Industrial development: Assessment of economic performance and competitiveness, Johannesburg in 2015

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Abstract

Following the financial crisis in 2008 and the recent drop in commodity prices, the performance of firms in the manufacturing industry continues to worsen. The data released by Statistics South Africa in 2016 alludes to poor performance by firms and the manufacturing sector's contribution to economic growth continues to decrease. This decline has been coupled with increasing unemployment, inequality and poverty levels. Notwithstanding this, one of the key objectives of South Africa's Department of Trade and Industry's Industrial Policy Action Plan is to stimulate greater economic growth and develop labour-absorbing sectors particularly in the manufacturing sector. The sustainability of the manufacturing sector is key, however, there is limited information on the factors that drive it. Recognising and appreciating the nature of manufacturing and the challenges faced by firms can assist policymakers to devise interventions which can stimulate inclusive growth and job-creation in Johannesburg. The Centre for Competition, Regulation, and Economic Development (CCRED) at the University of Johannesburg undertook a firm-level survey to understand the nature of economic activity in Johannesburg's 26 industrial nodes. Based on this survey, this paper analyses economic performance, competitiveness and the challenges faced by over 300 firms. Changes in growth, access to markets, capacity utilisation, technology and investment along with level of skills and education were assessed as an indication of economic performance and competitiveness. Despite the consensus that economic performance is weak, this study offers a different perspective. A significant proportion of firms exhibited growth in the past 3 years due to their sector grouping, access to the export market and investment in machinery and equipment among other factors. The key challenges faced by firms included unreliable electricity supply, inefficient public transport provision and lack of skills. The paper offers recommendations to address ways to stimulate economic performance and competitiveness in Johannesburg.

Key words: economic development, industrialisation, performance, competitiveness, firm-level survey.

1 Introduction

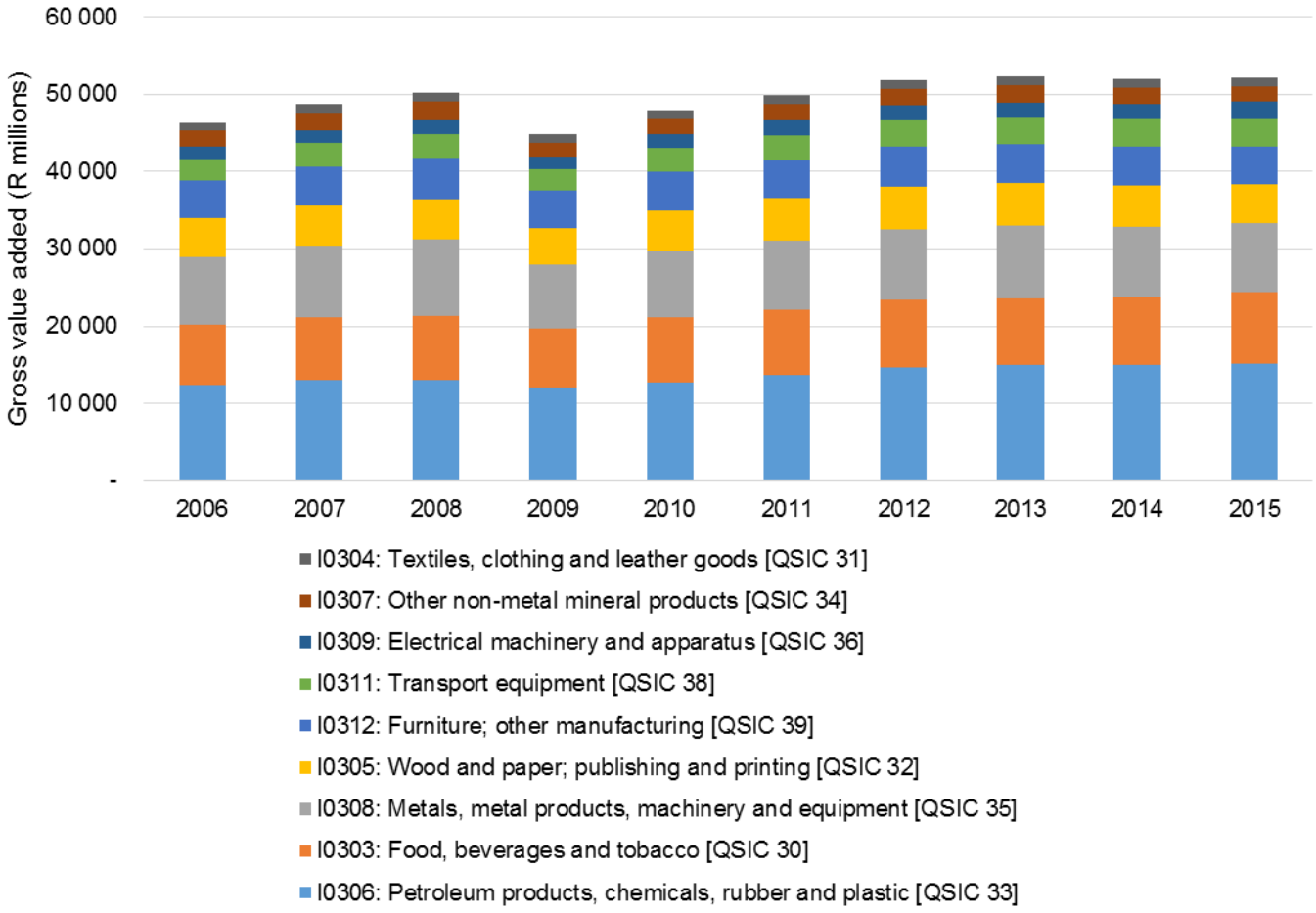
The City of Johannesburg accounts for 17% of South Africa's economic output and is the leading metro for most of the country's key sectors (City of Johannesburg Economic Strategy Roadmap, 2014). The character of economic activity in Johannesburg over the years has shifted from the primary sector towards secondary and tertiary sectors. The change has resulted in an uneven spread of economic activity in Johannesburg that is not well aligned with areas where the majority of the population lives (City of Johannesburg Economic Strategy Roadmap, 2014). Even with the economic contribution, the challenges of poverty and inequality remain acute. The level of unemployment continues to increase, impacting especially the youth. There is therefore need to increase competitive local production as a basis for job creation, exports and sustainable firm growth.

Between 2002 and 2005 South Africa experienced a commodity boom which resulted in the growth of the manufacturing sector and the economy as a whole (Hawthorne, das Nair and Bowen, 2005:1). However, the South African economy was heavily affected by the financial crisis of 2008 which saw an overall decline of 13.8% in manufacturing output in that year (Statistics South Africa, 2015). The decline of production volumes was matched by an increase in unemployment. To curtail the impact of the crisis on the manufacturing sector, the Department of Trade and Industry (the dti) formulated policies to revive the labour-absorbing manufacturing sectors. These policies include cluster development aimed at improving firms' performance in targeted sectors.

Despite these interventions, the manufacturing sector continues to perform dismally. In the third quarter of 2014, Statistics South Africa (2015b) indicated that there was a decline of 3.4% in manufacturing production with a further decline noted in December 2015. The decrease was due to poor performance in motor vehicles, parts and accessories and other transport equipment (-8.9% or -R5 390 million) and basic iron and steel, non-ferrous metal products, metal products and machinery (-3.2% or -R3 302 million) (Statistics South Africa, 2015b). The rate at which production in the manufacturing industry is decreasing is concerning, and it is imperative that the government implements actions that can curb this decline.

Manufacturing has been a significant contributor to gross value added (GVA) in Johannesburg, accounting for 76% of secondary sector between 1995 and 2013. Within the manufacturing sector, the figure below illustrated the manufacturing subsector's GVA values in the City of Johannesburg between 2006 and 2015. Petroleum products, chemicals, rubber and plastics have consistently been the highest contributor in terms of GVA.

Figure 1: Manufacturing GVA in Johannesburg, 2006-2015



Source: Quantec

This is followed by food, beverages and tobacco; and metals, metal products, machinery and equipment which have been alternating between the second and third highest values. Despite the drop in 2009, GVA increased by a small margin reaching a peak in 2012. Since 2012, GVA seems to have stagnated.

Local performance of firms, translates to the betterment of performance in the economy such that local development plays a pertinent role in the overall economy. The City of Johannesburg's economic performance has been suboptimal evidenced by the decline in employment from 189 062 in 2008 to 173 154 in 2015 (Quantec, 2016). Johannesburg has a number of industrial nodes with potential to contribute towards the revitalisation of the economy. However, the requirements to improve economic activity in these areas is still to be understood. A deeper understanding of these areas will allow policy makers to develop

targeted interventions and leverage resources in the direction of greatest potential return. The information available of node profiles is outdated; there has not been a dedicated survey since 1995 at a local level; and existing databases are skewed by the head office effect.

In order to address this information gap, the research questions that will be addressed therefore are:

1. What type of industrial activity is taking place?
2. What challenges do firms face?
3. What interventions can help promote growth, investment and employment creation?

This paper draws on the data which was collected from a firm-level survey of 26 industrial nodes to analyse economic performance and competitiveness of firms. The paper is structured as follows: section 2 provides an overview of the current literature on the role of manufacturing firms; and economic performance and competitiveness. Section 3 describes the approach and methodology employed to carry out the study and Section 4 explores the findings from the survey data. Section 5 concludes and suggests policy recommendations.

2 The role of the manufacturing industry

The decrease of the manufacturing industry's employment contribution to total employment and contribution to GDP in South Africa amounts to deindustrialisation. Since the 1980's, developing countries including South Africa experienced deindustrialisation. The effects of deindustrialisation are evidenced by high unemployment rates, low GDP per capita and high inequality rates (Tregenna, 2011). As such reindustrialisation plays a key role in industrial development which will lead to the resuscitation of an inclusive, resilient and competitive economy.

Tregenna (2011) notes that industrialisation, deindustrialisation and reindustrialisation denote the changes in the proportion of the manufacturing sector in the Gross Domestic Product (GDP) and/or employment levels. McCormick (1999) defines industrialisation as building up a country's capacity to transform raw materials to new products including the system that enables this transformation to occur. Green (2009) simply states that deindustrialisation describes the development of industry. Hence, an increase in the contribution of manufacturing to GDP and/or employment levels implies industrialisation (and in some cases reindustrialisation).

In an in-depth study, Tregenna (2011) analyses deindustrialisation in South Africa and internationally through disintegrating changes in the share and level of manufacturing

employment with respect to GDP. The study finds that deindustrialisation in South Africa was associated with policy changes such as trade and financial liberalisation. In South Africa, deindustrialisation occurred at income per capita levels that are significantly lower than those at which deindustrialisation occurred in developed countries and is thus termed premature deindustrialisation (Tregenna, 2011). Premature deindustrialisation is likely to have negative effects on the economy as the benefits from industrialisation are foregone (Tregenna, 2011). The effects of premature deindustrialisation can be seen in South Africa through retarded economic growth, high unemployment levels and the lower competitiveness internationally.

3 Economic performance and competitiveness

In order to redress the issue of deindustrialisation, measures need to be implemented to revive the manufacturing sector at a local level. Firm competitiveness and performance are key indicators of the state of the manufacturing industry. Competitiveness refers to the ability and performance of a firm to price and supply goods in a particular market relative to other firms in a similar market while economic performance tends to be subsumed into competitiveness as evidenced by Ajitabh and Momaya (2004) in their literature review on competitiveness.

Firm competitiveness can be assessed using a number of variables such as leverage, export activity, location, size and the management competence index. These factors were analysed in a study by Liargovas and Skandalis (2010) to understand the factors that influence competitiveness in a developing industry. The study found that leverage, export activity, location, size and financial performance are indeed related with the competitiveness of the firms. Export activity implies that firms are able to sell goods competitively internationally as well as protect their position in the local and prospective markets. Better performance by firms indicates increasing competitiveness, while deteriorating performance signals declining competitiveness. Onyemenam (2004) also noted that macroeconomic stability, institutions and technology affect economic performance in a study conducted in Nigeria.

Once the competitiveness indicators have been employed with effective management, a firm's performance will be bettered. Economic performance is usually evidenced through the company's profitability. It can further be illustrated by market value, growth, customer and employee satisfaction and environmental and social performance. Profitability and growth should be applied with caution because there are a number of factors that contribute to it, and requires analysis of these factors to be incorporated. However, taking competitive advantage into consideration implies that growth and profitability are adequate proxies for performance as the competitive advantage translates itself in profitability and growth (Santos and Brito, 2012). Competitive advantage indicates that a particular firm is able to meet the demand of a specific product at a lower cost that the rival firms. This advantage will then be

exhibited in the firm's profitability and growth, through developing and improving better products and leveraging off their efficiency. However, firms in a dominant position can limit the capability of smaller firms to improve their efficiency and lower costs through anti-competitive behaviour which subsequently increases the costs of entrants into that industry. Dominant firms may do this through securing exclusive deals with customers of suppliers that adversely affect rival firms and diminish consumer welfare (Banda et al, 2015).

Previous studies (Daniels, 2007, Phele, Roberts and Stewart, 2005 and Edwards 2002) of the manufacturing sector in South Africa also highlight the key role of other factors. Skills development and access to the appropriate skills have been lagging especially for technical and artisanal skills. Appropriately trained skills are not only able to carry out tasks but show initiative in improving the production process and products themselves. In the process of adopting and adapting technology, skills play a pivotal role. The current state of skills and education has been weak, and there have been a number of interventions to redress this situation. Technical Vocational Education and Training (TVET), a skills development initiative through FET colleges was developed to address this issue. However, the role of this initiative and the needs to the industry has been disconnected which resulted in shortage of skills and inadequately trained staff (Daniels, 2007).

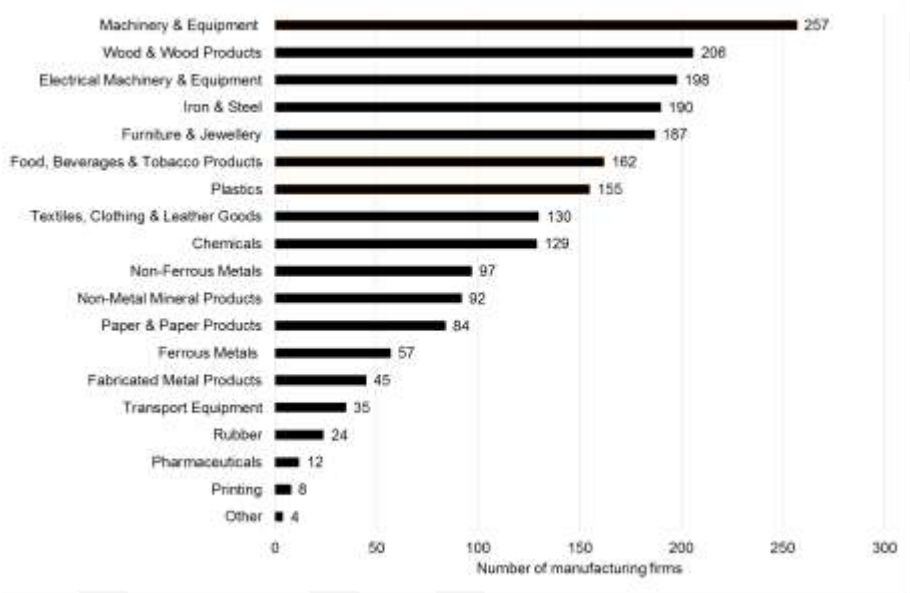
Summary

South Africa experienced deindustrialisation which has contributed to poor performance of firms, high unemployment rates, high inequality as well as poor economic growth. Deindustrialisation occurred at lower levels of GDP per capita than developed countries. The manufacturing sector plays a key role in labour-absorption and employment creation. There needs to be a conducive environment where firms can operate optimally to maximise competition and their performance. The current state of the manufacturing firms' performance and competitiveness remains to be understood before any interventions can be implemented to address this issue. Export patterns, growth, capacity utilisation as well as skills among other factors are key in determining the condition thereof. The role of this paper then is to fill in the gap of understanding the current state of performance and competitiveness and then suggest policies and recommendations to redress the current state.

4 Research Methodology

The City of Johannesburg is comprised of 28 industrial nodes. All the firms in these industrial areas were identified and classified into their sectors[1] and subsectors where possible, through street-by-street investigation. From the population of 2 174 firms, a manufacturing firms' sample of 1 532 firms was identified as shows in the figure below. Machinery and equipment is the largest sector followed by wood and wood products and lastly electrical machinery and equipment.

Figure 2: Manufacturing subsectors in Johannesburg



Source: CCRED Census data, 2015

From the sample of 1 534 firms, 105 firms were selected for in-depth interviews. Due to various challenges such as blocked email addresses, incorrect email addresses and refusal to participate in the survey, the questionnaire was not sent to all 2 174 manufacturing firms.

[1] The primary sectors are manufacturing, mining and quarrying, agriculture, wholesale and retail, community services, business services, transport, logistics and storage.

The survey that was administered online and the face-to-face in-depth interviews were conducted in English only. The face-to-face interviews were conducted in 7 industrial nodes which were spread across the regions of A to G of the City and were representative of the population.[2] In-depth interviews were undertaken to probe firm's responses to better understand and quantify, where possible, the challenges firms are facing. All firms were surveyed by email and follow-up calls we made to encourage and remind the respondents to participate in the survey. The collection of the data from the survey and in-depth interviews spanned over a three month period.

The themes that were addressed in the survey include general background information, performance and capacity utilisation, investment patterns, skills and training, research and development, quality of the local infrastructure and their interaction with the City of Johannesburg. The firms were also asked for recommendations that the City can adopt to retain business in these industrial areas and improve firms' performance and competitiveness. With the exception of the final open-ended question, the survey was made up of multiple choice questions. Realistic ranges were made possible by using secondary sources, such as the threshold for micro, small and medium enterprises, to avoid false responses. Firms were able to answer "other" or "not applicable" wherever relevant and prompted by a response to specify the answer.

In order to understand economic performance and competitiveness, measurable proxies will be employed. Firm size will be analysed through number of employees and annual turnover estimates. Economic performance will be analysed through change in annual turnover in the past two years and capacity utilisation. Firm competitiveness will be analysed through technology advancements and whether or not firms export. The state of skills will be viewed to see how this impact's firms performance as well.

The complexity of the questions in the survey was minimised and, as discussed above, most of the questions were in the form of multiple choice. This was intended to increase the ease of responding to the survey. In order to ensure that the respondents completed the survey truthfully, sensitive questions (such as turnover) were structured in broad categories.

[2] The 7 industrial nodes identified were City Deep, Devland, Kya Sand, Nancefield, Robertville, Strijdom Park and Wynberg/Marlboro

Categories ensure that the data was collected without influencing the respondent to overstate or understate their response. Nonetheless, there were incomplete responses, ranging from missing one question, to those who had started the questionnaire but given up after only a few questions. In the survey, the total responses per question will be used.

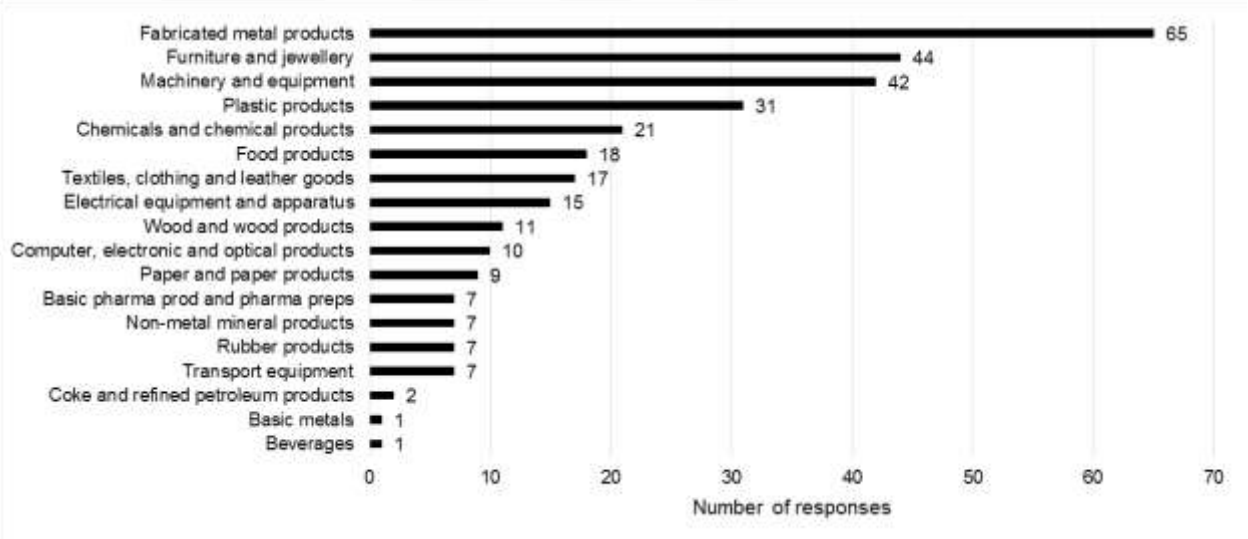
5 Findings and Data Analysis

The response rate was 24% with 305 firms responding to the survey with the addition of interviews from 47 firms. In this section we will focus on understanding economic performance, competitiveness as well as the challenges that firms are facing. The data was captured in Excel and analysed using Stata Statistical Software. Cross-tabulations were the main form of analysis in order to understand the relationships between variables.

5.1 Overview of the nature of firms in Johannesburg

The data indicates that there is a strong presence of, in descending order, fabricated metal products, furniture and jewellery, machinery and equipment, plastic, and chemicals and chemical products in Johannesburg (Figure 1). 21% of the firms that responded are manufacturers of fabricated metal products, except machinery and equipment. These products include display units, doors, fencing and machine components, spindles, pulleys, bolts & nuts, rail components, automotive and transformer industries. The prevalence of the fabricated metal products may bias survey results interpretation as they had the largest response.

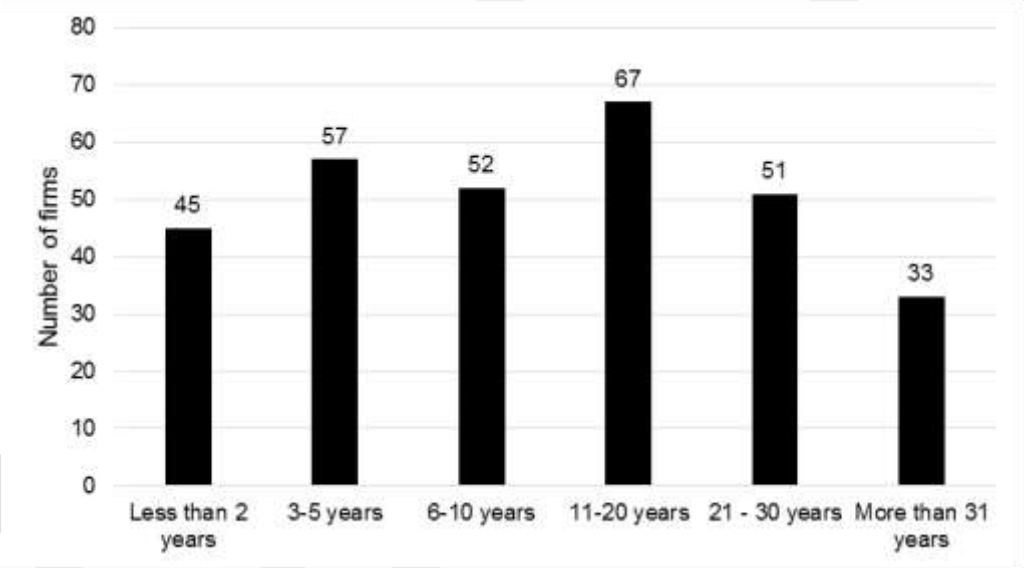
Figure 3: Sub-sector overview, n=307



Source: Survey data, 2016

Tenure at the current premises can be a proxy for the establishment's age, as illustrated in Figure 2. However, this proxy should be employed with caution as firms may have relocated to the premises for expansion purposes or other reasons. 68% of the firms have been located at their current premises for more than 5 years indicating that they are perhaps established. There are fairly new firms which have been at their premises for less than 5 years which may be start-ups of or recently located. The firms in these subsectors include manufacturers of machinery and equipment, wood, electrical machinery, food and paper. The in-depth interviews revealed that some firms had been operating for more than 10 years but had recently relocated as they purchased a building or were expanding. The older firms (31+ years) were in the basic metals, plastic, machinery and equipment, furniture and jewellery, wood & wood products subsectors.

Figure 4: Tenure at current premises, n=305



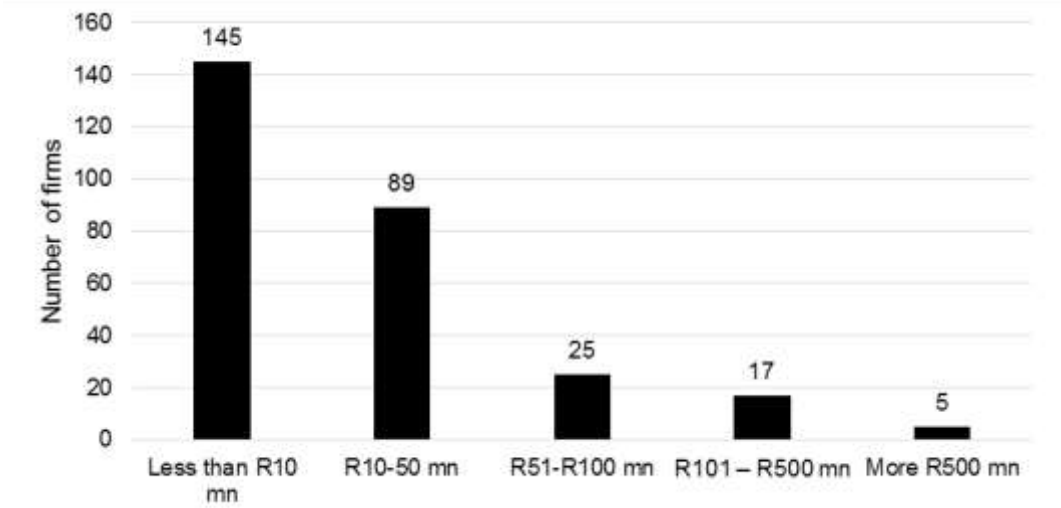
Source: Survey data, 2016

The firms that responded to the survey were largely small to medium size.[3] 80% of the firms that responded to the survey reported less than R200 million annual turnover. The rest earn

[3] Classified according to the thresholds in the National Small Business Amendment Act of 2003 which indicates that micro, very small and small manufacturing firms have fewer than 50 employees and earn an annual turnover of less than R13 million. Medium manufacturing enterprises earn less than R51 million and less than 200 employees. Manufacturing firms with over 200 employees and earn more than R52 million are automatically

more than R200 million per year. The 5 firms that earn more than R500 million are in the manufacture of fabricated metal products, plastic products, furniture and jewellery, non-metal mineral products, and machinery and equipment subsectors.

Figure 5: Company size (total value of sales), n= 281



Source: Survey data

Similarly in terms of number of employees, 96% of the firms that responded had fewer than 200 employees. The 3 firms which have more than 500 employees manufacture computer, electronic and optical products (*did not indicate annual turnover*), non-metal mineral products and plastic products. More firms answered the question pertaining to the number of employees as they are more willing to divulge information regarding number of employees versus annual turnover. This was also cited in the interviews where firms gave a ball park figure for turnover, and an accurate figure for number of employees.

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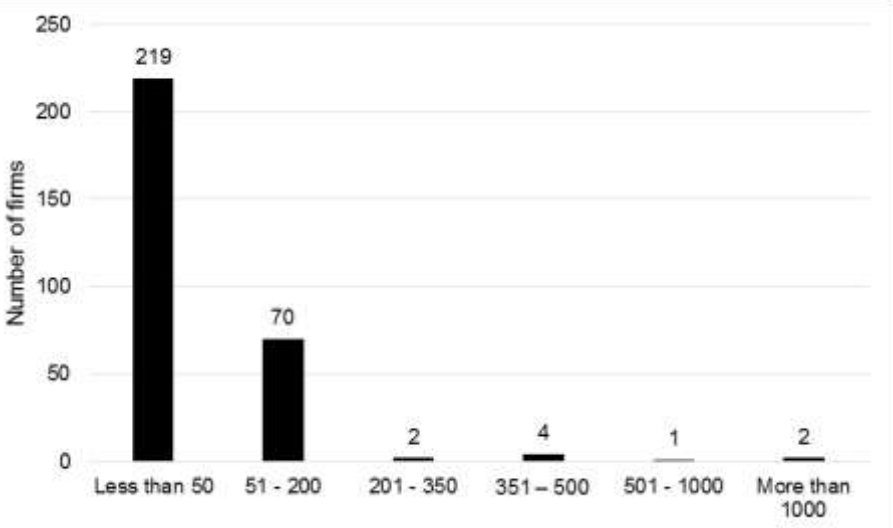
defined as large enterprises. These two measures (number of employees and turnover) were evaluated in the survey to understand the size of the firms.

Figure 6: Company size (employees), n=298



Source: Survey data

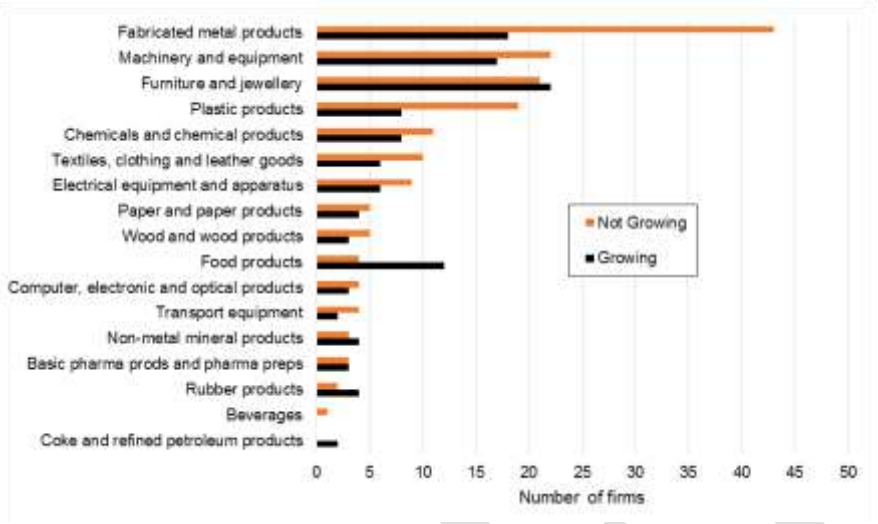
The firm overview indicates that a greater proportion of the firms that responded to the survey are well-established as they have been present at their current premises for more than 10 years. The firms are largely small and medium scale enterprises given their annual turnover and number of employees. These firms are in the fabricated metal products, furniture and jewellery and machinery and equipment mostly.

5.2 State of economic performance

Economic performance is analysed through changes on annual turnover between 2012 and 2015 and the current state of capacity utilisation. Firms were requested to indicate with annual turnover was ‘growing’, ‘stable’ or ‘declining.’ Stable and declining were grouped to indicate firms that were not growing, while growing was left as it. The performance was somewhat split evenly between growing (43%) and not growing (57%).

Illustrated in Figure 5 is a sectoral breakdown of economic performance. Largely firms in the manufacture of fabricated metal products, machinery and equipment and plastic products have been performing dismally compared to other sectors such as furniture and jewellery and rubber products. Weak performance, among other reasons, has been owed to the slowed growth in the mining and construction industries. On the other hand, growth in food, rubber and furniture and jewellery sectors has been propelled by increased urbanisation; rise in demand for food; and growth of supermarkets in the region. Firm mostly supplying the SADC market exhibited this growth, even in the sectors that are performing poorly.

Figure 7: Proportion of firms growing or not, n=289



Source: Survey data

From the diagram above, and preliminary analysis there seems to be a relationship between sector orientation and performance. Cross tabulation analysis was thus carried out to ascertain the validity of this relationship. The hypothesis that there is no relationship between growth and sector orientation was tested. Because the Pearson chi squared probability value was below 0.05, we reject the null hypothesis and conclude that there is a significant relationship between firm subsectors and performance. Below is an excerpt from the contingency table to illustrate economic performance in selected subsectors. In Table 1, the shaded area depicts the subsector where the proportion of firms that are growing is more prominent than firms that are not.

Table 1: Extract of the cross tabulation between sector and growth

Subsector	Declining	Growing	Static	Total
Electrical equipment & apparatus	0	6	9	15
	0%	5%	10%	5%
Fabricated metal prods	26	17	17	60
	37%	14%	19%	21%
Food products	0	11	4	15
	0%	9%	4%	5%
Furniture & jewellery	9	15	5	29
	13%	13%	5%	10%
Machinery & equipment	7	16	14	37
	10%	13%	15%	13%
Plastic prods	7	8	11	26
	10%	7%	12%	9%
	Pearson chi2(32) = 74.5767		Prob = 0.000	

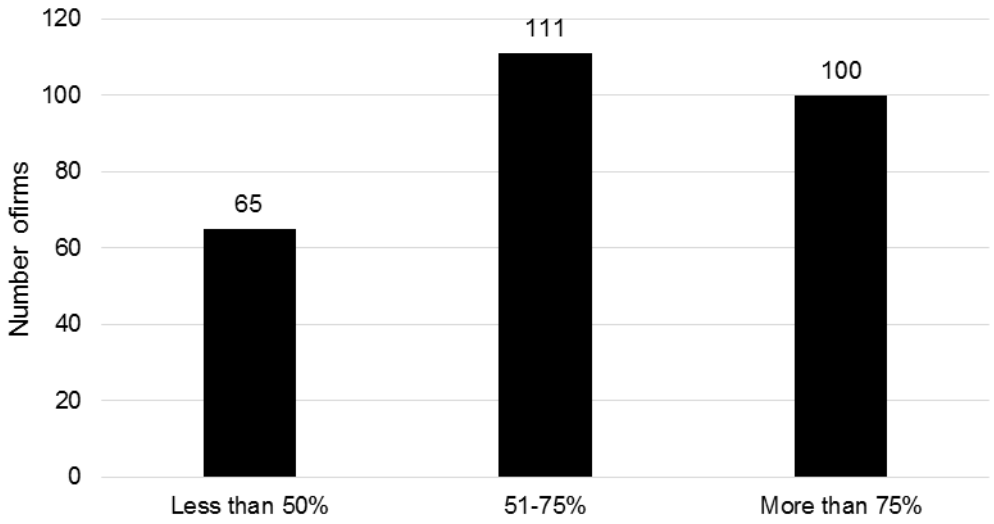
Source: Survey data, own analysis

Firms attributed poor performance to a decline in customer demand and lost sales to foreign and domestic competitors. Other reasons cited in the survey and echoed in the in-depth interviews were the political and economic climate, industrial strike action, labour costs and regulations, exchange rate, drought, lack of financial support and infrastructural challenges.

5.2.1 Capacity utilisation

The declining or static performance results in firms operating sub-optimally. In the in-depth interviews, firms indicated that the complexity and heterogeneity of firms' products implies that they normally operate at less than 100% capacity citing approximately 80% as an optimal level. 63% of the firms operated below 75% with the majority operating between 51% and 75% (figure 6).

Figure 8: Capacity utilisation, n = 276



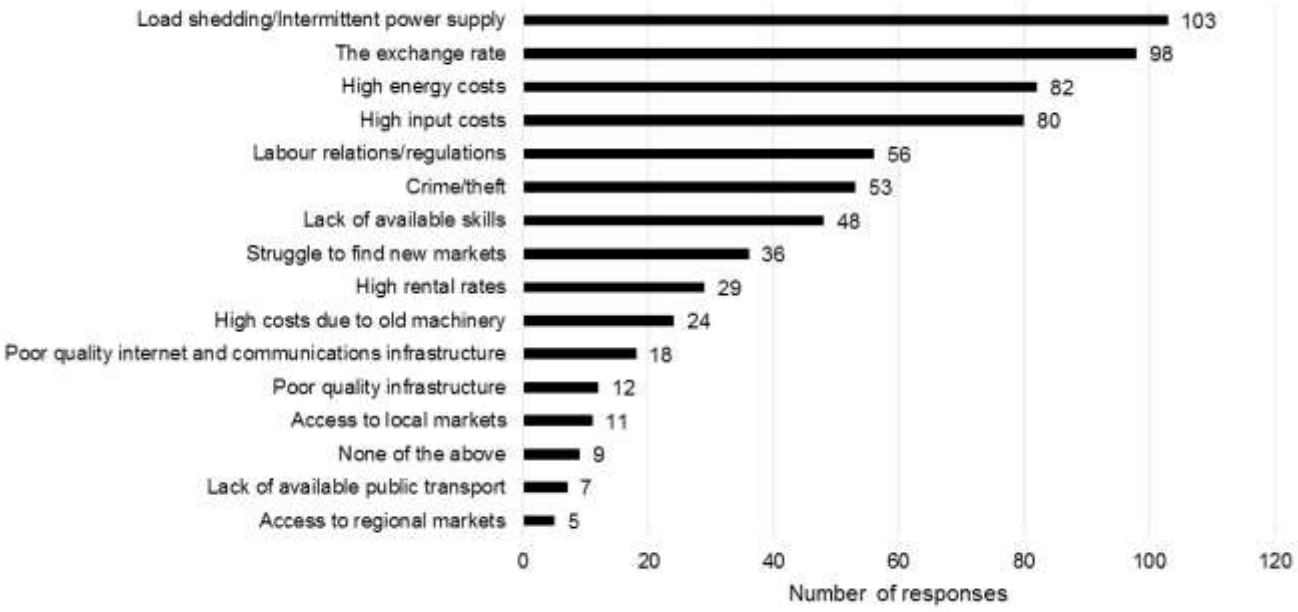
Source: Survey data

47% (100) of the firms operate at more than 75%. These estimates correlate with the firms' statistics showing firms change in annual turnover in the past three years. Subsector categories with high capacity utilisation are similar to subsector categories that are growing. These are in the food and rubber subsectors. Nonetheless, 53% (176) of the firms are either declining or static and in addition to the previously cited increased competition and declining local demand, unscheduled downtime from power outages and water interruptions worsen economic performance. Low capacity also indicates that there is pare capacity which can be utilised in the even that demand is increased. In this regard, there is a role of entering other markets given how small African economies are.

5.2.2 Main challenges to performance

Firms were required to cite the main challenges and are illustrated in Figure 7. Energy supply and the exchange rate volatility were cited as the modal challenges as they limit the ability of firms to price and cost accordingly.

Figure 9: Main challenges facing firms, n= 303



Source: Survey data

More than 96% of the firms experienced power outages over this period. The in-depth interviews however show that power outages have become less frequent though other power-related issues remain. Energy prices are higher compared to before, and are increasing (between 2009 and 2015 the cost of electricity increased by a compounded annual growth rate of 18%, Eskom website, 2016). Furthermore, voltage fluctuations are prevalent, occurring more than 3 times a week. This damages machinery and equipment and interrupts production flow. To curb the loss of sales and production, some firms have resorted to purchasing generators, while other firms are unable to. One firm cited that an adequate generator of 250kva costing R500 000 would suffice to power their factory, but lack funds to purchase this. The recurring fuel costs would also be added expenditure.

In 2015, the exchange rate was volatile in the past year reaching its highest ever level at $1:R16.89 on 20 January 2016 (SARB, 2016). This had detrimental effects on firms that import raw materials resulting in a cost increase of 40% on average for a few firm's imported inputs. However, for firms that export this has been advantageous. For example, a firm that sells their product to Zimbabwe noted that they gained from the exchange rate depreciation where they received more for their sales provided they invoiced in American dollars. However for the clients that they invoice in rand, it had an adverse effect on them.

Labour cost and regulations, crime and theft, and the lack of available skills are also issues which have disadvantaged economic performance (Figure 7). Firms have also attempted to enter new markets and faced significant difficulty especially with regards to financing the process, unfamiliar customs duties and taxes.

Summary

In spite of the prevailing economic condition, there are a substantial number of firms that have been growing. Among the firms that are not performing, the plastics and fabricated metal products sectors appear hardest hit. Their poor performance has been attributed to low consumer demand and competition from foreign and domestic rival firms. In order to improve their performance, firms are implementing other strategies to improve their competitiveness in order to regain lost market share. Upgrading machinery, investing in product development and exploring new markets encompass these strategies and will be elaborated in the subsequent section.

5.3 Factors driving firm competitiveness

Access to markets and investment patterns are instrumental in understanding firm competitiveness. Ability to enter other markets indicates that firms have reached economies of scale and are operating at a minimum efficient scale. This section will not only analyse these variables, but will go further into understanding the state of skills and development in Johannesburg.

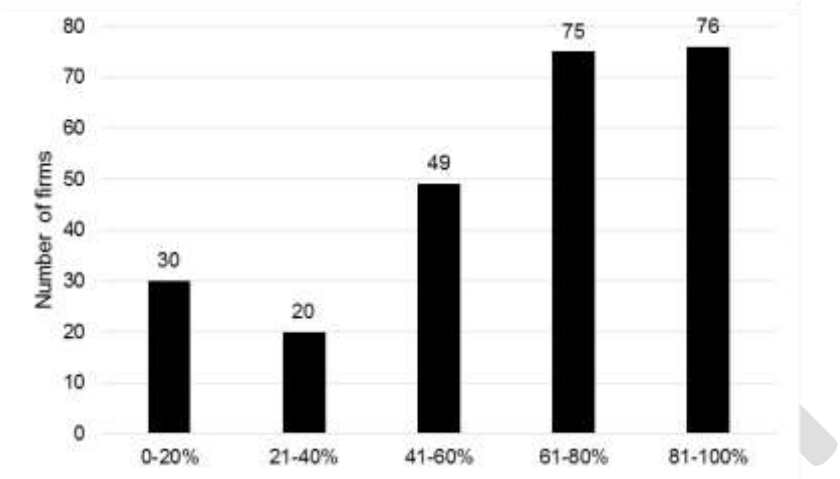
5.3.1 Access to market

SADC countries, particularly Mozambique, Tanzania and Zambia are experiencing phenominal growth rates averaging at more than 6% per annum. The drive towards urbanisation in these economies has led to increased demand for food and consumer products. Furthermore, in Zambia, the growth of the mining industry along the Copperbelt has resulted in demand for machinery and equipment. The growth of these economies have provided other avenues that South African firms can tap into especially given the suppressed local demand and the weakening of the rand.

Gauteng is the largest market for the firms operating in Johannesburg, with a few firms primarily supplying the rest of South Africa or the region. Firms were asked to estimate the proportion of sales o three regions namely: Gauteng, South Africa (excluding Gauteng) and export market – either Africa or the rest of the world. 70% of firms sell more than 50% of their products within Gauteng, while only 20% sell less than 40% of their production within Gauteng (Figure 8). There is a wide spectrum of subsectors that sell less than 10% within Gauteng. It should be noted that from the in-depth interviews, some firms indicated that they

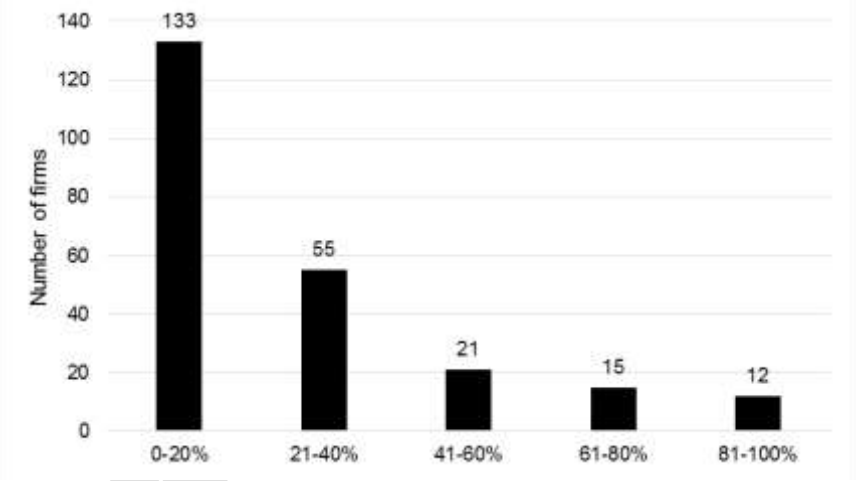
supply their products to their head office (mostly located in Gauteng), which ultimately distributes the product(s) to other regions.

Figure 10: Sales in Gauteng, n=250



Source: Survey data

Figure 11: Sales in SA (excluding Gauteng), n=236



Source: Survey data

The concentration of respondents on the left side of the chart in Figure 8 indicates that firms are less likely to sell their products out of Gauteng. This corroborates the previous finding that Gauteng is the largest market for many firms. 83% of firms sell less than 40% to the rest of SA, while 8 firms sell more than 90% to the rest of SA (figure 9). Firms that sell more than 90% to the rest of SA are in the textiles, clothing and leather goods, transport equipment, food products, non-metal mineral products, furniture and jewellery, wood and

wood products, fabricated metal products, except machinery and equipment, and machinery and equipment subsectors.

In terms of exports, 54% firms export. The proportion of exports to 'other African countries' or 'other destinations' is tabulated below. Other African countries seems to be the larger market with 80% of the firms that export indicating that they export to the rest of Africa compared to the rest of the world. A small proportion of the firms export more than 60% of their products.

Table 2: Spread of exports between rest of Africa and other destinations, n=142

Percentages	Other African countries	Other destinations	Total
<20%	99	21	120
20-60%	17	9	26
>60%	7	2	9
Total	**123**	**32**	**155***

Source: Survey data, own analysis

* Some firms selected both 'rest of Africa' and 'other destinations' and will appear in both columns.

In Table 2, the 4 firms that export 90-100% of their products manufacture food products, electrical equipment and apparatus, machinery and equipment, and furniture and jewellery. The propensity to sell to these regions may be driven by the rapid urbanisation. Cross tabulation by sector reveals a significant relationship between sectors and whether or not the firm exports (refer to Table 3 on the next page). The shaded columns indicates all the sectors where there are more firms that export than those that do not. Fabricated metal products excluding machinery and equipment and plastic products mainly supply the local market. In the previous sections it was also established that these are the two sectors in which firms are not performing well. Even though electrical equipment and apparatus is 5% of respondents, all the firms export; and has been performing well.

The relationship between firm growth and exporting is statistically significant at 10% level (Annexure 4). There is thus a relationship between growth and the likelihood of exporting and firms cited numerous reasons for exporting such as lower local demand, increased competition from local and domestic firms and the difficulty to penetrate the local market.

Some SADC countries are experiencing phenomenal growth rates coupled with increased urbanisation implying that there is increased demand for consumer goods, construction material and other related products. Firms have highlighted this as an opportunity that they can tap into given the suppressed local demand in South Africa. Even in the subsectors under strain, such as plastics and machinery, firms that have tapped into alternative markets are performing better than firms that have been confined to the domestic market.

Accessing new markets is challenging for firms, particularly for small and medium firms, which largely comprise firms in Johannesburg, versus international large firms that can achieve economies of scale. Entering a new market is fraught with expenses that small and medium firms ill afford. Government assistance towards subsidising exports and market information assist in growing sales for firms given the current low consumer demand in South Africa. In spite of the incentives from the Department of Trade and Industry to explore new markets that firms receive, other challenges still exist. Understanding the local demand which leads to product modification requires additional investment. In addition to this, globally firms are becoming more competitive.

Firms also experienced difficulty in entering the South African market due to entrenched incumbents who have secured market share, resorting to entering neighbouring countries. Contesting that market share would be too expensive given the required advertising outlay. As a result, smaller firms have thus resorted to entering other markets in spite of trade barriers and transport costs. The role of the incumbent firms has also been detrimental on the supply-side for these small and medium firms. Some firms are unable to secure supplies as the 'bigger' customers are given preference over the smaller buyers. Furthermore, the incumbents are price-setters and charge at import parity which is more expensive for firms given the volatile exchange rate. This reiterates the need for competition regulation enforcement.

Table 3: Cross tabulation of sector and export propensity

Subsector	Non-exporting	Exporting	Total
Basic pharma & pharma prods	1 1%	5 4%	6 2%
Chemicals & chemical prods	4 3%	11 8%	15 6%
Coke & refined petroleum prods	1 1%	1 1%	2 1%
Computer, electronic & optical prods	2 2%	4 3%	6 2%
Electrical equipment & apparatus	0 0%	13 9%	13 5%
Fabricated metal prods, except mach & equip	33 28%	25 17%	58 22%
Food products	6 5%	9 6%	15 6%
Furniture & jewellery	14 12%	14 10%	28 11%
Machinery & equipment	13 11%	22 16%	35 13%
Plastic prods	14 12%	11 8%	25 10%
Textiles, clothing & leather prods	4 3%	9 6%	13 5%
Pearson chi2(15)		= 29.05	Pr = 0.016

Source: Survey data, own calculations

Summary

The established firms are exporting to the rest of Africa and other destinations from Gauteng due to the strategic location of Gauteng and its accessibility to the SADC region. Gauteng is currently the biggest market with potential to supply the rest of Africa due to the manufacturing intensity in the industry as well. Firms are already exploiting other markets due to low local demand. At the same time regional markets have been growing exhibited by higher GDP growths in Zambia, Mozambique and other countries. The middle class in these countries is growing creating demand for consumer goods. There is a relationship between exports and growth. The firms that are exporting are competitive and hold the capability to produce. Firms are thus considering entry into other countries given the lower demand in South Africa. However, entry is fraught with high sunk costs on market research expenditure,

for example, and onerous regulatory requirements. Information dissemination on country requirements to enter and shared market research would be shared if the government were to play a coordination role.

5.3.2 Firm investment patterns

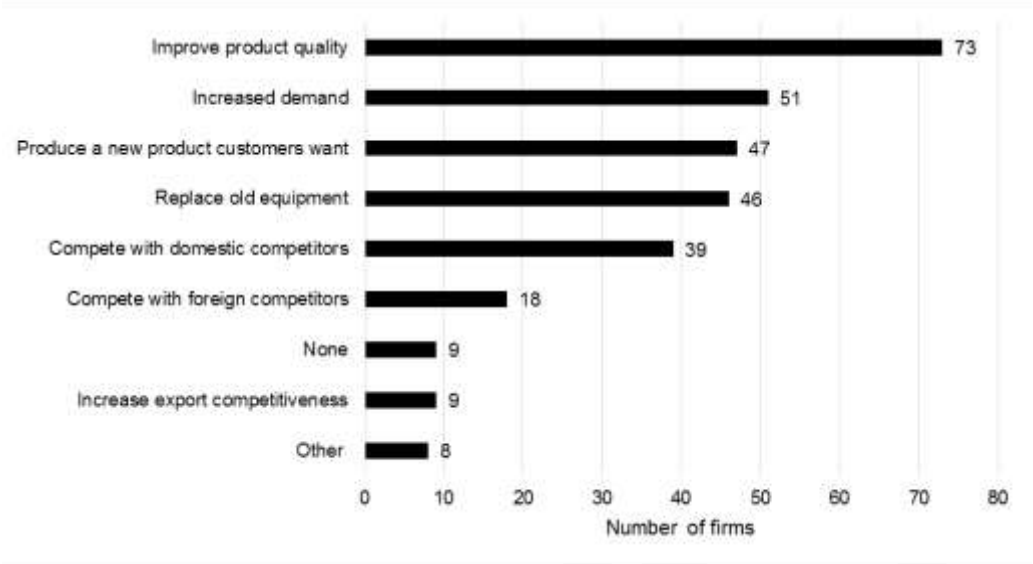
In the survey 53% of the firms had indicated making substantial investments at the site between 2014 and 2015 and quoted reasons for this investment. Investments were to upgrade, expand, in R&D or setting up. . Upgrading efficiency of the plant (78%) was the highest ranking response, followed by expanding the plant (57%), research and development (41%) and initial start-up/setting up new plant (27%). Some firms (16%) expanded existing premises in a new plant likely for expansion purposes. Some of the firms interviewed did indicate that they were expanding their factories and building new plants.

In addition to the investments mentioned above, firms invested in machinery and equipment to improve their product line. The top three responses illustrated in Figure 10 indicate that firms' investment priorities were product-related. Lower demand and competition from other firms likely encouraged the firms to be dynamic and enhance their product offering. Replacing old equipment was the fourth reason. Some firms noted that new machinery was not a prerequisite for producing a new product, and with their existing machinery could make minor modifications on their product. However, dissatisfaction of employing obsolete and dilapidated was expressed as old machinery tends to be inefficient and highly energy-intensive and is a separate issue that needs to be address. Other reasons for investment were mechanising, maintenance and property purchases.

Due to suppressed local demand and limited access to finance firms have been hesitant to reinvest in new machinery and equipment with some firms resorting purchasing second-hand machinery and equipment. Even though some firms did mention that their equipment has a long life span (about 20 years), and purchase the odd grinder and cutter here and there, there is a strong need to upgrade. 11% of the firms indicated that their machinery and equipment on average is older than 20 years.

The hypothesis that there is no relationship between investment and economic performance was tested. The null hypothesis was rejected at 5% significant level illustrated in Annexure 2 meaning that firms are that are investing are likely to be growing. 56% of the firms that are growing are investing, while 73% of the firms that are not growing are not investing.

Figure 12: Motivations for substantial investments in the past two years, n=300



Source: Survey data, 2016

Small and medium firms, the large proportion of the respondents, tend to adopt and adapt technology and have little capacity to produce blue technology. This is evident with 80% of the firms not possessing patents and/or licencing technology. Interviews did indicate that firms are likely to own patents versus licensing technology indicating that innovation is low. The larger firms that were interviewed noted that they do not hold patents at the manufacturing site, rather headquarters holds the patent which may not be located in the industrial area.

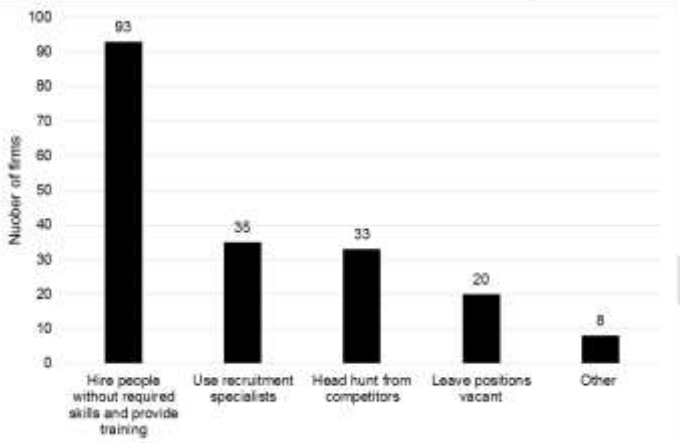
The positive relationship between subsector and economic performance as well as investment and economic performance implies that targeted interventions at sectoral levels are important. In addition, firms may require financial assistance so that they can invest in machinery and equipment and research and development in order to improve the competitiveness of their products and their performance versus the increased domestic and international competition.

5.3.3 Skills and development

In general, manufacturing firms tend to be labour absorbing and require unskilled labour. As a result, the largest proportion of employees have a pre-matric or matric qualification. 77% of

the firms experience difficulty in hiring appropriately trained and/or qualified employees especially technical and artisanal skills. Firms indicated that employees lack basic arithmetic and literacy skills despite possessing a matric certificate. This limits the ability to learn trades and leads to firms hiring unqualified staff and training on-the-job.

Figure 13: Recruitment approaches



Source: Survey data, 2016

Among the recruitment approaches used, firms largely (1) hire people without appropriate skills and provide training[4], (2) use recruitment specialists or (3) head hunt from competitors. Hiring and providing training adds to firm's expenses which detracts from investment in machinery and equipment and R&D for example. Head hunting deters the incentive by firms to invest in skills development as firms risk losing trained employees to rival firms. 11% of the firms leave positions vacant which is concerning given high unemployment rates (Figure 11). The aptitude of firms is important as they not only able to think of better ways of performing a task or require high levels of supervision, but can solve problems that arise without requiring external assistance.

[4] Some firms do claim back on the skills development levy, but the process has its own administrative challenges.

Only 4.1% of firms surveyed use Further Education and Training (FET) institutions that provide vocational and technical skills training. The low proportion of firms using this approach was echoed in the in-depth interviews were firms suggested that FETs are not adequately structured to meet the firms' needs. Ultimately, firms resort to their own forms of training which diverts resources from other efficiency-enhancing expenditure such as new machines and equipment and R&D.

The innovation culture as evidenced by the holders or patents and/or technology licensees is low. This indicates that firms are not improving their competitiveness relative to the foreign competition that they are facing. However, some firms improve their product offering without necessarily having to patent it. There is a weak skills base in the economy which has affected manufacturing firms as they mainly have a shortage of technical and artisanal skills. As such firms have resorted to employing inadequately equipped employees and offering on-the-job training. This overall has increased the spending on skills development even though some firms do claim back on the skills development levy.

6 Conclusions and Recommendations

Most manufacturing firms in Johannesburg are small to medium enterprises with over 90% having fewer than or 200 employees and 82% having less than R50 million annual turnover. 43% of firms are growing while the remainder are experiencing static or declining growth. Poor performance was also evident in the low capacity utilisation levels that reflect lost production opportunities. The main reasons for weak performance are falling customer demand; loss of market to foreign and domestic competitors; and poor state of infrastructure. In some rare instances, decline in performance has been curbed by implementing innovative ways to improve product quality and offerings.

Improving firm competitiveness

An area of coordination by the City is in setting up joint facilities and support for research, product development and testing for specific sectors. Johannesburg is well-located in terms of access to skills and proximity to higher education institutions which could lead to fruitful partnerships with local further and higher education institutions. This would need to be investigated at a sector-specific level, as needs differ sector-to-sector and even at subsector-level.

Accessing alternative markets

Gauteng is evidently the main market for many Johannesburg-based as most firms sell over 70% of their goods in Gauteng. Despite the propensity to supply most products within

Gauteng, almost half of the firms export their products either to other African countries or the rest of the world, however in small amounts. Among the firms that do export, growth exhibited was better than the firms confined to the South African market. Gauteng is the economic and manufacturing hub of Southern Africa, and South African based firms can use this opportunity to enter these markets.

The research shows that there is a large concentration of goods which are in demand in the region. These range from food products, construction material and mining equipment. Coordinated export promotion for particular sectors would be especially useful for smaller firms with limited resources which cannot necessarily afford to market themselves individually. Furthermore, creating awareness of the technical and customs regulations by sector or product for selected countries would also reduce costs per firm.

Public services

The state of public infrastructure was noted as dilapidated and unmaintained. Power supply is inadequate with most respondents having experienced power outages in the past year. Different from lack of supply, these outages were caused by illegal electricity connections, cable theft and poor maintenance of substations.

Reliable public transport was a serious issue cited which has resulted in the location of labour close to industrial areas in informal settlements. Not only is reliability an issue, but the cost of transport. Employees end up spending almost half of their salary on transport which begs the question whether the salaries are too low or whether transport is too high? As a result, firms have resorted to hiring employees that live close to the factory.

Johannesburg's Integrated Development Plan (IDP)'s '*back to basics*' initiative aims to improve service delivery in Johannesburg by addressing infrastructural challenges and improving the aesthetics of Johannesburg. Inconsistent availability of water and electricity drawbacks should be rectified along with the state of the road and land infrastructure. Presently, firms have implemented individual efforts to rectify these issues which increases operational expenses for the firms.

Addressing skills and training

A significant proportion of the firms in the survey identified skills levels as a challenge. Employees are not adequately equipped to perform task and learn trades. Firms as a result employ individual efforts to rectify these inefficiencies. There is need for the City to either design an intervention aimed at building artisanal skills in targeted sectors, or for the City to

engage with already existing training initiatives and see how these can be better tailored to suit firm's needs. However this in area that would require further research.

Improving the social welfare

An area for further research that was established in the survey was on how to improve social welfare of employees in industrial areas. This is an issues that needs to be addressed in all spheres of the government to ensure that housing, transport and security needs are met. It was established that employees have relocated close to the industrial areas in informal settlements which are not suitable for habitation. Areas like Cosmo City were designed to meet habitation requirements for the Furthermore, employees following pay day are prone to thievery and a number of incidents to this effect have been reported, where in some cases have resulted in fatalities.

Once these interventions have been implemented, firms will be in a favourable environment to compete internationally. Accessing reliable infrastructure will also ensure that firms are not diverting much needed resources to meet these needs.

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