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

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**Abstract**

Following the financial crisis in 2008 and the 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 continual decline to contribution to economic growth. 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 responses on economic performance, competitiveness and the challenges faced submitted by over 300 firms. In-depth interviews with 45 firms were also conducted to deepen the insights from the survey. Changes in growth; exporting patterns; investments and level of skills 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 paper offers recommendations to address ways to stimulate economic performance and competitiveness in Johannesburg.

JEL Classification

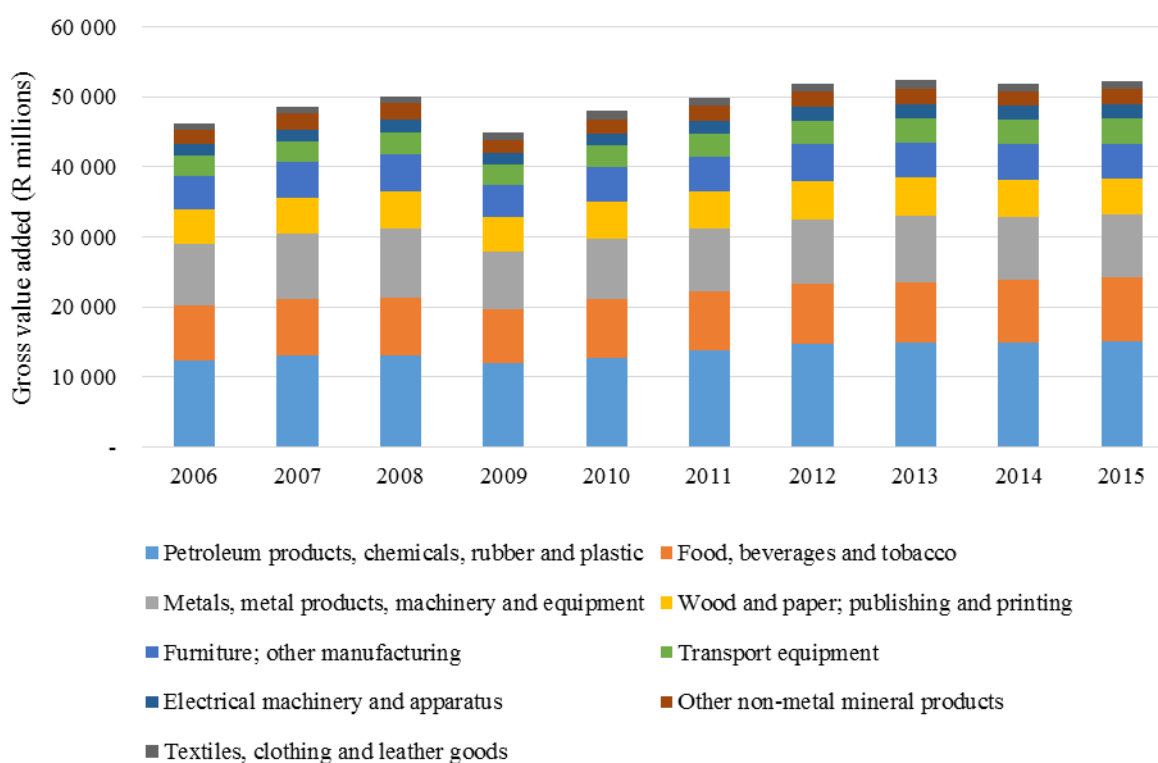
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## 1. INTRODUCTION

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 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, especially impacting the youth. There is, therefore need to increase competitive local production as a basis for job creation, exports and sustainable firm growth.

Manufacturing has been a significant contributor to gross value added (GVA) in Johannesburg, accounting for 76% of the secondary sector between 1995 and 2013. Within the manufacturing sector, FIGURE 1 below illustrates the manufacturing subsector's GVA contributions in the City of Johannesburg between 2006 and 2015.

**FIGURE 1: Manufacturing GVA in Johannesburg, 2006-2015**



Source: Quantec

Petroleum products, chemicals, rubber and plastics have consistently been the highest contributor in terms of GVA between 2006 and 2015 with an average of R15 billion between 2013 and 2015. These subsectors are followed by food, beverages and tobacco; and metals, metal products, machinery and equipment which have been alternating between the second and third highest values with R9 million. Textiles, clothing and leather goods are the lowest ranked hovering around R1 million. Despite the drop in 2009, overall GVA recovered reaching a peak in 2012 and plateauing from 2013.

Performance by local firms, translates to the betterment of the economy as a whole. 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, an 8% decrease (Quantec, 2016). Johannesburg has a number of industrial nodes with potential to contribute towards the

revitalisation of the economy. However, the interventions necessary to improve economic activity in these areas require adequate information pertaining to economic activity and challenges faced by firms, to be implemented. A sound understanding of industrial activity allows policy makers to develop targeted interventions and leverage resources in the direction of greatest potential return.

The research questions that this paper aims to address are:

1. What is the nature of economic activity in the City of Johannesburg?
2. Which factors influence economic performance and competitiveness?
3. How can economic performance be improved in these areas?

This paper draws on the data collected from the firm-level survey of 26 industrial nodes in Johannesburg to analyse firm's economic performance and competitiveness as well as insights from interviews conducted in selected nodes.

The next section provides an overview of the current literature on the role of manufacturing; and economic performance and competitiveness. Section 3 seeks to understand economic performance and the best proxies to be employed when assessing it. Section 3 describes the approach and methodology employed to carry out the study while the penultimate sector explores the findings from the survey data. Section 5 concludes and suggests policy recommendations.

## **2. DEINDUSTRIALISATION IN DEVELOPING ECONOMIES**

Industrial development plays an important role in the growth and sustainability of the manufacturing sector. Industrial development is evidenced by the growth and competitiveness of firms in an economy through changes in the contribution of the manufacturing sector to GDP. The decreasing contribution of the manufacturing sector to GDP, value added, and employment is termed deindustrialization. In South Africa, deindustrialisation was largely driven by financial liberalisation and trade liberalisation. This greatly affected the manufacturing sector, and interventions to reverse this phenomenon need to be tailored to the manufacturing industry, taking into account that reindustrialisation is challenging.

The manufacturing sector is the driver for economic growth due to the spill over effects thereof. This statement is derived from one of the Kaldorian laws which states that the faster the growth of the manufacturing sector, the faster the economy grows versus other sectors (Dasgupta and Singh, 2007:4). However, when GDP per capita reaches a certain level, the growth of the manufacturing sector begins to fall while the growths of other sectors starts to grow, particularly the services sector. The main implication is that excess labour from agriculture will not be captured in manufacturing, but rather remain in agriculture or low-productivity informal manufacturing and informal services (Dasgupta and Singh, 2007:6).

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) also refers to industrialisation as building up a country's capacity to transform raw materials to new products including the system that enables this transformation to occur. Simply, Green (2009) 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). The decrease however, may simply indicate retarded growth during that time period.

Since the 1980's, developing countries have experienced deindustrialisation and the effects thereof are evidenced by high unemployment rates, low GDP per capita and high inequality rates (Tregenna, 2009). 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.

Trade liberalisation had a negative impact on Latin American countries that industrialized under the import substitution industrialization (ISI) model: Argentina, Brazil, Chile, Costa Rica, Mexico, Uruguay, and Venezuela (Bogliaccini, 2013:80). Even though trade liberalisation assisted in the integration of local companies into the global economy, it had negative impacts on the economy resulting in increased inequality.

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 can have more severe negative effects on the economy as the benefits from industrialisation are foregone (Tregenna, 2011). These may include retarded economic growth, high unemployment levels and declining international competitiveness. As such, reindustrialisation plays a key role in economic growth, which will lead to the resuscitation of an inclusive, resilient and competitive economy.

### **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 of a firm to price and supply goods in a particular market relative to other firms in a similar market. Economic performance tends to be subsumed into competitiveness as evidenced by Ajitabh and Momaya (2004) in their literature review on competitiveness, where performance is measured by growth in sales and profits.

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. Macroeconomic variables such as inflation, interest rates and cost of capital also influence the ultimate cost of the product, which determines how competitive the product is in the market (Onyemenam, 2004:4).

Economic performance is usually exhibited 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, 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 than 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 or 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 that when considering firms competitiveness and performance, other factors need to be considered: skills, technology and investment. Skills development has been lagging behind especially for technical and artisanal skills which are required by manufacturing firms. In the process of adopting and adapting

technology, skills play a pivotal role. Appropriately trained skills are not only able to carry out tasks, but show initiative in improving the production process and products. 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).

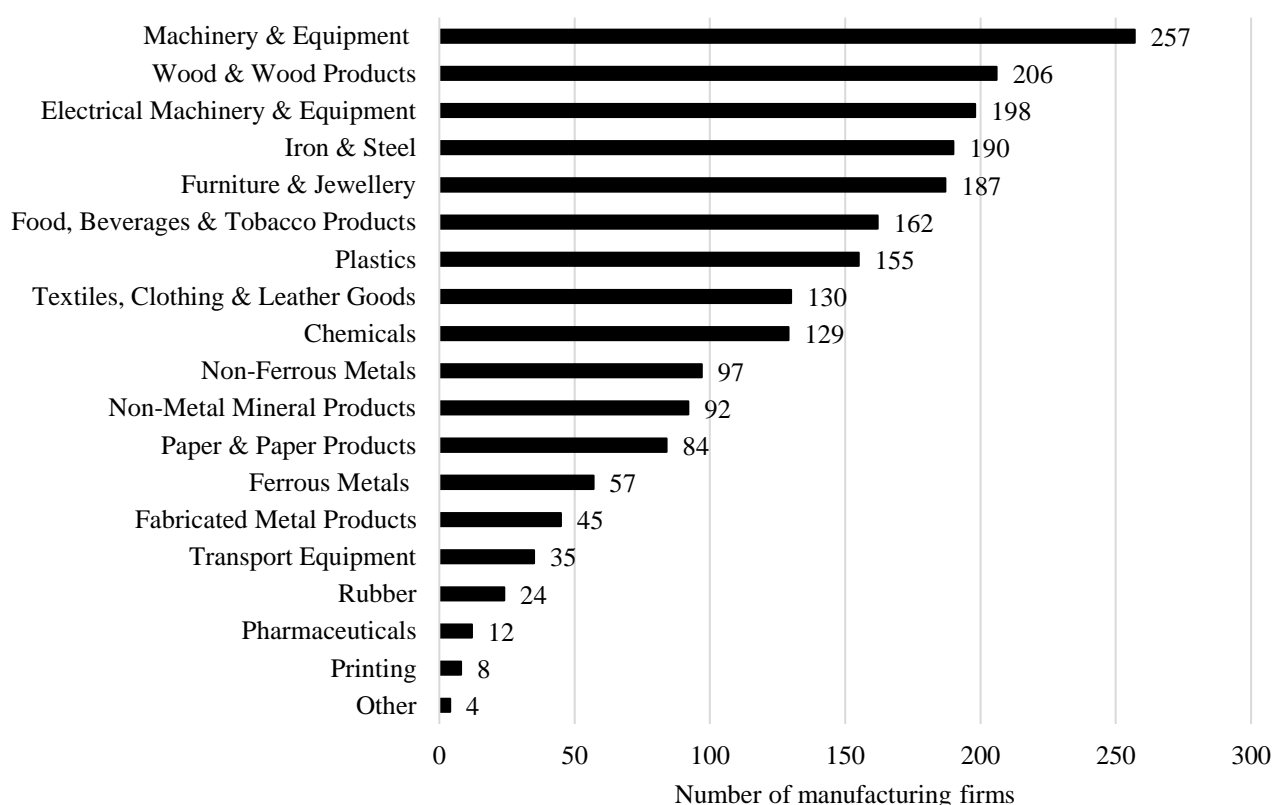
Technology can be transferred into an economy through transfer of ideas and new technology; importation of high technology products; adoption of foreign technology; imports of human capacity and foreign direct investment. Depending on the country's level of development, these different conduits are important (Borensztein, De Gregorio, and Lee, 1998:115). Accessing technology via international firms is becoming increasingly important and will require learning on the local firm's part (Lall, 1992:166). Such advancements are key in economic development as they increase productivity at a firm levels, which drives international competitiveness. An economy that has built up technological capabilities is also able to attract foreign direct investment, which will enhance transfer of technology through learning by doing, ultimately boosting productivity (Borensztein et al, 1998:115). Lall (1992) goes on to suggest that government interventions are also important in assisting the development of capabilities through the interaction of human resources, technological effort and institutional factors.

#### **4. RESEARCH METHODOLOGY**

The City of Johannesburg is comprised of 28 industrial nodes. This paper focuses on twenty-six industrial nodes as two were assessed in the pilot study. Through street-by-street investigation, all the firms in these industrial areas were identified and classified according to their primary activity. In order to verify the information collected, follow-up calls, internet searches and business cards were used. From the population, a manufacturing firms' sample of 2 064 was identified. However due to technical difficulties, the sample size was reduced to 1 532 firms (refer to figure 2). Machinery and equipment is the largest sector followed by wood and wood products and lastly electrical machinery and equipment.

From the sample of 1 532 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 subsequently administered to 1 287 manufacturing firms. The survey that was administered online and the face-to-face in-depth interviews were conducted in English only. In-depth interviews were undertaken to probe firm's responses to better understand and quantify, where possible, the challenges firms are facing.

**FIGURE 2: Manufacturing subsectors in Johannesburg**



*Source: CCRED Census data, 2016*

The themes covered in the survey are: 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 as well as improve firms' performance and competitiveness. With the exception of the final open-ended questions on recommendations, the survey comprised 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.

The survey and ensuing in-depth interviews were conducted with personnel at managerial level, or individuals with an intimate understanding of the operations of the company. The structure of these interviews were based on the survey themes, but allowed for deeper understanding on the issues that the firms were facing.

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 to ensure the measurable responses and to remove ambiguity. In order to ensure that the respondents completed the survey truthfully, sensitive questions (such as turnover) were structured in broad categories. Categories ensure that the data was collected without influencing the respondent to overstate or understate their response.

#### *Variables analysed*

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.

#### *Verification of survey data: industry classification*

Once all the survey data was collected, each firm's manufacturing subsector was verified. This was done by using firms' description of their business activity and matching these with the standard industrial classification codes (SICs). Even though efforts were made to ensure that sector allocation were specific, there may be instances, where mistakes occurred.

#### *Possible sources of bias in the survey*

Whilst efforts were made to ensure that all manufacturing firms were given the opportunity to participate in the survey, two potential sources of bias were identified. Firstly, because the survey was administered online, firms without stable/reliable internet access may have chosen not to participate in the survey. Secondly, there may have been self-selection bias in the sense that firms that are generally unhappy with the current state of infrastructure or service provision by the City are more likely to participate in a survey than those who are generally satisfied. However, this is unlikely. In fact, in follow-up calls, researchers experienced resistance from a number of firms that were unhappy with the services provided in their area. These firms often believed that the survey was a waste of time and that there would be no benefit from completing it. There does not seem to be any reason to believe that dissatisfied firms would be more predisposed to completing the survey than firms that are generally satisfied with prevailing conditions.

Despite the measures implemented above, 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 analysis, the total responses per question will be used. The response rate was 34% with 521 firms responding, therein 45 in-depth interviews included.

## **5. FINDINGS AND DATA ANALYSIS**

This section discusses the key findings from the survey by assessing economic performance, competitiveness as well as the challenges that firms are facing. The online survey instrument used captured the data in Excel and the analysis was conducted in Stata. Cross-tabulations were the main form of analysis in order to understand the relationship between variables.

The table below shows that there is a strong concentration of fabricated metal products, furniture and jewellery, machinery and equipment. This may indicate a weakness with firm's SIC code classification, where firms in fabricated metal products may have misclassified as machinery and equipment whilst those in the furniture and jewellery may have misclassified as wood and wood products. The misclassification may be the same in the case of basic metals; coke and refined petroleum products; and computer, electronic and optical products.

**Table 1: Census versus number of firms**

<b>Manufacturing subsector</b>	<b>Census</b>	<b>Survey</b>
Machinery and equipment	257	42
Wood and wood products	206	11
Electrical equipment and apparatus	198	16
Iron and steel	190	-
Furniture and jewellery	187	44
Food and beverages	162	19
Plastic products	155	31
Textiles, clothing and leather goods	130	19
Chemicals and chemical products	129	21
Non-ferrous metals	97	-
Non-metal mineral products	92	7
Paper and paper products	84	9
Ferrous metals	57	-
Fabricated metal products	45	66
Transport equipment	35	7
Rubber products	24	7
Basic pharm prods and pharm preps	12	2
Basic metals	-	1
Coke and refined petroleum products	-	2
Computer, electronic and optical products	-	10
Other	4	-
<b>Total respondents</b>	<b>2 064</b>	<b>314</b>

*Source: CCRED Census and survey data, 2016*

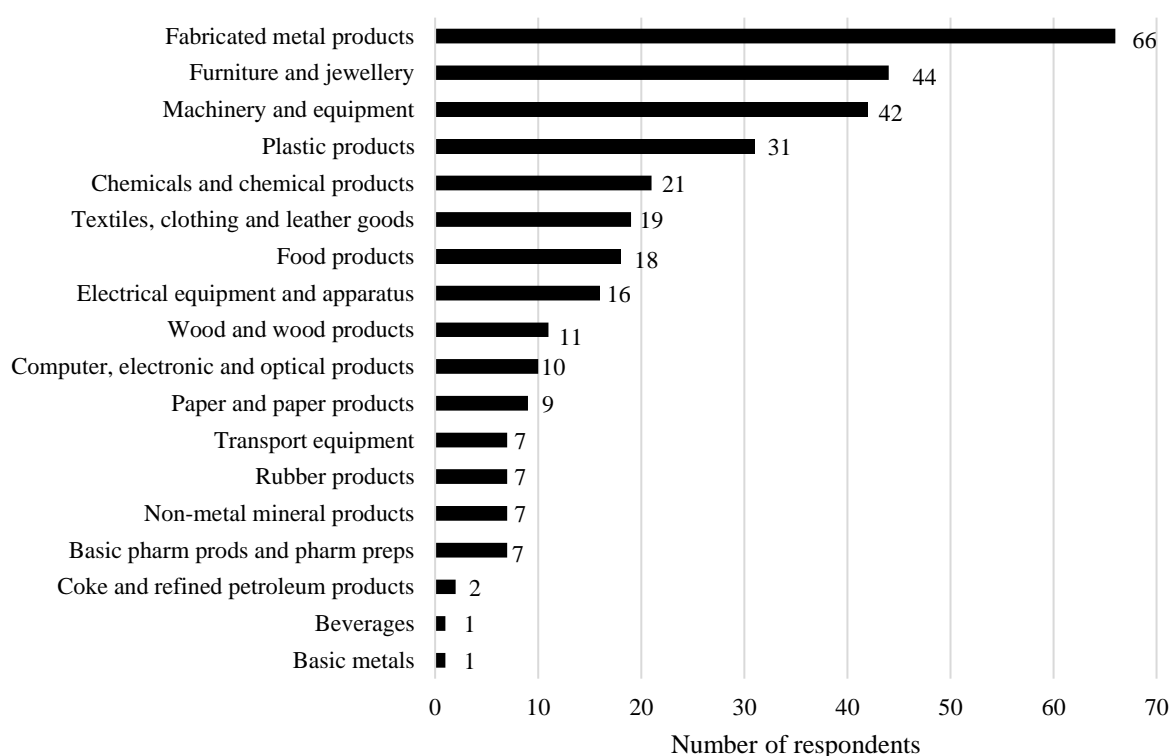
### **5.1 Overview of the nature of firms in Johannesburg**

The data indicates that there is a strong presence of fabricated metal products, furniture and jewellery, machinery and equipment, plastic, and chemicals and chemical products in Johannesburg (

**FIGURE 3** on the next page). 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 size of the firms were 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 employ less than 200 employees. Manufacturing firms with over 200 employees and earn more than R52 million are automatically 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 3: Sub-sector overview, n=307**



*Source: CCRED Survey data, 2016*

The firms that responded to the survey were largely small to medium sized. 80% of the firms reported less than R200 million annual turnover, while the remaining 20% earn more than R200 million per year. Of the firms that earn more than R200 million per annum, five of earn over R500 million and are in the manufacture of fabricated metal products, plastic products, furniture and jewellery, non-metal mineral products and machinery and equipment.

The number of employees metric corroborated the size of firms, as more firms were willing to divulge information regarding number of employees versus annual turnover. This was also cited in the interviews where firms provided an estimate for turnover, and an accurate figure for the number of employees. 96% of the firms had fewer than 200 employees (figure 5). Only 3 firms had more than 500 employees and these firms manufacture computer, electronic and optical products, non-metal mineral products and plastic products.

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 mostly in the fabricated metal products, furniture and jewellery and machinery and equipment. A small concentration of firms that manufacture rubber products, non-metal mineral products, beverages and basic metals also exist.

## **5.2 State of economic performance**

Economic performance is analysed through changes in annual turnover between 2013 and 2015 and the state of capacity utilisation in 2015. Firms were requested to indicate whether annual turnover was 'growing', 'stable' or 'declining.' Also, firms were requested to indicate the level of capacity they were operating at. These proxies for economic performance shall be discussed in turn below.

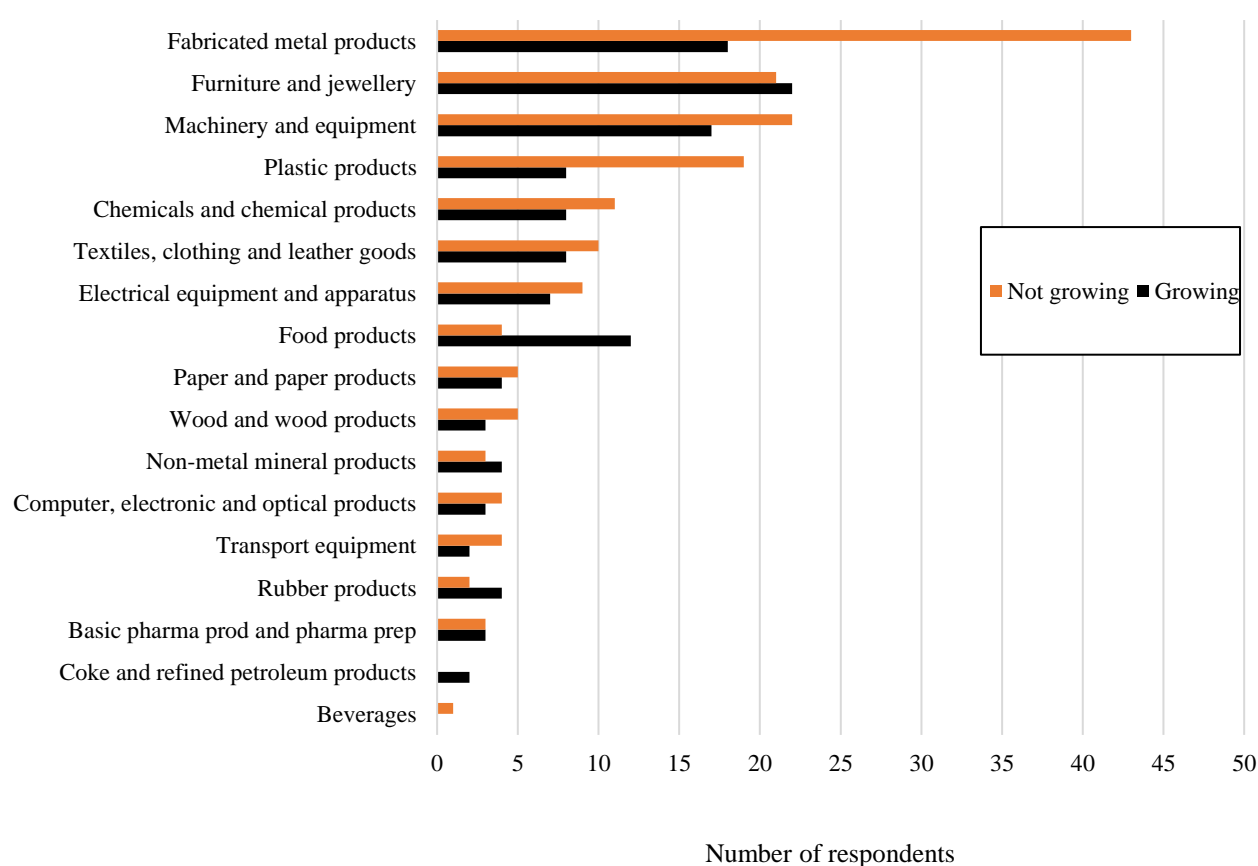
A significant proportion of the firms (43%) indicated that they were growing while 24% were declining and the remaining 33% were stable. The sectoral grouping of the firms illustrates a

close relationship between performance and sector orientation as illustrated in Figure 4. 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 rubber products. Weak performance, among other reasons, has been owed to the slowed growth in the mining and construction industries. The drop in commodity prices had a knock-on effect on firms that supply products, particularly machinery and equipment, to mining houses.

On the other hand, growth in food, rubber and furniture sectors has mainly been propelled by urbanisation in neighbouring countries (Zambia, Mozambique and Botswana). Urbanisation drives demand in food, which is subsequently promotes the growth of supermarkets in the region and propels the construction industry. Firms mostly supplying the SADC region exhibited positive growth, even in the sectors that are performing poorly locally.

From the figure below, there appears to be a relationship between sectoral grouping 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 sectoral grouping was tested. The Pearson chi squared probability value was below 0.05, therefore we can reject the null hypothesis and conclude that there is a significant relationship between firm subsectors and performance.

**FIGURE 4: Proportion of firms growing or not, n=289**



Source: CCRED Survey data, 2016

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

There is a strong association between growth and capacity utilisation (Table 2). This is unsurprising, as firms that exhibited growth between 2013 and 2015, are the ones utilising capacity levels higher than 75%. However, these firms may face challenges when they increase capacity utilisation due to limited spare capacity. In the event that demand increases, these firms will need additional capacity to meet increased demand and maintain growth. This has implications in terms of access to finance for the investments from financial intermediaries as well as land and electricity supply from local municipalities.

**Table 2: The relationship between growth and capacity utilisation**

Capacity utilisation	Frequency type	Growing	Not growing	Total
Less than 50 %	Actual	16	49	65
	Expected	27.9	37.1	65
51-75 %	Actual	44	68	112
	Expected	48.1	63.9	112
More than 75 %	Actual	63	39	102
	Expected	43.8	58.2	102
Total	Actual	123	156	279
	Expected	123	156	279
Pearson chi2(1) = 27.6493				Pr = 0.000

Source: Author's analysis, CCRED Survey data, 2016.

### 5.2.2 Main challenges faced by firms

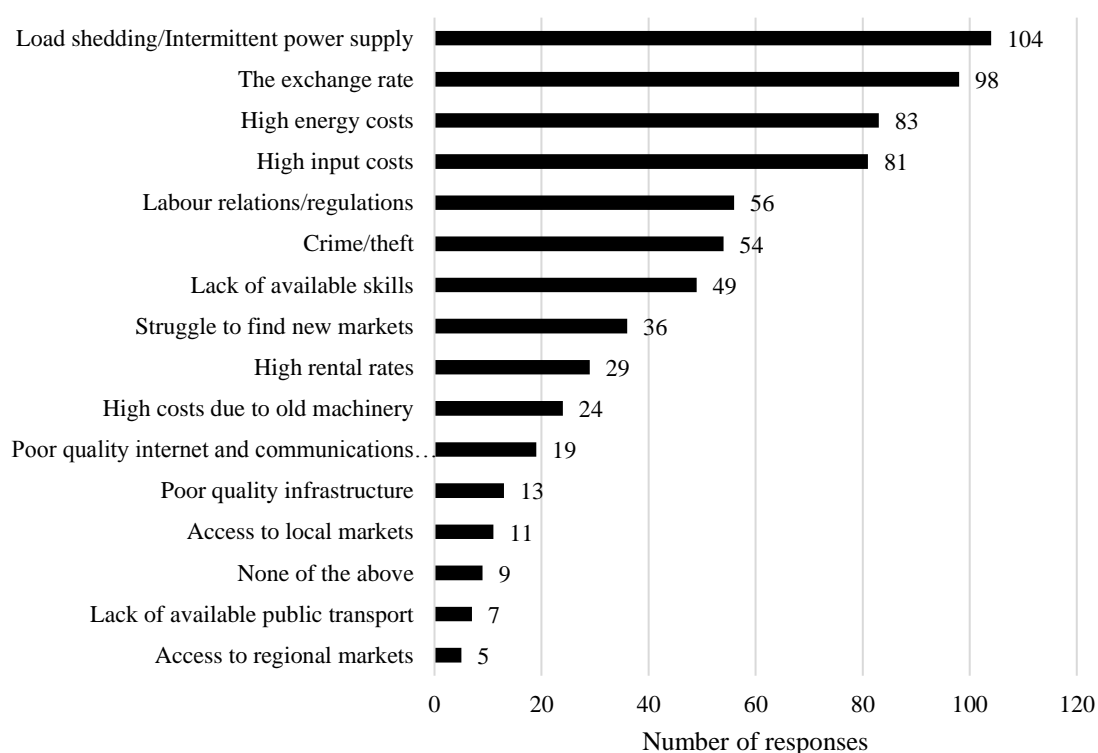
Figure 5 below illustrates the main challenges faced by firms between 2013 and 2015. Energy supply and the exchange rate volatility were cited as the modal challenges as they limit the ability of firms to price and cost accordingly.

More than 96% of the firms experienced power outages in 2015. The in-depth interviews however show that power outages related to power supply have become less frequent though other power-related issues remain the cause of power outages such as poor infrastructure maintenance. To curb the loss of sales and production from electricity interruptions, some firms have resorted to purchasing generators. One firm cited that an adequate generator of 250kva costing R500 000 would suffice to power their factory, but due to lack funds to purchase this, the firm is unable to invest in generators. The recurring fuel costs would also be added expenditure. This concern was raised by small and medium sized firms which are unable to purchase generators, and less so by large firms that are able to implement solutions.

Also noted during the interviews and evident in Eskom pricing schedules, is that electricity is becoming more expensive as energy prices are expected to increase. Between 2009 and 2015 the cost of electricity increased by a compounded annual growth rate of 18% (Eskom website). This is a cost that firms would either pass onto consumers or absorb. However, in light of the finds mentioned earlier, firms are facing increased competition such that increasing prices would have detrimental effects on them.

Adding to the electricity challenges are voltage fluctuations, which tend to be prevalent, occurring more than 3 times a week. This damages machinery and equipment and interrupts production flow. Electricity is a key input in the manufacturing process and it is paramount that firms have access to reliable and affordable electricity.

**FIGURE 5: Main challenges faced by firms, n=311**



Source: CCRED Survey data, 2016

The South African rand was heavily depreciated in 2015 reaching an exchange rate of \$1:R16.89 on 20 January 2016 (SARB, 2016). In addition, the depreciation was accompanied with volatility. Together, the depreciation and volatility had varying effects on firms that import and export. For those that import raw materials, this resulted in an average cost increase of 40% for imported inputs. Most firms cited that, instead of passing on the cost to the consumers, the cost increase was absorbed internally. Firms that exported enjoyed unexpected gains. For example, a firm that sells their product to Zimbabwe noted that they benefited from the exchange rate depreciation as they received more for their sales since payments were invoiced for in American dollars.

Labour cost and regulations, crime and theft, and the lack of available skills are also issues which have impacted economic performance. Lack of government support in terms of access to finance and assistance with trade missions also adversely impacts local firms. Some of their international counterparts have government backing when they enter the international market.

Beyond the prevailing macroeconomic conditions, 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.

## 5.2 Factors driving performance

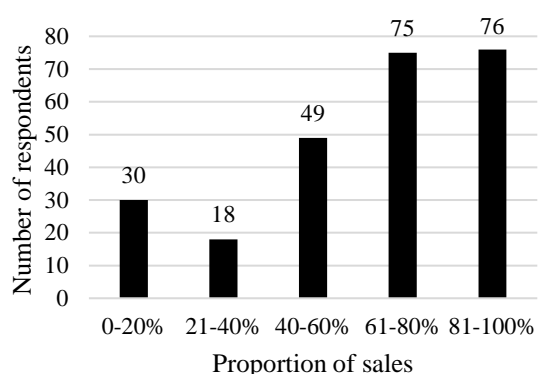
Access to markets and investment patterns are instrumental in understanding firm competitiveness. Ability to enter other markets indicates that firms have reached economies of scale and are operating at a minimum efficient scale. This section will not only analyse these variables, but will go further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

### 5.2.1 Access to market

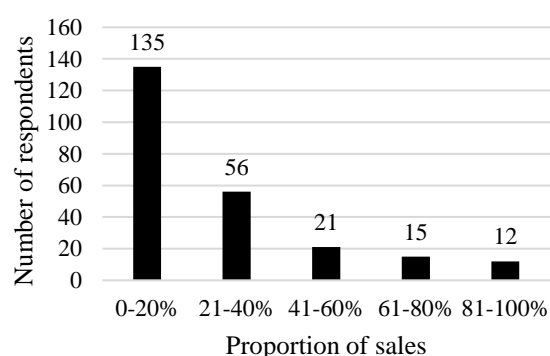
Access to markets and investment patterns are instrumental in understanding firm competitiveness. Ability to enter other markets indicates that firms can benefit from economies of scale; may be operating at a minimum efficient scale and are thus competitive. This section will discuss access to markets and investment patterns and also go on further to assess the state of skills availability and development in Johannesburg.

In the survey, firms estimated the proportion of sales to three regions: Gauteng, South Africa (excluding Gauteng) and export market – either Africa or the rest of the world. From the data, it was evident that 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. 70% of firms sell more than 50% of their products within Gauteng and 56% (135) firms sell less than 20% of their products in the rest of South Africa. (Figure 7). It should be noted that, during the interviews, some firms indicated that their output is delivered to the head office, usually located in Gauteng, which then ultimately distributes the product(s) to other regions.

**FIGURE 6: Sales in Gauteng, n=248**



**FIGURE 7: Sales in SA (excluding Gauteng), n=239**



Source: CCRED Survey data, 2016

Firms that sell more than 80% of their products to the rest of SA manufacture 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. These also coincide with the firms that were identified as being large.

In terms of exports 142 (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 exporting firms identifying the rest of Africa as their export destination.

**TABLE 3: 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
<b>Total</b>	<b>123</b>	<b>32</b>	<b>155*</b>

Source: Survey data, own analysis. \* Some firms selected both 'rest of Africa' and 'other destinations' and will appear in both columns.

A small proportion of the firms export more than 60% of their product and the 4 firms that export 90-100% of their products manufacture food products, electrical equipment and

apparatus, machinery and equipment, and furniture. The propensity to sell to these regions may be driven by the rapid urbanisation and the retarded demand in South Africa.

Cross tabulation by sector reveals a significant relationship between sectors and exporting behaviour (Table 4). The shaded columns indicate 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.

**TABLE 4: Cross tabulation of sector and export propensity\***

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

Source: Survey data, own calculations. \*Responses with less than five firms were omitted

Data analysis further reveals that there is a relationship between firm growth and exporting, which is statistically significant at 10% level. Firms that are likely to be exporting are those operating at high levels of capacity, and registered growth in annual sales between 2013 and 2015. The drive for firms to export is propelled by numerous reasons such as lower local demand and increase in urbanisation in the region.

SADC countries, particularly Mozambique, Tanzania and Zambia are experiencing phenomenal growth rates averaging at more than 6% per annum (World Development Indicators). The drive towards urbanisation in these economies has led to increased demand for food and consumer products. Furthermore, in Zambia and the Democratic Republic of Congo, the growth of the mining industry has resulted in rising demand for machinery and equipment. Furthermore, the middle class in these countries is growing creating demand for

consumer goods. 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. 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 in the case of Johannesburg where there is a large concentration of small and medium sized firms. Entering a new market is fraught with sunk costs that small and medium firms ill afford. Government assistance towards subsidising exports and access to market information can assist in entering new markets. The Department of Trade and Industry does offer to explore new markets, however firms struggle to access these, and for those that have accessed, there was a consensus that more assistance is required as other challenges still exist. Understanding the demand in export markets requires exploratory studies and product modification, which require additional investment. Competition from global firms which are more competitive, is another force that needs to be reckoned with.

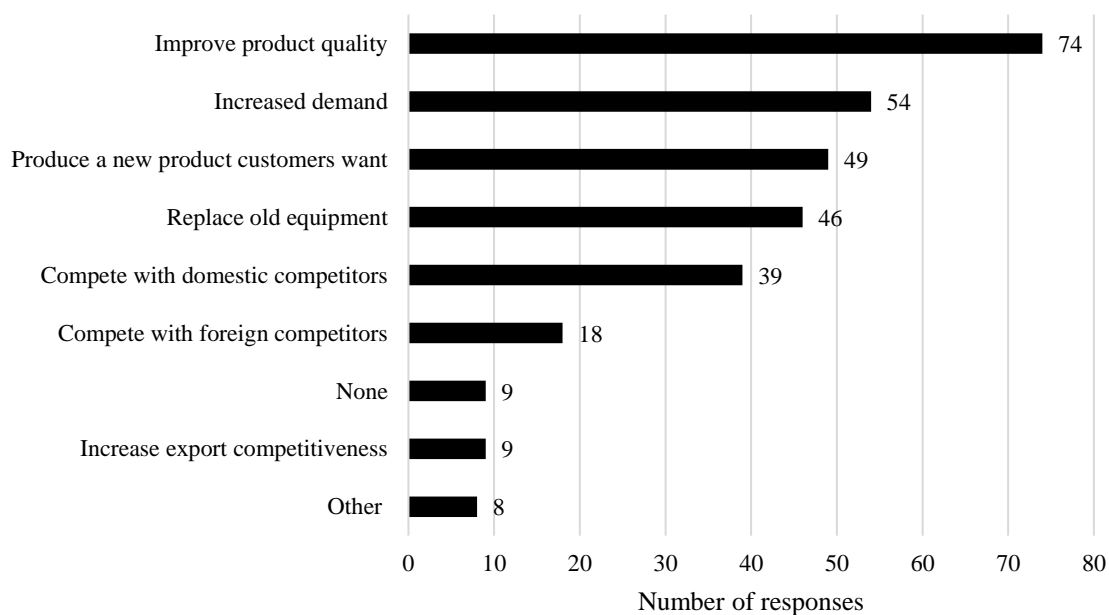
Firms also experienced difficulty in entering the South African market due to entrenched incumbents who have secured market share, and have resorted to entering neighbouring countries. Contesting that market share was cited as being too expensive given the required advertising outlay. As a result, smaller 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.

### **5.2.2 Investment in machinery and equipment**

In the survey 53% of the firms made substantial investments at the site between 2014 and 2015 and the main reasons cited for these investments were to upgrade, expand, in R&D or setting up premises. Upgrading efficiency of the plant was the highest ranking response (78%), followed by expanding the plant (57%), research and development (41%) and initial start-up/setting up new plant (27%). In the in-depth interviews, expansion included expanding existing premises by expanding factories or building new plants.

In addition to the investments mentioned above, firms mainly invested in machinery and equipment to improve their product line (Figure 8). Lower demand and competition from other firms may have encouraged the firms to be dynamic and enhance their product offering. 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. Replacing old equipment was the fourth reason. Old machinery tends to be inefficient and highly energy-intensive.

**Figure 8: Motivations for substantial investments in the past two years, n=300**



Source: CCRED Survey data, 2016

Due to suppressed local demand and limited access to finance, some firms were hesitant to reinvest in new machinery and equipment, resorting to purchasing second-hand machinery and equipment. Even though some firms did mention that their equipment has a long life span (about 20 years), 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 government can assist firms purchase new machines and equipment towards efficiency and competition enhancement.

The hypothesis that there is no relationship between investment and economic performance was tested. The null hypothesis was rejected at 5% significant level meaning that firms which invest 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.

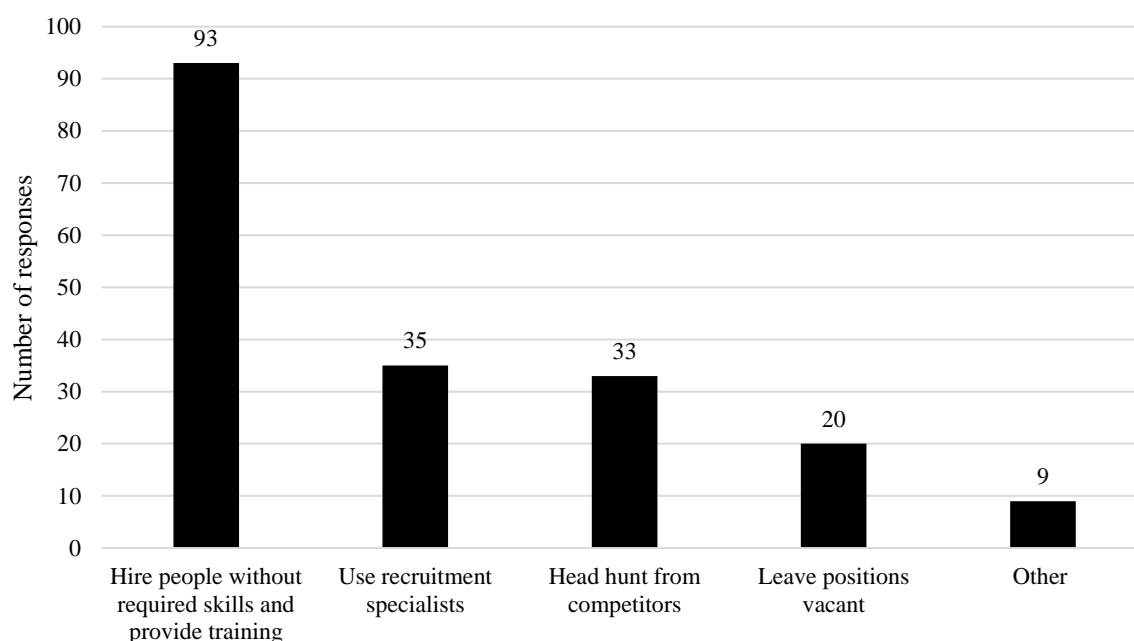
Small and medium firms, the large proportion of the respondents, tend to adopt and adapt technology and have little capacity to produce blue technology. This is evident with 80% of the firms not possessing patents and/or licencing technology. The larger firms interviewed noted that they do not hold patents 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 in face of the increased domestic and international competition.

### 5.2.3 Skills and development

The largest proportion of employees have a pre-matric or matric qualification. At the same time, 77% of the firms experience difficulty in hiring appropriately trained and/or qualified employees especially technical and artisanal skills (Figure 9). Firms indicated that employees lack basic arithmetic and literacy skills despite possessing a matric certificate and results in employees' limited ability to learn trades,

**FIGURE 9: Recruitment approaches, n=191**



*Source: CCRED Survey data, 2016*

Among the recruitment approaches used, firms largely (1) hire people without appropriate skills and provide training, (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 staff 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.

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 where firms suggested that FETs are not adequately structured to meet the firms' needs. This means that not only are firms diverting resources from other efficiency-enhancing expenditure such as new machines and equipment and R&D; government funds are not being appropriately spent.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

Most manufacturing firms in Johannesburg are small to medium enterprises with over 90% having fewer than 200 employees and 82% having less than R50 million annual turnover. 43% of firms are growing while the rest are experiencing static or declining growth. Poor performance was also evident among firms operating at low capacity utilisation levels, signalling 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 instances, decline in performance has been curbed by implementing innovative ways to improve product quality and offerings.

### **Improving firm performance and competitiveness**

Access to machinery and equipment, skilled labour and facilities for R&D are key in 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 businesses 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.

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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