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Analysing the impact of the Kigali Special Economic Zone on firm behaviour



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Executive Summary

Special Economic Zones are increasingly seen as an important policy tool for economic development. They are often adopted on the assumption that they help promote private investment, industry and export growth by offering quality infrastructure, streamlined business regulations and incentives to investors and businesses. While other policy tools exist, SEZs are seen to be more effective by exploiting economies of scale in public infrastructure and by facilitating cluster development.

Yet, to date, there has been limited rigorous empirical analysis on what impacts SEZs actually have on firms, especially in a Sub-Saharan African context. This report provides an assessment of the impact of the Kigali Special Economic Zone (KSEZ) on firm outcomes. To our knowledge, this is the first, robust analysis of SEZs on firm-level behaviour in Sub-Saharan Africa. This is made possible by using firm-level tax data, combined with advanced econometric methods such as propensity score matching. The study further allows us to identify some of the main channels of influence of the KSEZ by combining data analysis with interviews and review of official documents.

Special Economic Zones

In Chapter 2, we review the literature to give an overview of the potential ways in which SEZs can help overcome barriers to investment in the economy. Here, five possible benefits are identified:

- 1. Infrastructure/Utilities Provision:** SEZs may help address production challenges by providing access to cheap industrial land and reliable, low-cost utilities such as water and electricity.
- 2. Tax Incentives:** SEZs can attract new firms through designated tax incentives (e.g. tax holidays or tax rate reductions).
- 3. Trade Facilitation:** SEZs may facilitate international trade, either by offering customs exemption for imports, exports or by providing other trade facilitation schemes.
- 4. Business Regulation/Investment Aftercare:** SEZ firms may have preferential regulatory positions with a possible direct effect (e.g. requiring less time to obtain permits). SEZ firms may also receive intensive government support, offering indirect effects (e.g. being more aware of potential benefits, having more timely information about new policies and laws, and possibly having greater access to government to get specific challenges addressed).
- 5. Agglomeration Effects/Knowledge Spillovers:** Finally, SEZ firms may also benefit from proximity to other productive industries in the SEZ, which may result in economies of scale for specific industries, better targeting of public investment, or facilitate the sharing of ideas.

Considering the experience of SEZs around the world, this chapter finds that SEZs have been very influential and successful in an Asian context, particularly through Export Processing Zones (EPZs) which strengthened industrialisation through a labour-intensive assembly-model using imported components. Such a model has not had similar successes in an African context, where SEZs have often failed to provide export benefits. This is partly because African zones still struggle to deal with broader structural challenges, including higher transport, (relative) labour costs, and a shortage of skilled worker, limiting the potential of labour-intensive manufacturing in African SEZs.

The Kigali Special Economic Zone

Chapter 3 provides an overview of the history and the descriptive statistics of the KSEZ. This shows that the KSEZ is still young, having been established only in 2013, and is still taking shape in important ways. There are only a few firms currently operational in the second phase of KSEZ and some of its most important planned innovations (e.g. the establishment of an ICT Park) have not yet started. However, firms in the KSEZ already make an important contribution to Rwanda's aggregate economic outcomes. By the end of 2016, the 44 operational KSEZ firms, for which tax data was available, jointly employed around 2% of all Rwanda's permanent employees, and covered 2.5% of all VAT-reported sales.

We further find that between 2013 and 2016, the KSEZ has made up between 4.5-10% of all national exports and appears to have successfully catalysed Rwanda’s export promotion in two ways. We find that the KSEZ is an important source of non-traditional export products, and has expanded the scope of product types exported. It has also made a positive contribution to Rwanda’s trade balance for almost all quarters that it has operated. Yet, KSEZ firms also rely more on imports than other firms, and so also make up an important share of the import bill. This is likely because such imported goods are not available domestically, and such imports thus contribute to KSEZ firms’ higher productivity.

The Impact of the Kigali Special Economic Zone on Firm Behaviour

Chapter 4 assesses the impact of *moving into the KSEZ*. This tries to account for the fact that many firms were formally told to relocate into the KSEZ (e.g. for purposes of urban zoning permissions), and so may have also increased their sales, employment and export in the absence of the KSEZ.

To provide further clarity on this issue, and chapter 4 adopts a three-part econometric strategy based on Arnold and Javorcik (2009). First, the strategy focuses on within-firm changes over time. Second, it compares the performance of KSEZ firms to non-KSEZ firms. Third, it accounts for selection bias by creating a control group of firms similar in terms of observable characteristics to KSEZ entrants prior to their entry into KSEZ. This is accomplished by means of propensity score matching (PSM).

The results suggest that the KSEZ has had an important effect on firms’ overall performance in the first six quarters (18 months) of being in the KSEZ. Most notably, we find that moving into the KSEZ is associated with larger increase in sales, value-added and permanent employment numbers than would have been the case had such firms not moved there. Yet, when we consider the effect on trade, we find that the increase in KSEZ firm output is driven mostly by domestic sales. Indeed, while KSEZ may *attract* exporters, it does not appear to increase the likelihood of any firm to become an exporter, or to increase their overall exports as a result of being in the KSEZ. In contrast, we find that firms moving into the KSEZ are more likely to import goods, and also choose to import a higher value of goods than non-KSEZ firms.

Estimated Impact of Moving into KSEZ (1-6 Quarters) – (Model: PSM with Difference-in-Differences)

OUTCOME TYPE	OUTCOME VARIABLES	ESTIMATED IMPACT (1-6 QUARTERS)
Overall Economic Performance	Total Sales	+206%
	Value Added	+201%
	Value Added Share	+9%
	Permanent Employment Number	+18%
	Value Added per Worker	+130%
	Permanent Employment Average Pay	No Effect
International versus Domestic Trade	Probability of Exporting	No Effect
	Exports	No Effect
	Local Sales	+148%
	Probability of Importing	+16%
	Imports	+262%
	Local Purchases	+190%

What makes the Kigali Special Economic Zone ‘Special’?

Chapter 5 provides an overview of the main channels through which the KSEZ may have influenced firm behaviour based on the information obtained during interviews with a sample of KSEZ firms.

The KSEZ provides three main advantages over other locations in Kigali. These effects are important in themselves, but also have notable implications for international trade transactions.

We find that the KSEZ provides access to better infrastructure (roads) than is available elsewhere, which many firms note is key for their continuous stream of trucks that move into and out of the KSEZ. This benefit is combined with other industrial park provisions related to utilities such as reliable access to electricity, (mostly) reliable water and sanitation, and a fast internet connection.

The KSEZ also appears to offer better trade facilitation, both in terms of expedited customs procedures and in terms of a greater likelihood of entering into the Duty Remission Scheme (offering import duty exemptions). While this is technically available for all traders, analysis and feedback from the KSEZ firms suggests that some of these ‘perks’ may be more easily accessible to KSEZ firms than others.

This also suggests a third benefit: KSEZ firms appear to be explicitly supported by the Rwandan government in terms of streamlined regulatory benefits and through closer ties with other government agencies such as the Rwandan Development Board. As a result, KSEZ firms seem better aware of tax incentives, new laws and regulations, and can more easily push for policy change to address specific challenges.

KSEZ firms are not eligible for any specific types of tax incentives (e.g. tax holidays), and there is currently only limited interaction between KSEZ firms, suggesting that there are no clear benefits to being in the KSEZ in terms of sharing knowledge or ideas (agglomeration effects).

These benefits provide an important insight into the likely drivers of the KSEZ identified impacts. We believe that an important channel is through *importing*. The KSEZ appears to provide firms with more efficient importation, which can strongly increase firm productivity (leading to higher value added) because such inputs are often of higher quality and have a wider range of input varieties (Frazer, 2016; Khandelwal and Teachout, 2016). This in turn can make it worthwhile to expand sales and recruit additional employees. Other KSEZ benefits that lower the cost of doing business, including reliable utilities and streamlined regulations may also explain part of this variation.

Recommendations

Finally, chapter 6 offers a set of recommendations. To further improve the KSEZ for firms who are currently operational in the KSEZ, the study suggests that:

- 1. The current land price for plots in KSEZ Phase 2 is appropriate and should not be lowered, especially in absence of other management fees.** While some investors complain that the land price is too high, this is a one-off investment cost, which seems to be appropriately priced when considering both the direct (facility) and indirect (facilitation) benefits from being in the KSEZ. However, this could change if the operator Prime Economic Zone (PEZ) decides to charge management fees (which is often the case in other SEZs). If so, we recommend that the PEZ conducts a more detailed market analysis of the potential land price of different plots in the KSEZ and possibly lowers prices of some plots to compensate for higher regulatory costs.
- 2. Both KSEZ Phase 1 and Phase 2 should have access to reliable public transportation that facilitates workers’ daily commutes.** Firms complain that there are no current public transport links between KSEZ and the rest of the city, which makes it difficult and expensive for employees to come to work or go out for lunch. To serve the current absence of food, SEZAR reports that the KSEZ Phase 2 will have restaurants. Yet, to make sure this also benefits workers in the first

Phase, some form of transport *between* Phase 1 and Phase 2 may also need to be established.

3. **PEZ should work with RURA to investigate all firms' current and future electricity capacity needed, and increase the capacity for energy-intensive firms.** There are currently some firms who rely on their own private transformer to increase their energy capacity, which should not be necessary in an industrial park, and may prevent firms' future growth, especially for the manufacturing sector, which tends to use more energy than other sectors.
4. **PEZ should work with WASAC to investigate the wide disparity in water provision in the KSEZ, and ensure reliable access across all plots.** While some firms are happy with their water provision, others mentioned that this has been intermittent for a long period. The PEZ should take the lead in investigating these challenges, and address them as soon as possible.
5. **SEZAR should seek to extend its overall support to all KSEZ businesses and help improve business linkages.** There appear to be many ways in which KSEZ firms currently benefit from links with RDB, but these are often heterogeneous across firms. To extend such benefits across all KSEZ firms, SEZAR should thus organise more regular meetings where they formally share updates on new laws and regulation, discuss current challenges and help KSEZ firms to access particular benefits. Such meetings may also help strengthen collaborations between KSEZ firms, who can jointly discuss challenges and learn from each other.
6. **Government of Rwanda currently has sufficient tax incentives, and should refrain from introducing additional SEZ-specific incentives.** Investors appear to care more about market potential, business support and trade facilitation than about tax incentives (e.g. tax holidays). Reducing KSEZ business cost (e.g. cost of imports through reduced customs tariffs) is much more important than lowering profit taxes. In this regard, the decision by MINEACOM under the 'Made in Rwanda' policy (MINEACOM, 2017) to further reduce import tariffs on raw and intermediate goods is sufficient, and more important than any SEZ-specific incentives. In addition, the 2015 Investment Code also already sufficiently stimulates manufacturing and export-oriented firms for the 'marginal investor' who does seek specific tax incentives.

For Rwanda's plans to construct 8 additional SEZs throughout the country, the study recommends:

7. **MINEACOM should commence the development of the new district-level industrial parks only after additional demand analysis has been completed. For each park, this should identify a sufficient number of interested firms, with sufficient expected profitability, and notable added-value of the SEZ.** This study suggests that some KSEZ benefits are difficult to replicate outside of Kigali. Such parks are unlikely to have similar trade facilitation and indirect support through SEZAR than is currently the case for the KSEZ firms. Most KSEZ firms reported that they see little benefit from being outside Kigali: the road to Rwanda's borders are not far enough to warrant moving. Yet, firms risk losing their main clientele (Kigali customers and Government of Rwanda) and a border-town location would make them vulnerable to changing trade laws. MINEACOM may still choose to proceed if a number of criteria are met. It should conduct demand analysis to ensure there are a sufficient number of interested firms. This should also demonstrate that the SEZ has specific benefits over areas in the region which exceeds costs, and that each SEZ has a specific rationale for how it fits into Rwanda's wider economic strategy.

For the future direction of Special Economic Zones in Rwanda, the study recommends the following:

8. **Government of Rwanda should not rely too much on the traditional EPZ model for the SEZ, and instead develop a modern, Rwandan SEZ.** The traditional EPZ model focused of assembly of imported component (e.g. the garment sector) may not be the most appropriate focus for Rwanda, partly due to the high transport costs faced, and partly because of the fragile export conditions (e.g. AGOA) that such industries rely on.
9. **Instead, Rwanda's SEZs should be reoriented to better exploit their existing comparative advantage. Besides existing plans in agriculture, the SEZ may extend value addition projects to mining and tourism.** SEZs can play an important role in concentrate infrastructure to catalyse processes of agglomeration and help existing domestic industries reach benefits of scale and to compete more effectively on regional and global markets (Farole, 2011). For that reason, it may be worth exploring the use of the SEZ for value addition in natural resource sectors (mining and tourism). These are already considered to be priority sectors, so utilising the SEZ for that purpose may help leverage important benefits.
10. **The SEZ can also contribute to high-rent, niche areas of latent competitiveness, such as edible oils.** To compensate investors for Rwanda's costly trading position, the export activities should have particularly high rents. One such example described in the National Export Strategy (MINICOM, 2015) is in edible oils, though other potential sectors may be identified.
11. **The SEZ may wish to adopt different types of policy experimentation, focused on the Service Sector and Service Sector Trade.** Rwanda is particularly strong on business regulation (as noted by being the second-highest ranking African country in the World Bank Doing Business Index). For that reason, it may wish to focus on other experiments. One possibility is to experiment with additional competition from EAC service-sector providers (e.g. in financial services, accountancy, Law, ICT, and architecture and engineering). Service sector trade is also an important input and driver of manufacturing in the EAC (Hoekman and Shepherd, 2015). This focus on services is currently planned through the new ICT Park in KSEZ Phase 2, which opens up new opportunities for services trade in tertiary education and ICT. Yet, additional analysis is needed to explore and identify how SEZs can best to support other forms of (backbone) services trade.
12. **Keep a focus on knowledge spillovers, which are the long-run drivers of SEZ success.** The key long-term benefit to SEZs is to upgrade the productivity and learning of firms operating there. Successful SEZs in other countries have operated as important incubation centres for future exporters, industrial leaders and skilled technical staff through knowledge spillovers. To guide this, developers of current and future SEZs should answer the following questions:
 - Are the firms in the SEZ likely to form links with firms outside the SEZ?
 - Is there a likely sharing of knowledge and best practices that can help improve productivity?
 - Does the SEZ engage in specific policy experiments that are linked to the wider, national economic policy, and which may be emulated by other parts of the economy?
 - Are local governments sufficiently linked up to the operation of the SEZ to support them and to note which policies are fostering or hampering their economic activity?

In sum, in its first few years the Kigali Special Economic Zone has made an impressive inroad into strengthening Rwanda's industrial sector and in diversifying exports. To maintain this momentum, this study suggests that now is the time to consider what should be the overall future direction of Rwanda's SEZs. This study holds that SEZs in Rwanda should not be used as small, separate pockets of economic activity (enclaves). Instead, they should build on Rwanda's current strengths and be used as a key drivers (catalysts) to deliver on Rwanda's broader vision and overall economic strategy.

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List of Acronyms and Abbreviations

AFU	Advanced Factory Unit
AGOA	African Growth and Opportunity Act
CIT	Corporate Income Tax
EAC	East African Community
EDPRS	Economic Development and Poverty Reduction Strategy
EPZ	Export Processing Zone
EUCL	Energy Utility Corporation Limited
IGC	International Growth Centre
KSEZ	Kigali Special Economic Zone
MFA	Multi-Fibre Arrangement
MINEACOM	Ministry of Industry, Trade and EAC Affairs
MINECOFIN	Ministry of Finance and Economic Planning
MINICOM	Ministry of Industry and Trade
PAYE	Pay As You Earn
PEZ	Prime Economic Zone
PIT	Personal Income Tax
PSM	Propensity Score Matching
RRA	Rwanda Revenue Authority
RDB	Rwanda Development Board
RURA	Rwanda Utilities Regulatory Authority
SEZ	Special Economic Zone
SEZAR	Special Economic Zones Authority of Rwanda
UNIDO	United Nations Industrial Development Organization
VAT	Value Added Tax

1. Introduction

In search of models to stimulate their industrial sector and promote exports, many sub-Saharan African countries have looked towards Special Economic Zones (SEZs) as a key innovation. SEZs can overcome barriers to investment for targeted firms or sectors, by enabling them to experiment with market-friendly administrative, regulatory and fiscal regimes. Mirroring the experience of a number of Asian countries, such SEZs may thus set out a powerful path towards improving the investment environment and gradually expanding private-sector led growth to the wider economy (Zeng, 2015).

However, to date there has been limited robust analysis conducted on the role that SEZs have played on firms' behaviour, especially in a Sub-Saharan African context. Most studies on SEZs only make use of qualitative interviews or aggregate-level figures, and so struggle to provide accurate impact estimates or identify the channels through which the SEZ affects firm behaviour.¹ This study, focused on the Kigali Special Economic Zone, thus makes two important contributions.

First, to our knowledge, this study provides the first causal estimates of the impact of moving into the SEZ on firm outcomes in Sub-Saharan Africa. This is made possible by using firm-level tax data, combined with advanced econometric methods such as propensity score matching. This study can further indicate the main channels of influence through which the SEZ impacts on firm behaviour by combining such data analysis with firm-level interviews and a documentation review.

Second, this study also contributes to our understanding of the strong economic performance that Rwanda has experienced in recent years, with an annual growth rates of 8 percent over a long-time period (Ggombe and Newfarmer, 2017). Rwanda is known for a strong state-led model of economic development, in which industrial policy through Special Economic zones plays an important role. This report helps explain the ways in the Rwandan Government has structured such interventions, how it contributed to firms' growth, and reflects on how this could be improved in the near-future.

Overview

Chapter 2 provides an overview of the literature on SEZs by defining their key features, and by setting out the five different benefits that SEZs may exhibit in order to improve firms' performance. This is followed by a brief description of the impact of SEZs around the world, comparing the Asian success stories with the more disappointing results commonly observed in sub-Saharan Africa.

An overview of the Kigali Special Economic Zone (KSEZ) is provided in Chapter 3. This first sets out its recent history. Afterwards, it offers descriptive statistics using tax data that follow the KSEZ firms over the period 2013 to 2016 in terms of employment, sales, international trade and firm types.

On that basis, chapter 4 uses econometric analysis to analyse the impact of moving into the KSEZ on firms' behaviour (compared to other, similar firms, which did not move there). Chapter 5 then seeks to explain these outcomes by using firm interviews to identify the main benefits provided by the KSEZ.

Chapter 6 concludes and offers recommendations.

¹ One notable exception to this comes from Farole (2011), who collects survey data from SEZs across six African and four non-African countries and combines this with regression analysis to identify the correlations between specific SEZ features and aggregate SEZ outcomes (e.g. employment, exports, FDI). However, because of the methods used, such regression analysis is able to provide indicative results only.

2. Special Economic Zones

2.1 Definitions

The term 'Special Economic Zone' (SEZ) is used to denote a wide range of geographically delimited areas that aim to overcome barriers to investment in the wider economy. Types of SEZs include export processing zones, economic processing zones, free zones and industrial parks (FIAS, 2008).

SEZs tend to share three main features (Farole, 2011). First, they operate under a special *regulatory regime* that provide their demarcated territory with investment, trade and operating rules that are more liberal and administratively efficient than those in the rest of the economy. Second, they are usually based within an industrial park that provides them with *physical infrastructure*, often including access to land, roads, electricity, water and telecommunications. Third, the area tends to have a *dedicated governance structure* to ensure that investors benefit from efficient service provision and can quickly resolve any operational challenges.

The main purpose for establishing such SEZs is often to attract foreign direct investment into the country in order to access new business capital, improve firms' productivity and stimulate job-creation. In addition, SEZs are also used as part of a wider economic reform strategy that aims to develop and diversify new export industries (often manufacturing), or experiment with application of new policies and approaches before extending them to the rest of the economy (FIAS, 2008).

2.2 The Potential Benefits of Special Economic Zones

The main way in which SEZs stimulate the economic performance of firms is by improving the business climate, which can then be associated with higher levels of investment, productivity and exports (Eifert et al. 2005; Ekholm et al. 2007). SEZs can improve the investment climate by lowering *cost of production* and *cost of trade* (Farole, 2011). This, in turn, can affect firms' decision on where to invest, how and how much to invest, and how to structure their operations. We can further break down such firm-level benefits into five main elements:

1. Infrastructure/utilities provision
2. Tax incentives
3. Trade facilitation
4. Business regulation/investment aftercare
5. Agglomeration effects/knowledge spillovers

1. Infrastructure/Utilities Provision

SEZs may help address production challenges by providing land and offering access to reliable and cheap utilities such as water and electricity. Other facilities provided in SEZs may also include pre-fabricated factory units and warehouses. Infrastructure and utility provision is found to be strongly correlated to increased FDI and exporting (Dollar et al, 2004; Portugal-Perez and Wilson, 2010). It is also a strongly linked to the level of SEZ exports and employment in both South Asia (Aggarwal, 2005) and was the most important determinant of effectiveness of a sample of SEZs across 6 African countries (Farole, 2011). SEZs further allow the government to improve the returns to infrastructure and utility provision by concentrating investments in a small, targeted area (Collier and Page, 2009).

2. Tax Incentives

SEZs can attract new firms through designated tax incentives (e.g. tax holidays or rate reductions). Here, the literature finds mixed results. Advocates of SEZs often point towards China, where SEZ investors were offered a 15 percent corporate tax rate, half the rate of domestic firms outside the zone (Yuan et al., 2010). Similarly, Rolfe et al (2003) use a survey-based experiment with investors in

Kenya's export processing zone and find that upfront corporate tax holidays were considered to be more important to potential investors than firm location or their local market access.

However, appeasing such investor incentive preferences may not always translate into better outcomes. A range of empirical studies on tax incentives suggest they have little impact on attracting FDI (Head et al. 1999; Wei 2000; Bobonis and Shatz 2007). Similarly, Farole (2011) find that the use of corporate tax holidays has no significant effect on African SEZ's ability to attract FDI, improve exports or increase employment. For that reason, SEZs may exacerbate economic distortions and lead to lower welfare as a result of revenue losses from tax cuts (Kline and Moretti, 2014). Indeed, Farole (2011) find that successful SEZs (in China, Vietnam and Mauritius) are increasingly removing fiscal incentives and integrating their zones' tax regimes within their national economy.

3. Trade Facilitation

SEZs may facilitate trading, either by offering customs exemption for imports, exports or by providing other trade facilitation schemes. Such interventions provide important ways to reduce the cost of trading, and lower customs clearance times. There are strong empirical links between such transport and trade facilitation and export outcomes (Dollar et al, 2004; Djankov et al, 2006; Freund and Rocha, 2010; Portugal-Perez and Wilson, 2010).

Increased trade can also help existing firms to become more productive through "*learning-by-exporting*" (Newman et al, 2016; Khandelwal and Teachout, 2016). This is partly because foreign buyers typically have stronger preferences for product quality, which forces exporters to upgrade their production and managerial practices to satisfy client demands (Atkin et al, 2014).

Productivity gains may also come through the *importing mechanism*. Import duty exemption can lower the price of imported inputs, which are typically higher quality and offer a wider range of input varieties (Frazer, 2016; Halpern et al, 2015). As such, several studies have found a strong causal relation between lowering input tariffs and increased firm productivity (Amiti and Konings, 2007; Topalova and Khandelwal, 2011; Yu, 2014). It is also found to improve export diversification by enabling firms to enter new product lines (Goldberg et al., 2011).

4. Business Regulation/Investment Aftercare

SEZ firms may have preferential regulatory positions and better investment aftercare. This may have a direct effect on the cost of doing business, for instance when a One-Stop Centre enables firms to spend less time to register or obtain permits. Yet, this may also have important indirect effects, where firms can raise sector-specific challenges, are better informed about other (non-SEZ specific) government benefits, and have more timely access to information on new laws and regulations.

Here, Farole (2011) find that while the existence of a One-Stop Centre is not associated with better SEZ outcomes, this may reflect the gap between formal claims of having such a centre and their general effectiveness on speedy business registration. However, he does not find that an improved ranking in the Doing Business Index is positively correlated with SEZ investment and employment, which may thus reflect the de-facto improvement in business regulation.

5. Agglomeration Effects/Knowledge Spillovers

Finally, SEZ firms may also benefit from proximity to other productive industries in the SEZ, which can result in agglomeration benefits. SEZs may also facilitate sharing of ideas by providing an environment encouraging multinationals to invest and transfer knowhow related to production and marketing (Romer, 1993; Johannson, 1994). Such knowledge spillovers could also take the form of backward or forward linkages between the SEZ and the rest of the economy; for Bangladesh it was found that the SEZ had generated significant benefits for domestic suppliers (Kee, 2015).

Comparing Benefits

The most detailed comparison of all these elements can be found in Farole (2011). His study first used interviews with investors across both African and other SEZs (Table 2.1) to obtain information on their priorities. Here, respondents in African SEZ consistently ranked three factors as the most important: Infrastructure/utilities provision (cost and quality of utilities), trade facilitation (access to efficient transport/tariffs, duties and rules of origin) and business regulation. Other elements such as tax incentives and access to technology (a potential measure for agglomeration effects) were ranked considerably lower.

Table 2.1 Criteria for Investment Location (Top 4 highlighted), Surveyed SEZ Firms, (Source: Farole, 2011)

<i>Investment criteria</i>	<i>African zones</i>	<i>Non-African zones</i>
Cost and quality of utilities	1	3
Access to transport infrastructure	2	2
Business regulatory environment	3	5
Tariffs, duties, and rules of origin	4	8
Level of corporate taxes	5	6
Access to highly skilled labour	6	4
Access to suppliers	7	7
Access to low-cost labour	8	1
Availability/cost of land and buildings	9	10
Access to local and regional markets	10	9
Access to technology	11	11

Next, Farole (2011) used a cross-country dataset to correlate each of these benefits to SEZ outcomes, including FDI, exports and employment. He found that SEZ outcomes were strongly correlated with the quality of utilities and trade facilitation (customs clearance time, investors' perceptions of the transport and logistics environment). Observed benefits of improved business regulation were found to be limited (though the Doing Business Index predicted SEZ effectiveness). Tax incentives did not show any significant correlation with SEZ outcomes.

We will come back to these five elements in Chapter 5, to identify what types of benefits are provided in the Kigali SEZ and how this has affected the overall effectiveness on firm outcomes.

2.3 The Impact of Special Economic Zones around the World

The concept of SEZs has been developing gradually over time. The first example can be found in Shannon, Ireland in 1959. This Export Processing Zone (EPZ) managed to increase firms' exports in a short time period through a combination of a differential customs regime, investment incentives, dedicated administrative support and ready-built infrastructure. This was then adopted by for the Mexican *maquilas*, which successfully strengthened Mexico's industrial base by constructing industrial parks with special customs regulation on the US-Mexican border (FIAS, 2008).

Strong Performance in Asia

The main reason why SEZs have received the status of key industrial policy tool was due to their successful application across a number of Asian countries. These also relied on the EPZ model as a catalyst to diversify and expand their (non-traditional) export market. Taiwan and South Korea were the first to open their EPZs in 1969 and 1971, respectively. They were followed by Indonesia, Malaysia, the Philippines, Thailand, Singapore, and Sri Lanka. Many of Asia's EPZs experienced rapid and sustained growth, with a particularly noticeable success story in Masan, Korea (Box 2.1). Another important application came from China, where the SEZs played a key role in transitioning from a command-led economy towards a market-based economy (Box 2.2).

Box 2.1: Korea's Masan Free Zone: An Asian Success Story (based on Farole, 2011)

The Masan Free Zone offers one of the clearest success stories for SEZs. It was established in 1970 with the aim of attracting FDI in manufacturing export activities that could complement the domestic Korean economy. This was done by offering a combination of financial investments, external infrastructure (port, airport, roads) and a high-quality utilities with a designated industrial park management.

By 1971, the SEZ mainly attracted foreign enterprises in the electronics industry, which imported around 3 percent of their production components from Korea. By 1986, the overall share of these firms' imports from the SEZ increased to over 45 percent. Since then, the zone has grown further so that by 2007, FDI capital in Masan was US\$128 million, employment was over 7,500 and zone exports were US\$3.2 billion (10 percent of the country's overall trade surplus). The SEZ thus served as an important catalyst for developing a competitive cluster in high-value manufacturing.

Box 2.2: China's SEZs in Guangdong Province: A Catalyst for Change (based on Zeng, 2010)

In 1980, three areas in Guangdong Province were designated as special economic zones in order to take the lead in transitioning to an export-oriented and market-driven economy.

These SEZs received heavy direct investments from local governments, especially investment in high-quality infrastructure (roads, water, electricity, gas, sewerage, telephone and privileged port access). The local government provided loans and grants and offered various business services, including accounting, legal, business planning, marketing, import-export assistance, skills training and management consulting.

Yet, the main purpose of the SEZ was to encourage "special policies and flexible measures" that would serve as an experiment, which if proven successful, would then be implemented more widely across the country. SEZs were therefore provided with the legislative authority to develop designated municipal laws and regulations, including local tax rates (15% corporate income tax, versus 30% outside the zone) and structures to govern and administer these zones. They also used this to experiment extensively with more flexible labour markets, and incentive-based compensation. For instance, Yuan et al (2010) note that the SEZs were the only place in the country where employee wages were linked to performance. They were also the first places in China to implement a minimum wage, a pension insurance and other worker protections. This gradual experimental approach led to the famous expression by former leader of the Communist Party, Deng Xiaoping, that China was "crossing the river by feeling the stones".

These SEZs managed to reach unprecedented growth rates. Compared to a national annual GDP growth of 10 percent from 1980 to 1984, the three zones in Guangdong grew at an annual rate of 58%, 32% and 9%, respectively. Following this success, the total number of SEZs quickly grew in the 1980s and 1990s. By 2004, there were nearly 7,000 industrial parks in China. Currently, SEZs account for 22% of national GDP, 46% of FDI, and 60% of exports and generated in excess of 30 million jobs (Zeng 2010).

In sum, the Asian experience of SEZs provide an important success story for industrial policy and suggest that there was a "strong correlation between the use of zones and the development of successful export-led growth" (Farole, 2011, p. 50).

Disappointing Results in Africa

In the Sub-Saharan Africa region, several countries also launched SEZ programmes in the 1970s (Liberia in 1970, Mauritius in 1971, and Senegal in 1974). Dominant industries in African zones are textiles (apparel) and food processing, with a focus on the EU export market and more recently the United States under provision of the African Growth and Opportunity Act (AGOA) (FIAS, 2008).

The overall impact of SEZs in Africa is more mixed. Besides a clear success story from Mauritius (Johansson, 1994) and some more limited achievements in Lesotho and Madagascar, most SEZs in sub-Saharan Africa have not had any transformative impact (Zeng, 2012; Zeng, 2015). This is further confirmed by Farole (2011) which offers a comparison of SEZs across six African countries (Ghana, Kenya, Lesotho, Nigeria, Senegal and Tanzania) with those in four non-African countries (Dominican

Republic, Honduras, Vietnam and Bangladesh). They find that the African zones are generally lagging behind zones in other continents across investment, exports as well as employment generation.

While part of this may be due to the broader structural economic challenges in Africa, including higher transport and labour costs, Farole (2011) also show that African zones often fail to provide a sufficiently conducive business environment. For instance, in terms of infrastructure (Figure 2.1), African SEZs may have lower monthly downtime due to power shortages than outside the SEZ (about 54% fewer hours on average). Yet, they are still high in absolute terms, and are higher than most non-African general power shortages. Similarly, African SEZs may fail to reduce the average days needed for customs clearance (Figure 2.2). Here it shows that it may even take longer for SEZ firms than non-SEZ firms to clear customs. This in contrast to non-African SEZs, which see a strong advantage to customs time over non-SEZ firms. This further suggests that unless African SEZs can significantly change their scope and focus, they will unlikely provide the much-needed stimulus to develop a strong export-oriented manufacturing sector (Zeng 2012; Zeng, 2015).

Figure 2.1: Average Monthly Downtime Due to Power Outages (Source: Farole, 2011)

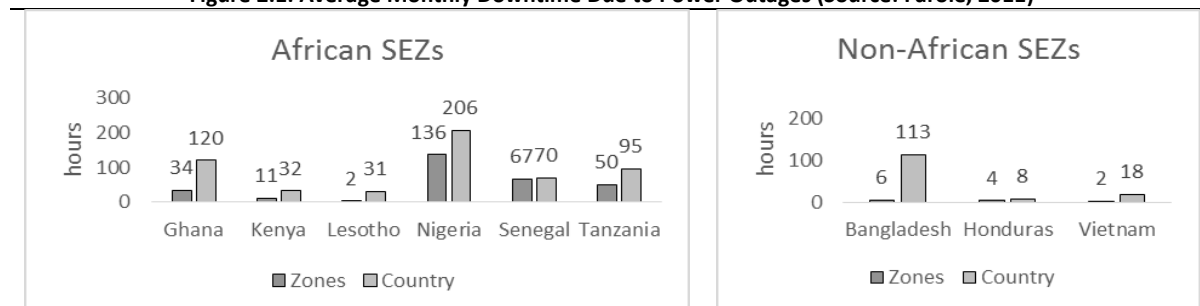
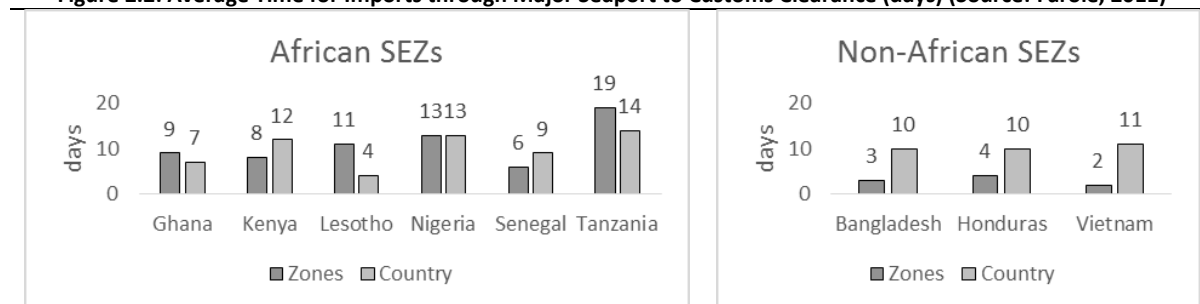


Figure 2.2: Average Time for Imports through Major Seaport to Customs Clearance (days) (Source: Farole, 2011)



2.4 The Future Challenges of Special Economic Zones in Africa

Looking forward, it is unclear what the appropriate role of SEZs are in African industrial policy. Several cases in Asia demonstrated that under the appropriate circumstances, SEZs can provide an important catalyst for economic transformation, especially under the Export Processing Zone (EPZ) variant. Yet, to date the overall results of such zones in Africa have been generally disappointing. SEZs in Africa are also faced with additional future challenges.

One such challenge relates to the changing global trading context in recent years. Most Asian SEZs were established in the 1980s and 1990s, linked to the original rise of global value chains, where the world saw large expansions in global trade and investment. In contrast, current trading opportunities are much more limited, with slowing demand in a number of traditional export markets. Especially for textiles (a focus of many African SEZs), the expiration of the Multi-Fibre Arrangement (MFA) further limits their potential to export to the United States (see Box 2.3 for an example from Ghana). Jayanthakumaran (2003, p, 64) thus reports that there is “a strong correlation between the growth of EPZs and the MFA in general” and that phasing out the MFA “will eventually result in lower rates of return and will be a possible threat to the existing and new EPZs”.

Box 2.3: Ghana's Special Economic Zone: The Decline of the Garment Sector (based on Farole, 2011)

Through a series of industrial policies and a Presidential Special Initiative (PSI) that were focused on a new Special Economic Zone, Ghana managed to develop an export-oriented textile industry in the early 2000s. Besides a high-quality industrial park, the government provided textile companies with grants for management and worker training, to support factory construction and even to purchase equipment.

The initial results were highly promising. After the launch of the African Growth and Opportunity Act (AGOA) in 2000, the Ghanaian textile sector grew to 24 factories that jointly employed 25,000 workers, and exporting over US\$6.8 million in apparels to the United States. Yet, such results were quickly reversed once the Multi-Fibre Arrangement (MFA) ended in 2004, eliminating Ghana's initial preferential trade benefits. Faced with competition from Bangladesh and China, Ghana's cotton apparel collapsed in 2008 to only 4 factories, employing 4,000 workers and exporting only US\$0.6 million in textiles. This case thus reflects the highly vulnerable position that many African SEZs find themselves in.

The overall potential of the assembly-based EPZ model for African SEZs is further limited by strong competition from low-priced and higher-quality Asian manufacturing companies (Milberg, 2007; Farole, 2014). Comparative analysis suggests that African countries still face relatively high labour costs and low productivity, with a shortage of skilled workers (particularly with vocational training). Combined with poor infrastructure and high transport costs, this significantly limits the potential of labour-intensive manufacturing in African SEZs. As argued by Farole "there are few situations in which establishing a base in an African zone rather than one in Asia or elsewhere would be part of a firm's competitive global manufacturing strategy" (2011, p. 252).

2.5 Summary

This chapter has provided an overview of the current literature on SEZs. We first noted that there are five potential major benefits that SEZs exhibit around the world: 1) Infrastructure/utilities provision 2) Tax incentives 3) Trade facilitation 4) Streamlined business regulations and 5) Agglomeration effects/knowledge spillovers. Next, we noted that SEZs have been particularly influential and successful in an Asian context, particularly through designated EPZs that relied on an assembly-model for imported components. Yet, this model has not had similar successes in an African context, where SEZs have mostly failed to provide noticeable export benefits. We noted that this further suggests the traditional EPZ model may not be the most appropriate focus for African SEZs. Instead African SEZs may need to reorient their focus to better exploit their existing comparative advantage or adopt different *types* of policy experimentation in order to stimulate export promotion. We will return to this point in the overall conclusion, and reflect on how these different models relate to the present and future of the Kigali Special Economic Zone.

3. The Kigali Special Economic Zone

3.1 History of the KSEZ

In 2006, Rwanda initiated its first two types of Special Economic Zones: the “Kigali Industrial Park” aimed at domestic producers, and the “Rwanda Free Trade Zone”, offering specific tax incentives to stimulate exports mainly to the neighbouring countries of Uganda, Kenya and Tanzania. With the accession of Rwanda to the East African Community (EAC) in 2007, the three main export markets became part of a single EAC Customs Territory, so that exports could no longer qualify for tax breaks. In 2009, it was thus decided to merge the two zones under a unified “Kigali Special Economic Zone” (KSEZ) Phase 1 and Phase 2, whose users could benefit from the same infrastructural benefits for both export and domestic sales (UNIDO, 2016).

Following this decision, the Government of Rwanda developed an extensive policy and regulatory framework for SEZs including the current SEZ Policy (MINICOM, 2010). In 2011, the SEZ law was approved, which among other things established a Special Economic Zone Authority of Rwanda (SEZAR) as the dedicated regulator, housed within the Rwanda Development Board (RDB). Other SEZ regulations were stipulated in other laws including the Land Law (2013) for SEZ land ownership rights and the 2015 Investment Code related to SEZ tax incentives (GoR, 2015).

Objectives

According to the SEZ Policy (MINICOM, 2010, p. 2), the overall aim of the policy is:

“To ensure the successful development of existing SEZs and future SEZs so that SEZs can contribute significantly to the development goals of Rwanda whilst utilising public resources in the most efficient and cost effective way. The Economic Development and Poverty Reduction Strategy (EDPRS) and Vision 2020 goals that a successful SEZ program will contribute to are:

- 1. Increase foreign and domestic private sector investment (15.2% of GDP by 2020)*
- 2. Export growth and diversification (annual export growth of 15% by 2020)*
- 3. Development of industry/ non-agriculture sectors (annual growth of 12% by 2020)*
- 4. Creation of off farm employment and income (600,000 new non-farm jobs by 2020)”*

Other objectives for the KSEZ include skills upgrading and technology transfers, environmental protection, increased tax revenue through base expansion and an improved trade balance through increased manufacturing of domestically consumed goods (RDB, 2015).

Phase 1 and Phase 2

From 2011 onwards, the land allocated for KSEZ was purchased from previous occupants and a private company, Prime Economic Zones Co. Ltd (PEZ) became the owner, developer and operator of the KSEZ. PEZ then mobilised USD\$ 45 million in equity from Government of Rwanda and selected private investors to develop Phase 1 (98 hectares), including the site’s infrastructure, access and internal roads, water, electricity, fibre-optics and sewage systems (UNIDO, 2016).

In 2013, the development of Phase 1 of the KSEZ was completed and the first 9 firms moved in, which were relocated from Gikondo Industrial Park. These firms were specifically selected for having an added value above 35%, turnover exceeding RwF 500,000 and at least 30 permanent staff (MINICOM, 2013). All other plots were allocated based on a first-come-first-served basis, based on purchase of land at the price of RwF 20,000 (USD\$24) per m² (with the all plots covering at least 1

hectare). It took approximately 3 years to fill all available plots, but all plots in Phase 1 have currently been sold (though not all Phase 1 firms are operational) (based on interviews with SEZAR).

PEZ has also started developing Phase 2 (178 hectares). To provide service to all 67 plots, it has earmarked USD \$30 million. Most of this has come from loans at domestic financial institutions. To cover the additional interest, PEZ has raised the overall land price to RwF 43,000 (USD\$51) per m². Alongside plots for industry and warehouses, 60 hectares of land (33%) have been purchased by RDB for the Kigali Technopole, an ICT park. This will bring together ICT firms with 4 technical universities (each taking about 4-5 hectares of land). There are currently 4 firms operational in Phase 2. Around 50% of all other plots have been purchased, with over 75% reserved (25%, or around 44 hectares is currently still available) (based on interviews with SEZAR and UNIDO, 2016).

3.2 Data Description for KSEZ

To provide additional information on the KSEZ, this study makes use of firms' tax returns, requested on behalf of the Ministry of Finance (MINECOFIN) and provided by the Rwanda Revenue Authority (RRA). The main data source comes from firms' quarterly Value-Added Tax (VAT) returns (to identify total sales, value-added, imports and exports). The study uses Corporate Income Tax (CIT) to identify the degree of tax incentives, Pay-As-You-Earn (PAYE) data to establish permanent employment numbers, and uses the RRA's trade database to identify the types of goods imported and exported. This is further supplemented by KSEZ information provided by MINEACOM and interviews with selected firms for additional qualitative corroboration.

Sample

The main focus of this study is on firms within the KSEZ. Table 3.1 shows that from all the KSEZ firms (including those 'under construction'), 85% have been identified in the tax database. To assess the impact of the KSEZ on firm behaviour, this study restrict the focus to *operational firms* and will not distinguish between Phase 1 and Phase 2 firms. From this sample of 52 operational KSEZ firms, 85% (44 firms) were identified in the tax database.

Table 3.1: Number of KSEZ Companies identified in Tax Database, Source: Authors

	Number of Kigali SEZ Companies	Kigali SEZ Companies identified in Tax Database	
		#	%
Kigali SEZ Phase 1	75	63	84
<i>Already Operational</i>	48	41	85
<i>In Construction</i>	27	22	81
Kigali SEZ Phase 2	9	8	89
<i>Already Operational</i>	4	3	75
<i>In Construction</i>	5	5	100
<i>Grand Total</i>	84	71	85

Table 3.2 provides greater detail on the observations of operational KSEZ firms identified in the tax database across financial quarters (both before, and while in the KSEZ). Unsurprisingly, observations across firms are unevenly skewed towards the end of the sample. In 2008, only 16 firms are in the database, which goes up to 26 in 2013 (when the SEZ became operational), and 44 by end of 2016.

Table 3.2: Number of KSEZ Observations by Financial Quarters, Source: Authors

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	Observations
<i># Operational KSEZ Companies identified in Tax Database (both before, and after moving into SEZ)</i>										
Q1	14	16	18	20	23	26	33	37	40	227
Q2	15	17	19	20	24	27	33	38	42	235
Q3	16	18	18	22	25	28	35	40	43	245
Q4	16	18	20	23	25	29	36	40	44	251

3.3 Total Figures from KSEZ

We can now provide an overview of figures of firms operational in the KSEZ from 2013-q2 to 2016-q4. To provide a more accurate indication, we have excluded those firms only providing support services (e.g. electricity, banking and security) for which KSEZ is not neither their headquarters nor their primary operational base. The full details are provided in Table A1-A2 in the annex.

Here we see that the number of KSEZ firms can be split into four yearly cohorts: there are 12 SEZ firms in 2013, 21 by end of 2014, 29 by end of 2015 and 41 by the final quarter of 2016. We will now provide further overviews on employment, overall sales and international trade for KSEZ firms.

Employment

Figure 3.1 provides an overview of the total number of permanent employees in the KSEZ. This increased considerably with the second cohort entering in 2014q2, raising KSEZ employment from 660 to almost 1,500. After this quarter, employment tended to increase proportionally to the number of SEZ firms (averaging around 55 permanent employees per firm). This underestimates the total number of jobs available in the KSEZ by excluding temporary jobs, for which there are currently no reliable estimates available. Estimates covering all employees range from 3,000 (UNIDO, 2016) to upwards of 4,000 employees (interviews with SEZAR).

Figure 3.1: Number of KSEZ Firms and the Number of Permanent Employees, Source: Authors

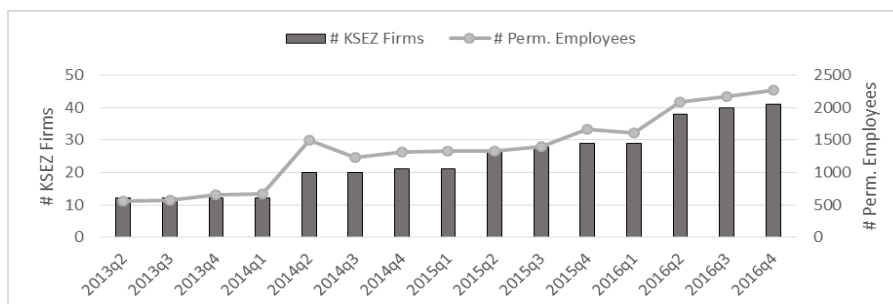
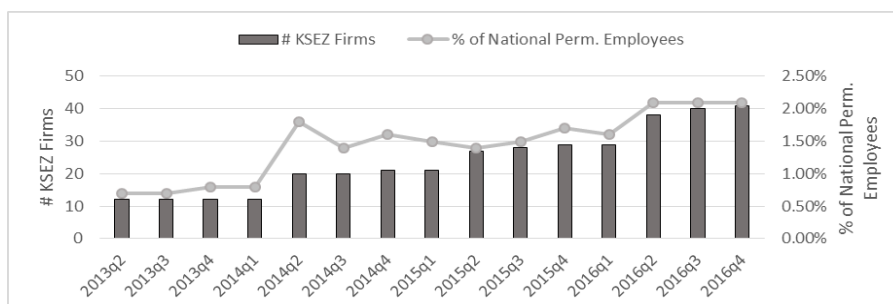


Figure 3.2: Number of KSEZ Firms and Permanent Employees (as % of National), Source: Authors



To get an estimate of the relative importance and magnitude of the KSEZ for Rwanda, we can further compare these totals to the overall totals for Rwanda, as reported in firms' Pay-As-You-Earn tax

returns.² From Figure 3.2 (Table A2 in the Annex), we see that the KSEZ provides 0.8% of all permanent employees in the country in 2013, and increased to just over 2% by the end of 2016.

Average annual salary for permanent employees lies around Rwf 550,000 (USD\$650) between 2013 and 2014. With a set of additional firms entering KSEZ in 2015, this increased to around Rwf 680,000 (USD\$800) and further increased in 2016 to almost Rwf 1.1 million (USD\$1300). This may indicate that the type of workers employed in later years are of a different type (e.g. more highly educated, higher share of foreign workers), or possibly reflects productivity improvements across KSEZ firms.

Sales

Total KSEZ sales have fluctuated considerably over time (Figure 3.3, Table A1). The KSEZ saw a large volume of sales in the third quarter of 2013 (Rwf 20.6 billion), followed by a minor slump in 2014. This started to pick up again near the end of 2015, and increased up to Rwf 32 billion by 2016.

Figure 3.3: Number of KSEZ Firms and the Total Sales in Rwf Million, Source: Authors

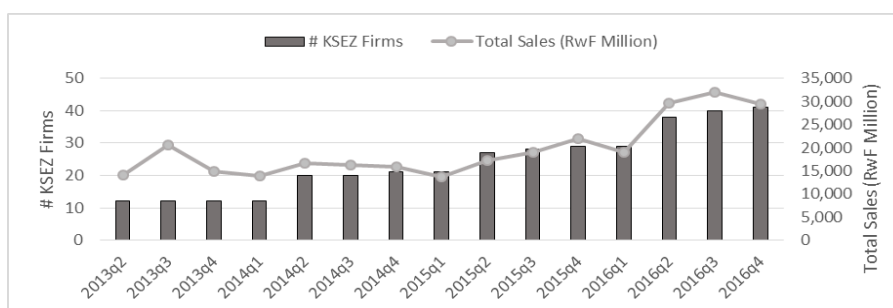
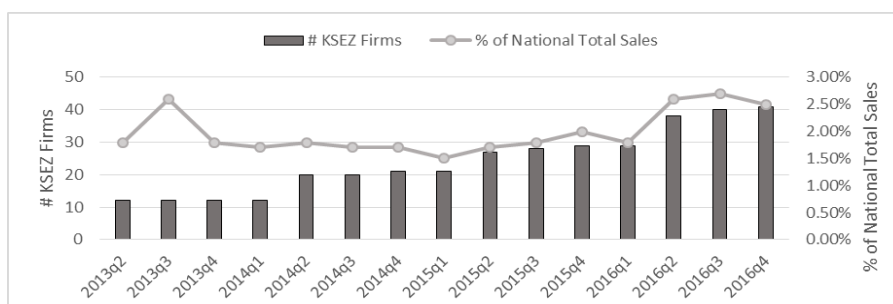


Figure 3.4: Number of KSEZ Firms and Total Sales (as % of National), Source: Authors



Between 2013 and 2015q3, the KSEZ sales (including domestic sales and exports) also reflect about 1.8% of the national total (Figure 3.4, Table A2), which subsequently increased to upwards of 2.5% for several quarters in 2016. For local sales (all sales minus exports) this also amounted to 1.8% in early 2013, dropping to around 1.2% in early 2015, and then finally increased to around 2.3% in 2016. KSEZ local purchases constituted around 0.5% of total local purchase value in 2013, increasing to 1% in 2015 and by the end of 2016 stood at around 1.7% of all local purchases.

Exporting and Importing

We can also provide an initial indication around KSEZ's impact on trade (Figure 3.5, Table A.1). First, the share of exporting KSEZ firms is relatively low and has gone down over time. In 2013, 33% of all

² This may deviate in important ways from the actual economic performance that quarter, as firms may report their VAT claimed inputs (imports, purchases) several months after they took place. Firms may also choose to underreport their total number of employees and share of international trade in order to evade tax payment. Finally, the tax data also omits all non-formal transactions from the estimates.

KSEZ firms exported some goods in any particular quarter, which dropped to 20% by mid-2015, and then increased so that by the end of 2016 25% of all firms exported. Firms who joined KSEZ between 2014 and 2016 thus appear to be more concentrated on the domestic market than the initial set of KSEZ firms. This differs significantly with the total number of importers. This fluctuates but is consistently high over time. In 2013, 75% of firms had imported goods at least once that year, which went down to around 50% between 2014 and 2015. It then increased again to 75% by 2016. Hence, there are a lot of firms who rely on imports, but strictly cater to the domestic market.

Figure 3.5: Share of KSEZ Firms Exporting and Importing, Source: Authors

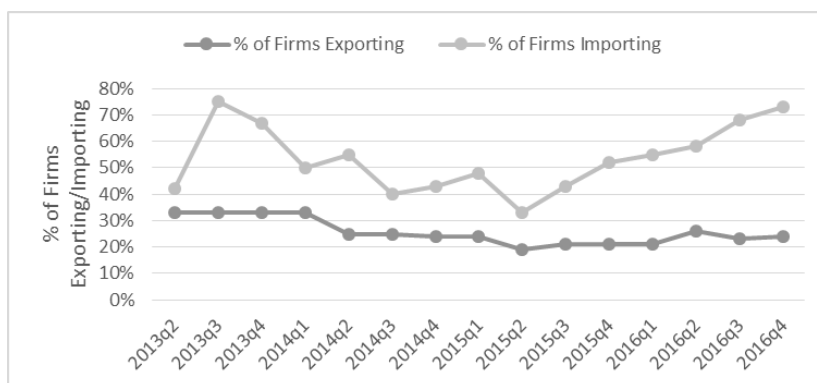


Figure 3.6 and Figure 3.7 then present the overall total of exports and imports in RwF million and as a share of the national totals. *These first suggest that the KSEZ has contributed to reducing Rwanda's trade imbalance.* Despite the low number of exporters, overall exports exceed imports in almost all financial quarters. This was true particularly in 2013q3, when the KSEZ exported over RwF 7.5 billion in value (10% of national exports), but imported only RwF 1 billion-worth (1% of national imports). Between 2014 and 2016, the total value of exports has gone down a little, but remained high at an average of over RwF 4 billion in value, and constituting around 6% of national exports. The amount of imports has also fluctuated, ranging between RwF 1-2.5 billion between 2014 and 2016 (1.5% of national imports), and subsequently shooting up in 2016 to over RwF 7 billion (around 4.5% of all national imports). From this, we can thus see that the KSEZ is an important source of national exports, but that not all firms export. Indeed, a much higher share of KSEZ firms import than export, and so trade facilitation in the KSEZ may thus also provide important benefits for domestic firms to better access imported goods. We will return to this conclusion in the next two chapters.

Figure 3.6: KSEZ Exports & Imports (RwF Million), Source: Authors

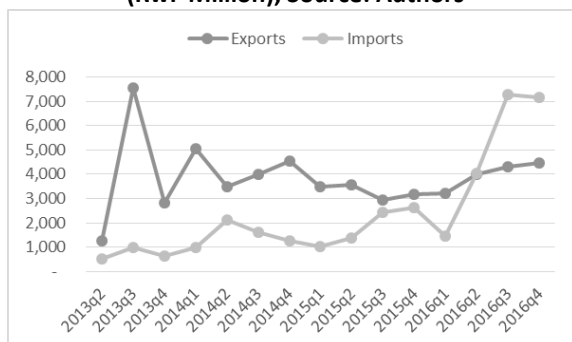
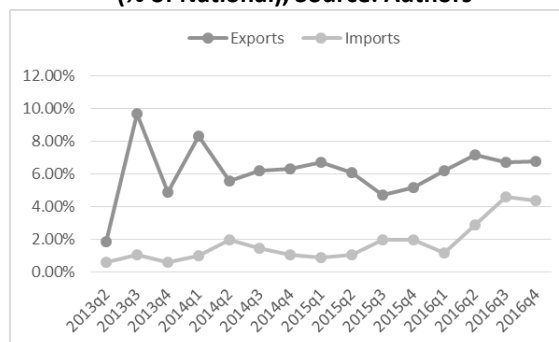


Figure 3.7: KSEZ Exports & Imports (% of National), Source: Authors



Type of Goods Exported and Imported

Figure 3.6 and Table A.4 in the Annex provide an overview of the type of products exported from the KSEZ. This shows that in 2013, the KSEZ mainly exported foodstuffs (75% of KSEZ exports) and

furniture and bedding (24%). In 2014, the KSEZ largest types of exports was furniture and bedding (51%), followed by two large and two minor types of exports.³ In 2015, with more firms entering into the KSEZ, the overall type of goods exported further diversified, and included 8 main product types.⁴ This diversification pattern is even more pronounced in 2016, when over 10 different types of products were exported from the KSEZ.⁵ Hence, while total exports has not expanded drastically over time (Figure 3.4), we see that the *type* of exports has extended considerably, *suggesting that the KSEZ is providing an important contribution to Rwanda’s overall goals of export diversification.*

Figure 3.8: Type of KSEZ Products Exported (relative shares from Tax Trade Database), Source: Authors

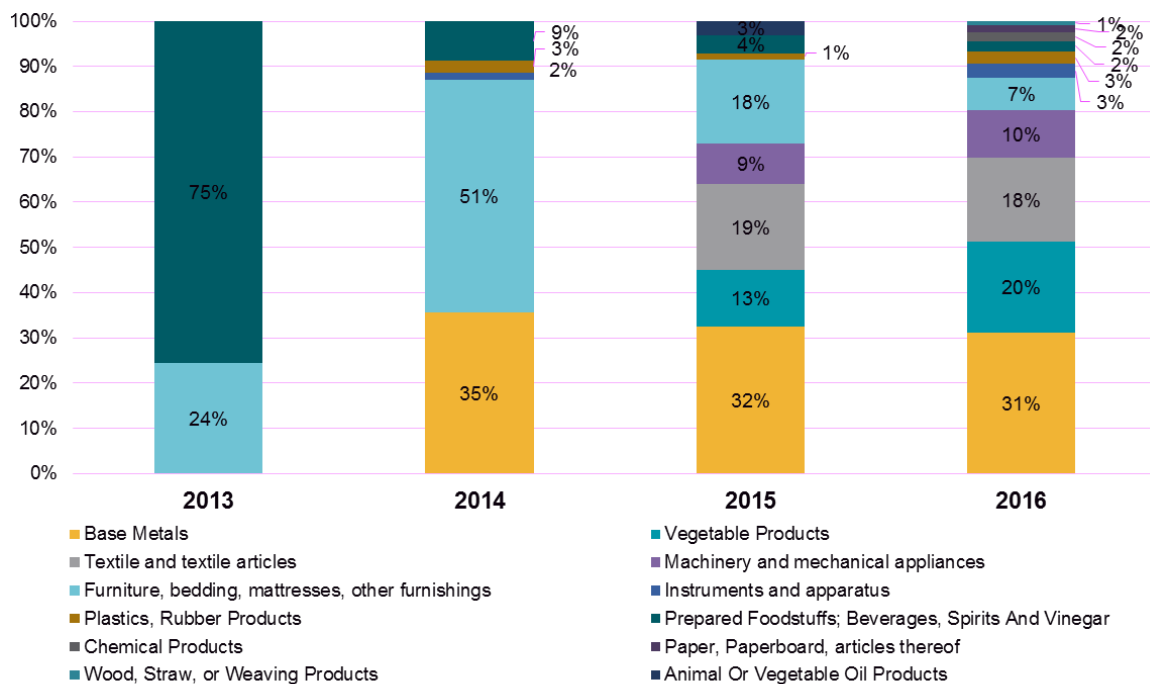


Table A.5 further shows that the KSEZ mainly imports raw inputs that are difficult to obtain in Rwanda. The biggest import is chemical products (16% of all imports in 2013, 62% in 2014, 41% in 2015 and 34% in 2016). This is followed by machinery and mechanical applications, which likely reflects initial setting-up costs for new factories (accounting for 20% of all imports in 2013, 4% in 2014, 12% in 2015 and 19% in 2016). Such a spike in (one-off) machinery imports may also be a likely explanation for the import spike in late-2016 (with a large number of new firms moving into the KSEZ). Mineral products (another important raw input) have become an important KSEZ import in both 2015 (16%) and 2016 (15%), while textiles have shifted over time (6% in 2013, 1% in 2014, and 10% in both 2015 and 2016). This is followed by a large number of other smaller, and potential one-off imported items.

3.4 Type of Firms Operational in the KSEZ

Figure 3.9 (Annex A3) provide an overview of the type of firms that moved into the KSEZ over time. There are four broad types of KSEZ firms: the largest share constitutes manufacturing firms, followed

³ Base metals (35%), prepared foodstuffs (8.6%), plastics and rubber (3%) and instruments and apparatus (2%).

⁴ These include base metals (32%), textile and textile articles (19%), furniture and bedding (18%), vegetable products (13%), machinery and mechanical appliances (9%) prepared foodstuffs (4%), animal and vegetable oil products (3%) and plastics and rubber products (1.4%).

⁵ The overall list includes base metals (31%), vegetable products (20%), textiles (18%), machinery and mechanical appliances (10%), furniture and bedding (7%), instruments and apparatus (3%), plastics and rubber (3%), prepared foodstuffs (2.2%), chemical products (2%) and paper products (1.5%).

by warehouses, 'other' firms (including construction, software and retail) and support services (security, electricity and banking). The share of manufacturing firms (ranging between 75-80% up to early 2015) has gone down to 66% by end of 2016 (Figure 3.7A). This has mainly been taken up by warehousing, whose share in the KSEZ has risen steadily from 8% in early 2013, to almost 20% from 2015 onwards. The 'other' firms mostly started in 2013, and so their share in the KSEZ has declined over time from 17% in 2013 to 9% in 2016 (Figure 3.7A). Finally, support services only started in 2015 (Figure 3.6), and cover 7% of all operational KSEZs by end of 2016 (Figure 3.7A).

Figure 3.9: KSEZ Firm Types (2013q3 – 2016q4), Source: Authors

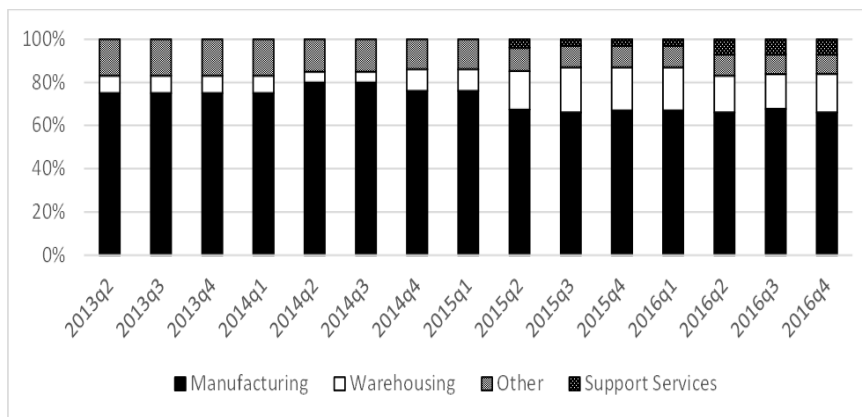
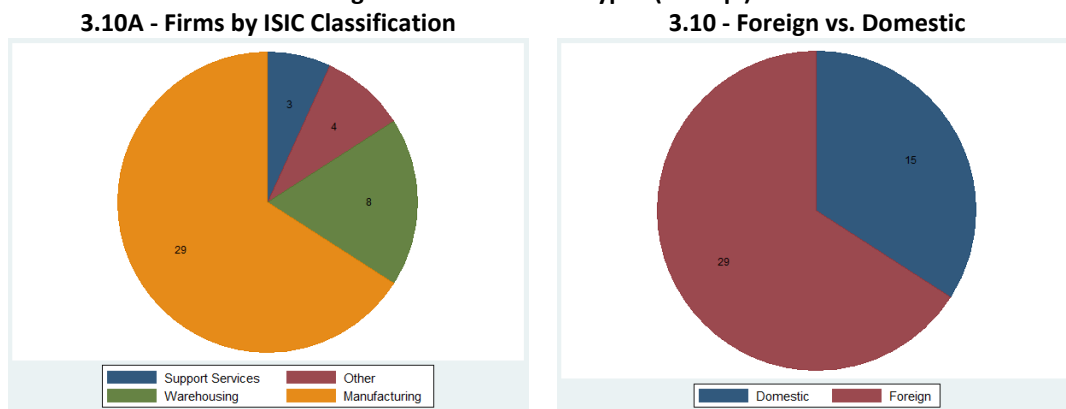
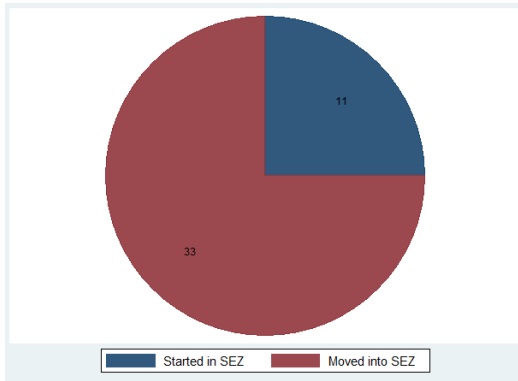


Figure 3.8B shows that by the end of 2016 the KSEZ is still dominated by foreign firms, which make up 66% (29 firms) of the total, while 34% (15) are domestic firms. This mainly includes firms from India (8, 18%), China (7, 16%), Tanzania (4, 9%) and then firms from another 9 different countries. From 3.8C we see that three-quarters of all KSEZ firms (33/44) were operational in Rwanda before moving into the zone, while a quarter started operations in the KSEZ. Lastly, Figure 3.8D shows that there is a broad split in KSEZ firm size, with 55% (24) small companies, 18% (8) medium-sized companies and 27% (12) large firms.

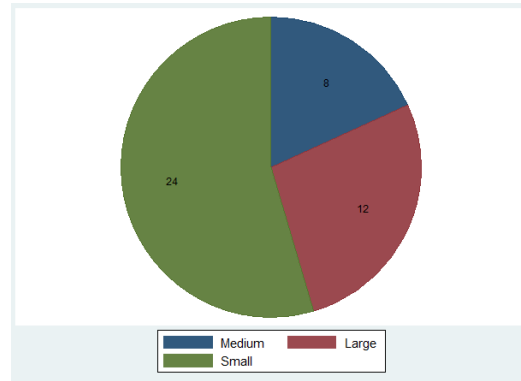
Figure 3.10: KSEZ Firm Types (2016q4)



3.10C - Started vs. Moved into SEZ



3.10D - Firm Size



3.5 Summary

This chapter has provided an overview of the history and the descriptive statistics for the KSEZ. Although, the KSEZ is still young (having been established only in 2013), the Government of Rwanda has put considerable efforts into developing its policy and legal framework. The KSEZ is still taking shape, with only a few firms currently operational in the second phase and with important innovations planned.

We find that firms located in the KSEZ make a significant contribution to the aggregate economic outcomes for Rwanda. This is true in terms of permanent employment and domestic sales, where the KSEZ makes up sizeable share of Rwanda's totals. It is also true of KSEZ's international trade. We find that in recent years, the KSEZ has made up around 4.5% of all national exports, and that it is increasingly diversifying the type of export products over time. We also find that KSEZ firms rely more on imports than other firms (likely because such imported goods are not available domestically), and so also make up an important share of the import bill. Overall, the KSEZ has made a positive contribution to Rwanda's trade balance in almost all quarters. The one exception relates to the late 2016, but imports likely exceeded exports at this time due to requirements associated with establishing new factories (e.g. purchase of machinery) for a new set of KSEZ firms. Lastly, this chapter also shows that KSEZ firms differ in important ways from other firms. For instance, they appear to be more likely to be manufacturing companies, are more likely to be foreign-owned and also appear larger than most firms that operate outside of the KSEZ.

Following these findings, we can now seek to shed light on the causal impact of moving into the KSEZ on firms' behaviour. This is the topic of the next chapter.

4. The Impact of Kigali Special Economic Zone on Firm Behaviour

4.1 Econometric Strategy

The aim of this chapter is to establish the causal impact of moving into the KSEZ on firms' outcomes. The challenge in doing so is that we expect that KSEZ firms are different from non-KSEZ firms in important ways. For instance, the previous chapter noted that initial KSEZ firms were specifically selected for having an added value above 35%, turnover exceeding RwF 500,000 and at least 30 permanent staff. While subsequent firms were able to move into the KSEZ based on their own choice (they had to purchase the land, and it was allocated on a first-come-first-serve basis), we still expect these firms to be *more productive, have higher turnover and have more staff* than non-KSEZ firms. This makes a simple comparison over time between KSEZ firms and non-KSEZ firms invalid. To deal with such endogeneity challenges, this study will follow the three-part approach adopted in Arnold and Javorcik (2009).

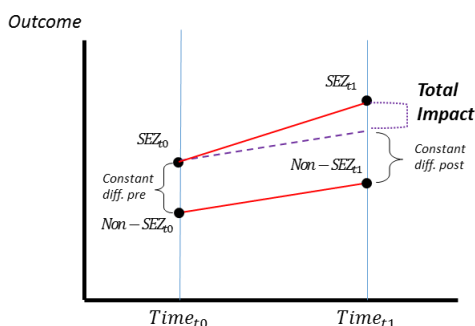
The first part to this is to focus only on those KSEZ firms that were initially *not* in the KSEZ and then *moved into* the KSEZ (enabling pre-and-post firm-level comparisons over time). For the purpose of this study, this means restricting the sample to only 20 firms for which we have a consistent, balanced dataset with at least 6 financial quarters *preceding*, and 6 financial quarters *following* the move into the KSEZ (13 time periods in total). The benefits to differencing over time is that it allows us to eliminate the influence of all observable and unobservable non-random elements of the KSEZ movement decision that are constant or strongly persistent over time.

The second part of the strategy relies on difference-in-differences, which enables comparison of KSEZ firm performance to non-KSEZ firm performance over time (explained in Box 4.1).

Box 4.1 What is Difference-in-Differences?

Difference-in-differences is an econometric strategy that compares the outcome of a treatment and control group at two or more different time periods both *pre-* and *post-*treatment. The key assumption underlying this approach is that in the absence of treatment (location in the KSEZ) the treated firms would have followed the path of the control firms. If this assumption holds, then the impact of moving into the SEZ equals to $(SEZ_{t1} - SEZ_{t0}) - (Non - SEZ_{t1} - Non - SEZ_{t0})$

This is visualised in the graph below. Here, the red line gives the observed outcome for SEZ and non-SEZ firms. By removing the initial SEZ/non-SEZ difference from the outcome, the purple line gives estimated *outcome of the SEZ firms had they not moved into the SEZ*. The remaining difference over time is considered to be the treatment effect (Angrist and Pishke, 2008).



To further account for the selection bias of KSEZ versus non-KSEZ firms, a third part of the strategy is introduced. This aims to account for the different 'type' of KSEZ firms either by creating a designated, comparable control group (Arnold and Javorcik, 2009)

Model 1: Fixed Effect Regression with Difference-in-differences

In the first baseline exercise, we compare the changes in outcomes of the treated firms (i.e., those joining the KSEZ) to the outcomes observed in the rest of the firm population. To take into account shocks specific to different sectors occurring at different points in time, the regression controls for sector*quarter fixed effects. The following model is estimated:

$$\Delta Y_{isq} = \tau \Delta SEZ_{isq} + \delta_{sez=1} + \Delta \theta_{sq} + \Delta \varepsilon_{isq} \quad (1)$$

The operator ' Δ ' denotes a differenced outcome variable. i denotes firm, s sector and q the quarter when the outcome is observed. We take the difference relative to the value observed 6 quarters before (e.g. $\Delta PermEmp_{isq} = PermEmp_t - PermEmp_{t-6}$), which means that for the periods when a firm is observed in the KSEZ the growth rate is always expressed relative to the pre-KSEZ period. ΔSEZ takes on the value of one if firm i operates in the KSEZ in a given quarter, and zero otherwise. δ is a dummy for treated firms which is intended to capture differential trends in outcomes for such firms. θ is a dummy capturing any sector- and quarter-specific shocks. They also take into the impact of seasonality on a given industry. τ is the variable of interest intended to inform us about the impact of moving to the KSEZ on the outcome Y (under the assumption of no firm-specific, time-varying shocks that are correlated with the timing of moving into the KSEZ).

Model 2: Propensity Score Matching with Difference-in-differences

Our second approach addresses the selection bias by using propensity score matching (PSM). This restricts the comparison to differences within carefully selected pairs of firms with similar observable characteristics prior to treatment. Each pair thus consists of a KSEZ firm and a non-KSEZ firm with similar observable characteristics in the periods preceding the KSEZ firm's move into the KSEZ, as shown in model 2:

$$E(Y_{t1} - Y_{t0} | SEZ=1) = (E(Y_{t1} | SEZ=1) - E(Y_{t0} | SEZ=0)) - (E(Y_{t0} | SEZ=1) - E(Y_{t0} | SEZ=0)) \quad (2)$$

This model thus seeks to construct a missing counterfactual (the outcome of KSEZ firms if they had not moved into the KSEZ). This is done through comparison with firms that share a similar *ex ante* propensity (likelihood) of moving into the KSEZ based on a vector of observable characteristics. This provides an unbiased estimate of the treatment impact as long as "the relevant differences between any two units are captured in the observable (pretreatment) covariates, which occurs when outcomes are independent of assignment to treatment conditional on pretreatment covariates" (Dehejia and Wahba, 2002).

The propensity score is the predicted probability of moving into the SEZ, where a vector of dummies capturing quarterly time-periods, industrial sectors, tax centre types (large, medium or small) and firm age serve as explanatory variables. The underlying idea is that for each firm that moved into the KSEZ we find a control firm similar in terms of observable characteristics (and thus the likelihood of moving into the KSEZ) that did not move into the KSEZ. Thus the underlying assumption is that in the absence of relocation to the KSEZ, the treated firm would have behaved in the same way as the control firm. Once the control group is found we estimate Model 2 on the subsample containing the treated and the matched controlled firms.

4.2 Outcome and Treatment Variables

To identify the impact that the KSEZ has on firm behaviour, we have selected twelve different outcome variables for the analysis. The first six are focused on the firms' overall performance,

including a firm's quarterly (logged) sales, (logged) value-added⁶ (sales minus product input costs), the share of value-added in sales, the (logged) number of permanent employees⁷ and the (logged) total pay for permanent employees.⁸

The second six outcome variables relate to KSEZ firms' quarterly involvement in international and domestic trade.⁹ They include their export status in a particular quarter, the (logged) value of goods exported, and the (logged) value of domestic sales. They further include the import status in a particular quarter, their (logged) value of goods imported and the (logged) value of local purchases.

Because firms moved into KSEZ in different years, our overall treatment variable is not focused on a specific time-period, but on the financial quarter that a firm moved into the KSEZ and beyond. We will use two different outcome variables. The first is a binary, which captures the average impact of moving into the KSEZ for 6 quarters, compared to 6 quarters previously.¹⁰ The second measure breaks this down, comparing year 1 and year 2, and estimating effects for each quarter separately.¹¹

4.3 Fixed Effects Regression Results (Model 1)

Based on the fixed effects model described above, the top panel in Table 4.1 provides the overall estimated impact of moving into the KSEZ over the first year-and-a-half (6 quarters), compared to 6 quarters previously. The results suggest that moving into the KSEZ is associated with large, statistically significant increases in KSEZ firms' overall sales (186% increase) and total value-added (154% increase), so that the overall share of value-added in sales (a measure related to profitability) also increased by about 7%. Aligned with this expansion of firm output, moving into the KSEZ is also associated with an increase in permanent employment of about 20%, though we find no significant impact on either the share of value-added per worker, or the average employee pay.

Interestingly, Table 4.1 suggests that moving into the KSEZ has no statistically significant impact on a firm's probability of exporting or the value of firms' exports. Instead, the expansion in output is driven through higher domestic sales (increasing more than 200% over the 6 quarters). In terms of purchase of inputs, the opposite is occurring; moving into the KSEZ is associated with a 13% higher likelihood of being an importer and increasing the overall amount of imports by 220%. There is no statistically significant increase in the amount of local inputs purchased.

The middle and bottom panel provide a breakdown of these result by year 1 (quarter 1-4) and year 2 (quarter 5-6). This suggests that the increase in sales is driven by the first year, which may thus be explained through initial start-up benefits of the KSEZ or initial increase in overall capacity. With the breakdown of results (covering a small number of KSEZ firms), the impacts on value-added turn statistically insignificant. However, the overall effect of KSEZ on employment remains robust and seems to increase over time (from 21% in year 1, to an overall increase of almost 35% by the end of

⁶ This measure of value-added is defined as sales minus input costs, and thus does not reflect other operational costs such as personnel, rent and financial expenses.

⁷ The study was restricted to permanent employees only due to known data limitations, unreliability and volatility of employment of temporary workers using the (Pay-As-You-Earn) tax database.

⁸ This measure includes all employees' basic pay, allowances in cash received, in-kind benefits received and all other form of remuneration that is subject to Pay-As-You-Earn tax liability.

⁹ This only includes firms' self-reported amount of goods sold or purchased for exports, imports and the domestic market through the Value-Added Tax database, and is not corroborated with other trade datasets.

¹⁰ This assumes a general effect, where moving into the KSEZ improve firm performance that persist over time.

¹¹ This can assess if the overall effect relates to the time a firm has been inside the KSEZ, either through an initial impact which wears off over time (a level-effect), or by growing in impact over time (a growth-effect).

6 quarters, compared to non-SEZ firms). In terms of employment pay, there appears to be some fluctuation over time, but cancelling each other out over the two time periods.

Table 4.1 OLS with Sector*Quarter Fixed Effects and Difference-in-Differences

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Log Output	Log Value Added	Value Added Share	Log Perm. Emp. Number	Log Value Added Per Worker	Log Perm. Emp. Pay	Prob. of Exporting	Log Exports	Log Local Sales	Prob. of Importing	Log Imports	Log Local Purchases
Move Into SEZ (Q1-6)	1.864*** (0.609)	1.541*** (0.587)	0.0731* (0.0387)	0.205** (0.0815)	0.390 (0.333)	0.00112 (0.0433)	-0.0218 (0.0431)	-0.495 (0.725)	2.157*** (0.590)	0.130** (0.0651)	2.203** (1.028)	0.687 (0.689)
Observations	179,149	170,503	179,149	70,792	60,661	64,368	179,149	179,149	179,149	179,149	179,149	179,149
R-squared	0.011	0.011	0.012	0.023	0.019	0.055	0.006	0.007	0.011	0.006	0.007	0.010
SEZ Year 1 (Q1 to Q4)	1.369** -0.654	0.823 (0.625)	0.0332 (0.0412)	0.210*** (0.0801)	-0.239 (0.247)	-0.120*** (0.0350)	-0.0543 (0.0483)	-0.996 (0.768)	1.840*** (0.663)	0.0475 (0.0685)	0.850 (1.098)	1.027 (0.625)
Observations	213,191	202,624	213,191	82,358	70,260	74,636	213,191	213,191	213,191	213,191	213,191	213,191
R-squared	0.009	0.010	0.009	0.017	0.015	0.051	0.006	0.006	0.009	0.005	0.005	0.008
SEZ Year 2 (Q5 to Q6)	0.573 (0.858)	-0.0524 (0.747)	0.0244 (0.0627)	0.344** (0.148)	0.187 (0.397)	0.120** (0.0552)	0.00792 (0.0729)	0.159 (1.265)	1.230 (0.901)	0.227** (0.108)	3.410** (1.689)	0.981 (1.183)
Observations	179,149	170,503	179,149	70,792	60,661	64,368	179,149	179,149	179,149	179,149	179,149	179,149
R-squared	0.011	0.011	0.012	0.023	0.019	0.055	0.006	0.007	0.010	0.006	0.007	0.010

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

In terms of trade, the KSEZ appears to sell more to the local market in both periods, though it is only significant in the first year. In contrast, the main effects on input purchases lies with imports rather than local purchases, but mainly in the second year (where the probability of being an importer increases by 23% compared to non-SEZ firms, and total import amounts increase by over 300%).

4.4 Propensity Score Matching Results

As there may still be some residual bias in the first model, we will now describe the results from estimates using Propensity Score Matching together with difference-in-differences.

First Stage

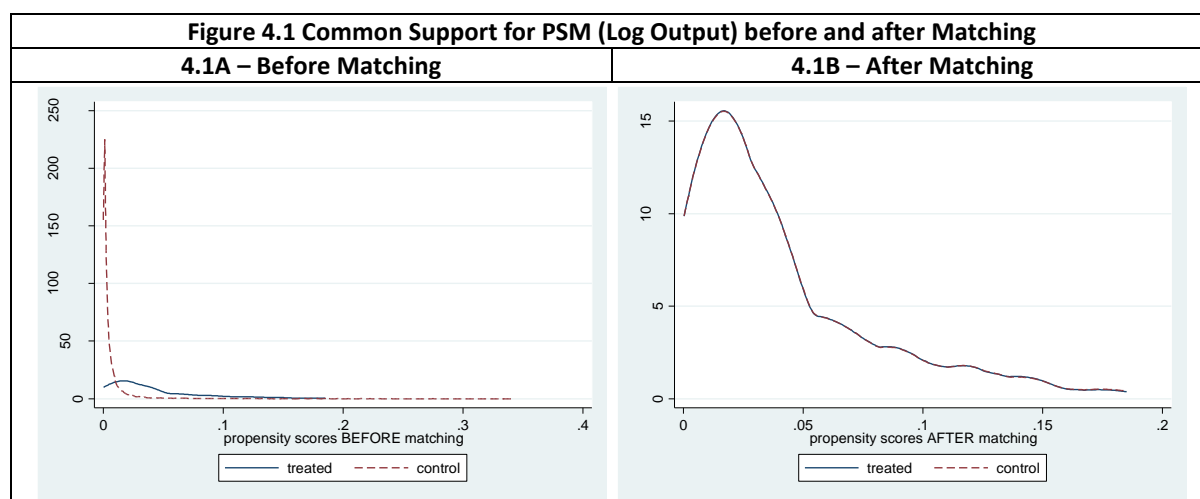
In the first stage of the PSM, we seek to estimate the propensity of moving into the KSEZ, based on the pre-KSEZ observable characteristics. Here we use all the outcome variables, lagged by six quarters, together with taxpayer size, firm age, and individual dummies for sector and quarter.

The results are shown in Table A.6 below, which should be seen as descriptive statistics only. This suggests that the best *predictors* of moving into the KSEZ include the overall amount of value-added (indicating that such firms are larger than non-KSEZ firms) and their likelihood of importing goods (though in smaller amounts than others, possibly indicating small repeated interactions). The firms tend to be a little older than the average firm. From the sector*quarter fixed effects (not shown in Table A.6), they are unsurprisingly more likely to operate in specific sectors (especially manufacturing) and enter in the later time periods (from 2012 onwards). With an overall pseudo-R-squared of 0.18, this suggests that the first-stage model offers a reasonable predictor of moving into the KSEZ.

Common Support

In the second-stage, PSM then compares treated firms (those that went into the KSEZ) to the comparable control firms (those that are similar but did not enter into the KSEZ). This is done using a nearest-neighbour estimator which uses a KSEZ firm’s closest control comparison on propensity scores. The estimate is restricted to the common support (overlapping propensity score) only.

Because of the large number of control versus treated firms, we see that before matching (Figure 4.1A), there is a larger spread of control propensity scores (ranging from 0-0.341) than treated scores (ranging from .0002-.185). After matching and restricting the sample to the common support, we see from the kernel graph that there is a very tight overlap between treated and control across the whole range. This suggests that based on observables, there are sufficient comparable control non-KSEZ firms to KSEZ firms to provide an unbiased comparison.



Estimated Impact

The overall estimated impact of moving into the KSEZ using PSM with Difference-in-Differences are presented in Table 4.3.

First, to check if the PSM provides a suitable control group, we compare the means in the overall outcomes in the treated and the control group in the six quarters *preceding the move into the KSEZ*. For all 12 outcome variables, we cannot reject the hypothesis that there is no statistically significant difference between the two groups prior to the treatment, suggesting that the matched control firms are indeed comparable to the treated one and thus the PSM approach appears to work well.

Then, considering the overall treatment effect, we see that moving into the KSEZ is associated with a large increase in output and value added (over 200%), which similarly increases the share of value added for output by about 9%. In addition, permanent employment number also goes up by about 17.5% so that in this estimation even the value-added per worker goes up considerably (suggesting possible productivity improvements). Moving into the KSEZ is also not associated with any change in employment pay.

In terms of trade, a similar pattern emerges here as in the previous model. The change in sales is primarily driven by increased domestic sales, with no significant effect on either the probability of exporting or the value of exports. However, for input purchases we see that moving into the KSEZ is associated with a 16% increased probability of importing and over 260% increase in the value of imports, though the value of local purchases also goes up considerably (190%).

The main impact on sales and value-added appears to arise in the second year, which also provides the only statistically significant impact on the value-added share and value-added per worker (thus suggesting potential learning effects from being in the KSEZ). The total number of employees is comparable though slightly higher in year two (+27% versus +30%, respectively). For employment pay, there appears to be a minor decrease in salary for the first year, but this again become insignificant in the second year. Unfortunately, when broken down by year, most impacts on the trade outcome variables turn are not precisely estimated, though the sign of most of the variables remain the same (no real impact on exporting, higher likelihood of importing and greater local purchases).

Quarterly Estimates

We can further break down these results by quarters, though results should be interpreted with caution because for the resulting small treatment sample size, estimates lose power and may thus become statistically insignificant. It may also over-emphasize shifts for any particular firm, either through an unrelated reason, or due to seasonal effects.

In Table A.4 we see that most estimates lose significance for all but one period. Generally the effect seems to be most pronounced at the end of the first year (q3 and q4). This is true of output and all measures of value added. Employment numbers are similar in size to previous estimates, but now turn insignificant. For trade, there appear to be large differences between quarters; across two quarters (q3 and q5) there may be some increase in exports (driven by a small number of firms), while imports are most pronounced for the 6th quarter. Moving into the KSEZ seems to be associated with higher local purchases across most time periods (and statistically significant for quarter 3-5). These results are further visualised in Figure A1-A12 in the Annex.

Table 4.3 Propensity Score Matching with Difference-in-Differences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	Log Output	Log Value Added	Value Added Share	Log Perm. Emp. Number	Log Value Added Per Worker	Log Perm. Emp. Pay	Prob. of Exporting	Log Exports	Log Local Sales	Prob. of Importing	Log Imports	Log Local Purchases
Pre-SEZ (Q-6 - Q-1)	0.301	0.348	0.0140	0.192	0.138	0.385	-0.0109	-0.199	0.751	0.109	1.664	0.662
	(0.492)	(0.521)	(0.0485)	(0.207)	(0.412)	(0.246)	(0.0679)	(1.252)	(0.749)	(0.0728)	(1.229)	(0.822)
Observations	184	184	184	184	184	184	184	184	184	184	184	184
Move In SEZ (Q1 to Q6)	2.061***	2.012***	0.0932*	0.175**	1.360***	-0.281	0.0326	0.608	1.476*	0.163**	2.624**	1.897**
	(0.676)	(0.685)	(0.0473)	(0.0836)	(0.513)	(0.188)	(0.0543)	(0.926)	(0.834)	(0.0815)	(1.293)	(0.815)
Observations	170	170	170	166	166	166	170	170	170	170	170	170
SEZ Year 1 (Q1 to Q4)	0.578*	0.519	0.0380	0.267***	0.211	-0.119*	0.0159	0.362	-0.272	1.350	0.821	0.578*
	(0.328)	(0.394)	(0.0492)	(0.0815)	(0.364)	(0.0623)	(0.0615)	(1.001)	(0.453)	(1.390)	(0.666)	(0.328)
Observations	126	126	126	124	124	124	126	126	126	126	126	126
SEZ Year 2 (Q5 to Q6)	1.812**	2.444***	0.171*	0.296**	1.738**	-0.400	0.188	3.519	-0.510	0.188	2.586	1.058
	(0.810)	(0.852)	(0.0863)	(0.144)	(0.716)	(0.397)	(0.114)	(2.117)	(1.113)	(0.157)	(2.454)	(1.428)
Observations	64	64	64	62	62	62	64	64	64	64	64	64

4.5 Summary

By analysing the change in firms' quarterly tax returns associated with the timing of moving into the KSEZ, we were able to provide an estimate of the impact of the KSEZ on firm behaviour.

Broadly speaking, the two models (fixed effects and propensity score matching) provide comparable results among most of the outcome variables, both in terms of size and significance of moving into the KSEZ. This suggests that the two models appear to be relatively robust to any specification bias, and can meaningfully estimate the impact of moving into the KSEZ on firm behaviour.

Our overall estimates suggest that moving into the KSEZ is associated with a larger increase in sales, value-added and employment than would have been the case had such firms not moved there (compared to similar firms who did not move into the KSEZ). The estimates further suggest that such output-growth is primarily driven by domestic sales rather than exportation. We also find that moving into the KSEZ is associated with an increased probability of importing goods, as well as importing a higher value of inputs, which may provide one of the explanations for the initially suggested improvement in firm outcomes.

5. What makes the Kigali Special Economic Zone ‘Special’?

5.1 Overview

The previous chapter found that moving into the KSEZ is associated with a larger increase in sales, value-added and employment than would have been the case had such firms not moved there. Moreover, we found that KSEZ tends to not to be associated with increased exports, though it does appear to lead to greater imports. This chapter seeks to explain why this is, by analysing the special provisions that the KSEZ provides. Here we will analyse the five potential benefits for SEZs identified in chapter 2:

1. Infrastructure/utilities provision
2. Tax incentives
3. Trade facilitation
4. Business regulation/investment aftercare
5. Agglomeration effects/knowledge spillovers

To identify the major benefits and disadvantages to being in the SEZ, this chapter relies on document reviews, together with interviews with a select number of KSEZ firms, SEZAR and PEZ and an overview of tax incentives from firms’ annual Corporate Income Tax returns.

5.2 Infrastructure/Utilities Provision

Given that the KSEZ started as an industrial park, the main emphasis of its benefits tends to be around the provision of key infrastructure and utilities. According to the RDB (2015), these include:

- Access to land
- Onsite and offsite roads and links to airports and main roads
- Reliable utilities: power, water and sanitation
- ICT infrastructure
- Office space

Notably, all these “access to infrastructure” elements are all considered as a key investor concern in Rwanda, as noted by MINICOM’s (2013) Private Sector Development Strategy.

Land

As noted in chapter 2, land prices have shifted considerably over time. In Phase 1 these cost around RwF 20,000 (USD\$24) per m², which was raised for Phase 2 to RwF 43,000 (USD\$51) per m². Most firms report that this price is on the high side, particularly for Phase 2, where the difference between current land prices inside and outside KSEZ were considered to be too large. Land cost was also an issue because the KSEZ was seen to be relatively far outside of the Kigali town centre. With limited transport opportunities, this meant that firms needed to have a separate office in town for their sales and human resource staff. Though several firms also considered these initial costs to be manageable, and fairly reflected the additional benefits provided by the KSEZ, further supported by the current absence of KSEZ management fees (see below).

Yet, another set of firms reported that their move into the KSEZ was not strictly voluntary, and was initiated primarily due to a change in Kigali zoning regulation, which prevented them from operating outside of the KSEZ. As such, access to land is not specifically beneficial in the KSEZ as elsewhere.

Roads

The construction of roads was the first element to be complemented by Prime Economic Zones (PEZ) in the development of both phases of the KSEZ. There is general agreement that all the plots are well laid out and because of high-quality roads and also easily accessible for most trucks. The only current limitation is that the offsite roads are restricted to trucks with a maximum axle weight of 30 tonnes, so that some firms reported to splitting up their normal goods across more trucks than they would do otherwise. However, this restriction also makes it comparable to the rest of Rwanda's (high quality) road network, and so does not constitute a major KSEZ limitation. Access to good roads is especially important given the import trade facilitation that most KSEZ firms receive (see below).

One remaining challenge in terms of road access is the lack of reliable public transportation into the KSEZ, which combined with the distance to other parts of the city, can make it difficult for employees to come to work or go out for lunch. Both are common firm complaints about the KSEZ.

Electricity

For electricity provision, the PEZ only provides the initial connection, but the overall supply is handled by the national electricity company (EUCL). From interviews, it is clear that electricity provision has improved considerably. Initially, there were reported challenges with high voltages that led to damages to machines, with occasional interruptions. Yet the reliability has improved more recently, and the EUCL now prioritises the KSEZ in electricity provision (thus limiting the damage due to load shedding). This means that most KSEZ firms that are not energy-intensive now report that they have access to reliable electricity and do not have to use a generator.

One remaining challenge relates to the size of the supply, which is restricted to only 250kWh per business, though one business reported needed up to 400kWh for its operations. As a result, they had to purchase their own transformer (at a cost of USD\$ 1 million). PEZ should seek to raise the limit towards overall electricity provision, so that any firm who wishes to expand their operations in the future will not be restricted by this electricity limit.

Table 5.1 New Electricity Prices in Rwanda, Source (RURA, 2016)

Consumption (kWh) block/month	Unit	Price in RwF (VAT exclusive)
1. RESIDENTIAL CUSTOMERS:		
[0-15]	RwF/KwH	89
[>15 – 50]	RwF/KwH	182
>50	RwF/KwH	189
2. NON- RESIDENTIAL CUSTOMERS		
[0 -100]	RwF/KwH	189
>100	RwF/KwH	192
3. MEDIUM INDUSTRIES: (0.4 Kv<V≤15kV)		
Energy charge	RwF/KwH	90
Max. Demand Charge (17H00- 23H00) Peak	Rwf/KVA/month	10,470
Max. Demand Charge (08H01'- 16H59') Shoulder	Rwf/KVA/month	5,588
Max. Demand Charge-(23H01' – 08H) Off-Peak	Rwf/KVA/month	1,892
Customer Service Charge	RwF/Customer/Month	3,125
4. LARGE INDUSTRIES: (15 kV<V≤33kV)		
Energy charge	RwF/KwH	83
Max. Demand Charge (17H00- 23H00) Peak	Rwf/KVA/month	7,184
Max. Demand Charge (08H01'- 16H59') Shoulder	Rwf/KVA/month	4,004
Max. Demand Charge-(23H01' – 08H) Off-Peak	Rwf/KVA/month	1,086
Customer Service Charge	RwF/Customer/Month	3,125

Another challenge relates to electricity prices, which are the same inside and outside the KSEZ. The

overall rates have shifted considerably over time. In 2015, a new electricity tariff was introduced where the price jumped from RwF134/kWh to RwF 182/kWh. This made electricity costs in Rwanda to be considerably higher than neighbouring countries (UNIDO, 2016), and affected competitiveness. Rwanda Utilities Regulatory Agency (RURA, 2016) then introduced new tariffs from 1 January 2017. Rather than providing one price, it combined designated industrial prices (RwF90/kWh for medium-sized industries) with three different peak surcharges; peak, shoulder and off-peak (Table 5.1). This provides new opportunities for energy-intensive industries that may be able to shift operations to off-peak times. Through interviews, firms reported that the change is not large enough to warrant shifting operational times, and so they end up paying roughly similar electricity prices in 2017 as they had been in 2016. Costly electricity thus remains a challenge, both inside and outside the SEZ

Water and Sanitation

For water and sanitation, the SEZ has three separate networks: a potable water network for drinking, a fire-fighting water network and a gardening water network from treated waste water from the sewage centre. According to the PEZ, the SEZ is the only industrial location in Kigali with a designated sewage network. Prime Economic Zone provides access and infrastructure, while the Water and Sanitation Corporation (WASAC) handles the water supply and charges for water use. Water tariffs are the same in the SEZ as elsewhere, and were generally not seen as a challenge.

In terms of water reliability, KSEZ firms' (from both Phase 1 and Phase 2) provided notably different responses. For some firms, this was seen to be reliable, though for others this was a major ongoing concern, with water-access being on-and-off for long periods of time. For instance, one firm reported that during 2016, some plots in the KSEZ had no access to water for over one-and-a-half month. This suggests that at least for some plots, PEZ can improve water provision.

ICT infrastructure

The first phase of KSEZ was one of the first in the country to access fibre-optic internet, yet it is now also available elsewhere. For that reason, most firms did not report internet access as a key benefit. Such internet was also considered to be expensive relative to other countries. Full coverage of fibre-optic internet is expected to be completed throughout 2017 for the second phase of the KSEZ, where it will likely be more important (especially with the establishment of the ICT Park).

Office Space

Most KSEZ firms only purchased an empty plot, and then had to spend considerable resources in developing this plot to construct a designated facility. The only exception to this relates to a MINEACOM project focused on five large-scale exporters. One of these companies is already operational in the KSEZ, while the other four are expected to move into the KSEZ by late-2017. For these firms, MINEACOM is directly supplying "Advanced Factory Units" (AFUs). These AFUs provide firms with 'plug-and-play' operational facilities by provision of ready-made factory and office buildings that have all their fittings and connections to access water, electricity and sewage facilities.

Summary

In sum, while there are potential areas of improvement, the KSEZ does provide an advantage over other areas of Kigali in terms of access to infrastructure and utilities, with initial connection costs that are subsidised and facilitated through the PEZ, and which also tends to be more reliable and of higher quality than plots elsewhere. Yet KSEZ firms do not receive any subsidies to the supply of utilities and pay the same fees as all other Rwandan firms of comparable size. However, land is not necessarily more competitive, and many firms also move into the KSEZ due to zoning regulation rather than choice.

5.3 Tax Incentives

The 2010 SEZ Policy (MINICOM, 2010) also initially suggested introducing designated SEZ tax incentives that would help make it more competitive and differentiated from competitor locations both within and outside Rwanda (including Kenya and Tanzania). This was justified on the basis that such tax incentives would attract and formally register additional firms, which would increase tax collection, so that such incentives would pay for themselves. Yet the SEZ Policy also noted that introducing targeted incentives or tax holidays can result in market distortions, enforcement problems and increased complexity of the tax code. Ultimately, the Policy proposed a flat 15% Corporate Income Tax rate for all SEZ firms (instead of the normal 30%) plus duty exemptions for all imported goods. This was seen to be easily enforceable, and its market demand analysis suggested this would be low enough to make the SEZs competitive and attractive to investors.

Initial Tax Incentives

However, the 15% SEZ rate was never implemented. Instead, only those firms that export at least 80% of their outputs were eligible to obtain an Export Processing Zone (EPZ) license (with 0% CIT). Yet, this incentives applied to all firms that meet the export criteria and are not exclusive to the SEZ.

There were also a number of other (non-SEZ specific) tax incentives for the corporate income tax. These include a special set of deductions: 2-7% for large employers, a 20-28% discount for firms that were publicly listed on the Kigali Stock Exchange, and a 0% CIT rate for 5 first years of establishment of microfinance and venture capital firms (Bode, Lohmann and Steenbergen, forthcoming).

2015 Investment Code

From 2016 onwards, tax incentives were greatly simplified and incorporated in the 2015 Investment Code. These provides a reduced, 15% CIT rate for all recent investors (6 years and below) in specified “priority economic sectors” which includes energy, ICT, manufacturing, and financial services. The reduced 15% CIT rate also applied to all firms who export at least 50% of their goods, except for coffee, tea, and minerals (Bode, Lohmann and Steenbergen, forthcoming).

In addition, the new Investment Code retains a number of designated incentives (UNIDO, 2016):

- International companies that base their headquarters in Kigali, invest a minimum of USD \$10 million, and fulfil a number of other requirements, are CIT exempt for an unspecified time;
- Investors who invest at least USD\$ 50 million in priority sectors receive a seven-year tax holiday;
- Investors who invest at least USD\$ 50 million in priority sectors receive a 50% accelerated depreciation rate.
- Excise tax has been eliminated in Rwanda for all but nine products.

In return, the Investment Code repealed a large number of smaller deductions, including the 0% CIT for EPZ and venture capital firms, and CIT deductions for large employers and publicly listed firms.

All customs duty exemptions are agreed on the basis of the East African Community (EAC) Customs Management Regulations (EAC, 2008). This exempts all EPZs (firms exporting over 80% outside the EAC) from customs taxes, but makes all goods from the SEZ subject to regular EAC and national import duties. This tends to be 0% on raw inputs, 10% on intermediate goods and 25% on importing of final goods (UNIDO, 2016). However, there is also a designated “Duty Remission Scheme”, which allows all manufacturing firms to apply for exemptions on all imported goods that are either used for exports, or for approved goods for home consumption. Such applications are considered annually on a firm-by-firm basis by the Rwanda Revenue Authority, and so is somewhat discretionary. When a firm’s item list is approved these are then published in the EAC Gazette (RRA, 2017a).

SEZ Tax Incentives

Based on the methodology of another IGC study (Bode, Lohmann and Steenbergen, forthcoming), we can provide some indication of the type of fiscal expenditures/tax incentives¹² that SEZ firms use. This is divided into three different parts of the tax code: exemptions for customs, VAT and CIT deductions and discounts. Table 5.2 then provides an overview of all the CIT-eligible firms between 2013 and 2016 that have a positive amount of sales and identifies which number and share receiving any form of tax exemption, broken down by non-SEZ and SEZ firms.

Table 5.2 first shows that the overall number of non-SEZ firms that are eligible for any type of exemptions is very low. The most common exemption is for VAT (15%), which is not strictly a tax incentive. This is followed by import-duty exemption (9%). Very few firms (3%) has any form of CIT deduction, and only 46 companies (0.4%) received any form of CIT discount between 2013-2016.

However, Table 5.2 further shows that the number of exemptions received by SEZ-firms is also very low. By far the largest exemption here relates to import duty, which 65% of the SEZ sample receive. This is considerably higher than all non-SEZ firms (a 56% difference), which may be partly due to the larger manufacturing-bases in the KSEZ, but due to the discretionary basis of import duty-approval, could also reflect a better knowledge, understanding and likelihood of becoming a member of the Duty Remission Scheme (see below). SEZ firms further are more likely to have export-related VAT exemptions (not a direct tax incentive). Surprisingly, we see that from 2013 to 2016, only 3 out of 20 KSEZ firms analysed receive any form of CIT deduction, and only 1 KSEZ firm received a CIT discount. This further suggests that besides a potential benefit on *importing goods*, there is no clear tax incentive benefit to being in the KSEZ.

Table 5.2 Number of SEZ and Non-SEZ Firms Receiving Tax Exemptions (2013-2016)

		Non-SEZ Firms (CIT eligible)			SEZ Firms			Difference
		# Firms	# Firms with Exemptions	(% Firms)	# Firms	# Firms with Exemptions	(% Firms)	(% Firms)
CUSTOMS	Excise Duty	12,270	68	0.6%	20	1	5%	4%
	Import Duty	12,270	1,046	8.5%	20	13	65%	56%
VAT	Exempted	12,270	1,799	14.7%	20	4	20%	5%
	Zero-rated	12,270	166	1.4%	20	2	10%	9%
	Exports	12,270	171	1.4%	20	5	25%	24%
CIT	Deductions	12,270	412	3.4%	20	3	15%	12%
	Discounts	12,270	46	0.4%	20	1	5%	5%

We would also like to identify whether receiving tax incentives is only explained by the *type* of firm that enters the KSEZ (e.g. more likely to be a manufacturer, more likely to trade internationally), or whether moving into the KSEZ also provides *additional benefits* (above and beyond the firm type). To do so, we conduct simple regression analysis using this tax incentive database. Here we first try to filter out the role of sector and year using fixed effects. We then also provide a dummy variable for 'being an SEZ firm' (which is always 1 if a firm moves into the KSEZ at any time). The variable of interest is 'moving into the SEZ' (which is 0 before, and 1 when a firm moves into the KSEZ).

The results are shown in Table 5.3. This suggests that 'being an SEZ firm' is associated with a 12% higher likelihood of receiving import duty exemptions, some greater chance of selling zero-rated VAT

¹² Fiscal expenditures are defined as "all revenue losses arising due to concessions that fall outside regular tax system". Tax incentives are sub-set of fiscal expenditure which "are departures from the benchmark system that are granted only to those investors or investments that satisfy the prescribed conditions" (Zolt, 2002)

goods, and an 18% higher likelihood of receiving CIT deductions. Yet, when we consider ‘moving into the SEZ’, we see that only two types of exemptions are statistically significant. The KSEZ is associated with a 47% higher likelihood of receiving import duty exemption and a 28% higher likelihood of receiving VAT export exemptions. In other words, the results suggests that there are some exemptions (import duty, VAT export) that firms are more likely to receive when they move into the KSEZ. This likelihood is above and beyond what they were likely to have prior to entering the KSEZ.

Table 5.3 OLS with Sector*Year Fixed Effects - Likelihood of Receiving a Type of Tax Incentives (2013-2016).

VARIABLES	CUSTOMS		VAT			CIT	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Excise Duty Exemption	Import Duty Exemption	VAT Exemption	VAT Zero-rated	VAT Exemption (Export)	CIT Deductions	CIT Discounts
Moving into SEZ	0.0501	0.474***	0.0660	-0.0366	0.275***	-0.0358	0.0500
	(0.0345)	(0.102)	(0.0754)	(0.0733)	(0.0706)	(0.0938)	(0.0345)
Being an SEZ Firm	-0.00210***	0.123*	0.0608	0.110*	-0.00109***	0.180**	-6.42e-05
	(0.000557)	(0.0676)	(0.0499)	(0.0604)	(0.000356)	(0.0748)	(5.91e-05)
Fixed Effects	Sector* Year	Sector* Year	Sector* Year	Sector* Year	Sector* Year	Sector* Year	Sector* Year
# SEZ Firms	20	20	20	20	20	20	20
# All Firms	81,264	81,264	81,264	81,264	81,264	81,264	81,264
Obs.	232,308	232,308	232,308	232,308	232,308	232,308	232,308
R-squared	0.002	0.016	0.014	0.005	0.019	0.005	0.008

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Summary

There are officially no designated SEZ tax incentives which do not also apply to other firms as well. When we consider the KSEZ firms’ actual tax returns, this seems to be the case for most incentives. There are some tax incentives which are tailored specifically to the type of KSEZ firms (e.g. manufacturing benefits), but they are unrelated to the timing of moving into the KSEZ (and so for most KSEZ firms also applied before they moved into the KSEZ). The one exception to this lies with import duty exemption, whose benefit appears to increase considerably when a firm moves into the KSEZ. Given the discretionary nature in which the Duty Remission Scheme is operated, this may indicate that KSEZ firms receive favourable treatment in accessing this scheme (either through greater knowledge, or improved government ties). If this exists, it provides an important indirect benefit to being in the KSEZ and would help explain why moving into the KSEZ is associated with a large increase in imports (see chapter 4).

5.4 Trade Facilitation

Another classic benefit for being in an SEZ relates to trade facilitation. The SEZ Policy (MINICOM, 2010) noted that the SEZ seeks to speed up customs procedures by reducing documentation through a single declaration form, on-site customs officials, and by allowing SEZ firms to trade goods without having to pass through customs (and instead relying on spot-checks for inspection).

There are currently two types of this expedited release process in place. The ‘Blue Channel’ is eligible for importers of goods over a certain size who maintain proper accounts, and is relatively easily accessible. The more advanced version is known as the ‘Gold Card Scheme’, which is available to a select number of firms who have a good compliance record with Customs, maintain proper records

and have audited financial reports. Firms then have to apply into this Scheme, which is scrutinised by Customs and may be subjected to an accreditation audit, followed by a signed Memorandum of Understanding which sets out the obligations of the RRA and the participants (RRA, 2017b).

Many KSEZ firms mentioned such trade facilitation (especially on import of goods) as one of the main benefits, allowing them to import goods through the ports of Dar es Salaam or Mombasa, to be declared directly, and from there brought to the factory without needing additional inspections. This allows them to bypass the inland container depot known as Magerwa. It is thus expected that most KSEZ firms are members of either the 'Blue Channel' and/or the 'Gold Card Scheme'. Indeed, some mentioned that receiving information and support to access such schemes (e.g. through RDB) was regarded as one of the ways in which this was made possible and thus also provides a key benefit.

According to SEZAR, the KSEZ does not yet have an on-site customs official, but Phase 2 will have a designated One-Stop-Centre in the KSEZ by end of 2018, which will also include a customs bureau.

5.5 Business regulation/investment aftercare

Another important objective for the SEZ is to reduce firms' regulatory compliance costs. The 2010 SEZ policy notes that addressing this was one of the "main goals of the SEZ". This is done by offering investors with regulatory relief by limiting bureaucracy and streamlining processes for registration, permits, land titles, environmental impact assessments and customs clearances through a single dedicated zones regulator. As noted in the policy:

"In general, successful SEZs offer less bureaucracy. In Rwanda's context, it is particularly important due to the high cost of doing business. The aim of the policy is to ensure that the administrative processes which are the most problematic and incur the highest compliance costs are addressed in SEZs" (MINICOM, 2010, p. 61)

The main areas that the KSEZ has sought to streamline (besides tax administration and customs procedures mentioned above) include:

- Licensing of KSEZ users. Firms can easily obtain SEZ status through submission of a small number of documents to SEZAR and by reserving the specific land for purchasing.
- Land administration processes, such as those for issuing and/or approving deeds, plans, lease contracts and land titles. This is indirectly streamlined through the designated KSEZ land, which further speeds up changes in KSEZ ownership and land titles.
- Environmental Impact Assessment, construction permit, and certificate of occupancy processes, which would once again be indirectly streamlined by relying upon the strategic impact assessments already conducted upon zone land in the feasibility studies;

All these are primarily delivered through the One-Stop Centre which is currently housed in the RDB, but will move into the KSEZ Phase 2 by 2018 (see above). In addition, SEZAR as the primary regulator also seeks to facilitate the KSEZ relationship with the rest of government. This is mainly done in terms of information provision on new laws and regulation, for instance by inviting the KSEZ firms to stakeholder meetings, providing seminars, and visiting the KSEZ for updates. The RDB also at times invites potential customers to the KSEZ to meet firms in order to stimulate potential clientele.

In addition, several KSEZ firms mention that the RDB plays an important role for them in terms of *lobbying for policy change on the firms' behalf*. One example of this related to a re-introduction of VAT on a firm's specific input, which the RDB successfully managed to stop through dialogue and discussion with the RRA. For that reason, one KSEZ firm reports

“I can tell you that we are favoured. I see a big support from the government. They visit us many times, and tell us about any recent changes in policy. If we ask for their support, they give us their support”.

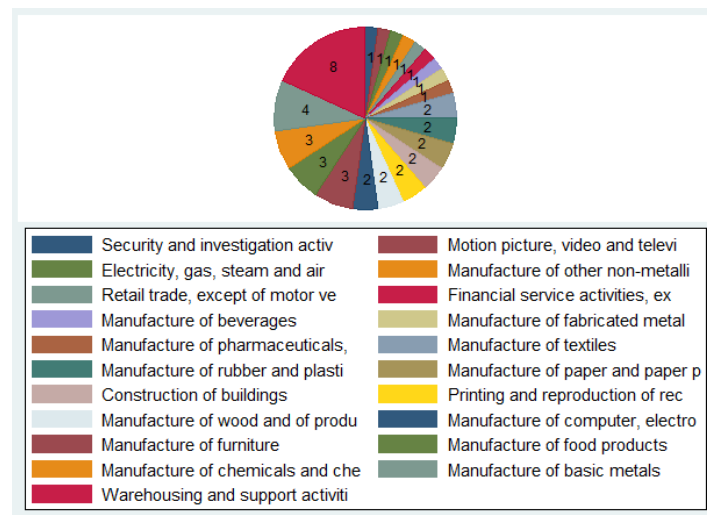
In sum, a key feature of the KSEZ is their overall regulatory support from the government, in terms of a more streamlined bureaucracy, receiving information on new laws and regulation, and in terms of taken into consideration their specific challenges and providing designated solutions.

5.5 Agglomeration effects/knowledge spillovers

A final possible benefit that firms might get from being in an SEZ relates to being nearby comparable firms, which may lead to knowledge spillovers and agglomeration effects (see chapter 2).

However, feedback from KSEZ firms suggests that they currently mainly operate independently, and see limited benefits in terms of sharing information (there is no regular meeting for KSEZ firms to come together and share challenges). Part of this reason may relate to the wide number of firm types that are currently operating in the KSEZ (see figure 5.1). Besides warehousing (with 8/44 firms), the most comparable firms are in basic metals (4/44) and chemicals, food and furniture (each with 3/44 firms). Yet for most parts, while KSEZ firms operate in manufacturing, they operate in very separate type of manufacturing industries.

Figure 5.1 Types of KSEZ Firms by 4-digit ISIC classification (2016q4)



Firms also report that they do not see much potential in other KSEZ firms either as suppliers of their inputs or buyers of their products. The one possible exception to this relates to one of the KSEZ construction companies, who is currently responsible for a large number of new projects. Yet even for this, firms report to make limited use of building materials produced within the KSEZ. This suggests that besides some of the benefits to government for channelling infrastructure investments in a small area (see 5.2) there are currently no directly observable agglomeration effects or knowledge spillovers in the SEZ which is partly due to the disparity in types of KSEZ firms.

However, for the KSEZ Phase 2, Government of Rwanda is focusing more explicitly on developing such knowledge effects in the ICT Park. This combines four technical universities with designated ICT companies, in order to provide hands-on skills training and stimulate mutual learning and product innovation. This is a promising new area of industrial policy, which warrants future research.

5.6 Summary

In conclusion, this chapter has shown that out of the five potential benefits for an SEZ, two do not appear to play any major role. Firms who move into the KSEZ are not eligible for any specific SEZ tax incentives, and there are limited agglomeration effects from moving into the SEZ. However, the KSEZ provides three important contributions over other locations in Kigali. First, it provides access to improved infrastructure and utilities, both in terms of access and occasionally in terms of reliability (though with no impact on price). Second, it provides an important form of trade facilitation, both in terms of expedited customs procedures and in terms of a greater likelihood of entering into the Duty Remission Scheme. Third, KSEZ firms appear to be explicitly supported and privileged by the RDB in terms of streamlined regulatory benefits. It also appears to provide them with improved ties to government agencies, which means they are better aware of specific tax incentives, new laws and regulation, and can more easily push for policy change to address challenges. This final point may be the most important reason why KSEZ firms do better over time than other, comparable firms who do not move into the KSEZ.

6. Conclusion and Recommendations

6.1 Summary

This report aimed to evaluate the impact of the Kigali Special Economic Zone (KSEZ) on firms' behaviour, using a combination of firm-level tax data, interviews and a documentation review. By analysing the change in firms' quarterly tax returns associated with the timing of moving into the KSEZ, combined with additional econometric techniques, we were able to estimate of the impact of the KSEZ on firm behaviour.

Our study first finds that between 2013 and 2016 (the time period of our study), the KSEZ has made significant contributions to Rwanda's aggregate economic outcomes, most notably in terms of permanent employment and domestic sales. The KSEZ has also improved Rwanda's trade balance in almost all quarters by contributing a non-negligible share of national exports. We find that KSEZ firms are helping Rwanda to diversify away from its traditional export products (coffee, tea and minerals) in new manufacturing sectors including in food and agro-processing, textiles and furniture-making. Yet, many firms were only able to do so by relying heavily on imported goods, for which domestic alternatives are simply not available, so that the KSEZ firms are also large importers.

However, part of the reason why the KSEZ contributes to Rwanda's economic performance is because many exporting and manufacturing firms have been formally told to relocate into the KSEZ, for purposes of urban planning and zoning permissions. For that reason, many of these firms may also have increased sales, employment and export *outside* of the KSEZ. To provide further clarity on this issue, and assess the impact of *moving into the KSEZ* (above and beyond what would have been the case otherwise), this study adopted a three-part econometric strategy that was based on Arnold and Javorcik (2009). This focused first on comparing firms over time who were initially not in the KSEZ and then moved into the KSEZ. Second, such KSEZ firms were then compared to non-KSEZ firms' performances over time. Third, to account for the initial higher ability of KSEZ firms by creating a designated, comparable control group using propensity score matching.

Both models find comparable results among most outcome variables (thus suggesting a certain robustness to specification bias). They also both suggest that the KSEZ has important effects on firms' economic outcomes. Most notably, we find that moving into the KSEZ is associated with larger increase in sales, value-added and permanent employment numbers than would have been the case had such firms not moved there. However, we find that the increase in KSEZ firm output is driven mostly by domestic sales. Indeed, while KSEZ may *attract* exporters, it does not appear to increase the likelihood of any firm to become an exporter, or to increase their overall exports as a result of being in the KSEZ. In contrast, we find that firms moving into the KSEZ are more likely to import goods, and also choose to import a higher value of goods than non-KSEZ firms.

The study's qualitative findings provide an overview of the main channels through which the KSEZ influences firm behaviour. This suggests that the KSEZ provides three important contributions over other locations in Kigali, all of which also have trade implications. First, the KSEZ reportedly provides access to better infrastructure (roads) than is available elsewhere, which many firms note is key for their continuous stream of trucks that move into and out of the KSEZ, together with better provision of other utilities such as (mostly) reliable water and electricity. Second, the KSEZ offers better trade facilitation, both in terms of expedited customs procedures and in terms of a greater likelihood of entering into the Duty Remission Scheme. While this is technically available for all traders, analysis and feedback from the KSEZ firms suggests that some of these 'perks' may be more easily accessible

to KSEZ firms than others. This leads to the third benefit: KSEZ firms appear to be explicitly supported and privileged by the Rwandan government in terms of streamlined regulatory benefits and through close ties to government agencies. As a result, KSEZ firms appear better aware of tax incentives, new laws and regulation, and can more easily push for policy change to address specific challenges. In contrast, KSEZ firms are not eligible for any specific other types of tax incentives (e.g. tax holidays), and there is currently only limited interaction between KSEZ firms, suggesting that there are no clear benefits to being in the KSEZ in terms of sharing knowledge or ideas (agglomeration effects).

Jointly, we thus believe that the *importing channel* offers an important part of the explanation for the other improvements in firm outcomes. As has been noted by the economic literature, improved access to imports, which are typically of higher quality offer a wider range of input varieties, can strongly increase firm productivity (leading to higher value added) which in turn can make it worthwhile to expand sales, and to produce such additional goods more employees are needed. Yet other KSEZ benefits, including reliable utilities and streamlined business regulations are also likely to explain part of this variation.

6.2 Improving the effectiveness of the Kigali Special Economic Zone

To further improve the KSEZ for firms who are currently operational in the KSEZ and for those that plan to start operations in the near future, the study makes the following recommendations:

- 1. The current land price for plots in KSEZ Phase 2 is appropriate and should not be lowered, especially in absence of other management fees.** While some investors complain that the land price is too high, this is a one-off investment cost, which seems to be appropriately priced when considering both the direct (facility) and indirect (facilitation) benefits from being in the KSEZ. However, this could change if the PEZ decides to charge management fees (which is often the case in other SEZs). If so, we recommend that the PEZ conducts a more detailed market analysis of the potential land price of different plots in the KSEZ and possibly lower some plots to compensate for higher regulatory costs.
- 2. Both KSEZ Phase 1 and Phase 2 should have access to reliable public transportation that facilitates workers' daily commutes.** Firms complain that there are no current public transport links between KSEZ and the rest of the city, which makes it difficult and expensive for employees to come to work or go out for lunch. To serve the current absence of food, SEZAR reports that the KSEZ Phase 2 will have restaurants. Yet, to make sure this also benefits workers in the first Phase, some form of transport *between* Phase 1 and Phase 2 may also need to be established.
- 3. PEZ should work with RURA to investigate all firms' current and future electricity capacity needs and increase the capacity for energy-intensive firms.** There are currently some firms who rely on their own private transformer to increase their energy capacity, which should not be necessary in an industrial park, and may prevent firms' future growth, especially for the manufacturing sector, which tends to use more energy than other sectors.
- 4. PEZ should work with WASAC to investigate the wide disparity in water provision in the KSEZ, and ensure reliable access across all plots.** While some firms are happy with their water provision, others mentioned that this has been intermittent for a long period. The PEZ should take the lead in investigating these challenges, and address them as soon as possible.

5. **SEZAR should seek to formalise its overall support to KSEZ businesses and help improve business linkages.** There appear to be many ways in which KSEZ firms currently benefit from links with SEZAR and RDB more generally, but because these are highly heterogeneous across firms. To extend such benefits across all KSEZ firms, SEZAR should thus organise more regular meetings where they formally share updates on new laws and regulation, discuss current challenges and help KSEZ firms to access particular benefits (e.g. sharing lessons on the benefits of Customs' "Gold Card" trade facilitation scheme, and offering support to enter into it for importers). Such meetings may also help to strengthen ties and collaborations between KSEZ firms, who can jointly discuss challenges and learn from each other.

6. **Government of Rwanda currently has sufficient tax incentives, and should refrain from introducing additional SEZ-specific incentives.** Recent empirical evidence suggests that tax incentives (e.g. tax holidays) tend to be an inefficient manner of attracting investors, and that investors care more about other factors such as market potential, business support and trade facilitation (Bode et al, forthcoming). This is further shared by our firm interviews, which suggested that foreign firms mainly chose to move to Rwanda to serve the domestic market, and thus appear to choose their market first and only consider the tax regime second. As such, reducing their business cost (e.g. cost of imports through reduced customs tariffs) is much more important than lowering profit taxes. In this regard, the decision by MINEACOM under the 'Made in Rwanda' policy (MINEACOM, 2017) to further reduce import tariffs on raw and intermediate goods is sufficient, and more important than any SEZ-specific incentives. In addition, the 2015 Investment Code also already sufficiently stimulates manufacturing and export-oriented firms for the 'marginal investor' who does seek specific tax incentives.

6.3 The Future Direction of Rwanda's Special Economic Zones

The Government of Rwanda is currently working hard to extend the number of SEZs beyond Kigali alone, and has drafted plans for an additional 8 SEZs throughout the country (UNIDO, 2016). For these, the study recommends that:

7. **MINEACOM should commence the development of the new district-level industrial parks only after additional demand analysis has been completed. For each park, this should identify a sufficient number of interested firms, with sufficient expected profitability, and notable added-value of the SEZ.** This study suggests that some main KSEZ benefits are very difficult to replicate outside of Kigali. Such parks will likely not have similar trade facilitation, and may also receive less indirect support through SEZAR and RDB than is the currently the case for the KSEZ firms. Similarly, no KSEZ firm reported that they would have established in a zone that is outside of Kigali, because there are limited benefits (the road to the border is not far enough to warrant moving towards the DRC, Burundi, Tanzania or Uganda border). Yet, there are many risks. For instance, firms' main clientele tends to be either Kigali customers or Government of Rwanda, both of which require a base in the capital city. Firms also report that a border-town location would make them vulnerable to changing trade laws, such as the recent closing of the Rwanda-Burundian border (The East African, 2016a), and or the experience with live animals trade to the DRC (The East African, 2016b). As such, new SEZs may fail to be populated, as has occurred in many other countries (Farole, 2011). MINEACOM may still choose to proceed if a number of criteria are met. It should conduct demand analysis to ensure that there are a sufficient number of interested and suitable firms. It should also demonstrate that the SEZ can add notable added-value over other areas in that region, and that the SEZ benefits exceed the initial set-up costs. In addition, future SEZs should each have a clear rationale for how their development fits into Rwanda's wider economic strategy. For that reason, each SEZ should seek to develop knowledge spillovers, and test these based on a number of questions set out under recommendation (12).

In addition, this study suggests that now is also an important time to consider what should be the overall future direction of Rwanda's SEZs. For this, this study recommends the following:

- 8. Government of Rwanda should not rely too much on the traditional EPZ model for the SEZ, and instead develop a modern, Rwandan SEZ.** The traditional EPZ model focused of assembly of imported component (e.g. the garment sector) may not be the most appropriate focus for Rwanda, partly due to the high transport costs faced, and partly because of the fragile export conditions (e.g. AGOA) that such industries rely on (as exemplified by Ghana's SEZs in Box 2.3).
- 9. Instead, Rwanda's SEZs should reorient to better exploit their existing comparative advantage. Besides existing plans in agriculture, the SEZ may extend value addition projects to mining and tourism.** SEZs can play an important role in concentrate infrastructure to catalyse processes of agglomeration and help existing domestic industries reach benefits of scale and to compete more effectively on regional and global markets (Farole, 2011). For that reason, it may be worth exploring the use of the SEZ for value addition in natural resource sectors (mining and tourism). This may not be possible within Kigali, so provides possible rationale for opening up additional SEZs in secondary cities, as is currently planned for a designated SEZ in tourism in Musanze. These are already considered to be priority sectors, so utilising the SEZ for that purpose may further help leverage important benefits.
- 10. The SEZ can also contribute to high-rent, niche areas of latent competitiveness, such as edible oils.** To compensate investors for Rwanda's costly trading position, the export activities should have particularly high rents. One such example described in the National Export Strategy (MINICOM, 2015) is in edible oils, though other potential sectors may be identified.
- 11. The SEZ may wish to adopt different types of policy experimentation, focused on the Service Sector and Service Sector Trade.** As shown chapter 2, the main benefit of SEZs in China related to experimentation with administrative reform. However, Rwanda is already particularly strong on business regulation (as noted by being the second-highest ranking African country in the World Bank Doing Business Index). For that reason, it may wish to focus on other experiments. One possibility would be to experiment with additional competition from EAC service-sector providers (e.g. in financial services, accountancy, Law, ICT, and architecture and engineering). Such service sector trade is also found to be an important input and driver of manufacturing in the EAC (Hoekman and Shepherd, 2015). This focus on services is currently planned through the new ICT Park in KSEZ Phase 2, which brings together four technical universities and regional ICT companies, thus opening up new opportunities for services trade in tertiary education and ICT. Additional analysis is needed to explore and identify how SEZs can best to support other forms of (backbone) services trade.
- 12. Keep a focus on knowledge spillovers, which are the long-run drivers of SEZ success.** Lastly, policymakers should remember that the key benefit to SEZs is to upgrade the productivity and learning of firms operating there. Successful SEZs in other countries have operated as important incubation centres for future exporters, industrial leaders and skilled technical staff through knowledge spillovers (Farole, 2011). The overall focus of developing the ICT Park is particularly critical in this regard, by providing such linkages between universities and ICT companies. As mentioned by Khandelwal and Teachout (2016): *Policymakers should not be misled by direct performance metrics, such as revenues, employment and exports—generated by the SEZ. While such metrics are important for determining the health of an SEZ, determining the overall success of SEZ policy requires understanding the impacts on the broader domestic economy*”.

To guide this, developers of current and future SEZs should answer the following questions:

- Are the firms in the SEZ likely to form links with firms outside the SEZ?
- Is there a likely sharing of knowledge and best practices that can help improve productivity?
- Does the SEZ engage in specific policy experiments that are linked to the wider, national economic policy, and which may be emulated by other parts of the economy?
- Are local governments sufficiently linked up to the operation of the SEZ to support them and to note which policies are fostering or hampering their economic activity?

In sum, successful SEZs are those that generate spillovers and foster institutional reforms in the broader economy. This is a key principle that any future SEZ policy should closely embody. This study holds that SEZs in Rwanda should not be used as small, separate pockets of economic activity (enclaves). Instead, they should build on Rwanda's current strengths and be used as a key drivers (catalysts) to deliver on Rwanda's broader vision and overall economic strategy.

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Annex: Additional Tables and Graphs

Table A.1: Overall Totals for KSEZ, Excluding Support Services (2013 q2 to 2016 q4)

Quarter	#	Perm. Employees		Total Sales	Local Sales	Local Purchase	Exports			Imports		
	SEZ Firms	Total Number	Average Salary (RwF)	(RwF Million)	(RwF Million)	(RwF Million)	(RwF Million)	% of Firms Exporting	% Exports v. Local Sales	(RwF Million)	% of Firms importing	% Imports v. Local Purchase
2013q2	12	555	515,421	14,011	12,750	687	1,262	33%	9%	533	42%	44%
2013q3	12	577	522,549	20,560	12,993	1,068	7,567	33%	37%	971	75%	48%
2013q4	12	652	629,353	14,949	12,112	783	2,837	33%	19%	634	67%	45%
2014q1	12	664	553,147	13,926	8,863	869	5,063	33%	36%	988	50%	53%
2014q2	20	1,494	560,958	16,689	13,201	1,705	3,488	25%	21%	2,111	55%	55%
2014q3	20	1,226	566,665	16,175	12,174	1,148	4,001	25%	25%	1,617	40%	58%
2014q4	21	1,316	526,635	15,854	11,307	1,332	4,547	24%	29%	1,254	43%	48%
2015q1	21	1,328	497,919	13,761	10,279	1,429	3,482	24%	25%	1,026	48%	42%
2015q2	27	1,332	719,410	17,303	13,724	2,117	3,579	19%	21%	1,389	33%	40%
2015q3	28	1,402	654,349	18,917	15,995	2,766	2,922	21%	15%	2,451	43%	47%
2015q4	29	1,666	716,231	22,009	18,844	2,939	3,165	21%	14%	2,642	52%	47%
2016q1	29	1,612	652,184	19,093	15,882	2,635	3,211	21%	17%	1,471	55%	36%
2016q2	38	2,084	873,797	29,661	25,659	5,422	4,002	26%	13%	4,026	58%	43%
2016q3	40	2,180	1,144,294	31,996	27,710	5,518	4,286	23%	13%	7,257	68%	57%
2016q4	41	2,271	1,252,082	29,368	24,900	5,139	4,468	24%	15%	7,147	73%	58%

Table A.2: KSEZ as a share of Rwandan total, Excluding Support Services (2013 q2 to 2016 q4)

Quarter	#	SEZ as a share of total in Rwanda (VAT and PAYE Reported)					
	SEZ Firms	Perm. Employees	Total Sales	Local Sales	Local Purchase	Exports	Imports
2013q2	12	0.7%	1.8%	1.8%	0.5%	1.9%	0.6%
2013q3	12	0.7%	2.6%	1.8%	0.7%	9.7%	1.0%
2013q4	12	0.8%	1.8%	1.6%	0.4%	4.9%	0.6%
2014q1	12	0.8%	1.7%	1.2%	0.5%	8.3%	1.0%
2014q2	20	1.8%	1.8%	1.5%	0.7%	5.6%	2.0%
2014q3	20	1.4%	1.7%	1.4%	0.5%	6.2%	1.5%
2014q4	21	1.6%	1.7%	1.3%	0.5%	6.3%	1.1%
2015q1	21	1.5%	1.5%	1.2%	0.6%	6.7%	0.9%
2015q2	27	1.4%	1.7%	1.4%	0.7%	6.1%	1.1%
2015q3	28	1.5%	1.8%	1.6%	0.9%	4.7%	1.9%
2015q4	29	1.7%	2.0%	1.8%	0.9%	5.2%	2.0%
2016q1	29	1.6%	1.8%	1.6%	0.9%	6.2%	1.2%
2016q2	38	2.1%	2.6%	2.4%	1.8%	7.2%	2.9%
2016q3	40	2.1%	2.7%	2.5%	1.7%	6.7%	4.5%
2016q4	41	2.1%	2.5%	2.2%	1.7%	6.8%	4.4%

Table A.3: Type of Firms Operational in KSEZ (2013 q1 to 2016 q4)

Quarter	# SEZ Firms	Firm Types by ISIC (%)				Foreign v. Domestic (%)		Firm Size (%)		
		Manufacturing	Warehousing	Other	Support Services	Foreign	Domestic	Large	Medium	Small
2013q2	12	75%	8%	17%	0%	75%	25%	33%	25%	42%
2013q3	12	75%	8%	17%	0%	75%	25%	33%	25%	42%
2013q4	12	75%	8%	17%	0%	75%	25%	33%	25%	42%
2014q1	12	75%	8%	17%	0%	75%	25%	33%	25%	42%
2014q2	20	80%	5%	15%	0%	75%	25%	30%	25%	45%
2014q3	20	80%	5%	15%	0%	75%	25%	30%	25%	45%
2014q4	21	76%	10%	14%	0%	76%	24%	29%	24%	48%
2015q1	21	76%	10%	14%	0%	76%	24%	29%	24%	48%
2015q2	28	68%	18%	11%	4%	71%	29%	25%	25%	50%
2015q3	29	66%	21%	10%	3%	69%	31%	24%	24%	52%
2015q4	30	67%	20%	10%	3%	70%	30%	27%	23%	50%
2016q1	30	67%	20%	10%	3%	70%	30%	27%	23%	50%
2016q2	41	66%	17%	10%	7%	68%	32%	29%	20%	51%
2016q3	43	67%	16%	9%	7%	67%	33%	28%	19%	53%
2016q4	44	66%	18%	9%	7%	66%	34%	27%	18%	55%

Table A.4: Overview of Products Exported from the KSEZ (relative shares from ASYCUDA Trade Database)

Type of Product	2013	2014	2015	2016
Base Metals	0.00%	35.29%	32.39%	30.94%
Vegetable Products	0.00%	0.11%	12.64%	20.05%
Textile and textile articles	0.00%	0.00%	18.90%	18.47%
Machinery and mechanical appliances	0.26%	0.10%	8.98%	10.40%
Furniture, bedding, mattresses and other furnishings	24.32%	51.05%	18.49%	7.04%
Instruments and apparatus (incl. optical, photographic, cinematographic, medical)	0.00%	1.58%	0.01%	3.11%
Plastics, Rubber Products	0.45%	2.70%	1.40%	2.75%
Prepared Foodstuffs; Beverages, Spirits And Vinegar	74.89%	8.60%	3.91%	2.24%
Chemical Products	0.08%	0.17%	0.13%	2.04%
Paper, Paperboard and Articles thereof	0.00%	0.01%	0.00%	1.54%
Wood, Straw, or Weaving Products	0.00%	0.00%	0.00%	0.81%
Vehicles and Transport Equipment	0.00%	0.38%	0.00%	0.49%
Articles of Stone, Plaster, Cement, Ceramics or similar materials	0.00%	0.01%	0.00%	0.10%
Footwear, Headgear and other accessories	0.00%	0.00%	0.00%	0.01%
Mineral Products	0.00%	0.00%	0.00%	0.00%
Animal Or Vegetable Oil Products	0.00%	0.00%	3.15%	0.00%
Grand Total	100.0%	100.0%	100.0%	100.0%

Table A.5: Overview of Products Imported from the SEZ (relative shares from ASYCUDA Trade Database)

Type of Product	2013	2014	2015	2016
Chemical Products	15.69%	61.89%	41.07%	34.32%
Machinery and mechanical appliances	20.37%	4.00%	11.56%	18.90%
Mineral Products	0.17%	0.50%	16.44%	15.26%
Textile and textile articles	6.30%	1.07%	9.71%	10.03%
Base Metals	12.29%	1.53%	2.18%	5.61%
Instruments and apparatus (incl. optical, photographic, cinematographic, medical)	0.09%	12.59%	6.23%	3.85%
Plastics, Rubber Products	22.75%	7.88%	4.54%	3.73%
Vegetable Products	1.83%	3.16%	3.27%	2.66%
Paper, Paperboard and Articles thereof	8.75%	2.95%	1.51%	2.11%
Furniture, bedding, mattresses and other furnishings	1.49%	1.16%	0.98%	0.89%
Vehicles and Transport Equipment	0.88%	0.35%	0.34%	0.79%
Articles of Stone, Plaster, Cement, Ceramics or similar materials	2.19%	0.84%	0.20%	0.68%
Prepared Foodstuffs; Beverages, Spirits And Vinegar	1.28%	1.13%	0.84%	0.65%
Wood, Straw, or Weaving Products	1.49%	0.28%	0.58%	0.25%
Animal Or Vegetable Oil Products	4.16%	0.54%	0.48%	0.16%
Raw Hides Skins And Leather Products	0.06%	0.02%	0.02%	0.07%
Live Animals; Animal Products	0.02%	0.00%	0.00%	0.02%
Footwear, Headgear and other accessories	0.19%	0.09%	0.05%	0.01%
Art and antiques	0.01%	0.00%	0.00%	0.00%
Precious metals, semi-precious stones, pearls	0.00%	0.00%	0.00%	0.00%
Grand Total	100.0%	100.0%	100.0%	100.0%

Table A.6 First Stage of the PSM Estimation (Binary SEZ Treatment Variable)

VARIABLES	(1) sez_treat
In_output (lagged 6 periods)	-0.358 (0.230)
In_valueadded (lagged 6 periods)	1.599* (0.930)
valueaddedshare (lagged 6 periods)	-0.999 (0.881)
In_emp_nr (lagged 6 periods)	-0.924 (0.983)
In_valueperworker (lagged 6 periods)	-1.082 (0.902)
In_emp_pay (lagged 6 periods)	-0.135 (0.113)
exporter (lagged 6 periods)	2.755 (1.745)
In_exports (lagged 6 periods)	-0.116 (0.100)
In_localsales (lagged 6 periods)	-0.0485 (0.0403)
importer (lagged 6 periods)	2.582** (1.239)
In_imports (lagged 6 periods)	-0.141* (0.0769)
In_localpurchases (lagged 6 periods)	0.0336 (0.0301)
Large taxpayers	-0.367 (0.458)
Medium taxpayers	-0.536 (0.346)
Firm age - 5 years	-0.163 (0.493)
Firm age - 6 years	0.352 (0.378)
Firm age - 7 years	-0.951** (0.472)
Firm age - 8 years	-0.871* (0.463)
Firm age - 10 years	1.145*** (0.318)
Constant	-5.328*** (1.824)
Sector*Quarter Fixed Effects	YES
Observations	14,463
Pseudo-R²	0.1803

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A.7 Propensity Score Matching with Difference-in-Differences (QUARTERLY)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	Log Output	Log Value Added	Value Added Share	Log Perm. Emp. Number	Log Value Added Per Worker	Log Perm. Emp. Pay	Prob. of Exporting	Log Exports	Log Local Sales	Prob. of Importing	Log Imports	Log Local Purchases
SEZ (q1)	1.903 (1.463)	1.775 (1.556)	0.106 (0.130)	-0.228 (0.192)	0.468 (0.584)	0.0186 (0.173)	0.0714 (0.117)	1.534 (2.183)	0.408 (2.040)	0.0714 (0.160)	1.833 (2.441)	-0.875 (1.267)
SEZ (q2)	1.673 (1.452)	1.747 (1.517)	0.119 (0.111)	-0.0354 (0.161)	0.338 (0.440)	-0.0296 (0.121)	0.0762 (0.125)	1.623 (2.298)	0.191 (2.032)	0.205 (0.168)	3.662 (2.444)	0.0548 (0.635)
SEZ (q3)	2.929* (1.606)	2.506 (1.658)	0.121 (0.104)	0.184 (0.173)	0.766 (0.714)	-0.212* (0.121)	0.205* (0.113)	3.583* (2.132)	1.429 (2.145)	0.0714 (0.152)	1.963 (2.203)	1.734** (0.713)
SEZ (q4)	3.168** (1.599)	3.003* (1.651)	0.175 (0.108)	0.178 (0.171)	1.253* (0.689)	-0.148 (0.118)	0.0762 (0.111)	1.748 (2.137)	1.687 (2.139)	0.138 (0.144)	1.884 (2.097)	2.770*** (0.742)
SEZ (q5)	2.406 (1.462)	2.552* (1.525)	0.215** (0.102)	0.149 (0.166)	0.943** (0.432)	-0.00600 (0.114)	0.210** (0.0989)	4.004** (1.997)	0.825 (2.039)	0.0714 (0.144)	1.220 (2.079)	1.845** (0.884)
SEZ (q6)	2.233 (1.461)	2.149 (1.520)	0.0842 (0.101)	0.121 (0.164)	0.527 (0.423)	0.183 (0.117)	0.0840 (0.103)	2.188 (2.038)	0.694 (2.038)	0.483*** (0.142)	7.217*** (2.016)	0.942 (0.635)
Observations	343	343	343	335	335	335	343	343	343	343	343	343

Graphs A1-A12: PSM with Difference-in-Differences (Quarterly)

Figure A1

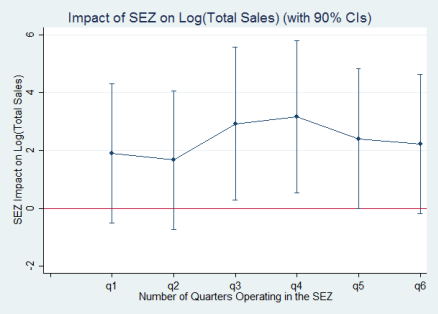


Figure A2

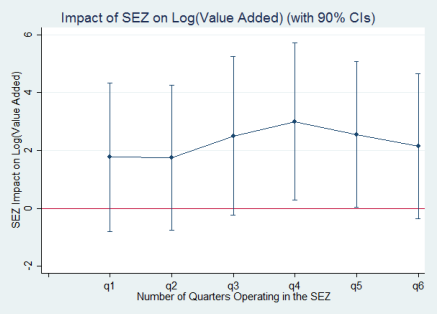


Figure A3

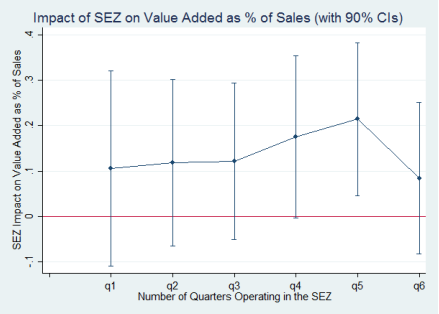


Figure A4



Figure A5

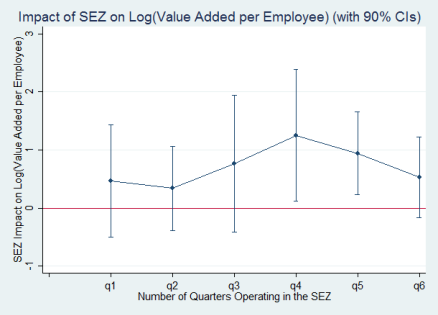


Figure A6

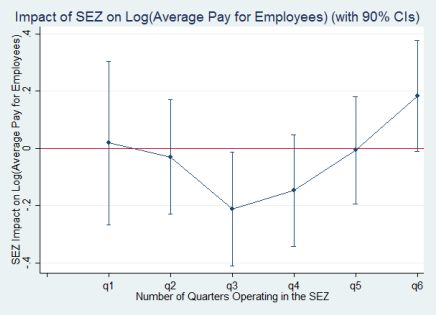


Figure A7

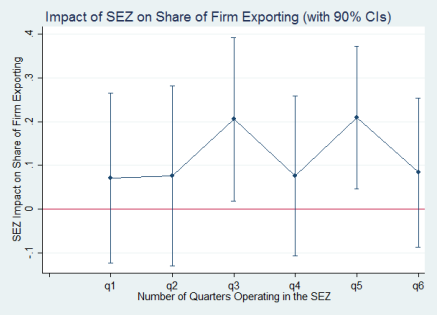


Figure A8

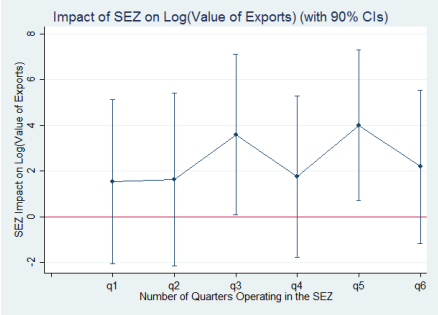


Figure A9

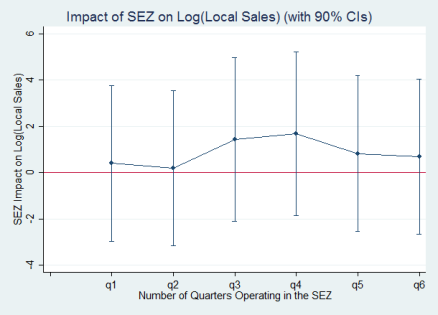


Figure A10

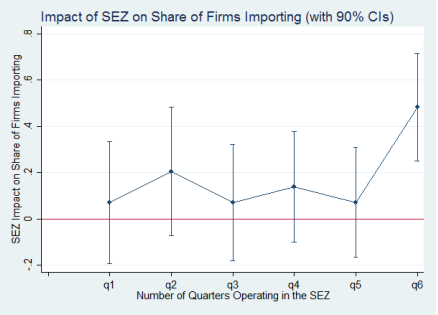


Figure A11

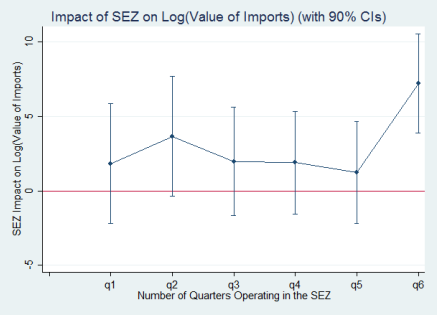
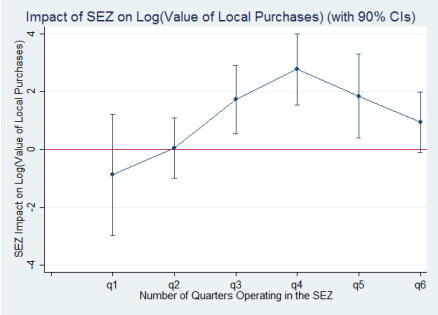


Figure A12



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