convention in February 2009—in the presence of King Mohamed VI—to set up an Institute for Aeronautical Training. With combinations of classroom and on-the-job training lasting between 23 and 42 weeks, the Institute aims to train technicians in capacities such as engine overhaul, metallurgy, electrical systems, and numerical systems and controls, as well as provide middle management professional development. GIMAS plays a central role in the design of the curriculum, with continuous course renovation to meet the needs of current and potential employers.

In 2013 Morocco's aerospace exports exceeded \$900 million. This record of success in the aeronautics industry, where labor problems have been negligible, may be the exception that proves the rule about the need for more labor market flexibility in Morocco. For a decade and a half, the aeronautics sector has been growing rapidly year over year. Wages are significantly higher than the national average and include some incentive compensation arrangements. The factories are new and highly desirable places to work. In short, aeronautics has been an appealing sector for skilled Moroccan workers. As a new sector, union activity has been minimal. Layoffs have proceeded without controversy since those laid off found new work almost

immediately (for example, during a strike at Boeing in Seattle in 2008, Matis laid off 70 of 600 workers in Casablanca who rapidly found at least temporary work elsewhere). In other sectors where growth is less dynamic and union control of the workplace is more pronounced, the ability of foreign investors and domestic companies to adjust to external market conditions is likely to be considerably more difficult in the absence of labor market reform. The expansion of the automotive hub in Tangier may depend on such reform.

Industrial Development Zones (IDZs) in South Africa

Drawbacks from inflexibility and overregulation in labor market policies are much more evident—and increasingly acknowledged—in the case of IDZs in South Africa (CDE 2012).

The South African economy has long enjoyed a significant high-skill-intensive FDI-led industrial sector, in particular in autos and transportation equipment. The country's 2013–15 Industrial Policy Action Plan (IPAP) proposes to draw in large numbers of foreign investors to expand the industrial base. The plan includes large-scale infrastructure expenditures to strengthen the country's three IDZs, in Richards Bay, East London, and Coega outside Port Elizabeth, and begin development of 10 new special economic zones (SEZs). The principal objective, as laid out in the New Growth Path 2010–20, is to use domestic and foreign investment to generate high-paying jobs for South African workers.

But the three IDZs have had a weak response. Despite impressive port and rail infrastructure on the northeast coast, Richards Bay had only one investor as of 2014 (Tata Steel). The East London IDZ has a handful of auto parts investors, a diamond polisher, and a dairy; the targeted sectors of IT and electronics, aquaculture, agroprocessing, renewable energy, and general manufacturing remain undeveloped. Only the Coega IDZ, in operation since 1999, has managed to attract an appealing but very modest portfolio of international investors. As of end-2012 there were 23 companies generating some 3,500 jobs.

A major obstacle to attracting FDI has been South African labor market regulations. Minimum wages are relatively high, and there is no trial or apprenticeship wage to introduce workers with on-the-job training. Labor bargaining councils are dominated by large established firms and unions; their agreements are typically extended to all businesses in a sector. This practice retards entry of new participants and inhibits smaller or less experienced companies from investing. At the same time, it is very expensive and costly in South Africa, as in Morocco, to lay off workers in response to changing conditions of external supply and demand. In 2012–13, South Africa was ranked 147 of 148 countries in the ease of hiring and firing category of the Global Competitiveness Index, and 142 in the relationship between pay and productivity.

Across the South African economy, rigid labor regulations are beginning to be recognized as a major factor contributing to unemployment rates above 30 percent, higher for youth—the Centre for

Development and Enterprise in Johannesburg estimates that the unemployed in the South African economy make up 40 percent of the workforce (CDE 2013). The regulations are also a major impediment to attracting new foreign investments or stimulating reinvestment.

Conclusion

To summarize the analysis thus far, globalization of industry offers a target-rich environment for emerging market authorities to attract foreign investors that can help upgrade and diversify the host production and export base. But to achieve this result, important market imperfections and obstacles must be overcome. Table 2 shows a comparison of measures to attract FDI in the five countries discussed.

Successful use of FDI to upgrade and diversify the host production and export base can generate additional benefits by creating backward linkages from foreign multinationals to local firms. The task of creating competitive supply chains that stretch broadly and deeply into the host economy poses further challenges.

VI. ENHANCING BACKWARD LINKAGES FROM FOREIGN INVESTORS TO LOCAL FIRMS: MULTIPLYING AND THICKENING SUPPLIER NETWORKS IN THE HOST ECONOMY

The past decade has seen growing analytic attention to the conditions that enhance the likelihood of backward linkages and spillovers from foreign investors to other firms in host country markets. This section aims to pull together policy recommendations that will be useful for host authorities and for external donors to promote backward linkages and spillovers, especially but not exclusively in the form of vertical local supplier networks to multinational investors. This is a fairly commonsense task, but requires overcoming widespread analytical confusion and misperceptions.

Beginning horizontally, foreign investors would naturally prefer to avoid creating rivals to their market position. But workers and managers often leave foreign plants to start up their own; local firms learn from watching the operations of foreigners. Competitive pressures from foreign entrants push indigenous companies to raise their performance. In Mauritius, six years after the beginnings of FDI-led export growth, 50 percent of the capital invested in export processing zones came from domestic companies founded by owners who had started in foreign firms nearby (Rhee, Katterback, and White 1990). In Ghana, Holger Görg and Eric Strobl (2005) find that local firms run by owners who worked for foreign firms in the same industry immediately before opening their own company are more productive than rivals who started up on their own.

Besides relocation of workers and managers, contemporary survey data from Eastern Europe show that indigenous firms imitate foreign practices in the horizontal direction: one-quarter of the managers of Czech firms and 15 percent of the managers of Latvian firms, in a sample collected by Beata Smarzynska

Javorcik and Mariana Spatareanu in 2003, report that they gained knowledge about new technologies by studying foreign firms as the latter entered their industry (Javorcik and Spatareanu 2005a). Twelve percent of the Czech managers and nine percent of the Latvian managers added that they learned new marketing techniques and discovered new sales outlets by scrutinizing foreigners' behavior.

It remains nonetheless true that multinational manufacturing investors try to limit horizontal spillovers as much as possible.

In the vertical direction, in contrast, foreign investors often have self-interest in creating low-cost reliable-quality suppliers in the host market. The outcome depends, however, on the structure and character of the industry involved (Farole and Winkler 2014). Evidence shows that the apparel industry, for example, is so burdened with trade and rules-of-origin constraints that the generation of backward linkages is difficult. Even after decades of exposure to FDI, country-by-country investigations of garments and apparel reveal limited domestic supplier networks. In the extractive sector, large modern mining and petroleum operations are so capital-intensive—with great economies of scale but requirements to use sophisticated drilling, earthmoving, and engineering equipment—that buying services from indigenous companies other than local service providers (transport, security, catering) may be infeasible. There are exceptions, as when a large mining company in an African country engages a Swiss pump maker to train host country companies to make pump parts, finds a US investor to supervise local firms in making conveyer belts, and attracts a German firm to teach domestic companies how to do sophisticated machinery maintenance. Similarly, in Ghana, foreign investors developed linkages to domestic suppliers of plastic piping, kilns and furnaces, and casting and grinding of mill liners (Farole and Winkler 2014, chapter 5). Eighty-six percent of local firms that supplied a foreign extractive investor expanded to sell to more than one customer, with referrals playing an important role. One-third of all suppliers to foreign extractive investors surveyed in Ghana, and 42 percent in Chile, started to export directly as a result of supplying foreign investors. In Chile, regional networks of domestic suppliers expanded into Peru and Bolivia.

What host country policies are conducive to promoting backward linkages from foreign investors to local suppliers, and which are detrimental? How might external support be used to expand vertical supplier relationships in the host economy?

Somewhat surprisingly, one of the more successful host policy initiatives is often controversial. It involves following up the attraction of prime multinational investors with energetic efforts to induce their first-tier suppliers from around the world to accompany them into the host economy. The host IPA may team up directly with prime investors to pull the most prominent component producers to cluster near the primes. In Penang, Hewlett-Packard, IBM, Seagate, Ericsson, Philips, Nokia, and Samsung, as well as the electronics keiretsu associated with Fujitsu, Hitachi, and Panasonic, brought electronics and telecom

input providers from Japan, Korea, the United States, and Europe that supplied them in their home markets to set up shop in Malaysia. In the Czech Republic, GM-Opel, Volkswagen, Fiat, and Suzuki have begun to induce their original equipment manufacturers (OEMs) to build parts plants in the new automotive clusters oriented toward supplying the European Union. In some countries, private industrial zone developers may work alongside the host IPA to pull first-tier suppliers as tenants.

An important variation of the host strategy to expand the presence of first-tier suppliers takes the form of inducing foreigners to set up local franchises with domestic companies or to form local joint ventures, especially with service providers. Indigenously owned and managed auditors working under the PwC logo and backed by PwC quality control, offer an example of the former. Turning to the formal joint venture model, the national phosphate company of Morocco (OCP) entered into a partnership with Jacobs Engineering that has branched out from building fertilizer plants to undertaking independent construction activities in water, power, and sanitation projects throughout the Moroccan economy, with a goal of providing such construction services throughout Africa and the Middle East.

Controversy about attracting first-tier suppliers from abroad arises, however, from apprehensions that they suppliers may denationalize the host industrial base, crowd out local capital, and siphon off the best workers and managers. Such apprehensions require scrutiny. It will be useful to look in detail at some carefully investigated instances in which a host country opened a sector to foreign investors and their first-tier suppliers.

One of the most analyzed cases involves liberalization of the transportation sector in India. The McKinsey Global Institute (2006, 95–121) shows that the lowering of trade protection and first-time permission for foreign multinationals to set up wholly owned affiliates in the early 1990s sent a shock wave across the host auto industry. In the horizontal direction, competitive pressures drove one of the largest domestic auto firms (PAL) into bankruptcy while two others (HM and the Maruti-Suzuki joint venture) struggled as their capacity use dropped. The host country capital base in this initial period surely contracted. Over the next five years, however, foreign firms moved into India with world-scale plants: DaimlerChrysler (\$54 million in 1994), General Motors (\$223 million in 1994), Honda (\$120 million in 1995), Hyundai (\$456 million in 1996), Fiat (\$455 million in 1997), and Ford (\$433 million in 1999).

In the vertical direction, participants in the previously protected Indian auto parts sector experienced severe competitive pressures, and many, if not most, did not survive (McKinsey does not provide precise data). But initial consolidation among indigenous firms was followed by extraordinary expansion on the part of both Indian and foreign investors. The internal auto parts industry tripled in size, including both local Indian firms and international component suppliers: Toyota set up a Toyota Village around its assembly plant to house suppliers, Hyundai created an industrial park for providers of automotive inputs, Ford brought in its Auto Component Group (ACG), and GM induced Delphi to come to India.

What this picture shows is that the entry of foreigners and their first-tier suppliers introduces Schumpeterian winds of creative destruction that may lead to a beneficial restructuring of the entire industry, including, over time, opportunities for better-performing domestic horizontal participants and vertical suppliers.

Half a world away, the entry of Wal-Mart into the Mexican retail market shows a different version of the same process, filled with denationalization, the crowding out of local capital, and the poaching of best workers and managers. After the passage of NAFTA, the Wal-Mart parent in 1997 bought a controlling interest in its joint venture with Mexican partner Aurrerá. The new majority-owned affiliate, Walmex, climbed rapidly over the ensuing decade to take a 46 percent share of the country's consumer goods market (sales rose to \$10.1 billion in the first five years), forcing many smaller retailers out of business along the way. In the horizontal direction, the major Mexican supermarkets sought reinforcements via joint ventures with outsiders (Comercial Mexicana with Costco, Gigante with Carrefour and Office Depot), while the Mexican firm Soriana managed to remain competitive as a standalone Mexican firm.

In the vertical direction, Walmex did not pull many first-tier suppliers into the Mexican market. But it did revolutionize how warehousing, distribution, and inventory management were done, requiring drivers with certified credentials to set up appointments at centralized warehouses and make deliveries on standardized palettes (rentable from Walmex) with contents shrinkwrapped and cushioned by corner protectors (Javorcik, Keller, and Tybout 2008). Suppliers were required to reduce prices and provide product innovations on an annual basis. The result was heavy competitive pressure in what had been, as the Mexican participants themselves described it, a protected, clubby, and somewhat corrupt industry (Javorcik, Keller, and Tybout 2008, 1565).¹⁰ Many Mexican suppliers were driven out of the market, but the scale of opportunities for those that remained were much larger: roughly 25 domestically owned small and medium-sized producers of storebrand (*marca blanca*) detergents and cleaners, for example, proved able to hold their own against national and international competitors.

Once again, restructuring of an industry exhibited Schumpeterian creative as well as destructive dynamics that are not captured in conventional apprehensions about denationalization and poaching of superior workers and managers. As for the phenomenon of crowding-in versus crowding-out of investment, the liberalization of investment in the Indian auto sector and the entry of Wal-Mart in Mexican retail show that introduction of new foreign competitors often leads to crowding-in and crowding-out simultaneously.

10. It was subsequently revealed that Wal-Mart itself, in setting up its retail outlets in Mexico, engaged in widespread bribery.

The important outcome to observe, however, is the changing economic performance of the entire sector, not some arbitrary measurement of the absolute amount of capital invested at any particular moment in the sector (as is mistakenly highlighted in the crowd-in/crowd-out debate).¹¹

From the point of view of the host country, it is surely desirable that indigenous firms rise to the occasion, improve their competitive skills, and flourish. But what if the survival of these firms turns out to be relatively weak? Is the incorporation of better workers into higher-productivity activities in foreign firms less good for host country welfare or growth potential than leaving those workers employed in lower-productivity domestic firms?

The analytics of what is best for an emerging market host economy might profit from redirecting the “Who Is Us?” perspective to developing countries. Originating in the debate about the pros and cons of Japanese investment in the United States in the 1980s–90s, the perspective posits that what is most beneficial to the domestic economy is a function of which firms create the highest-skilled, highest-paying jobs, the least expensive products, and the most competitive exports independent of the nationality of the owners (Reich 1990). That is, domestic policymakers—in developed as well as developing economies—should focus on the quality of jobs and strength of productive potential from firms in any given sector, rather than instinctively giving preference to home country owners.

If there are concerns about foreign ownership, they should be addressed objectively. There may be a concern that foreign firms will reinvest less than domestic firms, but the evidence usually shows that successful foreign firms have a strong record of reinvestment. Might foreign firms be more skillful in using transfer pricing to avoid host country taxes? Quite possibly, but this risk should be addressed by improving arm’s-length pricing audit capabilities on the part of host tax agencies, not consigning whole economic sectors to subpar domestic firm performance. Does foreign ownership raise legitimate questions about national security? The conditions in which foreign ownership might pose plausible threats to national security—as opposed to implausible apprehensions—are quite narrowly defined, and infrequently met (Moran 2009).

Turning from the attraction of MNC supplier firms from abroad to the creation of vertical supplier relationships among firms in the host economy, contemporary survey data—from sectors as diverse as furniture, chemicals, food products, printing, pulp and paper, fabricated metals, rubber, electrical machinery, communications equipment, and motor vehicles—document that direct assistance between foreigner and local supplier takes multiple forms. It may include training, help with setting up production lines, coaching in management strategy and financial planning, advance payment and others kinds of financing, assistance with quality control, and introduction to export markets (Javorcik and Spatareanu 2005 a).

11. For thorough analysis of the extensive literature on crowding-in vs. crowding-out of investment, see Moran (2011).

Such survey observations are increasingly being backed up by careful econometric analysis.¹² In the vertical direction, a new generation of studies using firm-level microdata—as exemplified in the work of Garrick Blalock and Paul Gertler and of Beata Javorcik—have established what is becoming the standard methodology to search for externalities upstream or downstream from foreign investors.

Using evidence from manufacturing establishments in Indonesia collected by region since 1988, when FDI operations were predominantly export-oriented, Blalock and Gertler (2005, 2008) investigate the relationship between the presence of foreign investors and the total factor productivity of domestic firms upstream and downstream from their operations. But since foreign firms may simply be settling in areas where productivity is already high, the next step is to observe how total factor productivity of the indigenous firms changes as the presence of foreign investors increases. Again, however, there may be external reasons why foreigners would increase their presence as local productivity grows (e.g., improvements in the business climate). To address the possibility that investors choose sites where suppliers are already productive, Blalock and Gertler include establishment fixed effects to judge whether the performance of upstream or downstream firms gets better after the arrival of the foreigners. To deal with the possibility that some external factor is raising the productivity of all firms, they include industry-year fixed effects, and region-year fixed effects to control for changes in conditions affecting all market participants. Finally, to deal with the possibility that suppliers might experience some exogenous improvement that was not part of industrywide or regionwide changes, they use a simultaneity correction (developed by Steven Olley and Ariel Pakes).

At the end of these steps, they find productivity improvements in upstream and downstream local firms that are significantly associated with the rise in foreign investment and not derived from other factors. The better performance of these indigenous firms in turn results in lower prices, increased output, higher profitability, and increased entry of vertically linked firms in the Indonesian economy.

But does correlation, however carefully traced, show causation here? And if causality can be established, what might be the mechanisms through which it takes place? Here—highly unusual for the economics community—Blalock and Gertler supplement their econometric investigations with survey data from actors on both sides.¹³ They report that the foreign investors and the Indonesian local company managers identified specific kinds of uncompensated assistance flowing between the parties, including help with production, quality control, and business management. US and Japanese multinationals testified that they assisted targeted suppliers to increase efficiency and reliability, moving from small-scale

12. This brief review of contemporary research that follows is all the more important because Dani Rodrik, for example, cites quite dated skeptical appraisals of the potential for vertical spillovers and appears unacquainted with the newer investigative approaches and evidence.

13. The authors report, however, that they were required to drop most of the observational data at the insistence of the *Journal of International Economics* editors and referees.

orders to larger regular purchases from local firms that showed promise. In the case of Japanese investors, the usual practice was to introduce successful Indonesian suppliers to members of the parent company group elsewhere in Southeast Asia, thus creating an export externality. But a positive outcome was by no means inevitable or automatic—some Indonesian firms failed to pass muster, others dropped out, some were abandoned by the foreigners due to subpar performance.

Using many of the same econometric measurement techniques, Javorcik (2004) finds productivity spillovers between foreign investors and upstream domestic firms in Lithuania. To address the problem that unobserved firm, time, and regional factors may exist that affect the correlation between productivity and foreign presence, she uses time differencing as well as a full set of fixed effects for year, industry, and region. She estimates a separate production function (taking into account the Olley-Pakes correction) for each industry. Since foreign entry into downstream sectors may increase demand for intermediate products, which in turn will allow local suppliers to reap the benefits of scale economies, she introduces controls to provide confidence that the outcome can be attributed to the effects of knowledge spillovers rather than simply to larger-scale economies.

Javorcik finds productivity spillovers from foreign investors to affiliates with shared local ownership, but no significant relationship with wholly owned affiliates (an outcome she associates with the inclination of the latter to import more intermediate inputs). A one-standard-deviation increase in the foreign presence in downstream sectors is associated with a 15 percent rise in output of each domestic firm in supplying industries. She separately considers spillovers from export- and domestic-oriented affiliates, and finds that in this relatively competitive market setting, both types of FDI generate spillovers to the supplying industries with no significant difference in magnitude.

So it is important to discover that vertical externalities from foreign investors to indigenous firms can be rigorously identified and objectively observed. But such spread of backward linkages has varied greatly across countries, and is by no means assured. Which policies to promote backward linkages are, and are not, successful?

Widespread evidence shows that creation of local supplier networks in emerging markets depends on how wide the gap is between the capabilities of the local business providers and the sophistication of what is demanded by the foreign purchaser. Ari Kokko (1994) shows that spillovers between foreign affiliates and local firms in Mexico vary as a function of the productivity difference. Kokko, Ruben Tansini, and Mario Zejan (1996) observe the same phenomenon in the Uruguayan manufacturing sector, as do Xiaming Liu, Chengang Wang, and Yingqi Wei (2009) in China. Blalock and Daniel Simon (2009) discover a nuanced outcome: local firms with larger size and greater absorptive capacity gain more from downstream FDI, but local firms with weaker productive abilities show stronger motivation to adopt new technologies provided by the downstream foreigners.

A first order of business for developing country authorities therefore is to adopt policies that increase the productivity and reliability of domestic companies. Like the foreigners they hope to serve, these companies need open, transparent, dependable conditions in which to expand and become competitive; such conditions include access to low-cost imports, relatively flexible labor markets, and protection of intellectual property rights.

Of particular importance is evidence that limited access to credit constitutes an important constraint to the development of host country supplier networks. Around the world, domestic firms with greater access to credit show themselves to be able to self-select into supplier status. Using data from 72 countries for the period 1975–95, Laura Alfaro, Sebnem Kalemli-Ozcan, and Selin Sayek (2009) show that countries with better-functioning financial systems enjoy higher total factor productivity among suppliers. So reform of the financial sector is an important ingredient of providing a business-friendly setting for domestic companies to grow and prosper.

Finally, a host government may want to copy host authorities elsewhere that have set up “vendor development” programs with the goal of promoting backward linkages from foreign investors. The first step is to work with foreign investor business associations to create programs that prepare local firms to acquire certification within appropriate parameters, including ISO 9000 quality control. Beyond this, many countries have followed Singapore’s Economic Development Board (EDB) model for supplier development.

EDB reimburses the salary of an engineer or manager in each foreign plant who is assigned to act as a talent scout to select and assist local firms in becoming suppliers. As part of its Local Industry Upgrading Program (LIUP), EDB provides capital for domestic firms to buy equipment recommended by foreign investors, to be paid back from purchase contracts awarded by the foreigners. Originally dedicated to building supplier relationships in the electronics sector, LIUP now covers medical products, petroleum and petrochemical, marine, transportation and logistics, and information technology clusters. Beyond Singapore, Malaysia establishes secondary industrial zones alongside the major export processing zones (EPZs), with databanks and “marriage counselors” to assist in supplier selection. Penang Skills Development Center has opened its doors to allow domestic firms to partake of a curriculum organized around specific needs and skill gaps identified by foreign multinationals as important for their suppliers to master or overcome.

The debates about how to establish links between foreign investors and potential host country supplier firms are unsettled. Should the host set up industrial zones for local supplier candidates adjacent to formal export processing zones (as in Malaysia)? Or should the host make export processing a legal status, rather than a geographical site, that allows the foreigner to export from wherever is most favorable, with potential suppliers following the foreign firm anywhere it settles (as in Mauritius)? In either case,

export processing regulations must not discriminate against the creation of local supplier relationships. And in every case, it is important that EPZs spearhead broader business-friendly reforms throughout the host economy—to provide a widespread favorable setting for local firms’ growth—and not become a substitute for such reforms.

The analysis of how to design policies to promote backward linkages would not be complete without introducing one more controversial discovery into the debate. Contrary to popular rhetoric, there is no empirical basis for giving preferential attention to small and medium-sized firms (SMEs) if the goal is to strengthen the supplier base. The evidence is that medium-sized and larger domestic firms are usually better candidates to qualify as suppliers because the gap between their capabilities and the capabilities of those who wish to purchase their inputs is typically smaller than at small firms (Freund 2011).

Developing country authorities frequently confound supply chain creation with support for SMEs. So do corporate social responsibility (CSR) advocates, including CSR officers in the MNCs themselves. A close look at case studies of supplier- and vendor-development programs, however, does not support the proposition that small firms should be the preferred targets for host country matchmakers or MNC talent scouts. Despite its title, the evidence in the latest study by the United Nations Conference on Trade and Development (UNCTAD), “How to Create and Benefit from FDI-SME Linkages: Lessons from Malaysia and Singapore” (Best Practices in Investment for Development series), for example, shows that medium-sized and larger indigenous companies “are more likely than their smaller counterparts to possess capabilities needed for linkages that result in ‘win-win’ scenarios” (UNCTAD 2011). Thus host countries will be most successful in generating backward linkages from foreign investors to domestic firms if they do not let supplier-support programs be captured by small-business lobbies.

DIGRESSION: WHAT CONSTITUTES A SATISFACTORY LEVEL OF BACKWARD LINKAGES AND VERTICAL SUPPLY CHAINS?

What is an “acceptable” spread of backward linkages and vertical supply chains? What is the appropriate relationship between quantity and quality? And what is the best metric for comparing relative levels of linkages and supply chains among countries? Perhaps the only consistent observation across country measurements is that whatever the host country achieves is never enough, and the grass is always greener elsewhere.

Early supplier relationships around the world usually start with the provision of simple services (e.g., transport, cleaning, canteen, construction, and security) and simple inputs (e.g., packaging and construction materials). In the three cases where the host used FDI to upgrade and diversify the country’s production and export base—Malaysia, the Czech Republic, and Costa Rica—these primitive supplier functions have been supplemented by the creation of more local networks to provide complex services and components.

In Malaysia, foreign investors began to generate increasingly sophisticated backward linkage networks in the 1980s. Firm-level research in the electronics sector reported that US and European companies provided engineering help to domestic firms to enable them to meet precise design specifications (Rasiah 1995). Foreign MNCs in the telecommunications and semiconductor industries assigned technicians to suppliers' plants to assist them in setting up large-volume production and quality control procedures. One study of nine Japanese electronics multinationals identified deliberate transfers to Malaysian suppliers that took the form of new product and process technologies, product-design specifications, advice on the use of equipment, and help with the solution of specific technical problems (Capanelli 1997). These kinds of assistance to local firms would not qualify as a true externality to the host economy if the recipients remained captive suppliers to those who provided the help, but the Malaysian firms used the knowledge gained to become contract manufacturers to the electronics industry more generally.

The early generation of backward linkages in Malaysia included contracts with local industries to supply molds and dies, machining, metal stamping, casting, heat treatment, metal fabrication, and plating/surface treatment. Seven of the nine largest machine tool companies in Malaysia entered the industry by securing contracts for tooling services from multinational electronics investors: each of their founders started out as a manager in the foreign purchaser, and 10 percent of the workforce received initial training in the foreign buyer plants. The multinational patrons then procured export contracts for the Malaysian machine tool firms from sister affiliates in the region, setting the stage for the firms to become independent players in the international market. Today industrial parks in Penang and other states feature local companies that codesign hardware and software systems with the foreign firms that buy their output.

In the Czech Republic survey data reveal that 90 percent of 119 majority-owned multinational investors have purchased inputs from at least one Czech supplier (Javorcik and Spatareanu 2005a). The median MNC affiliate acquires inputs from 10 local firms; one affiliate in the top quartile acquires inputs from at least 30 Czech firms; and one-tenth of those surveyed acquired all of their intermediates from local suppliers. The multinational investors in the Czech Republic do business in sectors spanning electrical machinery, communications equipment, motor vehicles and other transport equipment, fabricated metals, rubber, nonmetallic mineral products, pulp and paper products, furniture, printing, chemicals, food products, and textiles.

Of the three countries using FDI relatively successfully to build an array of domestic industries, Costa Rica shows perhaps the most modest success in developing backward linkages and supply chains. This may be due to the comparative lack of depth and capability in the country's business community. Nonetheless, looking solely at the local business relationships with Intel, a survey of 80 suppliers in 2000 indicated that 37 percent of service providers and 17 percent of goods providers received direct training

from Intel (Larraín, López-Calva, and Rodríguez-Clare 2001). By 2008, Intel purchased \$43 million in goods and services from 300 local suppliers.

So, what outcomes are satisfactory and what are lacking?

Reviewing the performance of Costa Rica, Eva Paus and Kevin Gallagher (2008) note that multinational investors' expenditures on locally produced inputs and services grew in absolute terms by nearly 400 percent—from nearly \$100 million to around \$370 million—between 1997 and 2005. But they lament that the rapidly increasing use of domestic inputs declined as a percentage of imports by 1.4 percent, from 11.8 percent to 10.4 percent. They wish Costa Rica had a strong coherent development strategy to generate backward linkages, like Ireland (an assessment that probably looked more appealing in 2007 than a few years later).

Turning to Malaysia, the preceding investigations reveal what might seem like an impressive extent of backward linkages from foreign investors to local firms in the electronics industry. Yet Dieter Ernst (2002) concludes that the extent of backward linkages between foreign investors and Malaysian firms has been disappointing. The metric for comparison is the masterful performance of Singapore or the accomplishments of Korea.

Moving beyond the country studies examined in this paper, what about the world's greatest powerhouse in using FDI to upgrade the national export base: China? Justino De La Cruz, Robert Koopman, Zhi Wang, and Shang-Jin Wei (2009, 2011) note that for high-skill-intensive sectors in China, such as computers and telecommunications equipment, the share of domestic value added is no more than 3.4 percent in computers and 8.4 percent in telecommunications. Greg Linden, Kenneth Kraemer, and Jason Dedrick (2007) famously find that the value added to the product through assembly in China is probably a few dollars at most (the popularly accepted figure is \$4). De La Cruz and colleagues look longingly at Mexico, where the maquiladora and PITEX (Program of Temporary Imports to Produce Export Goods) structures resemble China's processing-trade system, and find that the domestic value-added share ranges from almost twice as large to more than twice as large (8.5 percent share in computers, 8.4 percent share in telecommunications), compared with China.

What kind of a comparator is Mexico? Paus and Gallagher note that the use of domestic inputs in Mexico's electronics export sector rose almost 400 percent in real terms from 1999 to 2006 (and only a bit short of 1000 percent in real terms from 1990 to 2006), whereas the national share has only nearly doubled (1.2 percent to 2.2 percent). Here the grass-is-greener vision comes full circle: Paus and Gallagher blame what they see as weak development of the Mexican supplier base on the "comet-like rise of contract manufacturers" from the supposedly weak domestic base in Malaysia (Ernst 2002) as well as from Taiwan and Korea.

VII. THE THORNY QUESTION OF INDUSTRIAL POLICY

Do developing countries need an aggressive industrial policy to target and support specific sectors in the domestic economy? Should industrial policy efforts include protection of the chosen sectors? How can the tricky issues that bedevil industrial policy be handled, like ending support when the effort is failing, and avoiding capture by those being subsidized?

The evidence reviewed here provides a useful—and subtle—perspective on the debate about the need for something that might be called *industrial policy* for countries that want to use FDI to diversify and upgrade their production and export base. The literature on investment promotion shows clearly that developing country authorities should not merely sit back and wait to see what international market forces bring to them. The findings of Harding and Javorcik (2012) show that sector targeting by investment promotion agencies—not simply opening the host economy to FDI—doubles FDI flows into the chosen sectors and results in higher unit-value exports. This suggests the need for an interventionist state with some kind of mechanism for selecting industries and providing packages of public sector support (addressing coordination externalities).

FDI target selection can take place in a commonsense framework of comparative advantage, however, and IPA-sponsored feasibility studies will help either confirm or cast doubt on the plausibility of success. Public sector support takes the form of creating industrial parks, reliable infrastructure, and vocational training with curricula designed by companies that wish to employ the graduates. These interventions surely qualify as a kind of industrial policy, and definitely cost public moneys. They overcome imperfections in information markets and provide investors with public goods in the form of well-trained workers, supervisors, engineers, and managers. Multinational companies in some new sectors may thrive, and those in other new sectors may not prosper, or may never show up in the first place. Interventions need not include artificial subsidies for specific companies or protection for infant industries that cannot be withdrawn later. Public programs for supplier identification, vendor development, and certification can be conducted in transparent, competitive fashion, again with selection criteria laid out by the firms that will provide purchase contracts to those who qualify.

This approach, whose fuller rationale has been elaborated in earlier sections, might be called *light-form industrial policy* to harness FDI to development and generate backward linkages as deep as possible into the host economy.

This light-form policy might be contrasted with a policy that targets specific domestic industries for government support and protection while either excluding foreign investment altogether from the targeted industries or subjecting foreign firms to performance requirements such as domestic content mandates, joint venture mandates, and/or other technology-sharing pressures (Rodrik 2009; Cosbey

2009; Center for Environmental Law et al. 2009; Gallagher and Chudnovsky 2009). This approach would be called *heavy-form industrial policy*.

The counterproductive results from trying to create internationally competitive local industries simply by imposing domestic content requirements on foreign investors, and from trying to induce multinationals to deploy their most advanced technologies when they are required to form joint ventures with local firms or share technology according to host mandates, are well-documented (Moran 2011; Hufbauer and Schott et al. 2013). Arbitrary domestic content mandates reduce the competitiveness of local goods and services. Joint venture requirements or other technology-sharing requirements induce foreign investors to withhold their cutting-edge techniques and processes.

Despite the unpromising legacy of imposing explicit performance requirements on foreign investors, China is often viewed as the new testing ground. Given the size and dynamism of the Chinese market, foreign investors can sometimes achieve the economies of scale that render domestic-originated industries elsewhere uncompetitive. In a handful of high-profile industries, moreover, multinational corporations can be enticed into a Faustian bargain of deploying cutting-edge or near-cutting-edge technology in return for market access. High-speed rail, wind and other green technologies, and perhaps aerospace and automotive investments are examples (USCC 2012, 2013; Lewis 2013).

But a look at data from behind-the-headline investments in China reveals many of the same drawbacks of hard-form performance requirements deployed elsewhere. Guoqiang Long (2005) finds that wholly owned or majority-owned foreign affiliates in China are much more likely to receive the most advanced technology available to the parent than 50-50 or domestic majority-owned joint ventures: 32 percent of the wholly owned foreign affiliates and 40 percent of the majority foreign-owned affiliates used technology as advanced as that used by the parent firm, whereas the same was true of only 23 percent of the 50-50 share ownership affiliates and 6 percent of the majority Chinese-owned affiliates. Imposition of joint ownership requirements, in short, hinders foreign affiliates from reaching the technological frontier in China, as in other emerging markets.

This observation is reinforced when Bruce Blonigen and Alyson Ma (2010) investigate whether Chinese domestic firms are keeping up or even catching up with foreign multinational investors in the volume, composition, and quality of their exports. Blonigen and Ma show that foreign investors' share of exports by product category and foreign unit values relative to Chinese unit values are increasing, not decreasing. Of particular note for the debate about forced technology transfer, their data show that joint partnerships with foreign firms do not lead to greater catching-up in sophistication of output. Across the broad expanse of the domestic economy, heavy-form Chinese industrial policies to induce greater added value in China and greater spillovers to Chinese firms are not having marked success.

Recent research shows that Chinese use of tariffs, which generally have served to stifle competition, have been regularly associated with worse firm performance than policies that worked to increase competition (Aghion et al. 2014). Specifically, Luosha Du, Ann Harrison, and Gary Jefferson (2014) find that the increased competition that accompanied China's tariff reductions and entry into the WTO induced both backward linkages from foreign buyers to domestic suppliers and forward linkages from foreign suppliers to domestic buyers. They suggest that elimination of domestic content requirements spurred technology transfer and other spillovers from foreign to domestic firms.

Analysis of the cases presented here shows the clear need for a few specific public sector interventions to best harness FDI for development, but suggests that developing country authorities confine their efforts to light-form industrial policy and eschew heavy-form strategies.

VIII. CONCLUSIONS FOR HOST COUNTRIES IN THE DEVELOPING WORLD, DONOR COUNTRIES IN THE DEVELOPED WORLD, AND MULTILATERAL FINANCIAL INSTITUTIONS

The evidence reviewed here highlights the prime importance for would-be host countries to improve the business-friendly setting in which both foreign and domestic firms can operate. This objective is essential for developing countries that want to use FDI to both diversify and upgrade their production and export base, and to generate competitive supply chains deep into their economy. Reforms in on-the-ground treatment of foreign and host country companies have been shown to be a necessary but not sufficient condition for success. Host countries must supplement such reforms with carefully constructed policy interventions to overcome market imperfections and obstacles along the way. To a certain extent, emerging market hosts can carry out these policy interventions on their own. But the cases reviewed show that external support is often crucial to success.

Contemporary international business policy discourse often implies, indeed sometimes assumes, that with the explosion of international private sector investment flows there is less need for developed country donors and multilateral financial institutions to support growth and development programs—as opposed to pure poverty reduction programs—especially in middle-income emerging markets. But the cases reviewed show that there is a vital role for external donors, including the aid agencies of developed countries, the World Bank Group, and the regional development banks, to improve the functioning of markets so that emerging countries can better harness FDI for development.

The logical place to start is support for effective FDI promotion efforts and strategies. The evidence confirms that information markets are highly imperfect and developing countries need help in learning how to use investment promotion agencies to market their country effectively to multinational investors. Such marketing efforts will be futile, however, unless the IPA has good products to promote—that is, the ability to show that business-friendly macroeconomic, microeconomic, and institutional reforms are in

place or credibly under way. Simply preaching “Reform! Reform!” from afar is not sufficient. Developing countries often need practical guidance about how to take proactive steps to search out and attract new investors.

Investment promotion agencies must learn how to master the simple tasks of being responsive to investor queries, answering the phone, and responding to email with up-to-date information about economic conditions and regulations (World Bank Group 2009). IPA staff must be able to provide details—or better, mobilize responses—that go beyond what is posted on the website.

Beyond being responsive, however, the data reviewed in this paper confirm that there is demonstrable payoff to targeting investors in sectors and to developing expertise about the characteristics and needs of international companies in those sectors. This is a complicated and expensive undertaking, and would-be hosts that want to use FDI to upgrade and diversify the production and export base of their economies need training and counseling. The cases examined here are particularly useful in showing how to design trade and investment strategies to move less developed countries toward the ranks of more developed economies.

In addition to help with marketing strategies, IPAs must be shown how to achieve the oft-claimed, but less often achieved, status of serving as a one-stop shop for securing permits, permissions, and appropriate regulatory treatment for investors that want to launch a new operation. How successful IPAs have managed to accomplish this deserves detailed comparative research, the results of which can then be passed on to developing country officials.

In addition to marketing the country and attracting initial investors, IPAs need to emphasize after-investment care. The energy devoted to following up with initial investors is significant because of the size of potential reinvested earnings, because of the demonstration effect of satisfied investors in attracting other new investors, and because of the potential for cluster development as first-tier suppliers follow primes.

External support for this follow-on function opens the door to the controversial area of identifying policy reform champions in the host economy and helping them engage in policy advocacy. External donors can help fashion alliances of multinational investors, domestic companies, and reform-minded agencies to influence the political economy of policy formation in the host country.

Design of strategies to improve the host investment climate is not the only area in which policy advocacy will quickly become enmeshed in sensitive areas of controversy. External support for effective investment promotion requires toolkits, training initiatives, and capacity building for the sectors involved.

For FDI in middle- and upper-skilled industrial activities—which have received predominant attention in this paper—the evidence offers particularly important insights. Host governments that want to use FDI to upgrade and diversify their industrial production and export base need the resources

to integrate investment promotion per se with programs of infrastructure support and vocational training. Alongside such programs, host authorities and international donors alike must acknowledge the importance of labor market flexibility, in particular flexibility for firms to adjust workforce size in response to fluctuations in supply and demand (as pointed out, the key issue is ease of hiring and laying off workers, not hiring and firing workers as if the latter were termination for cause). Donor support in fashioning such investment promotion packages will not be effective if the outcome includes only two of these ingredients, not all three. To be sure, external advocacy to combine all three—infrastructure upgrades, vocational training partnerships, and labor market reforms—may be awkward, or worse. But it is essential.

Turning to promotion of backward linkages from foreign investors to local suppliers, the design of host strategies to meet the challenges involved has become a central focus in relating trade and investment to vigorous domestic development. In this endeavor the most important observation is also the most obvious: prospects for creating reliable and competitive domestic supplier firms require a business-friendly environment no less favorable than what is enjoyed by international investors. Supply chain development will falter if domestic companies do not enjoy efficient judicial systems, predictable regulatory regimes, and competitive market conditions.

Once again, however, while favorable doing-business indicators are a necessary condition for host supplier development, they may not be a sufficient condition for success. The evidence reviewed here shows positive benefits from external advice and support in creating supplier databases, setting up qualification and certification programs, training talent scouts and marriage brokers, and forming equipment financing programs backed by purchase agreements from foreign buyers. But host policy interventions can go too far, producing negative and counterproductive consequences by imposing heavy-handed mandatory domestic content requirements, joint venture mandates, and technology sharing regulations on foreign investors in the hope of creating viable supplier networks.

Even when host supplier development programs are carried out in an appropriately light-handed manner, however, the more promising candidates to achieve OEM status or other certification are—contrary to popular rhetoric—usually medium-sized or larger local companies, not smaller businesses. The tendency of supply chain development programs to be captured by small-business lobbies, and the willingness of international donors to tolerate, even promote this, has adverse consequences for emerging economies.

According to the evidence reviewed, the potential for local supplier development varies widely (Farole and Winkler 2014). In the extractive sector, for example, the capital intensity and sophistication of drilling or mining equipment often limit host country supplier relationships to the provision of maintenance, catering, and security services, although some local firms have managed to produce pumps,

conveyor belts, and other equipment on a competitive basis. In the textile and garment sector, trade restrictions and rules of origin greatly constrain the search for domestic sources of supply. On the other hand, in the agribusiness sector (processed foods, cut flowers and vegetables, prepared fruits and juices) the development of connections with regional and international markets can introduce hundreds of thousands of local farmers to the formal economy.

With regard to middle- and higher-skilled manufacturing FDI, the evidence shows that the payoff from help in promoting local supply chain development is sizable. And when host country firms achieve OEM or other supplier certification, the international corporations that purchase their goods and services not infrequently introduce them to affiliates in the region, creating an export externality. The newly launched supplier firms meanwhile often spin off simpler functions to second- and third-tier local providers in the original economy.

For developing countries, developed countries, and multilateral financial institutions, trade policy liberalization remains an important goal on the development agenda. Alongside this liberalization, trade facilitation has well-justified standing as a key objective for international assistance. But as trade and investment are increasingly linked, support for emerging market economies to use FDI to upgrade and diversify their production and export base—and to develop reliable and competitive supply chains deep into the local economy—is the new frontier for assistance from the developed country and multilateral donor community.

Most developed countries recognize that they serve their own interests as well as those of the developing world by helping home companies identify investment opportunities abroad as well as export opportunities. Sixteen of the 22 major developed countries help home-based multinationals both export to and invest in developing economies; three (the United States, Ireland, and Belgium) do not (CGD 2010–2012). The US Foreign Commercial Service, for example, assists US firms in bidding on foreign contracts and developing export markets, but is not trained or allowed to assist American companies in setting up supply chains abroad. A preoccupation in the United States is fear that outward investment by US multinationals weakens the domestic economy and undermines the potential for domestic job creation. This is a debate too vast for thorough treatment here, but careful analysis of the recent research affirms that outward investment from the United States (and other developed economies) complements rather than substitutes for economic activity in the domestic economy (Hufbauer, Moran, and Oldenski 2013).

Due to protectionist pressures in the United States, constraints on the US Overseas Private Investment Corporation (OPIC) are particularly severe. Among official political risk insurance agencies in the developed world, 14 of 19 provide crucial coverage for projects with powerful development impact, including labor-intensive FDI export projects from least developed countries and middle-skill-intensive

FDI export projects from more advanced developing countries. In contrast, OPIC is prohibited from offering coverage to what US labor organizations consider “sensitive sector” investments (e.g., textiles, auto parts, or electronics) or to agricultural processing projects if the crops grown are “in surplus” in the United States (CGD 2010–2012). Concern about Congressional reaction also effectively prevents OPIC from offering support to investors who wish to establish or manage export processing zones. What is needed instead is to rededicate OPIC to its original mission of promoting development by providing political risk insurance to projects that most benefit poorer countries. Alongside OPIC, meanwhile, the US Millennium Challenge Corporation should work with recipient countries to design compacts that overcome constraints to investment, tying local entrepreneurs to global markets and helping authorities implement compacts that facilitate both local and multinational private sector activity.

Finally, looking toward the future, developed and developing countries alike would benefit from a serious multilateral effort to limit locational incentives, subsidies, and other giveaway programs as alternative sites compete to attract international investment around the world.

Table 1 Manufacturing FDI flows to developing countries, annual averages for selected years (millions of US dollars)

| Sector | 1990–92 | 2005–07 | 2009–11 |
|---|------------|--------------|-------------|
| Lowest-skilled sectors | \$758 | \$2,496 | \$5,308 |
| Higher-skilled sectors | \$4,155 | \$34,788 | \$51,411 |
| Ratio of higher-skilled FDI to lowest-skilled FDI | 6x (5.48x) | 14x (13.94x) | 10x (9.69x) |

Note: For a breakdown by sector, see appendix A.

Source: UNCTAD Database, 2014.

Table 2 Comparative appraisal of host efforts to use FDI to upgrade and diversify domestic production and export base

| Host | Doing business indicators ^a | Proactive investment promotion agency | Infrastructure packages | Public-private partnerships for vocational training | Labor market flexibility | FDI upgrades and diversification outcomes |
|--------------------|--|---------------------------------------|-------------------------|---|--------------------------|---|
| Costa Rica | + | + | + | + | + | + |
| Malaysia/Penang | + | + | + | + | + | + |
| Czech Republic | + | + | + | + | + | + |
| Morocco/Tanger Med | + | + | + | n.a. | – | – |
| South Africa/IDZs | + | + | + | n.a. | – | – |

n.a. = not applicable; IDZs = industrial development zones

a. Doing-business indicators in export zones without considering labor market flexibility.

Note: The “plus” signs signify that these policy interventions were important and essential, the “minus” signs indicate that these policy interventions have not been fully implemented or (due to paucity of inward FDI) implemented at all.

Source: Author’s analysis.

Appendix A

Table A.1 Sector breakdown of manufacturing FDI flows to developing countries, annual averages for selected years (millions of US dollars)

| Sector | 1990–92 | 2005–07 | 2009–11 |
|---|---------|---------|---------|
| Lowest-skill sectors | | | |
| Food, beverages, and tobacco | 512 | 1,693 | 3,622 |
| Textiles, clothing, and leather | 130 | 439 | 1,063 |
| Wood and wood products | 116 | 363 | 623 |
| Total | 758 | 2,496 | 5,308 |
| Higher-skilled sectors | | | |
| Publishing, printing, and reproduction of printed materials | 0 | 48 | 56 |
| Coke, petroleum products, and nuclear fuels | 113 | 1,659 | 1,448 |
| Chemicals and chemical products | 544 | 2,514 | 4,335 |
| Rubber and plastic products | 22 | 186 | 771 |
| Nonmetallic mineral products | 126 | 555 | 1,015 |
| Metals and metal products | 212 | 2,375 | 4,828 |
| Machinery and equipment | 190 | 2,531 | 1,778 |
| Electrical and electronic equipment | 284 | 1,714 | 3,142 |
| Precision instruments | 20 | 22 | 161 |
| Motor vehicles and other transport equipment | 212 | 754 | 2,136 |
| Other manufacturing | 129 | 311 | 691 |
| Unspecified secondary | 2,302 | 22,119 | 31,049 |
| Total | 4,155 | 34,788 | 51,411 |

Source: UNCTAD Database, 2014.

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