Special economic zones and sourcing linkages with the local economy:

reality or pipedream?

by

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Abstract

In this study we investigate in how far firms in special economic zones (SEZs) have the potential to generate indirect benefits and knowledge spill-overs in the local economy through the creation of backward linkages with local suppliers. For this purpose, we map the linkages between SEZ firms and suppliers in the host economy in seven SEZs around the world, namely in Colombia, Ethiopia, Malaysia, Nigeria, Rwanda, South Africa and Vietnam, based on 103 interviews with SEZ firm managers. We furthermore analyse the challenges in the formation of these linkages. Overall, our findings suggest that, contrary to the objective of many of the zones, backward linkages between firms within SEZs as well as with firms outside the SEZs remain rather limited for the SEZs analysed. Firms primarily purchase services and minor inputs, such as packaging materials, from within or outside the SEZ. The sourcing of key inputs, however, is a major challenge due to a lack of local availability, high local prices and quality concerns. The majority of SEZ firms imports large parts of their inputs from abroad. This is true across a variety of sectors analysed, including garment, high-tech industries and services.

Keywords: Special economic zones, backward linkages, spill-overs, emerging countries

JEL Classification: F21, 014, 024, L52

1 Introduction

"Special economic zones (SEZs) are spatially delimited areas within an economy that function with administrative, regulatory, and often fiscal regimes that are different (typically more liberal) than those of the domestic economy" (Farole, 2011). Their assumed benefits have converted them into one of the most popular policy instruments for the stimulation of local economies. Their number has skyrocketed over the past decades with current estimates suggesting around 5,000 zones in virtually all countries around the world (The Economist, 2015) compared to just under 200 in the late 1980s (Singa Boyenge, 2007).

Why have SEZs become so popular? Why have they proliferated so rapidly of recent? One of the main reasons for the rapid proliferation of SEZs are their assumed benefits. Policy-makers the world over have generally resorted to SEZs in order to attract (foreign) investment, generate employment within the zones as well as increase exports. Their supposed benefits are, however, said to extend beyond the possible direct benefits arising within the zones to more 'dynamic' effects impacting also the areas surrounding the SEZs and the national economy as a whole. These dynamic or indirect benefits accrue through the interaction between SEZ firms and other actors in the local economy and through the generation of knowledge spill-overs. They are assumed to be even more important for the mid- to long-term development of local economies than the direct benefits (Farole, 2011). As the OECD puts it: "The success of Economic zones depends on the extent to which they create linkages with the local economy thereby generating employment and increasing transfer of know how" (OECD, 2010, p. 17).

Policymakers often use the promise of these indirect benefits to convince their constituencies of the convenience and advantages of investing in what are frequently costly SEZ interventions. However, in how far the benefits of these potential linkages and knowledge transfers actually materialize remains a question to be answered. Most research on SEZs analyses the determinants of the direct SEZ impact within the zones, such as investment attraction and job generation, rather than looking at indirect effects (see for example Frick, Rodríguez-Pose & Wong, 2019 and World Bank, 2011). Specific studies on spill-overs and indirect gains from SEZs are few and frequently focus on a few large countries (see for example Wang, 2013; Alder, Shao & Zilibotti, 2016 on SEZs in China), while the broader literature on the effect of FDI on the local economy comes to mixed conclusions (see for example Görg & Greeenaway, 2004; Havranek & Irsova, 2011; Lipsey & Sjöholm, 2005).

The aim of this paper is therefore to contribute to shedding light on this issue. While dynamic effects and spill-overs can occur through different channels, such as labour mobility between SEZ and non-SEZ firms, skills-upgrading of the local workforce and the imitation of SEZ-firm technology by domestic firms, this study focuses on the creation of backward linkages between firms located within SEZs and

other firms either within or outside the SEZ boundaries. It more specifically analyses the extent to which SEZ firms source their production inputs from suppliers in the host country and thereby become embedded in the local economy, contributing to the generation of agglomeration economies. For this purpose, we map the sourcing linkages as well as the drivers and barriers for such linkages in seven SEZs around the world, namely in Colombia, Ethiopia, Malaysia, Nigeria, Rwanda, South Africa and Vietnam, based on interviews with SEZ firm managers. In so doing, we contribute to the existing literature on dynamic SEZ impacts by adding a multi-country perspective and a specific focus on linkage creation. Furthermore, in contrast to the existing quantitative literature on knowledge spill-overs from FDI more generally, which generally treats spill-overs largely as a black box without consideration for the channel through which they are created (Alfaro et al., 2004), we explicitly analyse linkages as a possible facilitator.

The paper is organized as follows. Section 2 provides a brief overview of the literature on SEZs, knowledge spill-overs and linkages with the local economy. Section 3 explains the methodology and section 4 presents the analysis. The final section concludes.

2 SEZs, knowledge spill-overs and linkages

Dynamic gains and knowledge spill-overs from SEZ firms to the local economy are thought to contribute to a structural long-term transformation by upgrading the local production base, introducing innovation, and creating employment and economic activity beyond the borders of the zones (Farole, 2011; World Bank, 2011). The underlying premise is that (foreign) SEZ firms tend to be more productive and have higher technological capabilities than domestic firms. This technological advantage can therefore spill over to the surrounding areas, thus promoting structural change and enhancing local competitiveness. The spill-overs can occur through several channels. The most common ones are labour mobility between SEZ and local firms, the creation of forward and backward linkages with domestic producers, the imitation of technology, design and/or management practices by local firms, as well as a general upgrading of the skill-base of local workers (see for example Farole, 2011; World Bank, 2011).

It is commonly highlighted that the integration of the SEZ firms with the local economy is key for this type of spill-overs to occur (OECD, 2009; Steenbergen & Sutton, 2017; World Bank, 2011). The formation of sourcing linkages between SEZ firms with local suppliers is thought to be particularly important in this process (Amendolagine et al., 2013). Raising the share of locally sourced inputs can in itself have an important impact on local firms, as it can lead to increased employment and economic activity in upstream firms (see for example Morrissey, 2012; Rodríguez-Clare, 1996), but it is also

assumed to have the potential to increase the productivity and innovative capacity of the suppliers in the medium-term. SEZ firms – often foreign-owned and targeting global markets – have frequently higher quality requirements than local markets. This, in turn, can contribute to upgrading the production processes of local firms which aim to meet these quality standards to supply the SEZ firms (Steenbergen & Sutton, 2017). Foreign firms, furthermore, are thought to have an incentive to support local suppliers in this process to be able to source locally, thereby reducing costs and lead times (Javorcik, 2004). Mindful of these potential benefits, SEZ policies have at times sought to promote the embeddedness of FDI and foreign firms with local firms, with the aim of generating backward linkages that would benefit the local economy as a whole. One prominent example of this type of practice is China, a country that since the inception of its SEZs strategy has supported the formation of Sino-foreign joint ventures and partnerships. These partnerships, according to Wang (2013), contributed to root the economic activity of the SEZs within the local ecosystem without crowding out domestic investment. This is, however, in stark contrast with the policy followed in Chinese capital SEZs abroad. Here, differences in views and ambitions of Chinese zone sponsors and those of the host governments have often precluded embedding the economic activity of the zones within the local economy (Bräutigam and Tang, 2014).

In other cases, national and local governments have tried to impose local content requirements on foreign firms wanting to establish within an SEZ. China, once again, has been particularly active on this front with many sectors – independent of investments inside or outside a SEZ – requiring a minimum amount of local purchasing or partnering with local firms. The effectiveness of these local content requirements has, however, been heavily debated (see for example Deringer et al., 2018; Stone, Messent & Flaig, 2015), with some arguing that they may deter FDI from locating in a given country if requirements are too strict.

It is also important to note, however, that the establishment of backward linkages in itself does not guarantee knowledge spill-overs to occur. Sourcing linkages could be established without a meaningful transfer of knowledge involved between the SEZ firm and the supplier (Morrissey, 2012). Nguyen and Diez (2019), for example, show that in Vietnam, domestic suppliers of foreign firms in the Red River Delta region, on average, do not experience higher productivity growth than non-supplier firms. However, they also explore how some suppliers take advantage of the opportunities arising through the links to foreign firms in a more proactive way and reach higher productivity increases. Sourcing linkages can thus be a potentially important facilitator for knowledge spill-overs. But they should not be equated to them.

What does the empirical evidence on dynamic gains and knowledge spill-overs from SEZ firms to the local economy suggest? The specific literature on SEZs is relatively limited and focuses mainly on a few specific large countries. Wang (2013), for example, indicates that the presence of an SEZ policy within a prefecture-level-city in China increases per capita FDI by 31.7 percent, leading to improvements in agglomeration economies and in the average wage for workers. Similarly, Alder et al. (2016) show that the location of an SEZ within Chinese cities increases city level GDP by up to 20 percent. Ciżkowicz et al. (2016) investigate the Polish case, where SEZ have been used heavily as a policy instrument since the early 2000s. They find that SEZs increase employment in the counties where the SEZ is located as well as in neighbouring counties, suggesting dynamic gains in the local economy beyond the SEZ boundaries. A recent study from India, in contrast, shows that Indian SEZs have failed to contribute to the socio-economic development of the areas they are located in (Alkon, 2018). Finally, a World Bank (2017) report is one of the few pieces of research that so far looks at the impact of SEZs from a multi-SEZ, multi-country perspective. Analysing the experience of 345 SEZs in 22 emerging economies, it finds that SEZ growth increases growth in the surrounding areas of the SEZs, however with a very strong distance decay effect. The impact is not measurable beyond 50km. Frick and Rodríguez-Pose (2019) confirm these results with their extended analysis of the same dataset. Overall, the literature is scarce and mainly focused on a few specific cases. It furthermore does not analyse the channels through which the impact on the surrounding areas occurs, but rather looks at the overall economic outcomes. Whether these outcomes are driven by the direct SEZ effects, such as increased employment and investment, or whether they are driven by the establishment of sourcing linkages, increased productivity in local firms through knowledges spill-over and the alike remains unclear.

Since SEZ policies typically aim to attract foreign firms, research on knowledge spill-overs emanating from FDI allows to close some of these knowledge gaps. However, the evidence emerging from there continues to be highly inconclusive. Review articles on the existence of productivity spill-overs from foreign to domestic firms suggest that there is no strong evidence of the existence of positive effects and that results vary considerably between cross-sectional and time-series, as well as depending on the type of spill-over considered or the cases analysed (see for example Demena, & Van Bergeijk, 2017; Görg & Greeenaway, 2004; Havranek & Irsova, 2011; Lipsey & Sjöholm, 2005).

Looking at the different channels through which the spill-overs could occur, the results vary. Research on horizontal spill-overs, i.e. spill-overs between firms in the same industry, is limited for developing countries and evidence of a positive effect is rarely found (Demena & Van Bergeijk, 2017; Javorcik, 2004; Liang, 2017). Most research on this field focuses on developed countries (Keller & Yeaple, 2009) and the results are not very encouraging either. Overall, a lack of capacity of local firms as well as

protective measures by foreign firms seem to prevent knowledge leaking into the local firms through imitation and labour force turn-over.

The evidence for vertical spill-overs, i.e. those created through linkages from foreign firms to domestic suppliers, is more positive. For instance, Javorcik (2004) and Blalock and Gertler (2008) report spill-overs from foreign firms to local suppliers. They find that local firms' productivity is higher when there is a larger presence of foreign buyers in the downstream sectors. It is thought that foreign firms have higher incentives to transfer know-how to local suppliers in order to benefit from reduced lead times, improved quality and lower costs. Nevertheless, the evidence remains mixed and studies come to vastly different conclusions dependent on both country and firm characteristics as well as estimation methods (see for example Havranek & Irsova, 2011 for an overview). For instance, vertical spill-overs are more likely to occur if FDI takes the form of a joint-venture with a local firm rather than being fully foreign owned (Javorcik and Spatareanu, 2008) and when the local subsidiary has a higher level of autonomy to make input sourcing decisions, which often tend to be centralized at the headquarter level (Jindra et al., 2009). It is further hypothesized that the productivity gap between host and home country plays an important role. If the gap is too large, spill-overs are unlikely to happen (Rodríguez-Clare, 1996).

Finally, the literature specifically on linkage formation between foreign firms and local suppliers provides important insights. On average, the level of local sourcing tends to be lower from foreign firms than for domestic firms (Alfaro et al., 2004; Lauridsen, 2004) and foreign firms often mainly purchase low-cost, low-tech inputs, such as packaging material and services (Lauridsen, 2004; Nguyen & Diez, 2019; Kubny & Voss, 2014). Different factors have been identified to influence the level of local sourcing, including the market orientation of investors, the maturity of the investment, industrial sector and ownership structure of the FDI. For instance, several studies have shown that the level of local sourcing increases over time, the longer the foreign firm remains in the country (Amendolagine et al., 2013; Belderbos et al., 2001; Görg & Ruane, 2001; Jenkins & Arce, 2016), enabling the foreign firm to establish a local supplier network as familiarity with the local conditions increases. Market seeking FDI is also thought to have a higher local sourcing content than foreign firms entering a country for efficiency reasons as an export hub (Amendolagine et al., 2011, 2019; Belderbos et al., 2001). Firms aiming to serve the local market have stronger incentives to source locally as domestic suppliers are more familiar with the local market needs. Quality requirements may also be less stringent than when producing for global markets, hence making it easier for local supplier to comply (Hansen et al., 2009). In terms of industry sector, on average the manufacturing sector is deemed to have a larger potential for local linkages (Morrissey, 2012). Furthermore, industries using more sophisticated technologies tend to source less locally as suppliers for specific inputs are not readily

available in the host country, in particular in developing countries (Belderbos et al., 2001; Lauridsen, 2004). Product requirements in these industries are frequently very specific, so that there are only few suppliers in world to manufacture them (Nguyen & Diez, 2019). Other firm characteristics, such as the ownership structure and firm size, also influence firms' sourcing decisions (Frick et al., 2019). Firms with local participation tend to source more locally as they are assumed to have more knowledge of local suppliers and possibly pre-established networks (Amendolagine et al., 2013; Jenkins & Arce, 2016). This is in line with the findings from the literature on productivity spill-overs (Javorcik & Spatareanu, 2008). In contrast, larger firms often source less locally, as local suppliers may not be able to meet the quality or the high volumes required (Amendolagine et al., 2019; Görg & Ruane, 2001). This fact may complicate the establishment of local sourcing linkages as local suppliers only have an incentive to make costly changes to their production processes in order to become suppliers for foreign firms if the orders are large enough to make it worthwhile for them (Alfaro et al 2004). FDI parent firm strategy also impacts the level of linkages. Those firms with concentrated global value chains are less likely to source locally as input sourcing happens through pre-established global supplier networks and local subsidiaries do not have the autonomy to make sourcing decisions (Belderbos et al., 2001; Iguchi, 2008; Hansen et al., 2009). Unless the parent firm decides to integrate a firm from the host economy into the approved suppliers list, the subsidiary would not be able to source locally. Many sectors typically present in SEZs, such textiles and electronics, rely on these networks, hence limiting the potential for local sourcing. Finally, host country characteristics are also thought to have an impact on local sourcing with countries with a higher GDP per capita, higher educational attainment and a more developed rule of law, offering more opportunities for local sourcing (Amendolagine et al., 2013, 2019; Morrissey, 2012).

3 Methodology and data

3.1 Approach

The literature on dynamic gains and knowledge spill-overs from SEZs and FDI firms highlights their potential positive impact on local economies but is inconclusive in how far these gains actually materialize and through which channels. Both streams, however, point to the importance that SEZ firms build supplier linkages in order to generate more long-term structural benefits for the local economy – be this through their indirect impact on employment or through potential productivity spill-overs. In order to contribute to answer the question in how far SEZs are a suitable policy tool to stimulate the wider development of the regions they are located in, we therefore analyse the linkages generated from seven SEZs in emerging economies around the world. Our analysis focuses specifically

on mapping the linkages between SEZ firms and suppliers as well as drivers and barriers of these linkages. We follow a qualitative approach based on semi-structured interviews.

We are interested in assessing the extent of backward linkages with local firms both inside and outside the SEZs. The analysis therefore maps the sourcing linkages formed between firms within the same SEZs as well as those forged with firms outside the SEZs, exploring the type of local partners as well as the drivers and barriers for the formation of these sourcing linkages. The analysis followed a three-step framework:

(1) Intensity of input purchasing from host economy: In order to understand the level of local purchasing, firms were asked to indicate whether they purchased any of their inputs in the domestic market (as opposed to importing them), the type of inputs purchased as well as the importance of those purchases compared to imported inputs.

(2) Supplier firms: For those products purchased in the domestic market, firms were asked about the type and location of the supplier firms, including whether they purchased from foreign or local firms located in the host economy and channels through which the suppliers were found. This allows us to analyse how sourcing linkages actually benefit domestic firms and whether there is an agglomeration effect present.

(3) Drivers and barriers: Finally, firms were asked about the factors impeding or facilitating the purchasing of the intermediate inputs in the local market and about possible initiatives to transfer knowledge to local suppliers.

Using semi-structured interviews provided us with the flexibility needed to cover the different areas in the framework. To understand the intensity of the purchasing and to provide a characterization of both SEZ firm and suppliers, we relied on closed-ended questions. In contrast, a more open-ended approach was followed for the discussion around drivers and barriers.

3.2 Case studies

We considered both country and zone characteristics in the case study selection process. Following the suggestion of the literature that the economic structure of the host economy plays a potential mediating role for supplier linkages, the aim was to include countries with differing levels of socio-economic development as well as a wide range of production bases. Zones furthermore had to comply with a set of criteria to enable us to select from the myriad of different types of zones a somewhat comparable group of SEZs. The criteria were: (1) The presence of a differentiating regulatory framework and/or incentive scheme setting the zone apart from neighbouring areas; (2) a focus on manufacturing or services within the zone, with the objective of singling out and eliminating zones

that are primarily commercial and logistics hubs; (3) the presence of clear territorial boundaries, thus excluding single factory zones or large wide zones; and (4) a demonstrated capacity of the zone to fill with new firms the delimited geographical area, that is, a zone with a minimum threshold of occupancy. This last criterion eliminated many zones around the world that have struggled to gain traction and attract a meaningful number of investments (Frick et al., 2019). While this may positively bias our results, this choice has primarily practical purposes. A lack of investments and firm establishment within the zone also limits the capacity of the zone to generate dynamic gains, making the analysis meaningless.

Table 1 provides an overview of the resulting case countries and zones as well as some of the key characteristics of the zones. Of the seven zones identified, four are in Africa, two in Asia, and one in Latin America.

Table 1. Case studies

Country	SEZ	Firms	Firm Ownership	Employment	Sector focus
Colombia	Santander Zona France (ZF)	35	Domestic, foreign & mixed	~ 1,500	Services & mixed manufacturing
Ethiopia	Bole Lemi Industrial Park (IP) I	9	Exclusively foreign	~14,000	Garment
Malaysia	Kulim High-Tech Park (HTP)	37	Primarily foreign	~22.500	Mixed high-tech manufacturing
Nigeria	Lekki Free Trade Zone (FTZ)	25	Primarily foreign	~850	Mixed manufacturing
Rwanda	Kigali Special Economic Zone (SEZ)	85	Primarily foreign	~6,600 (up to 15,000 non-permanent)	Mixed manufacturing
South Africa	Coega Industrial Zone (IDZ)	40	Domestic, foreign & mixed	~5,500	Mixed manufacturing
Vietnam	Saigon High-Tech Park (HTP)	60	Domestic, foreign & mixed	~ 38,000	Mixed high-tech manufacturing

Source: SEZ firm Interviews (status: 2018)

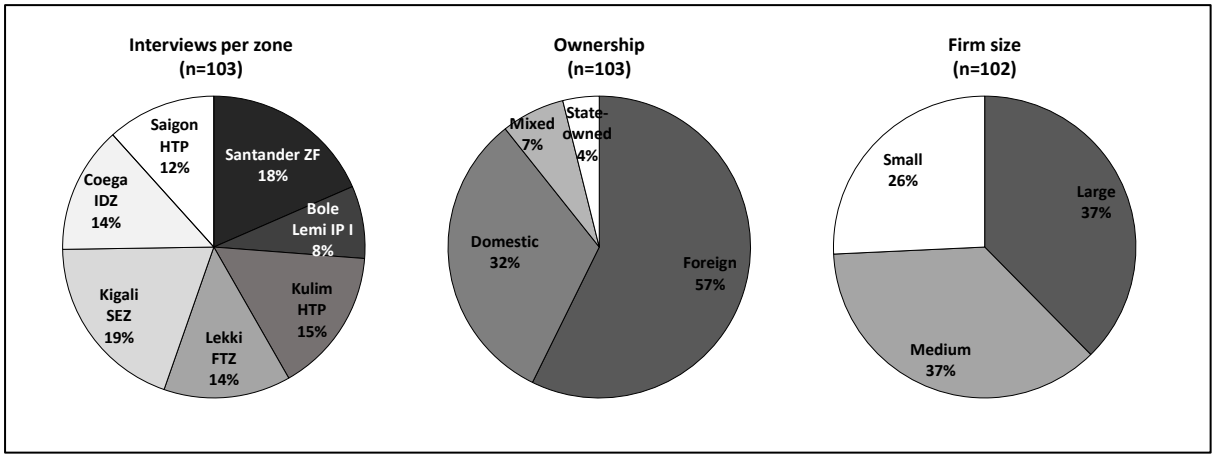
Four out of the seven zones hosted exclusively or primarily foreign-owned companies at the time of the interviews, whereas in Santander ZF, Coega IDZ and Saigon HTP a mix of foreign and local firms could be found. The smallest zone in terms of employment was the Lekki Free Trade Zone with around 850 employees and the largest, Saigon HTP, with approximately 38,000 employees. SEZs also differed in their sectorial focus. Santander ZF hosted both Services and manufacturing companies, Kulim HTP and Saigon HTP focused on mixed high-tech manufacturing, Bole Lemi IP targeted exclusively firms in the garment sector, while the remaining zones hosted an array of different manufacturing industries. None of the case countries has a local content requirement as part of its SEZ policy.

3.3 Interviews

103 interviews were conducted by researchers associated with the team in the seven SEZs. The field visits were funded by the World Bank as part of a wider research project aiming to understand determinants of direct and indirect SEZ impacts.

The interviews took place between May and June 2018. The interviewees included managers in senior management positions within the SEZ firms, such as managing directors and heads of strategy. Interviews were conducted in English except for interviews in the Santander ZF and the Lekki FZ. In Santander ZF, Spanish was spoken in all interviews, while in Lekki FZ interviews were in Mandarin and English, depending on the origin of the SEZ parent firm. In order to ensure a smooth communication, the associated researchers in these countries were native Spanish and Mandarin speakers respectively. Those interviews were then transcribed into English. Figure 1 gives an overview of the firm interviews which are at the core of the analysis.

Figure 1. Interviews per zone, ownership type and firm size[1]



We aimed to contact and interview as many firms as possible within each zone to maximise the information collected. For this purpose, we relied on snowballing technique and the support of the zone managers. The size of zones as well as the availability and openness of firms to participate in the research influenced the number of firms interviewed in each zone. This will have to be taken into account in the interpretation of the results. More than half of the interviewed firms were foreign (57 percent) and another 7 percent of mixed ownership, i.e. both local and foreign. This high percentage is not surprising as four out of the seven SEZs host primarily foreign-owned firms (see Table 1). 32 percent of the interviewed firms were domestic and 4 percent state-owned. Depending on the primary ownership type per SEZ, this is also reflected in the type of firms interviewed per zone.

[1] One interviewed firm was recently established and in the process of recruiting, hence there is no information on the company size for this firm.

Finally, the sample is dominated by large and medium sized firms, each representing 37 percent of the total. Small firms represent 26 percent of the sample.[2] Again, differences exist between the zones according to the composition of the zones.

4 Analysis

4.1 Linkages within SEZs

Table 2 provides an overview of the findings regarding internal input sourcing from other SEZ firms. On average, only 37% of interviewed firms across the seven SEZs purchased some sort of products or services from within the SEZ (Table 2, left side). Significant differences exist between the zones in this regard. Santander ZF had the highest percentage with 58% of interviewed firms sourcing inputs internally within the SEZ, while Bole Lemi IP I, Saigon HTP and Coega IDZ had the lowest shares. 0%, 8% and 9% respectively of the interviewed SEZ firms in the three zones purchased inputs from other SEZ firms.

Table 2: Sourcing linkages within SEZs, total and by type of input
(% of interviewed firms purchasing internally)

	Any type of input	Services	Construction services	Minor inputs	Key inputs
Bole Lemi IP I	-	-	-	-	-
Coega IDZ	9%	9%	-	9%	-
Kigali SEZ	50%	-	-	33%	17%
Kulim HTP	40%	27%	-	40%	-
Lekki FTZ	42%	14%	14%	14%	-
Saigon HTP	8%	-	-	8%	-
Santander ZF	58%	42%	31%	5%	-
Total	**37%**	**15%**	**8%**	**17%**	**3%**

Source: SEZ firm interviews

In terms of type of products purchased, the analysis reveals that, rather than acquiring parts, thus facilitating the formation of local value chains, firms primarily bought 'services' and 'minor inputs' from other firms within the SEZs (Table 2, right side). 15% of interviewed SEZ firms purchased sundry services such as events management, software products, and coffee services. Other minor inputs included packaging materials, gases and chemicals. This sort of transactions involved 17% of the interviewed firms across the SEZs. In Kigali SEZ, the SEZ with the second highest share of firms

[2] Following the employment-based classification, widely used in the Enterprise Survey of the World Bank, firms were classified as "Small", if they had less than 20 employees; "Medium", if they had between 20 and 99 employees; and "Large", if they had 100+ employees.

purchasing minor inputs from within the zone (33%), one of the few clear examples of backward linkages was in the packaging industry where several firms dedicated to packaging materials supplied other manufacturing firms within the zone. Similarly, in Kulim HTP, where 40% of firms sourced minor inputs from within the zone, internal purchases included mostly gas, chemicals and professional services.

Only a negligible 3% of firms across the seven SEZs bought part of their key inputs for production from other firms within the zone. Except for some firms in Kigali SEZ, none of the firms interviewed across the other SEZs sourced their key inputs from within the SEZ. This suggests that the degree of linkages and 'clusterization' within the zones is not only low, but that it is also limited to ancillary services with relatively low value added and, therefore, limited potential to make a large splash on the local economy. Conscious of this, different governments have adopted strategies to generate high value-added chains on key components, but, generally, without much success. In Bole Lemi in Ethiopia, for example, there was a concerted effort by the government to bring a textile manufacturer to another zone (Hawassa Industrial Park) with the aim of creating more efficient supply networks for garment manufacturers within the different SEZs in the country. This was considered a key step to reduce the lead time for inputs, which, at the time of writing, was over 100 days. A suitable (foreign) textile firm was lured to the site and had already started operations. However, the effectiveness of this measure remains to be seen and there are question marks about the capacity to attract additional firms to the SEZs in the country. Nevertheless, and despite the best efforts by the promoters of the SEZs, the development of value chains is highly constrained within the zones analysed.

When asked about the reasons for not purchasing more from other SEZ firms, the most recurrent answer was the non-availability of the required inputs in the zones. This is a barrier to internal sourcing, in particular in those SEZs with a wider mix of manufacturing firms (e.g. in Coega IDZ and Lekki FTZ) – as firms are frequently in entirely different sectors, the potential to establish linkages with other firms in the zone are limited. In zones with firms in related sectors (e.g. in Bole Lemi I IP and Saigon HTP) the main problem is that companies are frequently at similar levels in the value chain rather than in vertically connected steps. This significantly limits the potential to establish linkages. In Saigon HTP, for instance, most firms focus on assembly and hi-tech manufacturing and thus require basic raw materials or intermediate inputs in production. Such inputs are, however, not supplied by other firms within the SEZ. And while some hi-tech suppliers have joined the park (e.g. Minh Nguyen, one of Samsung's suppliers), there are not enough suppliers within the park to be able to handle the diversity, specialization, and scale of input demands of other firms in the Saigon HTP. In a few instances, firms were attracted to the zone by the possibility of supplying certain customers. A key example is with Samsung, which has strong backward linkages within the Saigon zone from co-located

supplier firms. One firm, a supporting industry enterprise, sells 85% of its production directly to Samsung. However, this is more an exception than a general rule.

4.2 Linkages outside SEZ

4.2.1 Intensity of input purchasing

Table 3 reports the sourcing linkages formed by the SEZ firms with suppliers in the host economy but outside the zones. The percentage of SEZ firms purchasing inputs externally is considerably higher in all SEZs compared to the internal purchasing described in the previous section. On average, 85% of interviewed firms sourced some of their inputs from firms outside the SEZ. The range went from 56% in Kigali SEZ to 100% in Kulim HTP and Bole Lemi IP I (where the number of firms was considerably lower, but the average size of firms far larger).

Table 3: Sourcing linkages from outside SEZs, total and by type of input
% of interviewed firms purchasing internally

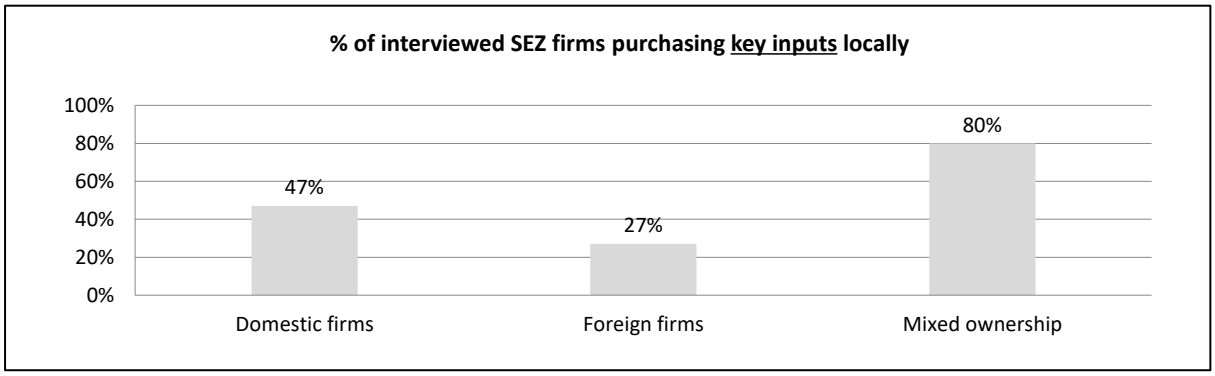
	Any type of input	Services	Construction services	Minor inputs	Key inputs
Bole Lemi IP I	100%	14%	-	71%	29%
Coega IDZ	85%	15%	-	15%	54%
Kigali SEZ	56%	17%	-	11%	28%
Kulim HTP	100%	44%	-	67%	22%
Lekki FTZ	85%	-	23%	46%	31%
Saigon HTP	92%	17%	-	8%	42%
Santander ZF	95%	42%	-	5%	47%
Total	**85%**	**22%**	**3%**	**26%**	**37%**

Source: SEZ firm interviews

In terms of the type of inputs purchased, the percentage of firms buying key inputs for their production was also significantly higher with an average of 37% across all SEZs as compared to the 3% of firms sourcing key inputs from within the SEZ (see Table 2 in previous section). The highest number was found in Coega IDZ with 54% of interviewed firms purchasing key inputs locally outside the zone, followed by Santander ZF and Saigon HTP with 47% and 42% respectively. The lowest share was reported in Kulim HTP with only 22% of interviewed firms buying outside the zones. Furthermore, another 26% of firms purchased minor inputs outside the zones. The range of products purchased was quite diverse. Minor inputs included packaging materials, labels and, in a few cases, gases and chemicals. The key inputs ranged from agricultural products, in the case of the foods industry, to aluminium and wafers, in the semi-conductor industry.

Interestingly, the three zones with the highest percentage of purchases of key inputs are those three zones in the sample which host both foreign and local firms, rather than primarily foreign firms. Figure 2 highlights the differences between foreign and local firms in terms of purchasing behaviour. While 47% of domestic and 80% of mixed firms purchased key inputs from within the country, the share declined to only 27% in the case of foreign firms. This suggests that foreign firms are more reluctant to establish linkages with the local economy, while, at the same time, they may also find it more difficult to find the products they need in the local market. This finding is in line with results of quantitative studies which show that vertical spill-overs are stronger where FDI projects are joint-ventures rather than fully foreign owned (Javorcik & Spatareanu, 2008). It is also reminiscent of studies on the sourcing linkages reporting the same effect (Amendolagine, 2013; Jenkins & Arce, 2016). It also provides some support to the alleged advantages of co-hosting foreign and domestic firms within SEZs, as suggested in more recent policy guides (see for examples OECD, 2010).

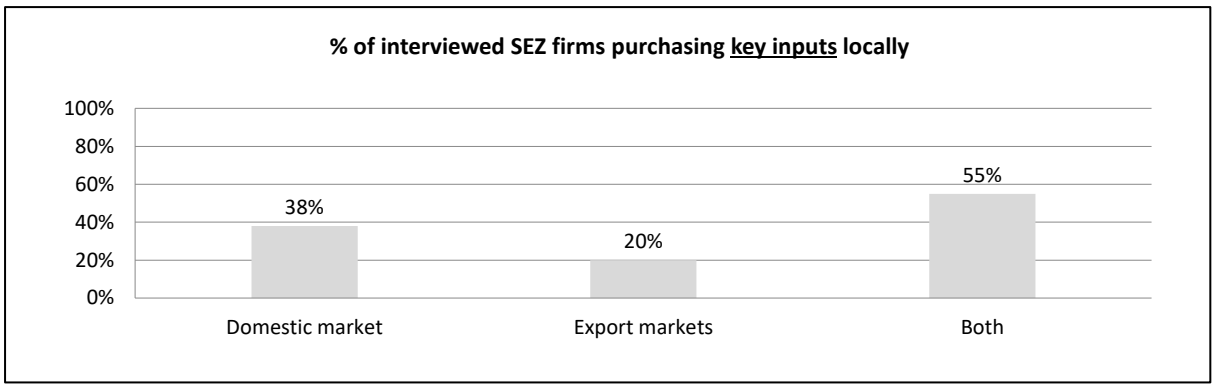
Figure 2: Sourcing from outside the SEZ by ownership



Source: SEZ firm interviews

Another factor highlighted in the literature on linkage formation is the market orientation of FDI firms (Amendolagine et al., 2013, 2019; Belderbos et al., 2001). Market seeking firms are thought to have a higher share of local sourcing than those firms using a country purely as an export hub. Our interview findings, presented in Figure 3, support this idea. Firms targeting export markets only are the least likely to source key inputs locally (20% of firms), while firms targeting the domestic market or both export and domestic markets have higher shares of local sourcing of key inputs (38% and 55% respectively).

Figure 3: Sourcing from outside the SEZ by target market



Source: SEZ firm interviews

In terms of the relevance of the locally purchased inputs compared to imported inputs, it is crucial to note that, despite the non-negligible share of firms purchasing some key inputs from suppliers within the host country, most interviewed firms emphasized that they still had to import the vast majority of key inputs from abroad. Even in the cases where firms purchased some key inputs locally, this frequently represented only a low percentage of their overall inputs. Only a very small fraction of firms interviewed stated that they relied on local suppliers and succeeded in sourcing mainly locally. This was primarily the case for Coega IDZ and Santander ZF where local SEZ firms pre-dated their establishment in the zone, meaning that, by the time they moved into the zone, they had already developed local supplier linkages that were maintained after their relocation. By contrast, the vast majority of foreign firms was only able to purchase a small portion of their key inputs locally and mostly relied on foreign suppliers outside the host economy. This finding lends support to the notion that sourcing linkages may take time to be established as described by Belderbos et al. (2001), Jenkins and Arce (2016) and Görg and Ruane (2001). It also supports again the idea that local participation in SEZ firms is an important factor for local sourcing (Amendolagine et al., 2013; Jenkins & Arce, 2016). The effectiveness of SEZs to promote sourcing linkages in the short run and thus upgrading of the local economy is, hence, likely to be limited in most cases. Benefits from indirect benefits and vertical productivity spill-overs though linkages will, if at all, take time to materialize over a longer time horizon.

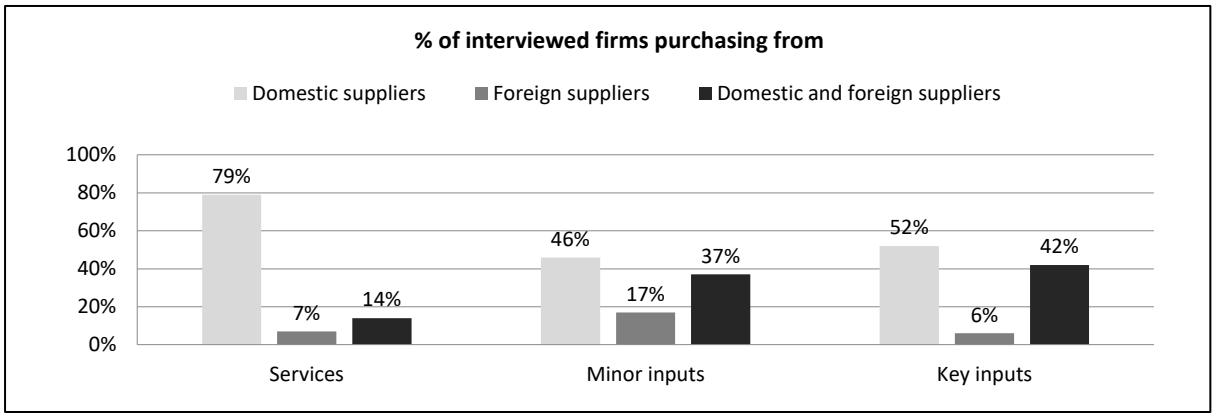
4.2.2 Supplier firms in host economy

Who were SEZ firms purchasing from? Figure 4 below summarizes the findings from the interviews. We distinguish between (1) local/ domestic suppliers – those that are located anywhere within the host economy (but outside the SEZ) and have local ownership; and (2) foreign suppliers – those that are located anywhere within the host economy (but outside the SEZ) and are foreign owned.

Domestic suppliers dominate the picture, especially for services. 79% of interviewed firms, which purchased services from within the country, had partnered with local firms. Only 7% of SEZ firms relied

on services from foreign suppliers located within the host country, while 14% on services from both local and foreign suppliers. The picture is more varied for minor and key inputs. In both cases, domestic suppliers still represented most of the sourcing partners, with 46% for minor inputs and 47% for key inputs. Few firms purchased only from foreign suppliers within the country in each of the two categories (17% and 9% respectively). A more significant share of firms bought minor and key inputs from both local and foreign suppliers including joint ventures (37% and 44%). This implies that while local firms represent the most important source for input sourcing for SEZ firms when purchasing in the local economy – implying some potential for indirect benefits and knowledge spill-overs – foreign firms still play an important part in local supply chains. While this may create an indirect employment benefit, it may counteract the objective of the zones to contribute to local productivity increases through linkages with SEZ firms.

Figure 4: Sourcing partners of SEZ firms



Source: SEZ firm interviews

In terms of location of the suppliers, no specific clustering around the zones was found for the SEZs analysed. In most cases, SEZ firms acquired the different products and services countrywide, depending on where they could find a suitable supplier. In Kulim HTP and Saigon HTP there was some trend towards purchasing more from the industrial cluster in the vicinity of the zones (i.e. Penang and HCMC). However, even in these cases, there was a significant spread, with many SEZ firms relying on suppliers from across the country. The only exception was Coega IDZ in South Africa, where many suppliers (although not exclusively) were in the vicinity of the zone, i.e. the Eastern Cape region.

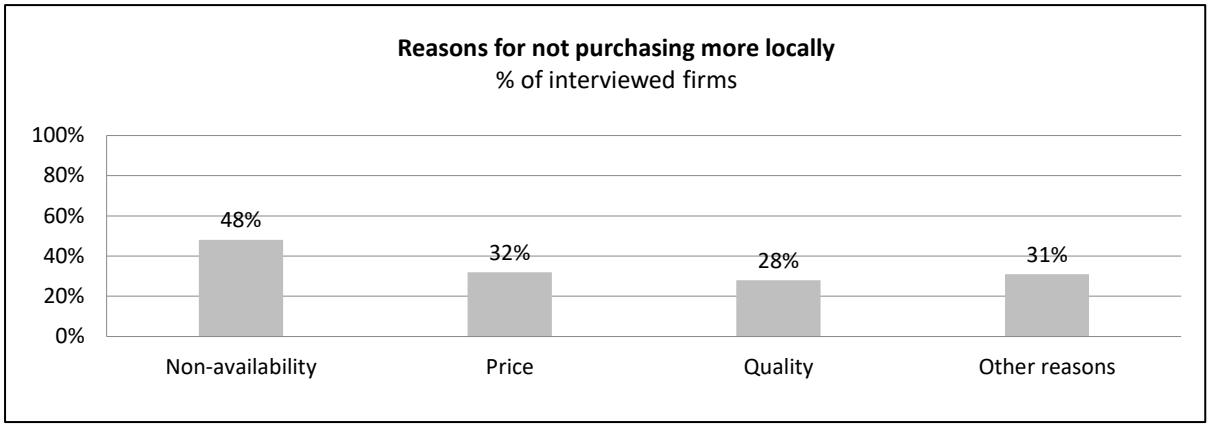
With regards to identifying suppliers, while a variety of channels exist, three common types were mentioned throughout the interviews. The first one is general industry knowledge. In many cases, only a few firms within the specific sector/ industry niche could supply the specific input required by the firms in the SEZs. These firms tended to be well known within the industry and/or make themselves known when new foreign companies moved into the zones. The second channel was through personal

connections and recommendations. This was more frequently the case for more basic inputs. And finally, firms – particularly large foreign ones – frequently relied on their pre-existing supplier networks with approved suppliers by the parent firm and/or clients. If these pre-qualified suppliers did not exist within the host economy, the SEZ firms were not able to purchase locally. A lack of information about possible local partners, as sometimes suggested by the literature and often emphasized in policies to support linkage formation (see for example Lauridsen, 2004 on Thailand and Steenbergen & Sutton, 2017 on Rwanda), did not appear to be a key impediment for stronger linkages.

4.2.3 Drivers and barriers for local purchasing

Why did firms in SEZs not purchase more inputs within the country in which the SEZ is located? The interviews reveal three interrelated reasons: 69 percent of all firms claim that it is either due to (i) a lack of availability of the specific inputs they require, (ii) issues with the quality of local suppliers, (iii) high prices when purchasing locally, or (iv) a combination of the three factors. Figure 5 summarizes the findings from the interviews.

Figure 5: Barriers for local purchasing



Source: SEZ firm interviews

In line with the literature (e.g. Lauridsen, 2004, Nguyen & Diez, 2019), the key challenge for local sourcing is related to the non-availability of the specific inputs required by SEZ firms. 48% of firms interviewed regarded this as the major impediment for more local purchasing. Interestingly, this was true across all sectors including the low-tech garment industry in Bole Lemi I IP and the high-tech industries in Saigon and Kulim HTPs rather than being only a challenge for those industries employing more sophisticated technologies.

Frequently one of the main constraints for the development of linkages and value chains was that the products required by the firms in zone were quite specific and sometimes could only be provided by a limited number of global suppliers. The national economy simply did not have the capacity and variety to produce them locally. Interviewees also suggested that given the limited size of possible

orders by the SEZ firms for very specific products, local firms did not have enough of an incentive to make the costly adjustments required in their production processes or to develop a specific variety of input in order to supply the SEZ firms. This issue has also been highlighted by Alfaro et al. (2004) as well as Nguyen and Diez (2019) and represents a challenge of lack of scale rather than that SEZ firms had a too large scale to be sourcing locally, as previously suggested by some of the literature (e.g. Amendolagine et al., 2019; Görg & Ruane, 2001). Too high volumes of input orders as an impediment for local sourcing was only reported by a handful of SEZ firms, primarily operating in one of the African SEZs in our sample and requiring large volumes of relatively basic inputs such as sugar, paper and steel.

The second main reason mentioned was price. 32% of interviewees referred to this as an impeding factor for buying inputs locally. Even when products were available locally, they were often more expensive than sourcing them from global suppliers, with some interviewees stressing that local products are up to five times more expensive. This was a recurrent factor in interviews across most zones but, particularly, in Africa. Since many SEZ policies allow the duty-free import of inputs and a general reduction of trade barriers and transport costs in the past decades, firms can source inputs globally from the most cost competitive producers. While this has opened opportunities for emerging economies to become part of global value chains, it also makes it difficult for local input suppliers to compete with global suppliers.

And finally, there were frequent concerns over the quality of local suppliers. This was considered an important challenge by 28% of firms that tried to source locally. This was true across all industries and zones. However, the (lack of) quality of local suppliers was a far bigger obstacle for those firms requiring international certifications, which are often expensive to obtain for local firms. Again, the combination of low order volumes by SEZ firms and expensive upgrading processes in order to comply with international quality standards limit the attractiveness for local firms of even consider becoming suppliers for SEZ firms. Furthermore, SEZ firms requiring international certifications for their inputs were frequently supplied from global supplier networks established by the parent company or a lead firm. This lack of autonomy of the subsidiary, a frequent feature of today's globalized production networks, represented an additional hurdle to local sourcing, meaning that global corporate strategy represents an important factor for the establishment (or lack) of local linkages (Belderbos et al. 2001, Hansen et al., 2009). However, it is important to note that by no means all firms interviewed formed part of large global corporations with established supplier networks and had thus significantly more independence to choose their suppliers. Even so, they struggled with the availability, price and quality of inputs.

Going beyond local linkages and to the question of knowledge spill-overs, there is some anecdotal evidence from the interviews that SEZ firms worked with local firms to increase their capacity, so they could become suppliers of the SEZ firms or to make sure the supplier met the quality criteria. This was however far from a universal practice and often happened only once the local firm was already a supplier or close to becoming one. In Kulim HTP for example, some individual initiatives (such as sending experts to help solve a specific problems) were happening on an ad-hoc basis. Firms appeared to rely more on importing from outside as the 'quality gap' between the required standards and the current standards or availability of products was considered too big. Another important factor is the dependency of many foreign firms in the SEZs on global value chains, limiting their freedom in terms of their capacity to create linkages with the local environment. This was particularly the case of Chinese firms in Lekki Free Trade Zone in Nigeria, where Chinese firms – following what seems to be a standard practice of China's SEZs in Africa (Bräutigam and Tang, 2014) – are highly dependent on inputs by the lead firm located in China. This challenge was also widely found for the Boli Lemi Industrial Park I in Ethiopia with its garment's firms supplying large global buyers. However, in the Ethiopian case, global buyers, such as H&M and PVH, were actively working on initiatives to develop more domestic suppliers in order to reduce lead times. At the time of the interviews, the results of these were yet to be seen given the initial stages of the efforts. In sum, the limited evidence of foreign firms in African and other SEZs working closely with local suppliers to pass on knowledge is in line with Nguyen and Diez (2019) for Vietnam, who found that only few foreign firms actively supported their local suppliers to support their upgrading efforts.

Similarly, there was limited evidence for the effectiveness of local supplier development programs. In many cases, even if such a program was in existence, SEZ firms were not aware of it or its impact was reduced. Many of these programs did not address the underlying key issues faced by firms. The notable difference was in Ethiopia, where the government has been making a concerted effort to bring in textile suppliers from abroad to slowly develop a local supplier chain. Whether this will also have a positive impact on local suppliers remains, however, to be seen.

5 Conclusion

In this paper, we have analysed the extent to which SEZs fulfil their promise of supporting structural upgrading of the local economy via the formation of backward linkages with local firms and associated knowledge spill-overs. We interviewed 103 representatives of companies across seven SEZs in the developing world to map the sourcing linkages formed by these firms. Overall, our findings suggest that backward linkages between firms within SEZs as well as with firms outside the SEZs remain rather limited for the SEZs analysed. Firms primarily purchase services and minor inputs such as packaging

materials from within or outside the SEZ. The sourcing of key inputs is a major challenge due to a lack of availability, prices and frequent quality concerns. The majority of SEZ firms still rely on importing large parts of their inputs from abroad. This holds across different sectors, including garment, high-tech assembly and services, while factors such as market orientation, corporate strategy and ownership structure of the SEZ firm impact the level of local sourcing.

Our findings need to be interpreted in light of the varying coverage of firms interviewed by SEZ. In some cases, e.g. Ethiopia, the firms interviewed covered more or less the entire spectrum of the firms present in the SEZ and thus give an accurate reflection of the situation. In other SEZs with more established firms, the share of interviewed firms was lower, e.g. the Saigon HTP, and thus needs to be interpreted with greater caution. Nevertheless, the findings emphasize that achieving the expected indirect impacts of SEZs on the local economies is far more difficult than originally envisaged in the many policy schemes promoting SEZs. Hence, the embedding of SEZ firms into local value chains and establishment of partnerships with local firms is much more elusive to achieve than frequently assumed by policy makers when devising SEZ policies. The creation of value chains involving local firms has been, in all the cases studied, by no means guaranteed nor did it happen automatically. This is particularly true when considering that the cases included in this study are SEZs that have been generally considered to be successful ones. In all cases they have attracted far greater international investments than the average SEZ in developing and emerging countries, pulling them apart from the many SEZs around the world that have already failed at this first hurdle.

The findings provide further nuance to the existing knowledge on the indirect effect and knowledge spill-over from SEZs, as the analysis includes a larger set of countries and cases and more in-depth insights coming from a large number of interviews. Overall, our findings generalise those of Alkon (2018) for the Indian case. He finds that Indian SEZs have had a very limited effect on the socio-economic development of the surrounding regions. They also add further nuance by specifically zooming in onto the question of linkages, which has been rarely analysed in the specific SEZ literature, despite its prominence in the policy debate. The challenge of the local absorptive capacity highlighted in the general FDI literature is also reflected in our findings. Finally, support is found for the notion that linkages and spill-overs are more likely to occur where FDI is realized through a joint-venture set-up and is market-seeking.

For policy makers, this represents a serious challenge. As the popularity of zones is frequently justified by the assumed indirect effects, it will be important to take a step back and analyse in how far this can realistically be achieved in a given context. Setting up an SEZ on its own is no guarantee of triggering greater transfers of knowledge, increasing local productivity, or generating additional employment

outside the boundaries of the zone (Frick et al., 2019). SEZ policies on their own do not suffice to dynamise the local economic fabric. Hence, the need to be combined with and inserted in more proactive and all-encompassing policies – ranging from the improvement of local skills to the capacity to assimilate new technology and improvements in quality provision – that would maximize the potential benefits of any type of investment in SEZs (Rodríguez-Pose and Wilkie, 2019). A concerted effort will be required to reap more of the benefits that SEZs can, in theory, deliver to the local and national economy of countries embarking in this type of schemes. In how far policymakers are willing to take this extra steps and funds remains to be seen.

Conflict of interest declaration:

None of the authors of the manuscript have any affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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