

## **SOUTH AFRICAN SUPER-EXPORTERS**

### **Are they different and what does this mean for policy?**

Draft: Do not cite

February 2014

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## **1. Introduction**

There are a number of reasons why South Africa needs to export more. The export market offers an opportunity for firms to grow beyond the limitations of the local market, and with this growth employ more people. Without higher export activity it seems unlikely that South African unemployment rates will fall from their existing high levels.

In addition, South Africa is faced with a continuously widening current account deficit. The South African Reserve Bank reports a deficit of 6.8 percent of GDP in the third quarter of 2013, a gap larger than even pre-crisis times. Over the last half decade following the global financial crisis, South Africa has struggled to grow exports despite an improvement in the economic activity of more developed trade partners.

Policy makers recognize the importance of export growth in improving the overall economy. In order to expand employment and bring about annual economic growth in excess of 5 percent the National Development Plan-2030 suggests increasing exports, particularly in construction, mining and manufacturing. The New Growth Path (2011) further states that increasing exports particularly into the region and emerging economies will stimulate investment, productivity, employment and income. Export growth will ultimately lead to a higher standard of living. However, despite the emphasis on exports in government's growth strategies, these strategies provide limited details on how this will happen. Part of the reason for this is that very little is known about export dynamics at a micro-level in South Africa. A better understanding of the characteristics and behavior of exporting firms can help in designing policies to increase exports.

Although there is a relatively large body of work on this topic, particularly in the developed setting, it has essentially been macroeconomic in direction. According to Bernard, Eaton, Jensen and Kortum (2003) 'trade theory has been aimed at understanding aggregate evidence on such topics'. As highlighted by Edwards, Rankin and Schöer (2008), it is the sum of exports at the firm level which make up aggregate exports and it is therefore the actions and decisions of firms in which we should be interested. This is specially the case in order to develop appropriate policies for improving South Africa's economic growth through exports.

Traditional theories of trade such as those of Ricardo and Heckscher-Ohlin were fundamentally oriented to macroeconomic study. Paul Krugman later developed a model

which incorporated increasing returns to scale and intra-industry trade, but this was still based on an aggregate level. It was only when Melitz (2003) developed a model that incorporated firm level heterogeneity that the focused exploration into the effects of firm-level characteristics began to be more popular.

With the increased availability of firm-level data research has now been done for a number of countries including, for example, Taiwan (Aw and Hwang, 1995), Columbia, Mexico, and Morocco (Clerides, Lach and Tybout, 1998), the US (Bernard and Jensen 1999), Germany (Wagner, 2007), and the Netherlands (Kox and Rajas-Ramagosa, 2010). However, due to a lack of data only Edwards, Rankin and Schöer (2008) and more recently Matthee and Krugell (2011) have done this for South Africa. The majority of this previous work finds that exporters are superior to non-exporters in terms of size, wages and productivity.

More recently, evidence has started to highlight the importance of large firms in the world markets (Neary, 2010). In light of this, and with the increasing availability of more disaggregated data on firm activities and behaviour, a new body of work is developing which focuses on the distribution of exports. In particular, the split between large firms, who drive the bulk of aggregate growth, and the other exporters further down the distribution.

One of the first papers to note the influence of large firms on aggregate outcomes was Gabaix (2010) who finds that in an economy the distribution of firm size is fat-tailed. In such cases shocks to individual firms do not aggregate out as previously thought. Thus idiosyncratic firm-level shocks can generate large aggregate fluctuations. Gabaix (2010) developed a model around this finding which measures the order and magnitude of such idiosyncratic shocks on aggregate outcomes. This idea was also carried into international trade literature through the work of di Giovanni and Levchenko (2012), Neary (2010), and Eaton, Kortum and Sotelo (2012) who adapt traditional trade models in order to account for the dominance of large firms in trade.

Empirically the significance of these large firms, in particular large exporters, has been studied by Bernard, Jensen, Redding and Schott (2007), Eaton, Eslava, Kugler and Tybout (2007), Mayer and Ottaviano (2008), Freund and Pierola (2012), and Cebeci, Fernandes, Freund and Pierola (2012). The findings suggest that exports are dominated by a handful of large exporters. These large exporters are more diverse, in terms of products and export

markets, grow faster and contribute more to export growth than exporters further down the export distribution. These studies suggest that marginal firms are less important in trade than the large exporters. Therefore, policy needs to create an environment where future or potential large exporters can flourish in order to promote export growth and diversification.

This paper sets out to investigate these larger exporters in the manufacturing sector in South Africa. However unlike the current literature which looks *within* exporters and investigates how these large exporters intrinsically differ from smaller exporters, this paper will look at a further split *within* these large super-exporters, the split between the top 1, 5 and 10 percent. It will add to the literature by asking how different each of these groups are from one another and exporters in general?

Understanding what characterizes these super-exporters is important for South African policy. As we will show, these super-exporters, although small in number, produce most of South Africa's export value. If South Africa wants to substantially increase its exports it needs these super-exporters to export more, if this is possible, and/or it needs the next tier of exporters to become more like these firms.

The paper is structured as follows: section 2 provides a discussion on the empirical literature related to large firms and exporting. Section 3 introduces the data on South African manufacturing firms used in this paper. Section 4 presents a descriptive analysis on the characteristics and dynamics of large exporters and section 5 concludes and remarks on some future steps.

## **2. Exporting at the firm-level**

The literature on international trade has advanced over the past few years as new theories have developed which focus on the role of firm heterogeneity in trade models, in particular the seminal contributions of Bernard, Eaton, Jensen and Kortum (2003) and Melitz (2003). These new micro-trade theories, along with the increase in access to firm-level data, have resulted in a rapid increase in understanding of the issues related to export behaviour and export dynamics at the firm-level.

Much of this research has investigated the superior performance of exporters relative to non-exporters. These empirical studies show that exporting firms are generally larger, more

productive, as well as more capital- and skill-intensive than non-exporters. See for example Aw and Hwang (1995) for Taiwan, Bernard and Wagner (1997) for German manufacturers, Clerides, Lach and Tybout (1998) for Columbia, Mexico, and Morocco, and Bernard and Jensen (1999) for U.S firms.

More recently, international research has turned to investigate the export premia and export markets. For example, a number of studies have found that the number of export markets served increases with productivity (Muuls and Pisu (2009) for Belgium, Wakasugi and Tanaka (2009) for Japan, and Castellani, Serti and Tomasi (2010), for Italy). Others have further found that exporters to more developed economies have higher productivity even before exporting than exporters to less developed economies (Pisu (2008) for Belgium, and Silva, Afonso and Africano (2010) for Portugal). For a comprehensive review of the recent empirical literature see Wagner (2011).

South African research is limited by the availability of good, firm-level data over time. However a number of studies on Africa in general, and South Africa in particular, which use mainly cross-sectional datasets, present findings in support of international evidence (Naude, 2000; Bigsten *et al*, 2004; Rankin, Soderbom and Teal, 2006; and Edwards, Rankin and Schoer, 2008).

In summary, the literature on South African exporters generates stylised facts regarding exporters; they tend to be larger, more capital intensive and more productive than non-exporters (Edwards, Rankin and Schoer, 2008). However, the productivity premium is only apparent when exporting outside of SADC. In addition very few South African exporters specialize in exporting, that is exporters export a very small proportion of their output. Rankin (2001), for example, found that while many South African firms export, very few export very much: around 70 percent of exporters participate in the export market, but less than half export more than 10 percent of their output.

These findings are supported by a more recent study by Matthee and Krugell (2011) who found significant differences between South African exporters and non-exporters in terms of age, size, foreign ownership and productivity. In addition the authors show that, after controlling for unobserved firm heterogeneity, firm size, productivity and access to finance affect the ability of a firm to export.

A new body of literature focuses on the importance of large firms in explaining aggregate outcomes, such as exports. Most notably is the work of Gabaix (2011) which argues that if the distribution of firm sizes in an economy is skewed, shocks to individual firms may not necessarily average out in the aggregate as previously assumed. Indeed, he argues that many fluctuations in the macro economy are due in part to the economic activity of the “incompressible grains” of the economy, i.e.: the large firms.

Through developing a simple “Island Economy” model, Gabaix (2010) constructs a granular residual which measures the order and magnitude of idiosyncratic shocks on aggregate fluctuations. Using calibration and direct empirical evidence from the U.S. Compustat data from 1951 to 2008, Gabaix finds that the individual actions of the largest 100 US firms explains close to one-third of the variation in output growth.

The importance of large firms has also been an increasing focus in the international trade literature. di Giovanni and Levchenko (2012), for example, build a multi-country model of firm level-trade to illustrate how, through openness to international trade, individual firm-specific shocks can have an effect on aggregate volatility. This is because firms that enter the trade market are not only larger and more productive ex-ante, but are also likely to grow even larger ex-post. Thus trade increases the relative importance of these large firms in the economy and makes the economy more granular.

Other theoretical papers that explore this idea include Neary (2010) and Eaton, Kortum and Sotelo (2012). Neary (2010) uses various models of oligopoly to highlight the importance of large firms in trade and shows how the more popular models of perfect competition and monopolistic competition fail to account for the dominance of these large firms in exporting. Eaton *et al* (2012) argue that the traditional way of treating individual firms as points on a continuum is only understandable in cases where the number of individual firms is significantly larger. However, there are also cases where individual exporters are so large that their individual outcomes have implications for the economy as a whole. The authors thus amend a standard heterogeneous firm trade model which allows for a finite number of firms and show how this model can adequately explain not only the skewness in the exporter size distribution but also the possibility of zeros in international trade.

A number of facts emerge from the handful of empirical studies of larger firms in trade (Bernard, Jensen, Redding and Schott, 2007; Eaton, Eslava, Kugler and Tybout, 2007; Mayer and Ottavianno, 2008; Freund and Pierola, 2012; Cebeci, Fernandes, Freund and Pierola (2012)). Firstly, as the new theories above predict, aggregate export sales are dominated by a few large exporters. In general, the top 1 percent, 5 percent and 10 percent of exporters contribute no less than 40 percent, 70 percent and 80 percent to aggregate exports respectively (Mayer and Ottavianno, 2008).

Secondly, large exporters are diverse; they sell many products to many countries (Bernard et al, 2007; Mayer and Ottavianno, 2008; Freund and Pierola, 2012). On average across a number of countries, larger exporters export 20 more products and export to 12 more markets than smaller exporters (Freund and Pierola, 2012). In addition, European firms that export more than ten products to more than ten markets account for more than 75 percent of total exports (Mayer and Ottavianno, 2008).

Finally, these large exporters grow quickly and are the main drivers of economic growth both in terms of the extensive margin and the intensive margin (Freund and Pierola, 2012). Eaton et al (2007) and Mayer and Ottaviano (2008) give evidence to show that from a policy perspective it is the extensive margin, the number of exporters, that matters most for export growth. In Columbia, for example, almost half the total growth in merchandise exports was as a result of firms that were not initially exporters, and among European firms an increase in the number of exporting firms has an almost one-to-one positive impact of the exporting country's size on bilateral trade. However, Cebeci, Fernandes, Freund and Pierola (2012) caution that in the short run the intensive margin, the average amount exported, contributes more to export growth than the extensive margin; the median contribution across countries is close to 85 percent. Thus short run policy should focus on expansions along the intensive margin.

This new literature has looked *within* exporters and investigated how these 'superstar' exporters intrinsically differ from smaller exporters. It finds that super-exporters are more diversified across products and destination, are larger and more productive ex-ante, and grow quickly as exporters relative to non-superstars. Very little, if any, research has looked at a further split *within* these superstar exporters between the top 5 percent, which

contribute the bulk of exports, and the second tier exporters which are immediately below these (the next 5 percent). This paper will add to the literature by asking how different are the top 5 percent of exporters to the next 5 percent? Why do the exporters in the second tier export so little relative to the first tier?

### **3. Data**

This study makes use of official data collected by Statistics South Africa's (Stats SA) in its Large Sample Surveys of manufacturing (LSS). These surveys are used for the purposes of calculating the national accounts and although designed to be cross-sectional in nature many firms can be linked between the years to create a panel dataset. There are approximately 10 000 manufacturing firms in each of the rounds (2005 and 2008) with less than a third of them being exporters (26% in 2005 and 30% in 2008).

These surveys collect data on industrial classification, employment, imports and exports, income and expenditure, profit or loss, inventories, carrying value of assets as well as details of products manufactured. To compare 2005 data to 2008, the 2008 data was deflated using industry level deflators, except for wages which are deflated by the CPI.

In order to rank exporters we calculate the total aggregate amount of exports in each year using the weights supplied by Statistics South Africa. Using the weights we calculate the total number of exporters in each year (1566 in 2005 and 2864 in 2008) and then rank exporters based on the amount their exporters contribute to total aggregate exports. The number of firms exporting almost doubles between the two years. Currently, we take only the proportions of exporters – top 1%, top 5% etc. and thus the absolute numbers in each group change. As future work in this paper, we will examine groups of fixed numbers, for example the top 50 exporters, the top 100 etc..

The contribution of each part of the distribution of exporters is reported in table 1. The degree of concentration is marked – the top 1% contribute between 65 and 72% of total export value and the top 5% contribute between 77 and 88 % of total export value. Furthermore, the absolute number of these super-exporters is small – 104 in 2005 and 191 in 2008 (for the top 5%). Relative to these exporters, the contribution of the next tier (5-

10%) is small. This group adds only between 4-10% to total export value. In total the top 10% of exporters produces approximately 90% of export value.

**Table 1. Concentration of South African Manufacturing Exporters**

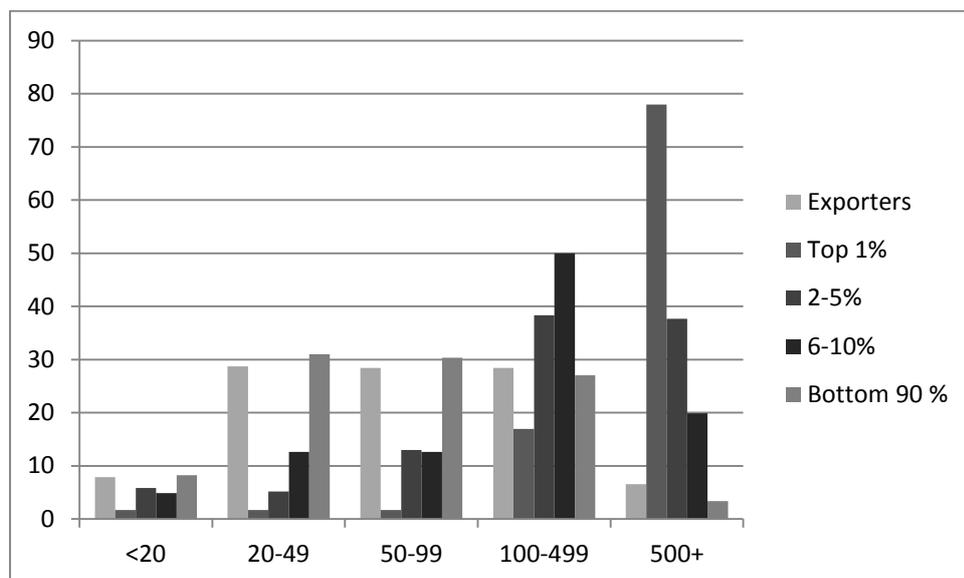
<u>Proportion Exported</u>	<u>2005</u>		<u>2008</u>		<u>Pooled</u>	
	Number of exporters	Contribution (%)	Number of exporters	Contribution (%)	Number of exporters	Contribution (%)
<i>Top 1%</i>	21	<b>65.58</b>	38	<b>72.23</b>	59	<b>71.18</b>
Top 2%	42	72.12	76	80.27	118	78.03
Top 3%	63	75.88	115	84.51	177	80.12
Top 4%	84	76.03	153	86.87	236	82.69
<b>Top 5%</b>	<b>104</b>	<b>76.74</b>	<b>191</b>	<b>88.10</b>	<b>295</b>	<b>85.37</b>
<b>Top 10%</b>	<b>209</b>	<b>87.03</b>	<b>382</b>	<b>92.64</b>	<b>591</b>	<b>91.07</b>
Top 20%	418	94.81	764	96.51	1182	96.11
Top 25%	522	96.87	955	97.56	1477	97.20
Bottom 75%	1566	3.13	2864	2.44	4431	2.80

#### 4. Characteristics and Dynamics of the ‘Super’ Exporters

##### 4.1 Characteristics

As Figure 1 illustrates super-exporters are more likely to be larger than other exporters. Almost 80% of the top 1% of exporters have 500 or more employees and approximately 80% of the top 5% have 100 or more employees. This figure also illustrates the correlation between firm size and exporting in general – even among the bottom 90% of exporters, less than 10% of these firms employ less than 20 people.

**Figure 1. Super-exporters by Employment Size**



The new micro-trade theories, and the empirical evidence from South Africa and other countries, indicate that exporters have higher levels of productivity than non-exporters. Furthermore, the Melitz-model predicts that firms with higher levels of productivity should export more. In order to test this for South Africa, we estimate standard Cobb-Douglas production functions with dummy variables to capture where in the export distribution a firm is. These are estimated in revenue terms, except for employment which is measured as the number of workers. This creates the well-known problem that the measure of total factor productivity (TFP-R) includes both the mark-up and what we traditionally think of as TFP.

Table 2 reports the estimates of the production function. Similar to Rankin (2001) we find that there is no premium in TFP-R for exporters in general (or data does not have export destination so we cannot investigate whether this is related to the export destination). The results do suggest that the top 10% of exporters may have higher TFP-R levels than exporters in general, and that there may be a further jump in TFP-R for those in the top 1%.

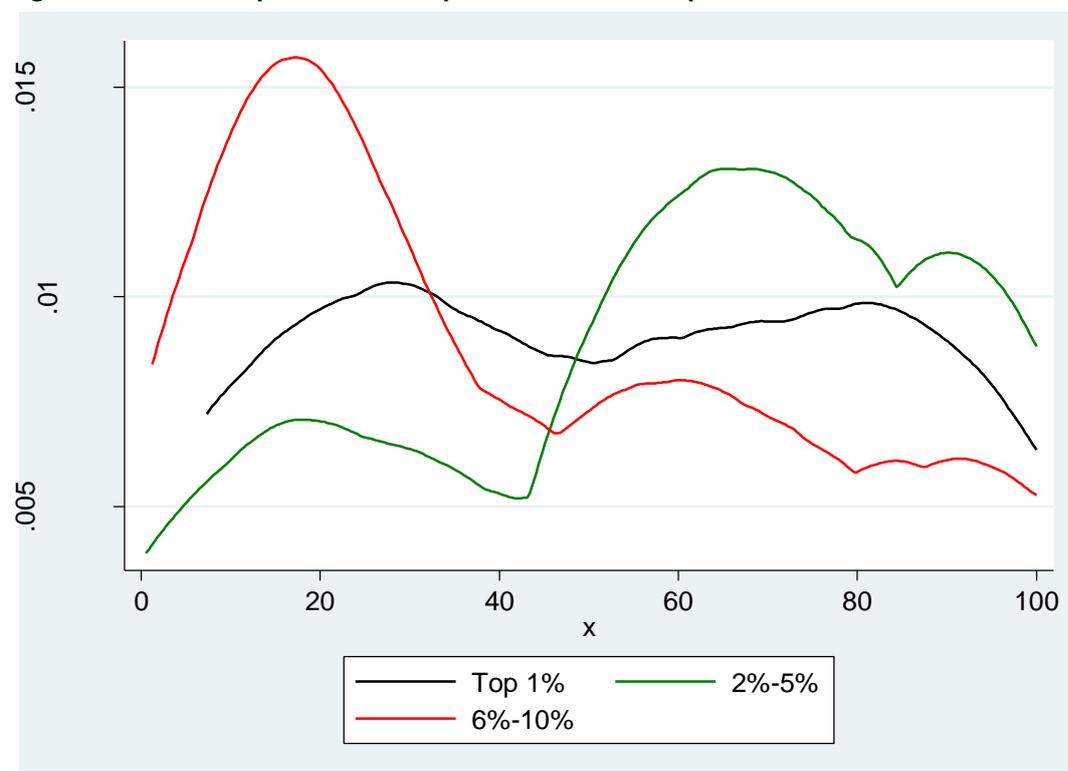
**Table 3. OLS and Fixed Effects estimation of the relationship between exporting, super-exporters and TFP-R**

VARIABLES	2005 Output/worker	2008 Output/worker	Pooled Output/worker	Pooled F.E Output/worker
<b>Exporter</b>	0.0268* (0.0152)	-0.0194** (0.00789)	0.00712 (0.00717)	-0.0120 (0.0193)
<b>Top 10%</b>	0.0431 (0.0517)	0.0922*** (0.0245)	0.0677*** (0.0244)	0.0247 (0.0557)
<b>Top 5%</b>	-0.0993 (0.0935)	0.000916 (0.0340)	0.00849 (0.0358)	-0.0298 (0.0795)
<b>Top 1%</b>	0.0439 (0.122)	0.0989* (0.0542)	0.0516 (0.0514)	0.0944 (0.127)
<b>2008</b>				0.0798*** (0.0125)
<b>Exporter*2008</b>				0.0373* (0.0224)
<b>Top 10%*2008</b>				-0.0209 (0.0636)
<b>Top 5%*2008</b>				0.0482 (0.0942)
<b>Top 1%*2008</b>				-0.0658 (0.124)
<b>Employment</b>	-0.00814* (0.00478)	-0.0248*** (0.00364)	-0.0176*** (0.00291)	-0.114*** (0.0147)
<b>Capital/worker</b>	0.0443*** (0.00538)	0.0357*** (0.00355)	0.0391*** (0.00305)	0.0154* (0.00821)
<b>Intermediate Inputs/ worker</b>	0.840*** (0.00703)	0.868*** (0.00495)	0.853*** (0.00412)	0.773*** (0.0150)
<b>Industry Controls</b>	Yes	Yes	Yes	Yes
<b>Observations</b>	3,248	6,082	9,330	9,330

These results suggest that there are differences in productivity among these super-exporters and it does seem that the top 1% of exporters is more productive than the rest. However, these results do not indicate whether these firms are specialist exporters or focus on the domestic market. Figure 2 shows the distribution of the proportion of output exported and compares the top 5% group to the next 5%. This shows that the top tier exports a higher proportion of their total output than the next tier (figure 2). The median super-exporter exports 64 percent of total output compared to the median exporter in the next 5 percent who exports only 34 percent of total output. This figure suggests that the

super-exporters are more likely to be specialist exporters than the next 5 percent; 30 percent of the super export more than 80 percent of total output compared to 16 percent of the next 5 percent.

**Figure 2. Amount Exported as a Proportion of Total Output**



#### 4.2 Dynamics

Table 4 presents the transition of the top exporters over the period 2005 to 2008. For the sake of this discussion tier one, two, three and four refer to the top 1 percent, top 2-5 percent, top 6-10 percent and bottom 90 percent respectively. Tier one and two together make up the 'super' exporters discussed thus far: that is the top 5 percent. Three interesting observations emerge from this table.

Firstly, a large majority (71%) of exporters in the top tier remained in the top tier over the period. Our data does not allow us to determine whether these top 1 percent of exporters in 2005 started as top 1 percent exporters, or if they entered further down on the export distribution and improved over the years. However, given that very few exporters from the lower tiers transitioned into the first tier over the period, this suggests that firms in this top tier are relatively constant.

Secondly, the higher an exporter is on the export distribution, the more likely they are to stay there. Super-exporters are more likely to stay super-exporters over the period than exporters in lower tiers: the majority of the third tier exporters fell into the fourth tier group by 2008. In addition, while the third tier are more likely to transition into the next highest tier than the second tier exporters (19% versus 9%), the third tier exporters are also more likely to transition into a lower tier. Taken together with the first point, this suggests a relatively stable group of the top 1% but more variability for other groups.

Finally, super-exporters are more likely to drop into the fourth tier (and, more so, out of exporting) than the third tier. One explanation for this is that these super-exporters are susceptible to shocks which can force them out of the export market.

**Table 4. Transitions over the Period between Groups**

<b>2005 Status</b>	<b>2008 Status</b>					
	Top 1%	2-5%	6-10%	Other exporter	Non-exporter	Not in sample
Top 1%	70.59	5.88	0	5.88	11.76	5.88
2-5%	8.93	32.14	7.14	14.29	23.21	14.29
6-10%	0	18.92	22.97	27.03	21.62	9.46
Other exporter	0.38	1.13	2.89	50.44	31.12	14.05
Non-exporter	0.61	1.25	1.41	20.27	46.69	29.77
Not in sample	0.07	0.29	0.63	24.72	74.29	–

To investigate the change in the proportion exported between the two periods we regress this change on a number of observed characteristics of the firms and their ranking in 2005. These results (table 5) indicate that exporters generally increase the proportion of output they export as they continue to participate in the export market. However, top exporters are no more likely to increase exports as a proportion of output than other exporters. This is not surprising since, as previously discussed; top exporters (certainly the top 1 and 5 percent) tend to mostly stay where they are along the export distribution, in terms of

proportion exported. Additionally, these top exporters already export a larger proportion of their sales, and thus expansion (since it is measured as a proportion of output) is ‘capped’.

**Table 5. Percentage Change in Exports as a Proportion of Total Output**

VARIABLES	%Change in proportion exported
II	0.125 (0.172)
lrkl	-0.150 (0.205)
lril	0.208 (0.267)
Exporter	2.575*** (0.469)
Top 10%	-1.015 (0.785)
Top 5%	-0.486 (1.056)
Top 1 %	0.0262 (1.709)
Industry Controls	Yes
<b>Observations<sup>+</sup></b>	<b>810</b>

<sup>+</sup> There are only 1310 observations for which we observe the proportion exported in both periods. Of these observations, 600 are non-missing in 2008 and zero in 2005 thus giving a *missing* value for percentage change in proportion.

## Conclusion

This paper uses a novel firm-level panel dataset containing information on exports for around 10 000 firms for the periods 2005 and 2008 to investigate export concentration in South African manufacturing. The data shows that exports are dominated by a small group of very large exporters; the ‘super’ exporters (top 5 percent or top 200 firms) contribute around 85 percent of South Africa’s total manufacturing exports.

Given that the next 5 percent contribute only an additional 11% on average, we set out to investigate what differences exist between the ‘super’ exporters and the next 5 percent. Given the relatively small contribution by the next 5 percent, if these firms can be

encouraged to increase the proportion exported to levels similar to those of the super-exporters, South African export growth would increase substantially.

The results indicate that super-exporters are stable; exporters in the top 5 percent are likely to stay in the top 5 percent over the years. The next 5 percent however are much more unstable with a large proportion falling even lower down the export distribution with time.

In addition to the stability exhibited by the top 5%, they are also more likely to be specialist exporters than the next 5%. Taken together this indicates that, in general, the export market is a major focus for the top 5% of exporters but is generally less important for the next 5%. Despite this difference in focus, it seems that super-exporters are no more productive in terms of TFP-R than the next 5 percent.

What do these results mean for designing policies to encourage South African exports? Firstly, they suggest that export policies need to acknowledge that there are different types of exporters – super-exporters, or those firms that can become super-exporters will need different interventions compared to smaller marginal exporters. Second, it seems most likely that increases in South Africa's total aggregate exports will be driven by firms in the top end of the export distribution. This may come through a variety of ways: specialist super-exporters may increase the amount they export; non-specialist super-exporters can increase the proportion of output they export (this would increase their total output if they maintained the same production for the domestic market but increased production for the export market); and second-tier exporters, in the 6-10% group, could become more like the specialist super-exporters.

Currently, we do not know what constrains exporters in the top end of the distribution, although it does seem that all these exporters have similar levels of productivity (at least in terms of TFP-R). Thus, it does not seem that lower levels of productivity are a constraint (although it may be that productivity differs by destination and that the second tier, and/or non-specialist exporters focus on regional markets where productivity requirements are not as high). However, given the non-specialist nature of many of these exporters, one explanation may be that relative to the international market the domestic market is too lucrative and that many firms use exports as a 'vent-for-surplus'. This fits with explanations provided by Edwards and Lawrence (2008) and others. If this is the case then policies to

increase competition in the domestic market, through for example further trade reform and competition policy, will change the incentives for focusing on the domestic market.

Another explanation is that each market a firm enters has its own fixed costs and that firms may confine themselves to a small number of markets, since other markets lack the scale to compensate for the fixed costs of entry. In order to investigate this, and the hypothesis that productivity and specialization is related to export destination, requires information on where firms export to which we do not have currently. A further plausible explanation is that firms are actually producing at full capacity and thus have a limited ability, or incentive, to expand production. If this is the case then we require information on capacity utilisation and constraints to investment and employment. Although this paper has advanced our understanding of the behaviour of South African exporters substantially further progress on this topic is hampered by the availability of data.

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Working draft – do not cite

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