



KCG Policy Paper

Quality FDI and Supply-Chains in Manufacturing

Overcoming Obstacles and Supporting Development

Theodore H. Moran, Holger Görg and Adnan Seric

No. 1 | November 2016

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Abstract: This paper aims to identify the obstacles to attracting “quality” foreign direct investment (FDI) in middle-skill manufacturing activities, so as to inform an action-agenda for policies that will help developing and emerging market economies to link into global supply chains while building backward linkages deep into their own economies. The evidence reviewed here shows positive benefits from external advice and support in creating supplier data-bases, setting up qualification and certification programs, training talent scouts and brokers, and forming financing programs backed by purchase agreements from foreign buyers. Thus, in the contemporary era in which trade and investment are increasingly intimately linked, support for developing and emerging market economies to use quality FDI to upgrade and diversify their production and export bases – and to develop reliable and competitive supply chains deep into the local economy – is the new frontier for assistance from the developed countries and multilateral community looking to the future.

Theodore H. Moran
Georgetown University
ICC 301
37th and O Streets NW
Washington, D.C. 20057
United States of America
morant@georgetown.edu

Holger Görg
Kiel Centre for Globalization
Kiel Institute for the World
Economy
Kiellinie 66
D-24105 Kiel
Germany
holger.goerg@ifw-kiel.de

Adnan Seric
United Nations Industrial
Development Organization
Wagramer Straße 5
1220 Vienna
Austria
A.Seric@unido.org

Acknowledgement: The authors fully acknowledge the input, review and useful comments received from various colleagues within the scope of drafting process, in particular from Frances Ruane (ESRI), Manuela Eyvazo, Frauke Steglich and Anders Isaksson of UNIDO. Sincere thanks for the formatting and layout of the document goes to Dorina Nati. The authors would like to express their sincere appreciation to Bernardo Calzadilla-Sarmiento, Director of Department of Trade, Investment and Innovation, for his overall support in development of the document.

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Abbreviations

ASCCI	Automotive Supply Chain Competitiveness Initiative
CINDE	Costa Rican investment promotion agency
DTI	South African Department of Trade and Industry
EDB	Singapore's Economic Development Board
FDI	Foreign Direct Investment
ILO	International Labour Organization
IPA	Investment Promotion Agency
LIUP	Local Industry Upgrading Program
MIDP	Motor Industry Development Programme
MNC	Multinational Company
MNE	Multinational Enterprise
MVA	Manufacturing Value Added
NAAMSA	National Association of Automobile Manufacturers of South Africa
NAFTA	North American Free Trade Agreement
OEMs	Original Equipment Manufacturers
PDC	State Development Committee of Penang
PSCD	Penang Skills Development Center
RCA	Revealed Comparative Advantage
SITC	Standard International Trade Classification
SMEs	Small and medium-sized enterprises
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WTO	World Trade Organization

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Quality Foreign Direct Investment and Supply-Chains in Manufacturing: Overcoming Obstacles and Supporting Development

I. Introduction: Providing a Framework for Analyzing the Impact of FDI on Development

This paper aims to identify the obstacles to attracting “quality” foreign direct investment (FDI) in middle-skill manufacturing activities, so as to support an action-agenda for policies that will help emerging market economies to link in to global supply chains while building backward linkages deep into their own economies.

What is “quality” FDI? Quality foreign direct investment is investment that takes place within a policy framework that allows the FDI to make the largest possible contribution to broad-based inclusive and sustainable development within the host economy. In policy terms, quality FDI may be characterized as investments that contribute to creation of decent and value-adding jobs, enhance the skill base of host economies, facilitate transfer of technology, knowledge and know-how, boost competitiveness of domestic firms and enable their access to markets, as well as operate in a socially and environmentally responsible manner.

At the same time, for any reasonable analysis of the impact of foreign direct on emerging market economies, FDI flows must be divided into at least five separate industry segments, each with distinctive policy and regulatory challenges. These include foreign direct investment in (i) extractive industries; (ii) foreign direct investment in low-skill (low-wage) manufacturing industries; (iii) foreign direct investment in middle-to high-skill; (iv) foreign direct investment in infrastructure; and (v) the understudied field of foreign direct investment in service industries¹. Each form of FDI presents particular kinds of policy challenges for developing-country host authorities, and generates diverse impacts on the developing host economy. The focus of this paper is on the development effects of FDI in manufacturing.

With this in mind, this paper examines foreign direct investment in mostly middle to high-skill manufacturing activities, focusing on the potential of developing countries to use such FDI flows to bring about the structural transformation and productivity growth for the host country. The objective is to derive policy recommendations on how to attract and harness “quality” foreign investment in manufacturing by fostering development of backward and forward linkages and connecting to global supply chains.

II. FDI in Middle-skill Manufacturing and Structural Transformation of the Host Economy

Why is structural transformation a central element in development strategy in the contemporary period?

¹ See, e.g., Foster, Isaksson and Kaulich (2015).

A growing accumulation of evidence demonstrates that countries that are able to upgrade and diversify their production and export base grow faster and enjoy larger welfare gains than countries that simply do more and more of what they have traditionally done.² The key question is how to replace traditional static comparative advantage with dynamic comparative advantage that transforms a developing country economy in ways that are viable and competitive when exposed to international markets.

Some emerging market countries have been able to rely on their own indigenous entrepreneurs to diversify and upgrade their economies. Most emerging market countries, however, have looked more to foreign direct investment to try to propel the process of structural transformation. For developing countries that want to use foreign direct investment to help with upgrading and diversifying their economy, there is uncontested but perhaps surprising good news.

Popular discussion often portrays foreign direct investment 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 – such as transportation equipment, industrial machinery, electronics and electrical products, scientific instruments, medical devices, chemicals, rubber, and plastic products – is nearly ten times larger per year in the most recent period for which data are available than the flow to low-skilled, labor-intensive operations, and has been speeding up over time. The ratio between higher and lower skill-intensive activities was roughly five times larger in the period 1990 to 1992, and reached approximately fourteen times larger in the period 2005 to 2007, receding to ten times larger in 2009 to 2011. So the globalization of industry offers great potential for developing economies to tap into the middle- and higher-skill-intensive supply chains of multinational corporate investors.

² See Hausmann, Hwang and Rodrik (2007).

Table 1: Manufacturing FDI Flows to Developing Countries (millions of dollars)

	1990 to 1992 (annual average)	2005 to 2007 (annual average)	2009 to 2011 (annual average)
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	5x (5.48x)	14x (13.94x)	10x (9.69x)

Source: *Manufacturing FDI flows to Developing Countries (UNCTAD 2014)*.

Note: For a complete breakdown by sector, see Table A1 in Appendix I.

As a consequence of this deployment of middle-skill operations to emerging markets, most manufacturing FDI is not being driven by a search for the very lowest-wage workers, even though differences in relative wage levels between home and host economies may be substantial. Broadly speaking, there are no comprehensive global data sets on number of workers by job classification and level of compensation. But the evidence that is available supports the general proposition that as skill-levels increase so do wages³. Survey data from industry sectors such as autos and auto equipment, electronics, chemicals, and industrial equipment – in comparison to 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 ten times as much for technical and supervisor positions, in comparison to what is earned by employees in comparable positions in lower-skilled MNC operations. This pattern is also evident in data from the UNIDO Africa Investor Survey 2011⁴. It shows that the median wage paid by high-tech multinationals is about 50 percent higher than the average in a low tech multinational.

What does the evidence from developing countries that have tried to use FDI to diversify and upgrade their production and export base demonstrate about the precise nature of market failures and the specific kinds of industrial policies to bring about structural transformation?

³ See e.g. ILO (2007).

⁴ See Coniglio, Prota and Seric (2015) and UNIDO (2012).

To answer this question, it would be desirable to have a large-N data-base covering the experiences of individual countries trying to attract FDI with micro-evidence about information asymmetries, about market failures, and about coordination externalities surrounding host government policies. Such a data-base does not exist, and proxies for such subtle variables may not even be able to be identified.

So instead this paper heads in the opposite direction, and begins by drawing on three case studies in which substantial evidence about micro-details of how attraction of foreign investment into novel middle-skilled and higher-skilled activities took place does exist, taking a closer look at the market failures and impediments to structural transformation across these cases.⁵

What are the key ingredients in attracting middle-skilled manufacturing investors into novel sectors or industries?

In the days of the Washington Consensus it might have been comfortable to suppose that all emerging market countries had to do was to improve their doing-business indicators, and then sit back and wait for international investors to show up. But these three case studies show that improving doing-business indicators is a necessary but not a sufficient condition for success.

Alongside improvements in the local business climate, pro-active and efficient investment promotion efforts are needed, backed by concrete measures to reassure foreign investors in middle-skilled activities that they will be able to link their new plant smoothly into the global production network upon which the parent MNC's competitive position in international markets depends. The most important such measures are (1) efficient infrastructure, and (2) access to appropriately trained workers, supervisors, technicians, and managers.

Using the Balassa Index, a measure of *revealed comparative advantage* (RCA)⁶, the evidence from these three cases confirms that the hosts were able to use middle-skill FDI to achieve structural transformation of the underlying production and export base in remarkably short periods of time.

Case Study I: Structural Transformation in Malaysia

Over a mere four decades, Malaysia shifted an exporter of rubber and tin, to a manufacturing powerhouse for electronics exports. Structural transformation came by inducing international electronics investors to upgrade their operations to complex sub-assemblies and final products.

⁵The detailed case studies summarized here – from Costa Rica and Malaysia – can be found in Moran, (2014).

⁶ For detailed explanation of the Balassa Index refer to

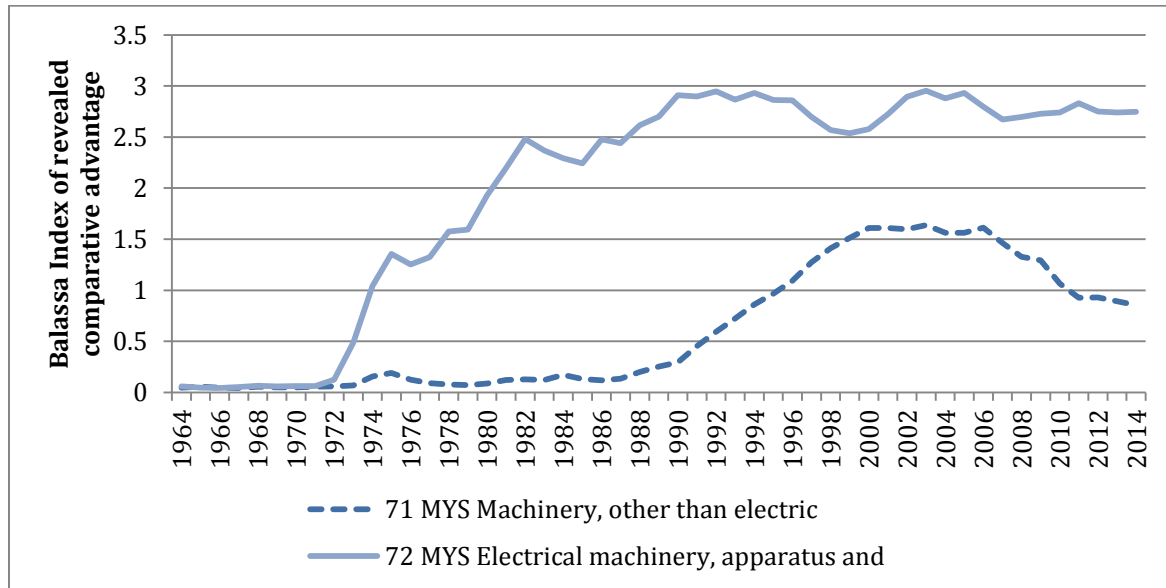
State Development Committee (PDC) of Penang oversaw the establishment of industrial parks with highly efficient physical and IT logistics around major airports. PDC also turned itself into a one-stop-shop investment promotion agency (IPA) modeled on nearby Singapore. Of particular note shift to more sophisticated electronics exports in the second half of the 1980s, PNC – with a steering committee headed by Motorola, Hewlett-Packard, and Intel – induced 24 “founder” firms to contribute equipment and assign executives to teach in the public-private Penang Skills Development Center (PSCD) in 1989. Within seven years – in 1996 – a United States Agency for International Development (USAID) study ranked the PSCD as one of the ten leading workforce development institutions in the world. The combination of top notch infrastructure and ready access to skilled workers, technicians, engineers, and managers reassured foreign investors that their increasingly high-skilled inputs could be integrated effectively into their global supply networks.

To document the structural transformation of the Malaysian export profile – led by Motorola, Hewlett-Packard, Intel, and their followers – it is possible to calculate revealed comparative advantage using the standard Balassa Index based on export trade data from the Comtrade database at the 4-digit SITC level⁷. On the basis of this index, a value greater than one implies that a country has revealed comparative advantage in an industry, as it exports a greater share in that industry than the typical country.

The Balassa Index shows that in the early 1970s, electrical machinery became a transformative export, followed by other types of machinery in the early 1990s (Figure 1 and Figure 2). FDI helped transform comparative advantage in a total of nine 4-digit sectors, within the 2-digit sector of electrical machinery; and six 4-digit sectors in the 2-digit sector of machinery, other than electric. Moreover, the process was exceedingly quick. RCA in electrical machinery appeared in just 2 years, in 1972 Malaysia showed no strength as an exporter in the sector with an RCA of 0.13, by 1974 Malaysia’s share of exports in this sector exceeded the global average.

⁷ Freund and Moran (2016 forthcoming).

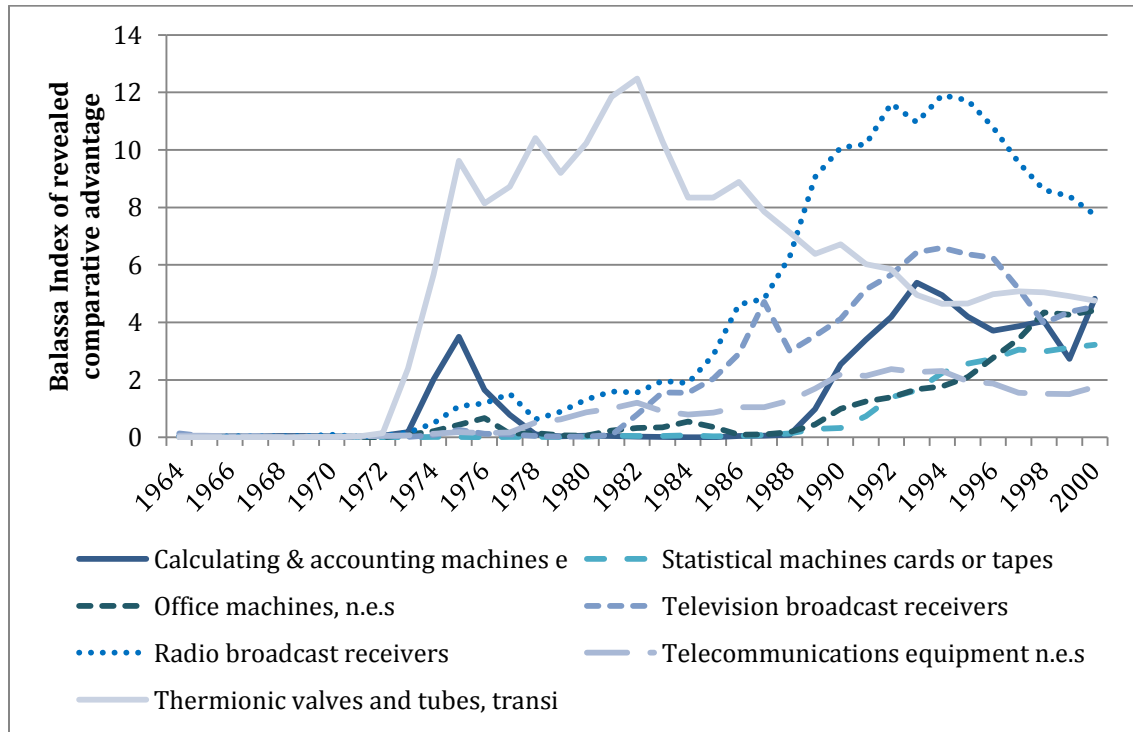
Figure 1: Development of Malaysia’s comparative advantage in electric (SITC 71) and other machinery (SITC 72) between 1964 and 2014



Source: Calculations according to Freund and Moran (2016 forthcoming) based on data from UN Comtrade (<http://comtrade.un.org/>).

Looking at the detailed industries more closely, investment came in big waves across related products. First came investors in thermionic tubes, valves and transistors; these were followed by investors in television and radio broadcasting systems (Figure 2). Revealed comparative advantage arises fast, with thermionic tubes going from zero in 1972, to Malaysia’s export share being more than double the world’s export share just one year later. In 1988-89 a similar burst of exports begins in computers, computer peripherals, and data processing components and systems.

Figure 2: Waves of Malaysia’s comparative advantage in selected sectors between 1964 and 2014



Source: Calculations according to Freund and Moran (2016 forthcoming) based on data from UN Comtrade (<http://comtrade.un.org/>).

Case Study II: Structural Transformation in Costa Rica

Costa Rica’s campaign to attract Intel offers a second slightly-later chronological case study with enough micro-data to identify the market failures and other impediments to using FDI for structural transformation⁸. For Costa Rican authorities, the challenge was not to move from lower to higher skill operations within a single industry as in Penang but rather to shift export sectors completely.

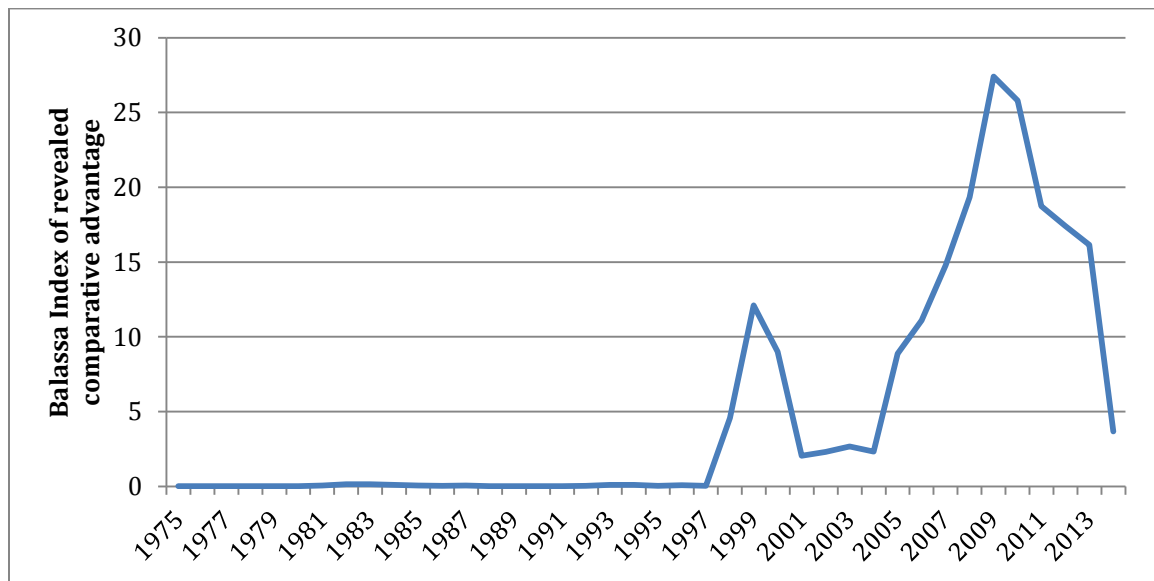
By the time President Jose Figueres took office in 1994, the country had already undertaken a series of reforms that today would be called improving doing-business indicators in the domestic economy. The president himself directed the Costa Rican investment promotion agency – CINDE – to study the needs of the information technology (IT) industry and actively seek out the semiconductor producer Intel as the principal company for FDI attraction.

⁸ See Spar (1998), Spar (2006) and Larrain, Lopez-Calva and Rodriguez-Clare (2001).

Two issues dominated the 19 negotiating sessions between Costa Rica and Intel. First, CINDE – backed by personal involvement of President Figueres – had to offer infrastructure enhancements that included a speeded-up renovation of the national airport with special facilities for Intel freight, plus building a new power substation on the electrical grid dedicated to the prospective Intel semiconductor plant. Second, the Figueres administration had to form a public-private partnership for vocational training in which the national technological institute (Instituto Tecnológico de Costa Rica) would co-design with Intel a training program for IT workers, supervisors, engineers, and managers. So, as in Penang, once Costa Rica provided reassurances about seamless integration, final negotiations about how to structure the final deal with Intel were able to proceed.

Figure 3 shows the Balassa Index for office machines and parts before and after the investment of Intel in 1997.

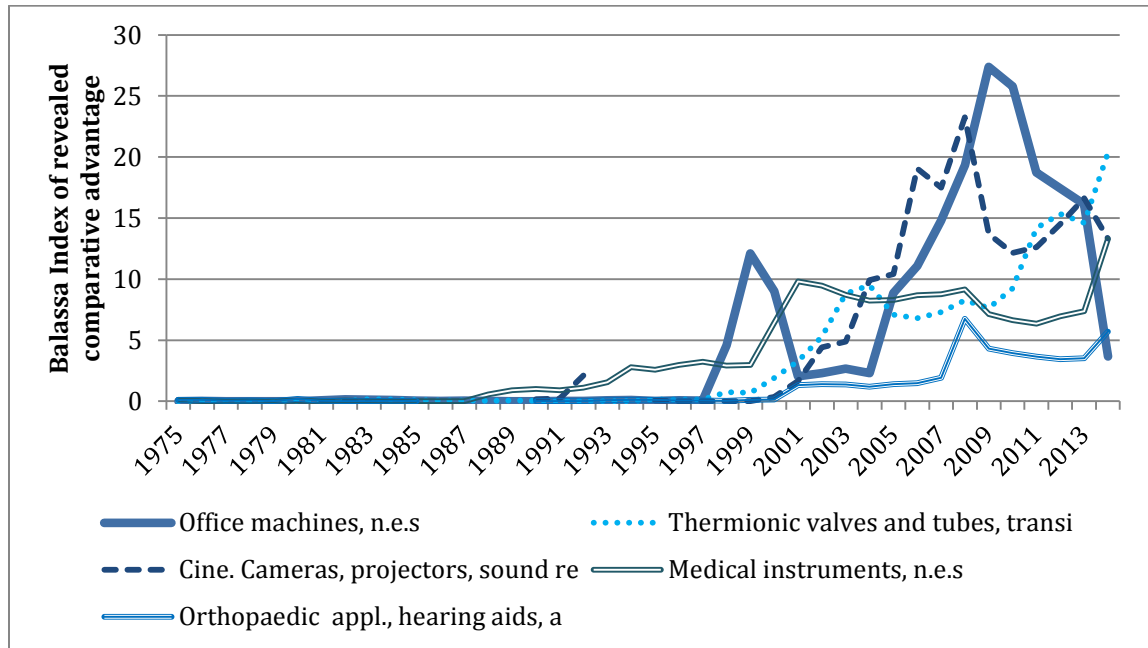
Figure 3: Development of Costa Rica’s revealed comparative advantage in office machines & parts (SITC 7149) between 1975 and 2013



Source: Calculations according to Freund and Moran (2016 forthcoming) based on data from UN Comtrade (<http://comtrade.un.org/>).

Follow-the-leader investment is also visible. Intel’s investment in 1997 prompted investment in other sectors, which also experienced large changes in comparative advantage in subsequent years (including thermionic tubes, cameras and projectors, medical instruments, and orthopedic appliances), as shown in Figure 4.

Figure 4: Waves of Costa Rica’s comparative advantage in selected sectors between 1975 and 2013



Source: Calculations according to Freund and Moran (2016 forthcoming) based on data from UN Comtrade (<http://comtrade.un.org/>).

Intel closed its semiconductor facility in Costa Rica in 2014, in response to changing demand for PC chips, while leaving a software development unit. Other MNC investment, initially attracted by the Intel success, continued to expand exports from Costa Rica.

Case Study III: Structural Transformation in South Africa⁹

Over the past two decades the South African automotive industry has been characterized by significant export expansion, substantial inflows of foreign investment, and new technology together with rapid productivity improvements; these were occurring in a climate of falling import duties and modest domestic demand expansion. This has been a period of remarkable industrial transformation; a once protected and inefficient industry has become highly outward oriented and is now a leading export sector. The value of total automotive exports increased from \$1.2 billion in 1995 to \$10.6 billion in 2012. Vehicle exports increased from 16 000 units in 1995 to 278 000 units in 2012. These developments have been strongly influenced by the policy

⁹ For in-depth analysis of South African automotive industry see Black (2009) and Barnes, Black and Techakanont (2015).

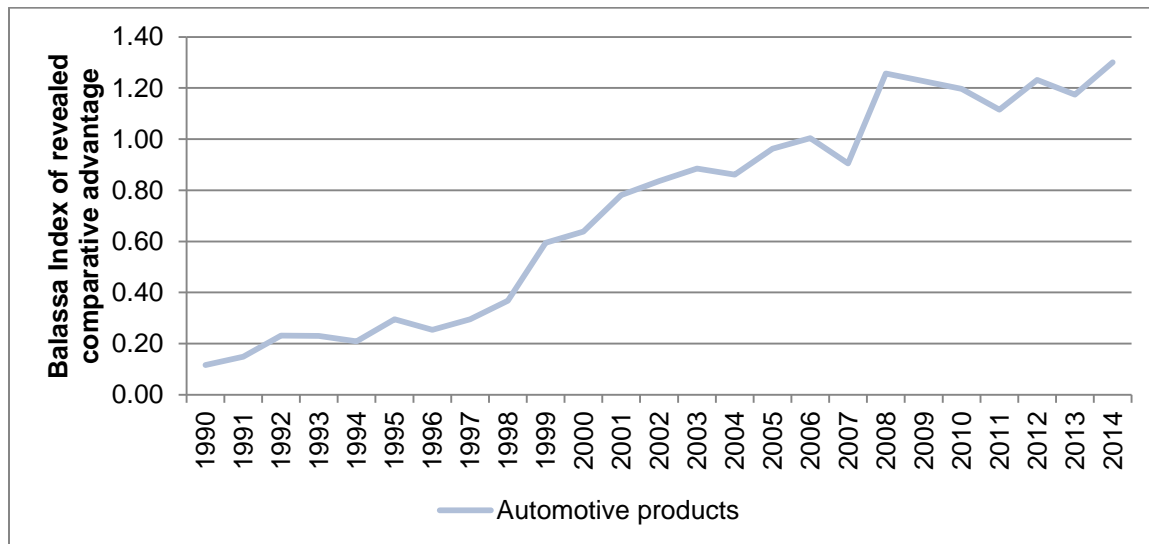
program introduced in 1995, the Motor Industry Development Programme (MIDP). As result, the MIDP is widely regarded as a successful example of trade and industrial policy¹⁰.

The MIDP was introduced in 1995, just a year after the first democratic elections. Tariffs were scheduled to phase down to 40 percent for light vehicles and 30 percent for components by 2002. They were later phased down further to 25 percent and 20 percent respectively. Minimum local content requirements were also abolished. Importantly, however, import duties on components and vehicles could be offset by import rebate credits derived from the export of vehicles and components. So while nominal duties on imported vehicles remained fairly high, the ability to rebate import duties by exporting enabled importers to ship in vehicles and components at lower effective rates of duty. The ability to offset import duties would therefore provide the lever to encourage firms to export and thereby secure a more significant presence in global value chains. In the scale-intensive automotive industry, exports were essential to achieve the higher volumes and greater specialization required to improve efficiencies. Essentially, what policy sought to encourage was a transition from completely knocked down assembly, which has typically been characteristic of vehicle production in protected developing country markets, through a transition stage to full manufacturing.

Figure 5 illustrates the development of the Balassa Index for automotive products in South Africa. Starting from very low levels in the 1990s the Balassa Index has increased steadily, a development that has been largely credited to presence of a policy environment focused on providing targeted measures to facilitate investments and localization of foreign original equipment manufacturers (OEMs) in South Africa. Within a little more than a decade the MIDP and other sector-specific support and development initiatives resulted in South Africa's share of exports in this sector exceeding the world average and the country becoming a nodal point in the global automotive production network.

¹⁰ Barnes and Morris (2008), Barnes, Kaplinsky and Morris (2004) and Roberts (2008).

Figure 5: Development of South Africa’s revealed comparative advantage in automotive products between 1990 and 2014



Source: Own calculations based on WTO data (<http://stat.wto.org/>) for SITC groups 781, 782, 783, 784, and subgroups 7132, 7783.

The industrial policy changes developed and implemented at the national level coincided with broader global developments affecting the automotive value chains of major original equipment manufacturers (OEMs). For instance, the vehicle export strategies of the German companies (BMW, Volkswagen [VW], and DaimlerChrysler) were motivated partly by the fact that none of them had a wide global distribution of plants. The South African operations, therefore, benefited from the globalization of German vehicle manufacturers looking to expand capacity and increase their share of output outside of high cost Germany. Using low-volume South African plants as an export base constituted to a certain extent a strategic advantage. For example, it has enabled them to access low-volume markets in Asia and Australia and reduce shipping times from Europe¹¹.

As the sector was gradually exposed to higher levels of international competition, for many local firms to continue operating as first tier suppliers to vehicle assemblers, international linkages were crucial for being able to source technology and gain access to global networks. Beyond that, increasing foreign ownership as a result of industrial policy shifts also had implications for the lower tier suppliers within the local supply chain. Foreign-owned suppliers continued operating at lower local content levels and proved rather pessimistic about the capabilities of local suppliers. However, this view is slowly changing given the concentrated efforts of national stakeholders supported by international development partners.

¹¹ See Holweg and Pil (2004).

In 2011, a Purchasing Council was formed as a sub-committee of the National Association of Automobile Manufacturers of South Africa (NAAMSA) comprising the purchasing heads of the seven localized vehicle manufacturers with the aim to increase local content. Its main function is to research component categories and/or new technologies that could be made locally and deployed across multiple vehicle platforms and brands. Following this initiative, in 2013 the Department of Trade and Industry (DTI), vehicle manufacturers and related institutions launched the Automotive Supply Chain Competitiveness Initiative (ASCCI). In an industry-first for South Africa, a national strategy for competitiveness improvement will be led and implemented through a facilitated steering committee structure, with committed participation from the major national stakeholders. The overall objective of ASCCI is to increase supplier Manufacturing Value Added (MVA) in support of producing 1.2m vehicles by 2020, increasing employment, enabling local supply chain capabilities, increasing local content, and advancing transformation. International development partners are actively supporting government policy efforts by providing technical expertise and advisory services aimed at strengthening capabilities of domestic suppliers and creating platforms for strengthening of upstream and downstream linkages across the value chain.

These case studies are not alone in helping to identify the obstacles to attracting middle-skill manufacturing FDI, and to demonstrate how such obstacles might best be overcome. We now turn to look at the importance of backward linkages and spillovers for the host economy.

III. FDI and Backward Linkages into the Host Economy

The past two decades have seen growing analytic attention to those conditions that enhance the likelihood of backward linkages and spillovers from foreign investors to other firms in the host country markets. The 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.¹² This is a fairly common-sense task, but requires overcoming widespread analytical confusions and misperceptions along the way.

Horizontal vs vertical relationships

Beginning horizontally, it is recognized that foreign investors would prefer to avoid creating rivals to their own market position. But workers and managers often enough leave foreign plants to start up their own ventures; 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 indigenous companies founded by owners who had started in foreign firms nearby¹³. Research on Ghana traced the

¹² This section draws on Moran (2014).

¹³ See Rhee, Katterback and White (1990).

path of managers who leave multinational employers to set up their own companies and found 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 in the industry who started up on their own¹⁴.

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 report that they gained knowledge about new technologies by studying foreign firms as the latter entered their industry¹⁵. 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.

More recently, thanks to the availability of a rich firm-level dataset generated by UNIDO (2012) on a large sample of firms from 19 sub-Saharan African countries, a team of researchers has examined the characteristics of domestic firms that either gain or lose from the presence of MNEs in their domestic markets by analyzing the strategic reactions that domestic firms adopt as a consequence of MNEs' presence¹⁶. The authors find evidence that a large number of domestic African firms react by "imitating" foreign firms, mainly by producing similar products and/or applying similar marketing strategies. Interestingly, the firms which benefit more from interactions with foreign affiliates are those more likely to be associated with the adoption of imitation strategies. In contrast, the (net) losers from FDI are more likely to remain idle, i.e. report not to react strategically at all, or react to the foreign presence by shifting to different product lines. The research also finds evidence that the size and, even more importantly, the "quality" of linkages between domestic and foreign firms boost the likelihood of "learning by imitation". It remains nonetheless true that multinational manufacturing investors try to limit horizontal spillovers as much as possible.

By contrast, in the vertical direction, foreign investors often have self-interest in creating low-cost reliable-quality suppliers in the host market. What host country policies are conducive to promoting backward linkages from foreign investors to local suppliers, and what are detrimental? How might external support be used to expand vertical supplier relationships within the host economy?

Perhaps somewhat surprisingly, one of the more successful host policy initiatives turns out often to be controversial. This initiative consists of 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 domestic economy. The host investment promotion agencies (IPA) may team up directly with prime investors to pull the most prominent component producers to cluster near the primes. In the case of Penang, for example, Hewlett Packard, IBM, Seagate, Ericsson, Philips, Nokia, and Samsung, as well as the electronics conglomerates associated with Fujitsu, Hitachi, and Panasonic, brought electronics and telecom input providers from Japan,

¹⁴ See Görg and Strobl (2005).

¹⁵ See Javorcik and Spatareanu (2005).

¹⁶ See Boly, Coniglio, Prota and Seric (2015).

Korea, the US, and Europe, that supplied them in their home markets, to set up shop alongside them in Malaysia.

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 Price Waterhouse logo, backed by quality control provided by Price Waterhouse headquarters, offer an example of the former.

Controversy about attracting first-tier suppliers from abroad arises, however, from apprehensions that these suppliers may denationalize the host industrial base, crowd out local capital, and siphon off the best workers and managers. Such apprehensions require scrutiny.

Selected case study evidence

Here 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 in the early 1990s. In the horizontal direction, competitive pressures drove one of the largest indigenous auto firms (PAL) into bankruptcy while two others (HM and the Maruti-Suzuki joint venture) struggled as their capacity utilization 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: Daimler Chrysler (\$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), Ford (\$433 million in 1999)¹⁷.

In the vertical direction, participants in the previously protected Indian auto parts sector experienced severe competitive pressures, and many, if not most, did most likely not survive¹⁸. 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 Ford AGC (Auto Component Group); 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 indigenous horizontal participants and indigenous vertical suppliers.

¹⁷ See McKinsey (2001).

¹⁸ McKinsey (2001) does not provide precise data.

Half a world away, the entry of Wal-Mart into the Mexican retail market introduces a slightly different version of the same process, filled with denationalization, crowding out local capital, and poaching of best workers and managers.

After passage of NAFTA, the Wal-Mart parent in 1997 bought a controlling interest in its joint venture with Mexican partner Aurerra. 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 rising 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 indigenous 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 host market. But Walmex 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 shrink-wrapped and cushioned by corner protectors¹⁹. Suppliers were required to reduce prices and provide product innovations on an annual basis. The result was heavy competitive pressure within what had been – as the Mexican participants themselves described the sector – a protected, clubby, and somewhat corrupt industry²⁰. Many Mexican suppliers were driven out of the market, but the scale of opportunities for those who remained were much larger: roughly 25 domestically owned small and medium-sized producers of store brand (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 into Mexican retail show that introduction of new foreign competitors often leads to crowding-in and crowding-out simultaneously.

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 time in the sector (as is mistakenly highlighted in the crowd-in/crowd-out debate).²¹

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 indigenous firms turns out to be relatively weak? Is having better workers being incorporated into higher-

¹⁹ See Javorcik, Keller and Tybout (2006).

²⁰ See Javorcik, Keller and Tybout (2006).

²¹ For thorough analysis of the literature on crowding-in/crowding-out of investment, see (Moran, 2011).

productivity activities within foreign firms less good for host country welfare or growth potential than leaving those workers employed in lower-productivity indigenous firms?

The analytics of what is best for an emerging market host economy might profit from a refocus of the “Who Is Us?” perspective, so as to be applied specifically to developing countries. Originating in the debate about the pros and cons of Japanese investment in the United States in the 1980s to 1990s, the “Who Is Us?” perspective argues 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 owners²². 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. Perhaps there is an implicit concern that foreign firms might 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 met²³.

Analytical work on backward linkages

Turning from the attraction of MNC supplier firms from abroad to the creation of vertical supplier relationships among indigenous 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, including 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 markets²⁴.

Such survey observations are increasingly being backed up by careful econometric analysis. In the vertical direction, a first generation of studies combined firm-level microdata with industry level information on the strength of vertical linkages. An often cited study provides evidence on the relationship between the presence of foreign investors and the total factor productivity of domestic firms in the Indonesian manufacturing sector²⁵. The research finds productivity improvements in upstream and downstream local firms that are significantly associated with the

²² Reich (1990).

²³ See Moran (2009).

²⁴ See Javorcik and Spatareanu (2005).

²⁵ See Blalock and Gertler (2005) and Blalock and Gertler (2008).

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 actual 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 – the research team supplement their econometric investigations with survey data from actors on both sides. 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 target suppliers to increase efficiency and reliability, moving from small-scale 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 performance²⁶.

One drawback of these studies is that they can only establish a link between productivity of domestic firms, irrespective of whether they are suppliers or not, and an industry-wide measure of linkages between multinationals and domestic firms.²⁷ A second generation of studies uses firm level information on local suppliers to multinationals to estimate whether productivity is higher in firms that supply multinationals. A challenge is, of course, to establish whether a possible productivity premium for suppliers is actually due to firms starting their supplier relationship, or whether it just reflects the fact that multinationals cherry pick the best performing local firms as suppliers²⁸. In general, those studies suggest that, on average, more productive firms are more likely to become suppliers. However, suppliers also tend to improve their productivity through learning from their relationship with multinationals.

Policy options to strengthen backward linkages

Taking all this together, it appears 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 upon how wide the gap is between the capabilities of the local business providers and the sophistication of what is demanded by the foreign purchaser. Broadly speaking, local firms with larger size and greater absorptive capacity gain more from downstream FDI, but local firms

²⁶ See Javorcik (2004) for a similar study on Lithuania.

²⁷ strong assumptions are necessary for such an approach; see Barrios, Görg and Strobl (2011).

²⁸ Javorcik and Spatareanu (2009) and Godart and Görg (2013) are two studies that look at this issue, controlling for the possibility of “cherry picking”.

with weaker productive abilities show stronger motivation to adopt new technologies provided by the downstream foreigners²⁹. Recent evidence from the UK firm-level data shows that backward spillovers are more prevalent when local firms have the necessary absorptive capacity, measured in terms of the productivity gap between an individual firm and the industry leader³⁰.

A first order of business for developing country authorities therefore is to adopt policies that increase the productivity and reliability of indigenous companies. Indigenous firms no less than the foreigners they hope to serve need open, transparent, dependable conditions in which to expand and become competitive, including access to low-cost imports, relatively flexible labor markets, and protection of intellectual property rights.

Of particular importance is evidence that access to credit constitutes an important constraint to development of indigenous supplier networks. Around the world, domestic firms with greater access to credit show themselves to be able to self-select into supplier status³¹. Thus, 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 indigenous companies to grow and prosper. The next discussion covers then design of programs whereby potential suppliers finance equipment purchases on the basis of purchase contracts from foreign buyers. Finally, a host may want to copy those host authorities that have set up explicit “vendor development” programs with the goal of promoting backward linkages from foreign investors.

The first step may be to work with foreign investor business associations to set up programs that prepare local firms to acquire certification within appropriate parameters, including ISO quality control standards. Beyond this, many countries have followed Singapore’s Economic Development Board (EDB) model for supplier development. It 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 to become suppliers. As part of its Local Industry Upgrading Program (LIUP), EDB provides capital for indigenous 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 EPZs, with databanks and “marriage counselors” to assist in supplier selection. Penang’s Skills Development Center has opened its doors to indigenous 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. UNIDO Africa Investor Survey (2011) micro data reveal that “match making” between customers and suppliers facilitated by governments can have beneficial effects on supplier performance³².

²⁹ See Blalock and Simon (2009).

³⁰ See Girma, Görg, and Pisu (2008).

³¹ See Alfaro, Kalemli-Ozcan, and Sayek (2009).

³² See Görg and Seric (2016 forthcoming).

The debates about how to establish links between foreign investors and potential indigenous 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, which allows the foreigner to export from wherever is most favorable, with potential suppliers following the foreign firm anywhere the latter settles (as in Mauritius)? In either case, it is important not to let export processing regulations discriminate against 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.

There is, however, a danger that developing country authorities confound supply-chain creation with support for SMEs. The evidence in an UNCTAD study, 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.”³³ Host countries will likely be most successful in generating backward linkages from foreign investors to indigenous firms if they do not focus exclusively on smaller local firms.

Recent UNIDO led research on drivers of FDI related linkages finds that foreign businesses in Africa increase their linkages with local firms over-time³⁴. This implies that the actual low level of linkages might, at least partly, be explained by the relatively recent history of FDI inflows in the continent. In fact, a large share of the current FDI inward stock in Sub-Sahara Africa has been formed in the last decade. Foreign firms with a local partner and those with a final-market orientation (horizontal FDI) have a higher degree of interactions with local firms while local linkages tend to be firmer when the local management of the foreign subsidiaries possesses a higher degree of autonomy from the headquarters. In line with this result, foreign firms which are not part of an extensive network of subsidiaries, i.e., first time foreign direct investors, present a larger share of linkages with domestic companies. Interestingly, UNIDO led research finds some evidence that investments made by members of the diaspora generate more linkages with domestic firms and enhance host countries export performance, thereby directly contributing to internationalization of developing countries³⁵. Additional analysis also shows that foreign firms with a knowledge base which is too advanced with respect to the absorptive capacity of the domestic economy are less conducive to interactions with domestic economic agents often inducing the incumbent firms to change ways of doing business³⁶. The latter finding emphasizes the importance of attracting foreign firms that have a real potential of “fertilizing” already existing domestic capacities rather than attracting highly sophisticated firms with the hope of observing an unlikely leapfrogging of the domestic economy.

While the research is based on micro data for Africa, it seems likely that the factors identified should also be important in the case of other developing countries or regions.

³³ See UNCTAD (2011).

³⁴ See Amendolagine, Boly, Coniglio, Prota & Seric (2013) and Pérez-Villar & Seric (2015).

³⁵ See Boly, Coniglio, Prota and Seric (2014).

³⁶ See Boly, Coniglio, Prota and Seric (2015).

IV. Policy Implications

The evidence examined here has an important contribution to make to the thorny question of whether developing countries need an “industrial policy” to harness FDI for their own development. As shown clearly in the earlier case studies, developing countries that want to use FDI to upgrade and diversify the production and export base of the host economy cannot simply sit back and wait to see what international market forces bring to them. They need tailored policies to overcome imperfections in information markets, assure potential investors that they will be able to integrate plants in novel sectors smoothly into their worldwide production networks, and overcome coordination externalities to make such assurances credible.

Investment promotion target selection can take place within a common-sense framework of comparative advantage, and IPA-sponsored feasibility studies will help 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 who wish to employ the graduates. These interventions surely qualify as a kind of industrial policy, and definitely cost public money. Multinational companies in some new sectors may thrive, while multinational companies in other new sectors may not prosper, or may never show up in the first place. These 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 a transparent competitive fashion, again with selection criteria laid out by those firms who will provide purchase contracts to those that qualify.

These policy recommendations might be called *light-form industrial policy* to hitch FDI to development goals and generate backward linkages as deep as possible into the host economy.

This light-form industrial policy might be contrasted with policies that target specific domestic industries for special government support and protection, while excluding foreign investment altogether or subjecting foreign firms to performance requirements in the form of domestic content mandates, joint venture mandates, and/or other technology-sharing pressures. This alternative approach might be called *heavy-form industrial policy*. The case studies and other evidence presented in this paper show that great progress can be achieved without either substantial levels of protection or large amounts of direct support.

But the evidence offered earlier does provide important insights about the kind and timing of subsidies. The key ingredients that host countries must offer to ensure smooth integration and reduce the likelihood of disruptions – such as infrastructure improvements and public-private partnerships in vocational education – certainly cost public money whether or not they constitute a direct subsidy to the investors. And, an accountant could create a spread-sheet that tally up added costs of doing business due to an electric power outage, a delay at the port or airport, a shortage of technical workers, or a labor walk-out to protest layoffs. But host policies that provide a financial subsidy, lower tax rates, or offer sub-market input costs cannot by themselves reassure the investor about quality control in production or about the speed and

reliability of incorporating output into the parent firm's global network. Instead, to be successful a host must address the seamless-integration worries of the investor directly. There is a threshold effect, indicating that a policy change or infrastructure investment that attracts one big player or a few big players can change a country's export structure. Importantly, unlike subsidies, which are direct payments to the firm out of the government budget, investment in transport and logistics (or other areas related to supply chain development), offer other economic and social benefits as well. This means small policy changes, attuned to business needs, can have large income effects.

As for the *timing of public expenditures*, the case studies and other evidence make clear that host country measures to reassure first investors about smooth integration into global supply networks must be undertaken *long before* the calculation of economic and social externalities is anything but a gleam in the eye of the Investment Promotion Agency Chairmen, Ministers, or Presidents of would-be hosts. Costa Rica had to allocate public funds to renovate the national airport and build a new power substation for Intel use before the government could possibly know the extent of the demonstration effects from the Intel decision to invest.

This has direct implications for the powers entrusted to the Investment Promotion Agency or the inter-Ministerial Investment Promotion Committee. It has direct implications for programs to support investment promotion offered by external donors, including the development finance institutions and technical assistance agencies³⁷.

To be sure, the evidence observed here highlights the prime importance for would-be host countries to improve the business-friendly setting in which both foreign and indigenous firms can operate. Reforms in on-the-ground treatment of foreign and indigenous companies have been shown here to be a necessary but not a sufficient condition for success in attracting FDI in novel sectors. Host countries must supplement such reforms with carefully-constructed policy interventions to overcome the market imperfections and other difficult obstacles that this paper has identified along the way.

Contemporary discourse often suggests 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 paper shows that there is a vital role for external donors and multilateral development partners to improve the functioning of markets so that emerging countries can better harness FDI for development.

The logical place to start is to *intensify support for effective FDI promotion efforts* and strategies. The evidence presented here 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 Investment Promotion Agency has a “good product” to promote; that is, the ability to show that business-friendly macro-economic, micro-economic, and institutional

³⁷ For instance, UNIDO (2003) and Bartels and de Crombrughe (2009).

reforms are in place or credibly underway. But simply preaching “Reform, Reform!” from afar is not sufficient. Developing countries often need practical guidance about how to take pro-active steps to search out and attract new investors.

The importance of a pro-active efficient investment promotion effort on the part of the host found in the case studies above is strongly supported by broader econometric analysis³⁸.

The evidence discussed above not only confirms that there is a demonstrable pay-off to targeting individual, large investors pro-actively in particular sectors, but also that IPAs must acquire expertise about the characteristics and needs of international companies in those sectors. This is a complicated and expensive undertaking – Costa Rica’s CINDE wooed Intel with a staff of ten, of whom five had MBAs or equivalent, three had law degrees, and two had bachelor’s degrees in business administration; Morocco renovated its Investment Promotion Agency using fresh hires with private sector experience that were paid salaries higher than civil service levels³⁹. Today’s would-be hosts that want to use FDI to upgrade and diversify the production and export base of their economies need financial resources and advice on best practices in order to succeed.

In addition to help with marketing strategies, IPAs must be shown how to achieve the oft-proclaimed – but less often achieved – status of serving as a *one-stop*-shop in securing permits, permissions, and appropriate regulatory treatment for those investors that want to launch a new operation. How successful IPAs have managed to accomplish the tricky feat of *avoiding turf wars* with host Ministries deserves more detailed comparative research, which can then be passed on to developing country recipients.

In addition to marketing the country and attracting initial investors, Investment Promotion Agencies need to be shown the importance of 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 into the host market.

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: to repeat earlier admonitions, the prospects for creating reliable and competitive domestic supplier firms requires 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.

³⁸ See, for instance, Harding and Javorcik (2011) and Harding and Javorcik (2012) who conclude that, in developing countries, targeted sectors receive more than twice as much FDI as non-targeted sectors.

³⁹ See IBRD; IFC (2012) and Kingdom of Morocco (2006).

Once again, however, while favorable doing-business indicators are a necessary condition for indigenous supplier development, they may not be sufficient for success. The evidence reviewed here shows positive benefits from external advice and support in creating supplier data-bases, setting up qualification and certification programs, training talent scouts and marriage brokers, and forming equipment financing programs backed by purchase agreements from foreign buyers.

For developing countries, developed countries, and multilateral financial institutions, the goal of *trade policy liberalization* remains an important component of the development agenda. Alongside trade policy liberalization, *trade facilitation* has well-justified standing as a key objective for international assistance. But in the contemporary era in which trade-and-investment are increasingly intimately linked, support for developing and emerging market economies to use quality FDI to upgrade and diversify their production and export bases – 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 looking to the future.

Appendix I

Table A1: Manufacturing FDI Flows to Developing Countries (millions of dollars)

	1990-1992	2005-2007	2009-2011
	(annual average)	(annual average)	(annual average)
Lowest-Skill Sector			
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	\$0	\$48	\$56
Coke, petroleum products and nuclear	\$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	\$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: Manufacturing FDI flows to Developing Countries (UNCTAD 2014).

Appendix II

Balassa Index

The so called Balassa Index is defined as the ratio of a country's exports in a specific sector to its share in total exports⁴⁰:

$$RCA_{ik} = \frac{\frac{x_{ik}}{X_i}}{\frac{x_{wk}}{X_w}},$$

where x_{ik} is exports from country i in industry k and X_i is total exports from country i , and x_{wk} is world exports in industry k and X_w is total world exports.

A Balassa Index greater than one implies that a country has revealed comparative advantage in an industry, as it exports a greater share in that industry than the typical country. The data used in the case studies in this paper are from the Comtrade database, at the 4-digit SITC level, which is the main category used in the early part of the period.

As an example, the following data are required to calculate the revealed comparative advantage for German automotive products⁴¹ in 2014: German total exports in 2014 ($X_{Ger, total}$), German exports of automotive products in 2014 ($X_{Ger, auto}$), total exports of the World in 2014 ($X_{World, total}$), and World exports of automotive products in 2014 ($X_{World, auto}$).

Year	$X_{Ger, total}$	$X_{Ger, auto}$	$X_{World, total}$	$X_{World, auto}$
2014	\$1,494,608M	\$263,334M	\$18,995,000M	\$1,394,809M

Source: WTO Statistics on trade (<http://stat.wto.org/>)

The RCA for German automotive products can then be calculated as follows:

$$RCA_{Ger, auto, 2014} = \frac{\frac{X_{Ger, auto, 2014}}{X_{Ger, total, 2014}}}{\frac{X_{World, auto, 2014}}{X_{World, total, 2014}}} = \frac{\frac{\$263,334M}{\$1,494,608M}}{\frac{\$1,394,809M}{\$18,995,000M}} = 2.40$$

The RCA is greater than one, which states that the share of German exports of automotive products is greater than the average export share of automotive products. Therefore, Germany has a revealed comparative advantage in automotive products.

⁴⁰ See Balassa and Noland (1989).

⁴¹ Automotive products include motor cars and other motor vehicles principally designed for the transport of persons (SITC groups 781, 782, 783, 784, and subgroups 7132, 7783).

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