

SIZE MATTERS: COMPARING THE COMPETITIVENESS OF MANUFACTURERS OF VARIOUS SIZES IN SOUTH AFRICA

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Abstract

The competitiveness platform of industries of various sizes is compared in this study, which also examines their competitiveness indices and aspects relating to the competitiveness platform of large, medium and small firms respectively. The reasons that small and medium enterprises (SMMEs) deserve the attention of policymakers are considered first, and the merits of large firms are then assessed. Finally, the results of an empirical investigation into the competitiveness of South African industries are considered. The study revealed that firms of different sizes have strengths and weaknesses influencing their respective international competitiveness. When development policies and strategies are designed to enhance the competitiveness of industrial SMMEs, this should be kept in mind. A firm can be enhanced, for example, through the supplying of information, infrastructure, development funds and the acquisition of modern technology. Competitiveness and productivity increase as the size of firms increases.

Keywords:

Competitiveness, manufacturing development, SMME, SME, firm size, industry, industrial policy, development

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1. INTRODUCTION

Factors which influence the competitiveness of manufacturers vary between firms of different sizes, and this study wishes to examine these differences. The South African authorities have policies aimed at the development of small and medium enterprises (SMMEs). These rest on certain assumptions, for example that SMMEs are more labour-intensive and more innovative. These kind of assumptions need to be verified. To drive an effective development strategy for SMMEs, it is important to know where the strengths and weaknesses of these firms lie. The same applies to large firms and these also merit attention in an industrial development programme. Challenges facing large firms differ from those experienced by small firms.

This article focuses firstly on the merits of SMMEs and large firms in the economy and current literature's findings on the relationship between firm size and competitiveness. Secondly, the results of an empirical investigation into the industrial competitive platform in South Africa are discussed. Thirdly, some findings about South Africa's competitive platform will be considered. The competitiveness indices that were calculated for the various firm sizes are examined and, finally, specific aspects of the competitiveness platform of large, medium and small firms are discussed.

2. THE PROMOTION OF SMALL BUSINESS

Since up to 80% of new employment is created in small and medium enterprises (SMMEs), the Department of Trade and Industry of South Africa (DTI) has a Small Business Promotion Policy (DTI, 2003). The policy was accepted after many large firms were forced to downsize while small companies thrived during the 1980s (DTI, 1998). Small firms are seen as drivers of economic growth. Furthermore, small firms have the ability to penetrate new markets and expand economies in creative ways. SMMEs have the potential for innovation, positive export growth in niche markets and employment-creation spill-overs (IDC, 1998). This is especially the case with firms that are technology-based and suppliers of services with high growth rates. They apply labour-intensive technology, reward entrepreneurial activity and are the beginning of large businesses.

Besides their socio-economic and developmental importance (DTI, 1998), SMMEs broaden ownership of national assets and broaden participation in the economy. SMMEs produce between a third and a half of South Africa's GDP and represent the largest number of firms (Joffe, Kaplan, Kaplinsky & Lewis, 1994). SMMEs raise income and improve wealth distribution. SMMEs can adapt faster to change, create new products and supply promptly to the market. Due to their size, SMMEs can easily apply flexible production technologies, are manoeuvrable and adaptable, easy to manage and can easily orientate themselves to the changing challenges of globalisation and modern technology (Hirsch & Hanival, 1998).

On the other hand, the majority of new SMMEs default and involve much more risk than large firms (Kleynhans, 2007). Technology-intensive SMMEs have a very low survival rate. Many new ventures fail due to inadequate financing, and a lack of expertise in management, products and the market. These lead to poor strategies, products and services, and a failure to develop strategic alliances and find effective distribution methods.

Larger firms are usually the ones that conduct research and development (R&D). Since they have the manpower and funds available, they can develop and register new patents and innovations.

Large firms can enjoy economies of scale and employ modern technology and engineering expertise. With modern technology, larger firms can enjoy increasing returns on a longer section of the production function before decreasing marginal returns begin to affect production. Large firms have many linkages to other firms. It is here that small firms complement the activities of large-scale industries and work in symbiosis with them, providing low-cost, high-value services and products as intermediate inputs (Hirsch & Hanival, 1998).

3. LITERATURE OVERVIEW ON FIRM SIZE AND COMPETITIVENESS

Literature considering the effect of firm size on the competitive platform of manufacturing firms is limited. Most studies assume that the importance of SMME development leads to special tax allowances given to small businesses (National Treasury, 2005). Others consider specific aspects of SMME development. Berry and Escandon (1999), for instance, investigated the role of small and medium-sized manufacturers and exporters and their support systems in Colombia's development, while Rogerson (2001) studied growth of SMME manufacturing in Gauteng. Several studies found a negative relation between the growth rates of firms and their size (e.g. Cabral, 1995; Evens, 1987; Hall, 1987; Dunne, Roberts & Sameulson, 1989).

Viviers, et al. (2005) made a comparative study of the competitive intelligence of small versus large firms and found little difference between the competitive intelligence capability among these firm sizes. Another study considered the survival rate of small and large mining companies in South Africa (Anon, 1995). Patricio (1999) found that small firms are less affected by recessions. Others studied the competitiveness of banks in Italy (Paolo, 2005) and the competitiveness of banks serving SMMEs credit markets in the United States (Berger, 2004). Carter and McNulty (2005) considered the effect of technological change on competitiveness. Paraque (2000) studied the rate of return and capitalisation of small manufacturers and Page (1996) and Page and Palmer (1991) found that the size of firms influences their earnings on the Johannesburg Securities Exchange.

Mowery (1983) concludes that "during the twentieth century, large firms 'dominated' industrial research" and Link (1980) stated that "size is a prerequisite for successful innovative activity". Schumpeter (1950) emphasised the statistical relationship between firm size and innovative activity (Kamien & Schwartz, 1975) and Narula (2001) investigated the effect of globalisation and innovation on the competitiveness of SMMEs. Motohashi (2002) studied innovation of SMMEs in Japan and Hughes and Wood (1999) in Britain. Acs and Audretsch (1987) found that large firms have an overall relative innovative advantage in industries, while small firms tend to have a relative advantage in being highly innovative, young companies, utilising a large component of skilled labour.

Correlations between firm size and wages, as well as human capital are generally positive (Schmidt & Zimmerman, 1991) and the existence of an optimal size for firms is generally accepted, especially with regard to the management of human capital (Calvo & Wellisz, 1978).

Albaladeja (2001) considered building the competitiveness of SMME clusters in Latin America, while Mbatha (2002) considered the development of efficiency in the SMME market, especially in acquiring finances. Several studies emphasise synergy between firms. Attention was focused on the interaction between big and small firms, developing small business (Mantle & Ryan, 1994), subcontracting between big and small firms (Anon, 1996). Some studies illustrate how the management of large firms could assist, back up and support small firms (Kedzierski, 1988 &

McDowell, 1998).

Studying the effect of firm size on the industrial competitive platform of manufacturing firms in South Africa is therefore necessary to fill this gap in the existing literature.

4. EMPIRICAL ANALYSIS

4.1 The survey

An empirical investigation of the industrial competitiveness platform was conducted to determine South Africa's ability to address the challenges presented by modern technological development and globalisation.

A random sample of 450 firms was drawn by the Bureau of Market Research (UNISA) from their manufacturing database and questionnaires were posted. The response rate was 16.7%, which is regarded as satisfactory for a mail-based survey in Africa. The author would, however, prefer to report only on the responding firms as a case study. As most findings correlate with earlier studies like those of the South African Netherlands Programme on Alternative approaches to Development (SANPAD, 1999, 2000), Roberts and Mohamed (2005), Koch and Ntege (2005), and Walker and Phele (2005), some generalisation might be in order.

TABLE 1: Cronbach-Alpha Coefficients

| <i>Question Groups</i> | <i>Coefficients</i> |
|---|---------------------|
| Human Capital | 0.855 |
| Resources | 0.892 |
| Demand Conditions | 0.815 |
| Related & Supporting Industrial & Institutional | 0.878 |
| Firm Strategy, Structure & Rivalry | 0.873 |
| Technology & Innovation | 0.914 |
| Quality & Environment | 0.801 |
| Perspective & Expectations: Current | 0.868 |
| Perspective & Expectations: Future | 0.789 |
| Shortages: Current Quarter | 0.917 |
| Shortages: Future | 0.863 |

Source: Kleynhans, 2006a

In compiling the questionnaire, the Porter's Competitiveness Diamond was taken as the basis – taking into consideration input factors, demand conditions, firm strategy, structure and rivalry, and related and supporting firms, which represent the industrial competitive platform (Porter, 1999). The questionnaire was extended to include questions measuring specific aspects, such as location and expectations. Indices were subsequently calculated using the methodology of the International Institute for Management Development (IMD), in principle, to calculate annual

World Competitiveness Indices.

Affirmative factor analysis was carried out and the significantly high values of the Cronbach-Alpha coefficients that were obtained indicated that the questionnaire was a reliable measuring instrument to measure the proposed objectives.

TABLE 1 indicates some of the most important Cronbach-Alpha coefficients of the various groups of questions. To be reliable, Cronbach-Alpha coefficients should exceed 0.5 (Anastasi & Urbina, 1997), and **TABLE 1** indicates that all values were satisfactory, most exceeding 0.8 (Kleynhans, 2006b). The high Cronbach-Alpha values and the consistency of the responses to the items in the survey suggest that respondents completed the questionnaire with great care and a high degree of accuracy.

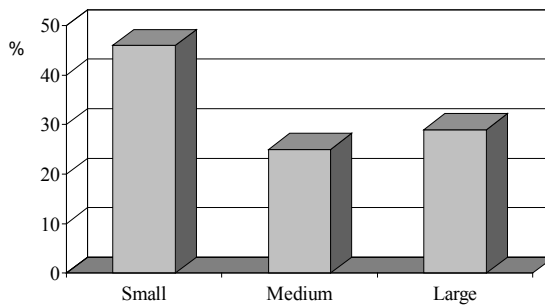


FIGURE 1: Number of employees

Source: *The Trade and Industrial Survey of the Industrial Competitiveness Platform*

The response to the questionnaire covered an even spread of firms. In terms of annual turnover, a total of 47.6% of the responding firms had a turnover in excess of R10 million, 27% were between one and five million and 15.9% had a turnover of less than a R1 million annually. **FIGURE 1** indicates that most respondents were from small firms (45.5%) employing less than 50 employees, while 28.8% were from large firms, employing more than 250 workers. The number of employees ranged between 1 and 8 400 employees.

As regards the various sub-sectors of manufacturing, the largest response of 22.4% was from the sub-sector manufacturing products of basic metals, machinery and office equipment, followed by 20.7% from food processing and beverages, 12.1% from producers of chemicals, chemical products, coke, petroleum products, nuclear fuel, and products from rubber and plastic, 21.1% from textiles, clothing and leather products, and 10.3% came from the sub-sectors of electrical and electronic equipment taken together.

With respect to the spatial response from the nine provinces in South Africa, the largest response of 39.6% was from Gauteng, compared to 13.6% from the Eastern Cape, 12.1% from North West and 10.6% from the Free State. Some firms were visited in person to complete and collect questionnaires. This made the response from Gauteng disproportionately higher than the other

provinces. Gauteng is, however, the most important centre of manufacturing, producing more than half of South Africa's GDP.

4.2 The industrial competitive platform of South Africa

The most important findings regarding the competitive platform of South Africa are represented in **FIGURE 2**. Most questions in the questionnaire expected respondents to rate their response on a five-point scale where 5 is excellent, 4 is good, 3 fair, 2 poor and 1 very bad. Although South Africa is a less developed country, all categories were on average rated about fair, but none of the main constructs of the questionnaire was rated good or excellent. Human resources rated much higher than expected. The survey confirmed the perception that the country's human capital is poor, especially low on productivity, motivation and work ethics. The country's managerial shortage is a widely accepted phenomenon, but the survey also highlighted a shortage of artisans, which merits attention (Kleynhans, 2003). Vocational and industry-related training facilities are also insufficient.

It is further indicated in **FIGURE 2** that the country's technological base is rated between "fair" and "good", as is management strategy and quality. In some industries, like electronics, a poor technological platform is still hampering competitiveness and the technological base was not rated as "good" in any industry (Kleynhans, 2006b). The provision of support services, such as cold storage and harbour facilities, for example, are inefficient and, where they do exist, they are underutilised.

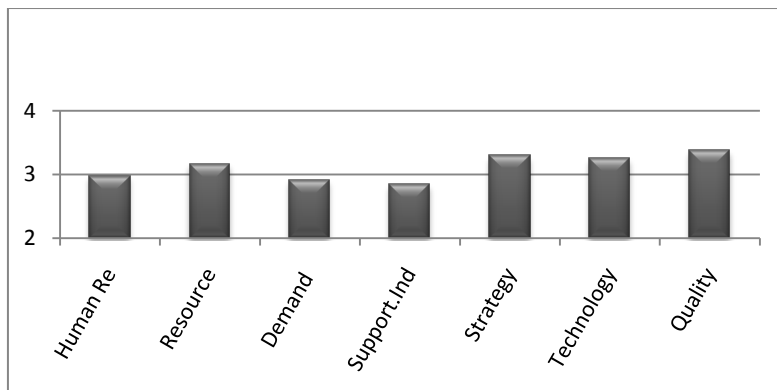


FIGURE 2: Strengths and opportunities

Source: Survey conducted

All firms have a very poor perception of the government and civil service, rating them between poor and very bad. They are regarded as inefficient and uncooperative. Competitiveness is also retarded due to a lack of government assistance, information, aid and incentives, as well as political and policy instability. This is a matter that merits serious attention from the government. As usual, respondents are unhappy about high costs, taxes and interest rates. There are sometimes shortages of raw materials, but this is not serious. Finally, poor market demand restricts the competitiveness and growth of manufacturers.

In the following section, competitiveness indices that were calculated according to the size of firms will be considered in order to learn more about the relative competitiveness of the various firm sizes.

4.3 Competitiveness Index according to the size of firms

Competitiveness indices were calculated according to the size of manufacturing firms and are listed in **TABLE 2** and **TABLE 4**. The methodology followed is, in principle, similar to that used by the IMD in calculating the World Competitiveness Index of various countries annually (IMD, 2007). A competitiveness index is similar to a standard deviation, where more competitive firms will have a positive index and those performing below average have a negative index.

TABLE 2: Competitive Indices According to the Size of Firms in South Africa

| Sub-Categories | Ranking | Local Economy | Internationalisation | Government | Finance | Infrastructure | Management | Science & Technology | People | Total |
|----------------|---------|---------------|----------------------|------------|---------|----------------|------------|----------------------|--------|--------|
| Large | 1 | 0.565 | 1.131 | 0.178 | -0.090 | -0.018 | 0.856 | 0.930 | 0.096 | 3.648 |
| Medium | 2 | 0.590 | 0.365 | 0.899 | 1.044 | 1.009 | 0.243 | 0.128 | 0.948 | 5.226 |
| Small | 3 | -1.155 | -0.766 | -1.080 | -0.950 | -0.991 | -1.099 | -1.058 | -1.045 | -8.144 |

Source: Author's own calculations

TABLE 3: Productivity Index

| Provincial Indices | Sub-Sector Indices | Firm Size Indices |
|--------------------|--------------------|------------------------|
| KwaZulu-Natal | 0.802 | Food -0.199 |
| North West | 0.966 | Textiles -0.563 |
| Mpumalanga | 0.604 | Paper & Wood -1.378 |
| Eastern Cape | -0.208 | Chemicals 0.771 |
| Gauteng | 0.383 | Non-Metal Mine 1.561 |
| Northern Cape | -0.434 | Basic Metal Prod 0.995 |
| Free State | 0.731 | Electrical -1.897 |
| Western Cape | -0.681 | Electronics 0.178 |
| Limpopo | -2.164 | Transport 0.178 |
| | | Furniture 0.178 |

Source: Author's own calculations

Cronbach-Alpha Coefficient: 0.741

It was found that ranking according to the competitiveness indices correlated with firm size, as larger firms are more competitive. On internationalisation, management, people, science and

technology, large firms are the most competitive. A productivity index was also compiled and, as shown in **TABLE 3**, productivity also correlated with firm size. In several instances medium firms outperform large firms, and are the most competitive. Medium firms are the top performers in the categories of local economy, government, finance, and infrastructure.

TABLE 4 presents the competitiveness indices for small, medium and large firms calculated according to the 2007 IMD categories, offering more information. According to IMD's current sub-categories, the results so far obtained in this study are confirmed.

TABLE 4: Competitive Indices and Firm Size (IMD 2003 Categories)

| <i>Sub-Categories</i> | <i>Ranking</i> | <i>Economic Performance</i> | <i>Government Efficiency</i> | <i>Business Efficiency</i> | <i>Infrastructure</i> | <i>Total</i> |
|-----------------------|----------------|-----------------------------|------------------------------|----------------------------|-----------------------|--------------|
| Large | 1 | 1.008 | 0.224 | 0.237 | 0.903 | 2.372 |
| Medium | 2 | -0.017 | 0.869 | 0.860 | 0.171 | 1.883 |
| Small | 3 | -0.991 | -1.093 | -1.097 | -1.075 | -4.256 |

Source: Author's own calculations

On total ranking, infrastructure, economic performance and competitiveness increase with firm size. Medium firms are, however, the strongest performers in the sub-categories of government and business efficiency. It should be noted that IMD does not currently (2007) calculate the infrastructure index using the method deployed before 2001. This is why the values in **TABLE 2** and **TABLE 4** differ. The newest index (see **TABLE 4**) also includes science, technology, innovation, quality, environment and health in the sub-category for infrastructure.

As the indices that were calculated confirm what was learned about the competitive platform when the results of the questionnaire were analysed, the calculation of indices could be seen as unnecessary. It does, however, provide additional information on the sub-categories and confirm the results.

4.4 Other aspects of competitiveness in various firm-sizes

Further analysis of the data mostly confirmed what would be expected and thus substantiated the reliability of the data in general. Small firms have an annual turnover of less than R5 million and their annual overhead costs are far lower than larger firms. It was found that small firms use less skilled labour and less advanced technology. Only the largest firms export more than five percent of their annual turnover and firm size expands over time. The age of the largest responding firms averaged 45 years, ranging between 4 and 105 years, while the average age of medium-sized firms is 24 years. Surprisingly, some of the smallest firms are more than 100 years old. None of the medium or large firms are younger than four years. Medium-sized firms are the group that is mostly active in flexible production. Small firms probably do not have enough networks and contacts to rely on other companies for intermediate input, and larger firms are large enough to manufacture the whole product themselves. More than a third of all firms, however, specialise and process part of the final product. They also provide support services in

the production chain. This is an indication that technology in South Africa is not as undeveloped as in other African countries.

It can be assumed that large firms are better informed and the questionnaire confirmed this, as 23.5% of the large firms knew about Spatial Development Initiatives (SDIs) in their vicinity compared to only 3.3% of the small firms. Larger firms are also in a better position to make use of the incentives and advantages that government initiatives and development offer. For instance, SDI development did not enhance production in small firms, while about half of the medium-sized firms that knew about SDIs indicated that it enhanced their production – a view shared by 66.7% of the largest firms. This also applied to increasing returns and economies of scale resulting from SDIs. It had no effect on small companies, advanced 33.3% of the medium-sized firms and a quarter of the largest firms.

The fact that less than 24% of the largest firms do not know about the SDIs in their vicinity might indicate poor competitive intelligence in South African industries. The level and utilisation of modern technology is, however, sufficient to sustain development and it probably confirms the unfavourable perception of respondents relating to the public sector: government’s inability to disseminate information, and a lack of efficient communication.

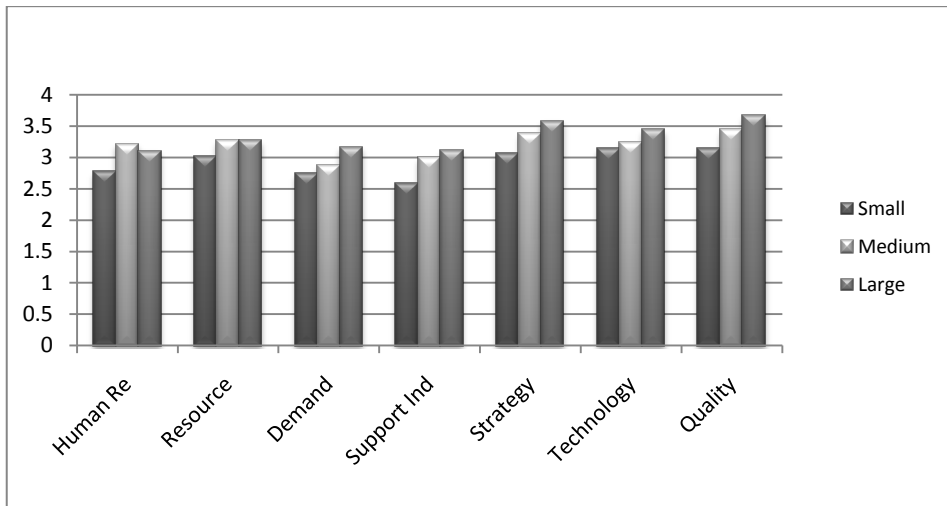


FIGURE 3: Competitiveness and Firm Size

Source: Kleyhans, 2007

FIGURE 3 shows the main factors of competitiveness that were surveyed according to firm size (Kleyhans, 2007). As can be seen on the graph, larger firms are more competitive. On all factors other than human resources, competitiveness grew with firm size. Smaller firms are generally more labour-intensive and this might be the reason why the largest companies are not so competitive when human capital is considered. Demand for skilled and specialised labour increases as firm size increases and this might also be a reason why respondents from the largest firms rate the quality of their labour input as less efficient. Larger companies can achieve economies of scale, as they are more efficient and more competitive.

4.4.1 Human resources

Small firms rate all aspects of their human capital to be poor. The only aspects that are satisfactory are the availability of unskilled workers and workplace regulations. The worst aspects are the efficiency of civil servants, which none rated as excellent, followed by a shortage of managerial staff and artisans and industry-related training facilities.

Medium-sized firms also experienced problems with the inefficient civil service and inadequate training facilities, but also with the work ethics of the workforce that are unmotivated, neglected and not conscientious. The respondents of medium-sized firms rated all other factors relating to human capital as fair.

Large companies also found inefficient civil servants to be the greatest obstacle to competitiveness when considering human capital, followed by high unit costs per worker. Other factors were all satisfactory and the best factor was the availability of unskilled labour.

TABLE 5 shows the average overhead cost per labourer of the responding firms. From the table it can be seen that the overhead per worker in smaller firms is higher and declines with firm size. This might suggest that smaller firms are not as productive; it also correlates with the productivity indices of **TABLE 3**, which indicates that productivity rises with firm size. It is, however, doubtful whether the overhead cost per labourer could be interpreted as a measure of productivity, as fewer people have to handle more overheads in smaller firms.

TABLE 5: Overhead Cost per labourer

| | Rand |
|--------|---------|
| Large | 37 757 |
| Medium | 116 896 |
| Small | 128 837 |

Source: Author's own calculations

4.4.2 Other resources

Besides human capital other resources also indicate that competitiveness rises with firm size. All firms rated the high quality and reliability of the telecommunication services as the most important factor enhancing their competitiveness. The cost and reliability of electricity supply and the availability of suitable land are also rated as very important. The cost of capital (including price and the impact of interest rates and the exchange rate) has a large impact on small firms, as well as the sea transport network and traffic at harbour and border posts.

Medium-sized firms also consider the level of development of the financial and banking sectors, the availability and quality of research facilities, resources and support services, the application of modern technology and market and product information as factors that have an important impact on their competitiveness. Aspects that retard their competitiveness are the costs involved in the import of inputs, the sea transport network and traffic at harbours and border posts.

Next to telecommunication and electricity, information on products and markets, as well as the application of modern technology, has the largest impact on the competitiveness of large firms.

Respondents of large firms rated the air transport network and transport at border posts and harbours as their biggest obstacles when considering resources. Scientific infrastructure, research facilities and support services were rated as fair but not sufficient. Social infrastructure, sea transport, trade and business association support also rated very low although not unsatisfactory, implying that there is room for improvement.

4.4.3 Demand conditions

As can be seen in **FIGURE 3**, most respondents rated demand conditions very low, especially in the small and medium enterprises. Small firms rated all factors related to demand as poor, while medium-sized firms rated export opportunities as poor, as well as HIV/AIDS and government demand. Large firms regarded all demand factors to be satisfactory except government demand, population growth and HIV/AIDS, which have a negative effect on their competitiveness. Large firms regarded export opportunities; the size of the local market and market sale prices as the demand factors that enhance their competitiveness the most.

4.4.4 Related and supporting industries and institutions

As can be seen from **FIGURE 2**, respondents rated related and supporting industries and institutions just as low as demand factors. The low perception of government competence, interventions, and policies was the main reason why support services are rated so low. The effective differences between the response of small and large firms yields a Cohen's d-value of 1.55 for supporting services and institutions, indicating that the differences are of practical significance. Small firms only rated linkages to technology, access to information, exchange of research and joint problem-solving as fair, as did all other firms. All other factors relating to support services that could enhance small firm's economies of scope were rated as poor. Medium and large firms rated the quality of legal institutions and membership of business associations as inefficient. Like the smallest firms, the largest companies had problems using support services. Dependence on imports for consumer, intermediate, and capital goods presented a large obstacle to all firms but were rated as worst by the largest firms. Large firms regarded local supplies and linkages to technology as fair.

4.4.5 Firm strategy, structure and rivalry

Firms regard their strategy and management as more competitive than the previous factors noted above. Large firms rated their managerial skills in integration and innovation of business activities and their co-operation with clients to be good. Managerial skills, business contacts, co-operation with suppliers, the ability to enter foreign markets and export growth were also rated high, ranging between fair and good.

Medium-sized firms rated their co-operation with suppliers and clients as the strongest factors that enhance their competitiveness and their ability to enter foreign markets and growth in exports as their weakest. All other aspects related to strategy, management, structure and rivalry are rated as fair. None of the factors considered in this category was rated as good by small firms. Their strongest assets rated as fair were co-operation with clients and managerial skills and practices. With a Cohen's d-value of 0.79 it can be assumed that the differences between large and small firms are of practical significance.

4.4.6 Technology and innovation

Respondents rated most factors regarding technological and innovation as fair. Although large firms have many innovations and find several innovative applications for the technology, new patents are rarely developed and registered. This is the only factor regarded as poor by large companies concerning technology. The strongest factors enhancing competitiveness of large companies are the continued upgrading of their technology, input and production mix, their utilisation of computers in the production process together with their use of cell phones and other modern communication technology. On all aspects, the standard deviation on the answers of respondents from large firms was less than one, answering on a five-point scale, indicating that the level of technology and innovation in all large firms is about the same.

Medium-sized firms see their use of cell phones, modern communication technology and new innovations within their firms as their most competitive elements ranging from very satisfactory to good. Respondents also regarded their use of computer technology in the production processes and the continued upgrading of their production processes as satisfactory. New patents are rarely further developed and registered in medium and small firms; they conduct very little research and utilisation of technology and knowledge spill-overs from other firms are seldom enjoyed.

Other technological factors that are poorly rated by small firms are their use of computers in the production process and the efficient use of the internet. No factors are rated as good. Their strongest points are the use of new innovations within the firm and the use of cell phones.

4.4.7 Quality and environment

All manufacturers rate the quality of their products as good. The quality of input production factors ranges between satisfactory in small firms to good in the largest firms. This is probably because larger firms can afford to buy better quality resources. The difference between small and large firms is of practical significance, with a Cohen's *d*-value of 1.49. The quality of products exported also shows the same trend, ranging from satisfactory in small firms to good in the medium and large firms. These responses might also be interpreted to indicate that smaller firms do not rate the impact of the quality of exports as being significant, as only 7.2% of the small firms export more than half of their output.

Regarding the environment, manufacturers do not see their levels of pollutants in their production processes as a serious risk to the environment, although larger companies pollute more and it costs them more to comply with the standards that are set (Kotzé & Kleynhans, 2009). Compliance with those standards does, however, cost medium-sized firms more. All firms regard legislation regarding the environment as unclear and the cost of compliance with that legislation in general rises with the size of firms.

4.4.8 Aspects related to location

As with most factors, the quality of the location of their premises rises with firm size. Large firms consider the quality and availability of water as the most important advantage of their locations, followed by the reliability of the electrical supply, and the availability of courier, trucking, corporate finance and health services. The poorest locational aspects are the lack of cold storage, the proximity of semi-processed materials and the proximity, costs and quality of international airport facilities. As with all other firms, one of the biggest obstacles to competitiveness regarding location is the low quality, efficiency and availability of government

incentives, aid, support and tariffs, as well as international trade restrictions and the inefficiency of the civil service (Kleynhans & Drewes, 2008). Business support services and investment from abroad are also poor.

Locational aspects that enhanced the competitiveness of medium-sized firms most, and rated between good and excellent, were their proximity to main road links and the availability of courier and financial services. Other factors rated as good were the reliability of the water and electrical supply and their personal contact with customers. As most respondents were from landlocked provinces, all regarded the availability of harbour facilities and ocean freight services as poor and small and medium firms regarded these as totally failing. As could be expected, there was a large standard deviation on this question, as most companies do not export and some are near the coast. All companies have problems with cold storage, the quality and support from the public authorities, and insufficient investment from abroad. Other factors rated as poor by the respondents of medium-sized firms were the availability and proximity of raw and semi-processed materials and intermediate inputs, business support services and other manufacturing firms in the industrial districts.

The strongest locational aspects of small firms are their proximity to main road links and the reliability and quality of telecommunication, water, electricity, and other utilities (Drewes & Kleynhans, 2008). Other aspects that were rated as most satisfactory were the availability of trucking and courier services. All firms find labour cost to be a fair obstacle and, to small firms, this is a little bit higher, but there are no significant differences between firms of different sizes. Small firms experience investment from abroad, import tariffs and other international trade restrictions as failing with regard to their location and competitiveness. Following their frustration with government support and services, the poorest factors related to location are the distance from airports, the unavailability of industrial land, proximity to suppliers of spare parts and availability of intermediate inputs.

4.4.9 Perceptions and expectations of business conditions and costs

Large and medium firms regard business conditions as satisfactory and do not expect this situation to worsen in the near future. Business conditions are, however, not satisfactory to small firms and they also regard political and policy stability in South Africa as being poor. They also do not expect the situation to change in the near future. All firms produce below capacity, all anticipate their delivery times to improve in future, and none expect their sales or costs to rise significantly. The largest cost factor is the average purchasing unit price of raw material. This is higher in small firms than large firms, but highest in medium-sized firms, and most expect costs to remain constant but some believe costs will rise.

Shortages hamper production of the largest firms more than small firms, although small firms expect the availability of all factors to deteriorate in the near future. Small firms have a slight problem with the availability of raw materials and medium-sized firms with shortages of machinery and equipment. Factors that companies experience slight shortages of are skilled labour, managerial staff, raw materials, machinery and equipment, technology and knowledge support services. Medium-sized firms expect utilities (excluding water and electricity) and the availability of machinery, equipment and technology and knowledge support services to decline in the future. The only factors that large companies expect to decline in the future are the availability of electricity and the availability of factory workers, including skilled labour, probably due to the effect of HIV/AIDS.

Insufficient demand, short-term interest rates and municipal levies, taxes and permit costs present slight obstacles to small firms and they expect the situation to decline further in the future. These factors, together with an uncooperative civil service, have a retarding influence on medium-sized firms, who expect the situation to decline. Next to these factors, large firms also experience problems with the availability of medium-term finance and import and export restrictions and barriers. They also expect these factors to deteriorate in the near future. Some of the replies from respondents are, however, contradictory. Large firms rated business conditions as satisfactory and they do not expect this to change during the following quarter. On the question concerning their expectations of general business conditions in twelve months' time they expected these to deteriorate. The difference is probably because they expect business conditions to remain constant in the medium term but get worse in the long term.

5. FURTHER RESEARCH

The topic should be further investigated in order to enable generalisation of the findings and to determine whether the identified trends persist over time. This will, however, require much greater funding. Perceptions of utilities, especially with regard to electricity, have in all probability changed. Further research, especially with larger samples, can enable comparison of firms in the various sub-sectors of manufacturing, such as food processing and basic metal products and textiles, as well as comparisons for the various provinces. Such research will generate more specific recommendations and may also suggest an agenda for development. Much research has been conducted on SMMEs, but larger firms are neglected and deserve further investigation. The synergy between small, medium and large firms also deserves attention.

6. SUMMARY AND CONCLUSION

This study investigated the international competitiveness platform of South African manufacturing firms of various sizes. It was found that the competitiveness of manufacturing firms increases with size. Small firms have very low competitiveness indices, reflecting a competitiveness disadvantage, compared to larger firms. In many instances, medium-sized firms are the best performers. Large firms probably experience diminishing marginal returns as their use of production factors is beyond the optimal point of profit maximisation and they may be becoming incompetent bureaucracies.

Industrial development policies aimed at promoting SMMEs should help these firms to increase exports by supplying information, infrastructure, development funds and resources of foreign investment. As SMMEs do not have the ability to conduct research and development, government could conduct this on their behalf. This may help SMMEs to perform better in the local economy and use knowledge and technological spill-overs better. Small firms should be assisted in the acquisition and use of modern technology.

The provision of vocational and industry-related training facilities deserves attention. The quality of human capital and a need for management and artisans are retarding the competitiveness of firms. In this regard, small firms lack expertise in the use of computers in the production process and the internet. Training, technology and other means should be employed to improve productivity in all firms, as the unit cost per worker is very high and increases as firm size declines. This is also the case with government and civil service co-operation and efficiency.

Government urgently needs positive upgrading and good public relations in order to improve its image and assist industrial development.

Large firms experience problems with human capital, infrastructure and performance in the local economy. Although large firms have many innovations and find several innovative applications for technology, new patents are rarely developed and registered. Since this concerns all firms, government could provide assistance. Large firms often experience a lack of available financing and, in many cases, medium-sized firms outperform them. Because large firms are large generators of GDP, income and R&D, they also deserve attention in industrial development policies. There is a symbiosis between firms of various sizes and the development of large firms should not be neglected. This study has found that firms of different sizes have different fields of strength and also different weaknesses that curb international competitiveness and this should be noted in the designing of an SMME and industrial development strategy.

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