Inaugural speech: Prof Marianne Matthee

Introduction

Why countries trade and the economic activity that makes trade possible have been the subject of innumerable studies throughout the world. Yet countries' circumstances are continually changing, which means that the trading landscape is fluid – as are the theories surrounding the motivation for, and impact of, trade.

Broadly, countries trade because it allows for specialisation and improvement in welfare (Du Plessis, Smit & McCarthy, 1987). Welfare is increased in a number of ways. Firms engaged in trade are able to achieve economies of scale, take advantage of expanded market opportunities and spread their risk. Consumers in turn benefit from cheaper goods and more choice.

In the empirical literature, it is a well-established fact that exports are good for growth and development. The rationale for and consequences of trade have been the focus of many researchers throughout history – think Smith, Ricardo, Heckscher-Ohlin, and the like. In these traditional explanations of trade (such as the Heckscher-Ohlin model) trade patterns between countries depend on natural resources, skills and other factors of production. A number of assumptions are made, including that trade occurs in a perfectly competitive and frictionless (precise) world without the complication of distance or geographic features (Salvatore, 1998, 766)[1].

[1] This is drawn from: Matthee, M. 2007. Essays in domestic transport costs and export regions in South Africa. North-West University.

In reality, the world is not frictionless, economic activity tends to be clustered and there are a number of impediments to exports. Where economic activity takes place or where exports originate must be taken into account. This implies that distance between markets (and ports) have to be brought into the equation, and distance gives rise to transport costs.

New economic geography

More recent theories take distance – and by association, transport costs – into account. These are the new trade theory and the new economic geography (NEG) theory, pioneered by Paul Krugman (1991). The new economic geography theory provides insight into how distance influences firms' location choices. Firms tend to locate near larger markets, creating agglomerations (at the "core"). In these agglomerations, the firms are able to achieve economies of scale while at the same time minimise their transport costs. These agglomerations will attract workers, creating an even higher local demand (called the home-market effect). The effect is that economic activity (and exports) is stimulated in the core and exports are then traded with the periphery (in other countries).[2]

The case of South Africa

South Africa represents a particularly interesting application of the NEG theory, due to its external and internal geography. In terms of its external geography, South Africa is

[2] This is drawn from: Matthee, M. & Naudé, W.A. 2008. Determinants of Regional Manufactured Exports from a Developing Country. International Regional Science Review, 31(4): 343–358.

located far from its traditional export markets in Europe and the US, and also far from its main trading partner, China. Internally, economic activity is highly skewed towards the inland regions. For example, in 2017 Gauteng produced around 35% of the country's economic activity (in terms of gross value added), followed by KwaZulu-Natal with 16% and the Western Cape with 14%. These figures were more or less the same in 1996[3]. To understand the reasons for the persistently skewed, or unequal, economic activity in the country, the history of South Africa's spatial development must be analysed.

South Africa's skewed spatial structure can to some extent be attributed to developments on the policymaking front, but the main cause can be traced back to the discovery of diamonds and gold. During the 1700s, spatial development in South Africa was largely concentrated along the coast (in Cape Town, Port Elizabeth and Durban). The discovery of diamonds in the 1800s changed this concentration, with Kimberly developing into the first major inland agglomeration. The discovery of gold spurred the development of Johannesburg in a similar fashion. Johannesburg and its surrounding areas experienced rapid urbanisation as supporting industries to the mining sector stimulated the development of a manufacturing sector within the Johannesburg–Pretoria agglomeration.

The tightening of apartheid's grip in the 1950s reinforced South Africa's spatial inequalities, with the introduction of various territorial development policies fostering the unequal

[3] This is drawn from: Matthee, M. and Krugell, W.F. 2018. *Driving more inclusive growth through targeted investment: The location attractiveness index.* Alexander Forbes Benefits Barometer. *Forthcoming.*

distribution of economic activity. Because of apartheid the majority of South Africans were relegated to locations far from their places of work. This created inefficient land use, exclusion from the benefits of society, high transport costs and under-investment in transport infrastructure, telecommunications and electricity as these services could not be sustained.

With the advent of democracy in 1994, South Africa's trade liberalisation programme also influenced the spatial structure of economic activity in the country. Owing to changes in the country's trade policy and incentives, including the reduction of protective tariffs, organisations that could not cope with rising levels of competition closed down (for example, the textile industry in the Western Cape), while those that were able to move into new markets thrived (for example, the motor industry in the Eastern Cape).

Work by Krugell, Naudé and others have contributed to the application of the NEG in the South African context by developing a profile of South Africa's economic concentration and sub-national inequality and by estimating the degree of convergence or divergence in per capita incomes since the country's re-integration into the world economy in 1994 (see, for example, Krugell et al., 2005; Naudé & Krugell, 2006; and Bosker & Krugell, 2008)[4].

In this literature, however, little attention was paid to the influence of location on sub-national exports. Transport costs, and accordingly the location of exporters, play a key role in South Africa for two main reasons. First, the cities

[4] This is drawn from: Matthee, M. and Krugell, W.F. 2018. *Driving more inclusive growth through targeted investment: The location attractiveness index.* Alexander Forbes Benefits Barometer. *Forthcoming.*

located near ports are smaller than those situated inland (Krugell, 2005). This contrasts with the theory that exporters will locate closer to ports in order to minimise transport costs. This is because distance creates transport costs, which in turn influence the location decisions of firms that produce manufactures for the export market (Naudé & Gries, 2004). Secondly, the major sources of manufactured exports are located inland, which makes domestic transport costs a relevant issue in South Africa. In 2002, only 22 of the 354 magisterial districts produced 84 percent of the country's total manufactured exports, with Gauteng producing 33% of that percentage. The other large agglomerations that export manufactures are Durban-Pietermaritzburg (11%), Pretoria-Brits (8%) and Cape Town-Bellville (6%) (Naudé & Gries, 2004; Naudé & Krugell, 2005; Matthee, Krugell & Naudé, 2006)[5].

Exploring the sub-national nature of South Africa's exports

The sub-national research on exports in South Africa has added to the empirical literature on geographic economics and in particular has enhanced people's understanding of the relationship between trade, distance and location. The justification, as noted above, can be summarised in Figure 1, which illustrates the particular case of exports originating from within South Africa. The darker places export a higher percentage of manufactured exports. The South African literature on the sub-national nature of exports was

[5] This is drawn from: Matthee, M., Naudé, W.A. & Krugell, W.F. 2006. *Domestic transport costs and the location of export- oriented manufacturing firms in South Africa: A cubic-spline density approach*. EcoMod conference on Regional and Urban Modeling, Brussels, May.

advanced through four specific contributions, which are briefly discussed below.

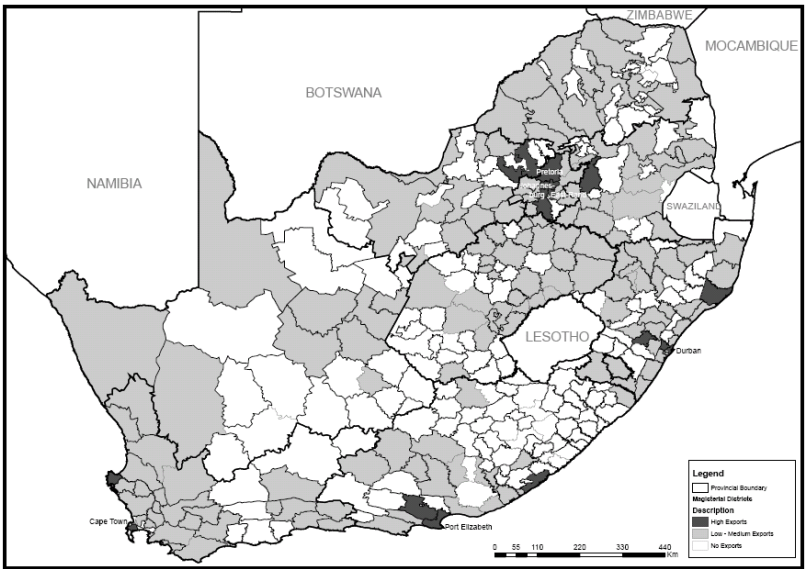

Figure 1: Exports per magisterial district

Source: Naudé and Matthee (2010: 279)

The first contribution was to enhance people's understanding of the location of exporting firms by proposing a theoretical model of an exporting firm's location decision that explicitly takes distance to a port into consideration (Gries, Naudé & Matthee, 2009). Distances within a country matter to trade. In this article, the point of departure was that the location decisions of export-oriented firms would have to consider the distance from the closest port, given that all international transactions need to pass through a port. Generally, the location behaviour of export-oriented firms has been neglected in the regional and international economics

literature. Most often, the focus has either been on international distances and transport costs, or when the concern is the location of firms, on transport costs. The article argued, however, that transport cost is only one component of distance that affects optimal location (and that transport cost may in itself not be a straightforward proxy for distance, or vice versa).

In the economic model presented in the article, it was shown that the components of distance that affect the location of export-oriented firms include skilled human capital, imported input requirements and the natural resource intensity of production. Because ports are mostly located in urban areas (they are usually part of an agglomeration), wages can be expected to fall as the distance to the port increases. This, together with the degree of natural resource intensity, creates a dispersal force, whereby the requirement for human capital and intermediate imported inputs creates a pull effect in the direction of the port. It was illustrated that for each firm the eventual optimal location will depend on the different marginal costs.

With a growing share of an exporting firm's output, transportation becomes increasingly important, and hence the distance to port is expected to decline. Especially if domestic land transportation costs are high, the production site will be closer to the port. A similar expectation is suggested for production processes with high import shares. Further, if the port is also an urban centre, two additional aspects come into play: (i) human capital- and technology-intensive firms require proximity to specific human capital, and so these firms are most likely to be located close to a centre; (ii) if a firm is large or its production processes are land- and physical resource-intensive, the costs of using these input factors will decrease with the distance to the

centre; hence, these industries are expected to be located not in the centre but rather at a certain distance from a hub.

In order to test the predictive power of the model, data on sub-national exports, imports, human capital and primary production from 354 magisterial districts in South Africa over the period 1996–2006 was used. The results supported the model, suggesting that the optimal location from a port might be determined by a firm's need for skilled human capital and the need to source imports. It was also found that in more distant locations (from a port), the share of primary production (agriculture and mining) tends to be higher, the skills levels of human capital lower and import intensity lower, and that as a result exports are also lower. The relative sizes of the coefficients for exports and imports suggested that in South Africa transport costs of imported goods might (on average) be relatively more important than transport cost of exports[6].

The second contribution was to investigate the geographical location of manufacturing export industries in South Africa (Naudé & Matthee, 2010). The premise of this research was that there is a growing body of literature showing a generally positive relationship between exports and economic growth in Sub-Saharan Africa (SSA). But despite this literature, little is known about the spatial location of manufacturing export industries in SSA and how, over time, the location decisions of firms influence their export orientation, and vice versa. This article helped to ameliorate this knowledge gap by recognising that geography — and distance — might matter for growth and trade in Africa. This is an important

[6] This is drawn from: Gries, T., Naudé, W.A. & Matthee, M. 2009. The Optimal Distance to Port for Exporting Firms. Journal of Regional Science, 49(3): 513–528.

contribution as knowledge of the location of African manufacturing export industries and their dynamics over time will reveal the relative strengths and importance of various ultimate determinants of firms' export behaviour.

Given that firms need to move their exports through ports (generally export hubs such as sea ports or dry ports), the article considered the density of manufacturing exports originating at various distances from South Africa's ports. Data on manufactured exports from 354 magisterial districts for the period 1996–2004 was obtained, and cubic-spline density functions estimated on the relationship between manufactured exports and distance.

The exploratory results showed that South Africa's manufactured exports tend to be spatially concentrated. Around 22 of the 354 magisterial districts produced 84% of the total manufactured exports. Distance (in kilometres) was negatively related to the density of manufactured exports, and statistically significant. Given that distance is the main determinant of transport cost, the results provided an indirect measure that domestic transport costs are important in manufactured exports. The results further showed that the largest volumes of manufactured exports were generated within 100 km of an export hub. For certain goods, such as electronics, about 98% of manufacturing took place within 100 km of an export hub (see Table 1)[7].

[7] This is drawn from: Naudé, W.A. & Matthee, M. 2010. The location of manufacturing exporters in Africa: Empirical evidence. African Development Review, 22(2): 276–291.

Table 1: Percentage exports per manufacturing sub-sector by distance

Sector	Distance in km from nearest export hub							Total % of manufactured exports
	0–100	101–200	201–300	301–400	401–500	501–600	601 +	
Food, beverages and tobacco products	84.28	8.14	4.25	2.76	0.50	0.05	0.02	100
Textiles, clothing and leather goods	79.15	1.50	12.50	6.59	0.25	0.01	0.00	100
Wood and wood products	82.39	16.62	0.47	0.39	0.12	0.00	0.00	100
Fuel, petroleum, chemical and rubber products	78.60	14.34	1.38	2.12	3.56	0.01	0.00	100
Other non-metallic mineral products	94.21	2.74	2.19	0.74	0.09	0.02	0.00	100
Metal products, machinery and household appliances	75.75	20.12	0.84	2.43	0.52	0.01	0.33	100
Electrical machinery and apparatus	92.74	0.97	6.05	0.12	0.08	0.02	0.01	100
Electronic, sound/vision, medical and other appliances	98.79	0.64	0.32	0.10	0.13	0.01	0.00	100
Transport equipment	81.28	3.92	14.36	0.26	0.11	0.06	0.00	100
Furniture and other	71.53	2.47	1.94	0.82	23.23	0.00	0.01	100

Source: Naudé and Matthee (2010: 284)

It was also found that the relationship between exports and distance from an export hub is not uniformly negative – there is a second band of locations for export-oriented manufacturing firms at a distance of between 200 km and 400 km from the nearest hub (see Figure 2). A third band occurs at around 600 km. The manufactured exports that originate from this band tend to be low skill intensive and resource based. Comparisons over time showed that the number of locations from which manufactured exports originate in South Africa increased by 15% in the period 1996–2004 and that manufactured exports increased in the band that is between 200 km and 400 km from the nearest hub. Although a number of factors simultaneously have a dispersal effect on manufactured exports, there is some evidence to suggest that reductions in transport costs (both shipping and domestic transport costs) play an important role in this dispersal[8].

[8] This is drawn from: Naudé, W.A. & Matthee, M. 2010. The location of manufacturing exporters in Africa: Empirical evidence. African Development Review, 22(2): 276–291.

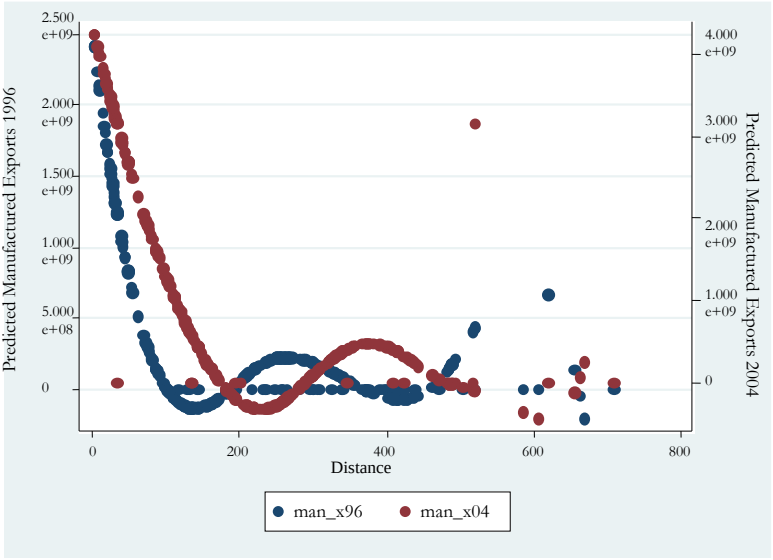

Figure 2: Manufactured exports in 1996 and 2004

Source: Naudé & Matthee (2010:283)

The third contribution was to investigate the geographic location and regional determinants of exports from a developing country perspective (Matthee & Naudé, 2008). Drawing on insights from geographic economics, agglomeration and increasing returns to scale (the home-market effect) and transport costs (proxied by distance) are identified as major determinants of choice of location for exporters. The contribution of this article was to test for these determinants using developing country data and to generally add to the limited literature on this topic. Data from 354 magisterial districts in South Africa was used with a variety of estimators (Tobit, RE-Tobit and type II Tobit). It was

found that the home-market effect (measured as the size of local GDP) and distance (measured as the distance in km to the nearest port) are significant determinants of regional manufactured exports. The main result of this article was that internal distance and thus domestic transport costs influence the extent to which different regions in a developing country can be expected to be successful in exporting manufactures[9].

The fourth contribution was to investigate the desirability of export specialisation or diversification as a strategy for local economic development in a developing-country context. This would contribute to the relatively limited empirical literature on the relationship between the degree of export specialisation or diversification and local economic growth within countries (Naudé, Bosker & Matthee, 2010).

In contrast to the many studies focusing on a country level, far fewer studies have so far been concerned with the empirical relationship between export diversification and economic growth on a sub-national (or local) level, within countries. This is a significant shortcoming for two reasons. First, it may very well be that the relationship between export diversification and growth is different for different levels of aggregation. Thus while it may be better for a country to diversify its exports, this may not be applicable to all localities within that country. One reason could be that with greater labour mobility within a country, people may decide to take advantage of a well-performing region.

Indeed, a widely held view, based on local economic base theory, is that local economic development should best

[9] This is drawn from: Matthee, M. & Naudé, W.A. 2008. Determinants of Regional Manufactured Exports from a Developing Country. International Regional Science Review, 31(4): 343–358.

proceed through the development of clusters whereby particular places can specialise in particular competitive niches. Second, exports are a potentially important determinant of spatial inequality within countries. Recently, in the growing field of new economic geography (NEG), a number of contributions have provided a theoretical basis for the relationship between exports and spatial inequality. So far, however, relatively few studies have provided empirical tests of these ideas and, moreover, very few have been concerned with the relationship between the degree of export diversity and spatial inequality. It therefore remains to be seen whether localities or regions that want to catch up through export-led growth will be able to do so optimally by specialising or diversifying their exports.

Using data on 354 South African magisterial districts' exports for 1996 and 2001 (corresponding with the country's two census years), the article provided spatial growth regressions that included various measures of export specialisation⁄diversification. It was found that the faster-growing magisterial districts in South Africa between 1996 and 2001 were not those with the initially more diversified export structures; indeed, those magisterial districts recording the highest growth between 1996 and 2001 were generally also those that became more specialised in their exports – in particular, magisterial districts that specialised in agricultural and mining products, for which the global demand was growing rapidly over the period of the study[10].

[10] This is drawn from: Naudé, W.A., Bosker, M. & Matthee, M. 2010. Export Specialization and Local Economic Growth in South Africa. The World Economy, 33(4): 552–572.

Focus on firm-level research: The Melitz model (2003)

> "…it is ultimately not countries but firms that export to, and invest in, other countries. These firms differ from one another enormously in terms of amount of capital, labour and technology used in the production process and in terms of size and productivity level" (Van Marrewijk, 2012: 400).

As explained by Van Marrewijk, when studying exports, whether on a national or sub-national level, one has to take cognisance of the fact that they are ultimately generated by exporting firms which differ in terms of their nature and performance. Indeed, since the mid-1990s, theoretical models of international trade have advanced substantially in the wake of new theories being developed on the role of firm heterogeneity in trade. Initial work done by Bernard and Jensen (1995, 1999) showed that, contrary to the underlying assumptions of many of the 'new' trade models, exporting was relatively rare and exporters were different from non-exporters across many dimensions. This, in turn, led to the development of new models to explain trade at the firm level, such as that of Melitz (2003)[11].

Melitz (2003) emphasises the importance of productivity, which differs across firms, for enabling firms to enter and succeed in the export market. In short, the model is based on assumptions of firm heterogeneity in productivity and fixed costs (associated with exporting). Since firms differ (or exhibit heterogeneity) in their productivity, only the more

[11] This is drawn from: Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

productive ones are able to generate sufficient operating profits in a destination market to cover the associated fixed costs, and serve the market through exports. Therefore, exporting occurs because the more productive firms self-select into exporting. This theoretical literature has subsequently developed to explain the additional variation in export behaviour at the product level (for example, Bernard et al., 2011)[12].

The abovementioned theoretical advances have, with the availability of firm-level data, led to an improved understanding of exports. Indeed, the vast international empirical literature that exists on the heterogeneous nature and performance of firms has shown that exporters are 'superior' to non-exporters across a number of dimensions: exporting firms are generally larger, more labour productive and more capital- and skill-intensive than non-exporters.[13]

[12] This is drawn from: Matthee, M. & Santana Gallego, M. 2017. Identifying the Determinants of South Africa's Extensive and Intensive Trade Margins: A Gravity Model Approach. *SAJEMS*, 20(1): 703–724; Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

[13] This is drawn from: Matthee, M. & Santana Gallego, M. 2017. Identifying the Determinants of South Africa's Extensive and Intensive Trade Margins: A Gravity Model Approach. *SAJEMS*, 20(1): 703–724; Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

Cross-sectional firm-level research on South African exports

Although similar firm-level research to that undertaken internationally has been done in South Africa, its scope has been limited by the unavailability of comprehensive firm-level data on the population over time (Edwards et al., 2008). The main shortcomings of existing studies are that they are cross-sectional in nature and cover a sample, rather than the population, of firms[14]. However, these studies provided a first step in understanding the heterogeneous nature and performance of firms in South Africa. Examples of these studies are illustrated in Table 2.

Table 2: South African firm-level export studies

Authors (date)	**Article title**
Cuyvers, Dumont, Viviers, De Pelsmacker, Muller, Jegers and Saayman (2008)	Export intensity and the Competitive Intelligence of exporting companies: Evidence from South Africa
De Pelsmacker, Muller, Viviers, Saayman, Cuyvers and Jegers (2005)	Competitive Intelligence practices of South African and Belgian exporters
Edwards (2004)	A firm level analysis of trade, technology and employment in South Africa
Edwards and Behar (2005)	Trade liberalisation and labour demand within South African manufacturing firms
Edwards, Rankin and Schöer (2008)	South African exporting firms: What do we know and what should we know?

[14] Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

Gumede and Rasmussen (2002)	Small manufacturing enterprises and exporting in South Africa: A preliminary assessment of key success factors
Koch and Peet (2007)	Non-tariff barriers faced by South African firms: Are there any lessons?
May and O'Neill (2008)	South African exporter performance: New research into firm-specific and market characteristics
Naudé, Oostendorp and Serumaga-Zake (2005)	Determinants of manufacturing exports: Results from a regional firm level survey in South Africa
Naughtin and Rankin (2014)	South African super-exporters. Are they different and what does this mean for policy?
Rankin (2001)	The export behaviour of South African manufacturing firms
Rankin (2013)	Exporting and Export Dynamics Among South African Firms
Soontiëns (2002)	Managing international trade: an analysis of South African SMEs and regional exports
Van Eldik and Viviers (2005)	The measurement of export readiness of companies in South Africa
Viviers and Calof (1995)	Internationalization behaviour of small and medium sized South African enterprises
Viviers and Calof (2002)	International information seeking behaviour of South African exporters
Viviers, Calof and Kroon (1995)	The export behaviour of South African enterprises: Countries served, mode forms and process evolution
Viviers, Calof and Kroon (1996)	Export behaviour of SA enterprises: Stages and attitudes towards exports

From Table 2 it is clear that a number of studies have investigated firms' internationalisation processes and practices, labour and firm-level trade, exporter premia and the determinants of firm-level trade. However, none of these has investigated the extensive and intensive margins of South Africa's exports on a firm level. Matthee and Krugell (2012) address this gap by analysing the impact of resource barriers – more specifically, firm size, productivity, firm-specific capital and labour market constraints – on South African firms' decision to internationalise (export propensity, which captures the extensive margin) and on the extent to which its exports contribute to economic growth (export intensity, which captures the intensive margin). They use a panel dataset comprising World Bank Enterprise Survey data for 2003 and 2007. A two-step Heckman selection model (which contains observations of 2003 and 2007) is estimated to determine the predictors of firms' export propensities and intensities. From the overall results of the model, it is clear that the unobserved factors that make exporting more likely tend to be associated with lower levels of exports. The main findings are that firm size and productivity matter for exports. Furthermore, barriers to doing business, such as electricity supply and transportation problems, and the use of imported inputs influence exporting firms' supply-side capabilities.[15]

Still focusing on the extensive and intensive trade margins, Matthee et al. (2015) further contribute to this topic in the South African literature by examining how changes at the

[15] This is drawn from: Matthee, M. & Krugell, W.F. 2012. Barriers to internationalisation: Firm-level evidence from South Africa. Studia UBB Oeconomica, 57(1):3–20.

intensive margin (established exporters exporting existing products to established markets) and the extensive margin (new exporters, products or markets) contribute to South Africa's export growth and how the latter was affected by the global financial crisis. The first source of data is customs transaction data at the firm–product destination level as provided by the South African Revenue Service. The second is data from Statistics South Africa's Large Sample Survey (LSS) of manufacturing. Together, these datasets provide a more nuanced view of South African export behaviour at a micro level than was previously evident.

It was found that the intensive margin is the more important contributor to export growth, contributing more than three quarters of observed growth. The intensive margin contracted significantly during the global financial crisis of 2009 but then quickly bounced back to pre-crisis levels. However, the impact on the extensive margin persisted after the crisis with lower levels of entry of firms, new products and new destinations. The short-term impact of the crisis was mitigated by the concentration of South African exports among larger, more productive super-exporters. Yet the decline in entry of new firms, products and destinations as a result of the crisis may mean that this concentration will persist and, at least over the next few years, South Africa will not diversify and broaden its exports.[16]

[16] This is drawn from: Matthee, M., Farole, T., Naughtin, T. & Rankin, N.A. 2016. South African exporters and the global crisis: Intensive margin shock, extensive margin hangover. South African Journal of Economics, 84(2):183–198.

Administrative data firm-level studies

Although a number of studies have looked at the microeconomics of exporting in South Africa, such work has been hampered by a lack of access to the type of administrative data used in other countries. The lack of a 'corpus' of academic research in this field has also meant that the discussion around export policy has remained shallow. For example, the National Development Plan acknowledges the importance of increasing exports but has very little to say about the types of firms (rather than sectors) that would be the source of export growth (National Planning Commission, 2013) [17]. Rankin (2013: 5) surmises that 'much of the South African debate on exporting, however, occurs in an environment devoid of fact, based on anecdote and prejudice'.

This lack of information has been overcome by a research initiative launched by The United Nations University's World Institute for Development Economics Research in conjunction with National Treasury and the South African Revenue Service (SARS). Through this initiative and with business entity-level data from the administrative records of SARS, the type of research that has become commonplace internationally can now be done on South Africa, with this population data overcoming the sampling issues that plagued previous research[18]. The administrative datasets available for firm-level research include: the Company Income Tax (CIT)

[17] This is drawn from: Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

[18] This is drawn from: Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

return data, the Pay as You Earn (or Personal Income Tax employee data (PAYE, or IRP5)) and customs transactions data. Studies conducted under this research initiative have made an important contribution to the South African literature on firm-level exporters, illustrating in particular how the multiparty collaboration can produce practical and useful results from both an academic and policy perspective. For example, the studies that have emerged have gone a long way in adding clarity to the available data and resolving some longstanding data issues with SARS[19]. Several rounds of project studies have been completed under this research initiative. Specific contributions to South Africa's export literature are outlined below.

The first contribution using the SARS data was to illustrate "stylised facts" about South African manufacturing exporters and to investigate the relationship between exporting and productivity in more detail (Matthee et al., 2018). Descriptive statistics showed that South African exporting at the firm level is similar to the stylised facts of firm-level exporting found internationally: less than a fifth of firms export in any given year; specialist exporting (exporting more than half the value of total output) is very rare and total export value is dominated by a small number of firms (see Figure 3); and calculating the export premia showed that exporters are larger, pay better and are more productive.

[19] Bezuidenhout, C., Matthee, M., & Rankin, N.A 2017. Inclusive growth and wage inequality: the case of South African manufacturing exporters. WTO Public Forum 2017, Geneva, Switzerland. 27–29 September.

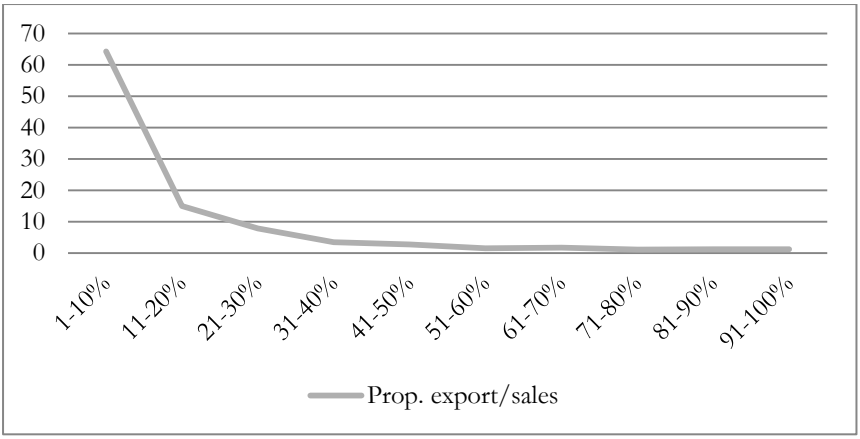

Figure 3: Proportion of output exported if a firm exports

Source: Matthee et al. (2018: 104)

Investigating the trade margins showed that there is also a large degree of churn – entry into and exit from the export market – but this does not seem to translate into sustained exporting. Most of South Africa's export growth comes from expansion on the intensive margin – existing exporters expanding their exports of existing products to existing destinations[20].

[20] This is drawn from: Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout C. 2018. Understanding manufactured exporters at the firm-level: new insights from using SARS administrative data. *South African Journal of Economics*, 86(S1): 96–119.

Table 3: Percentage of intensive and extensive margins' manufacturing export growth over the period 2010–13

		2010–2011	2011–2012	2012–2013
Exporter entry and exit	Enter	0.8	2.8	1.4
	Exit	-0.5	-0.7	-5.7
	Net entry (firms enter minus firms exit)	0.3	2.1	-4.2
Diversification	Added/new:	14.9	16.7	12.8
	1. New product, existing destination	3.6	4.0	3.0
	2. Existing product, new destination	3.9	3.4	4.3
	3. New product, new destination	2.5	1.5	1.3
	4. New combination of existing product, existing destination	4.9	7.9	4.2
	Dropped:	-10.8	-15.6	-11.9
	1. Dropped product, existing destination	2.6	7.0	3.3
	2. Existing product, dropped destination	2.8	3.1	3.1
	3. Dropped product, dropped destination	0.6	0.9	1.1
	4. Dropped combination of existing product, existing destination	4.8	4.5	4.5
	Net diversification (added minus dropped)	4.1	1.2	0.9
Intensive margin	Net intensive margin (existing product–market combinations)	10.7	4.0	12.0
Total change in exports		15.2	7.3	8.7
percent annual growth due to:				
Net extensive margin (net entry and net diversification)		29.5%	45.2%	-38.2%
-Net entry (new minus exit)		2.2%	29.1%	-48.5%
-Net diversification (added minus dropped)		27.3%	16.1%	10.3%
Net intensive margin		70.5%	54.8%	138.2 %

Source: Matthee et al. (2018: 110)

An advantage of utilising firm and transaction data is that one is able to discern the heterogeneity that exists within exporting. Not only do exporters differ in terms of the amount exported, they also differ in terms of the number of

products and destinations they export to. These in turn relate to firm-level characteristics, including productivity.

Multiproduct, and multidestination exporters contribute the most to total export value. They are also bigger and more productive than other types of exporters. Productivity varies by both the number of products exported and the number of destinations exported to. Single-product exporters, regardless of where they export to, have productivity levels that are similar to domestic firms. Multiproduct exporters exporting within Africa are only about 4% more productive, and multiproduct exporters exporting outside of Africa are approximately 10% more productive compared to producers for the domestic market. Overall these results indicate that South African exporters are, in general, very similar in characteristics and behaviour to exporters in other countries where similar research has been undertaken. Furthermore, the results show that some of the earlier results, such as the lack of an exporter premium, may have been driven by the characteristics of the samples used in previous research or the inability to differentiate between the heterogeneous aspects of exporting behaviour, like destinations and number of products. These limitations were overcome in this paper through the use of population-level administrative data[21].

The second contribution using the SARS data was to investigate the linkages between exporting, labour demand and wages in South Africa (Matthee et al., 2017). Exports are often advocated by policy makers as a means to stimulate

[21] This is drawn from: Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2018. Understanding manufactured exporters at the firm-level: New insights from using SARS administrative data. *South African Journal of Economics*, 86(S1): 96–119.

economic growth and create jobs. South Africa is no exception. The South African government has identified (in its National Development Plan) exports to be the key driver of faster economic growth (World Bank, 2014). More recently, the Minister of Trade and Industry, Rob Davies (2016), emphasised this point saying '… increasing exports, particularly in manufacturing, may be crucial for low-skilled job creation needed to substantially reduce high overall unemployment'. Using SARS data, this research shed light on these linkages by disentangling the differences between exporters and non-exporters in terms of labour demand and wages and by investigating how exporter heterogeneity affects labour demand and wages. Moreover, it also investigated how exporters stimulate employment growth and provided a depiction of their within-firm wage distribution.

Table 4 and Figure 4 provide an overall view of the number of manufacturing firms, both exporters and non-exporters, and the contributions of various export destinations to total exports.

Table 4: Number of manufacturing non-exporters and exporters (different destinations)

	2010	**2011**	**2012**	**2013**	**2014**
Non-exporters	24 959	25 561	24 868	27 256	22 992
Exporters	4 957	6 868	7 145	8 117	7 257
- SACU only	*1 124*	*1 726*	*1 770*	*2 027*	*1 636*
- Africa only (excluding SACU)	*1 836*	*2 284*	*2 454*	*2 719*	*2 590*
- International	*1 997*	*2 858*	*2 921*	*3 371*	*3 031*
Total	29 916	32 429	32 013	35 373	30 249

manufacturing firms

Source: Matthee et al. (2017: 8)

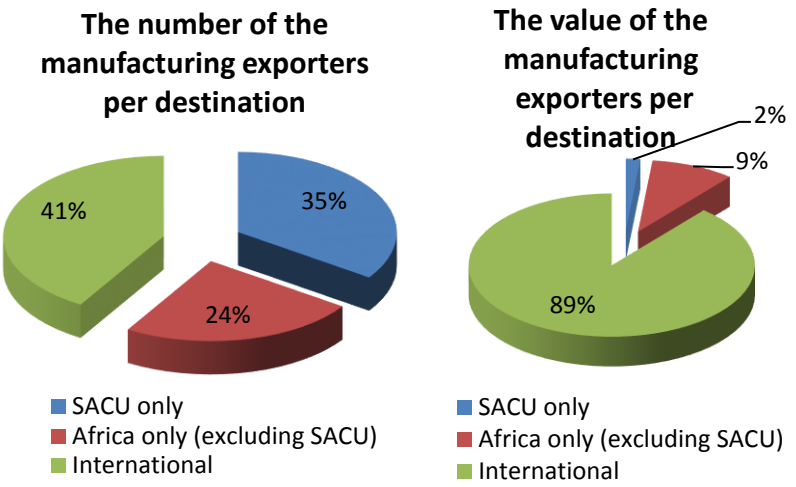

Figure 4: The average number and value of the manufacturing exporters per destination (2010–14)

Source: Matthee et al. (2017:9)

Utilising export premia regressions, the results firstly show that, in terms of labour demand and wages, South African manufacturing exporters employ more workers and pay higher wages than non-exporters. Heterogeneity (in terms of numbers of employees and wages) within exporters is evident and is dependent on the exporters' status (i.e. if they are an entrant, a continuous exporter or exiting the export

market) and their export destination (Southern African Customs Union (SACU), Africa or non-African markets) (see Figure 5).

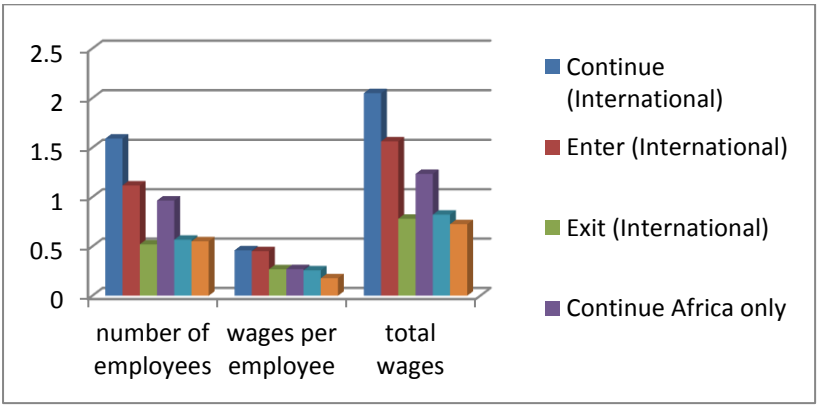

Figure 5: Labour demand and wages: Non-exporters versus exporters (within and outside Africa)

Source: Matthee et al. (2017: 8)

Note: Premium relative to non-exporters

Secondly, using employment growth over a four-year period, the results indicate that exporters stimulate employment growth among more experienced (older), better-paid workers. These results suggest that South African manufacturing exporters' behaviour is similar to that in the stylised findings in the international literature. They employ more people and pay higher wages (also taking their heterogeneous behaviour into account) (see Table 5).

Table 5: Employment growth: exporters within and outside Africa

	Δ No of employees (1)	**Δ below age of 30 (2)**	**Δ above age of 30 (3)**	**Δ below R6 500 pm (4)**	**Δ above R6 500 pm (5)**
Export dummy	0.212***	0.157***	0.251***	0.0583*	0.408***
	(0.0301)	(0.0288)	(0.0297)	(0.0322)	(0.0265)
Africa only	-0.143***	-0.116***	-0.165***	-0.0440	-0.196***
	(0.0312)	(0.0298)	(0.0308)	(0.0334)	(0.0275)
Δ lkl	0.150***	0.102***	0.143***	0.136***	0.0958***
	(0.00111)	(0.00106)	(0.00109)	(0.00119)	(0.000974)
No. dest and prod control	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes
Observations	31 961	31 961	31 961	31 961	31 961

Source: Matthee et al. (2017: 17)

Note: ***p<0.01, **p<0.05, *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively)

However, limited work has been done on how these higher wages are distributed within the exporting firm – are all employees better off, or only some of them? The third set of results makes a special contribution to the limited international literature on wage distribution and inequality within exporting firms. This is particularly important in the South African context given the high degree of wage inequality that already exists. There appears to be a wide dispersion of wages within exporters (particularly international/non-African exporters) (see Figure 6). However, almost all of that dispersion (particularly among continuing exporters) is explained by the labour productivity and size of these firms (see Figure 7). This may suggest that the inequality is driven by the distribution of firm size within exporters relative to non-exporters and much of the

observed inequality is because larger firms are more likely to be exporters, i.e. there is a large degree of dispersion of such variables for these firm groups (relative to non-exporters). The remaining inequality may therefore be associated with the process of exporting or being in the export market. These specific types of firms appear to have these types of wage distributions to start with[22].

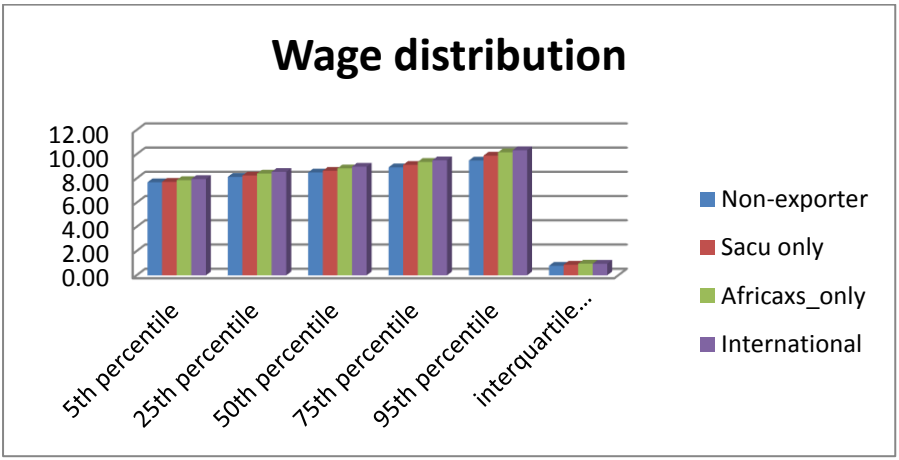

Figure 6: Wage distribution: Non-exporters versus exporters (within and outside Africa)

Source: Matthee et al. (2017: 19)

[22] This is drawn from: Matthee, M., Rankin, N.A. and Bezuidenhout, C. 2017. Labour demand and the distribution of wages in South African manufacturing exporters. UNU-WIDER Working Paper 2017/11.

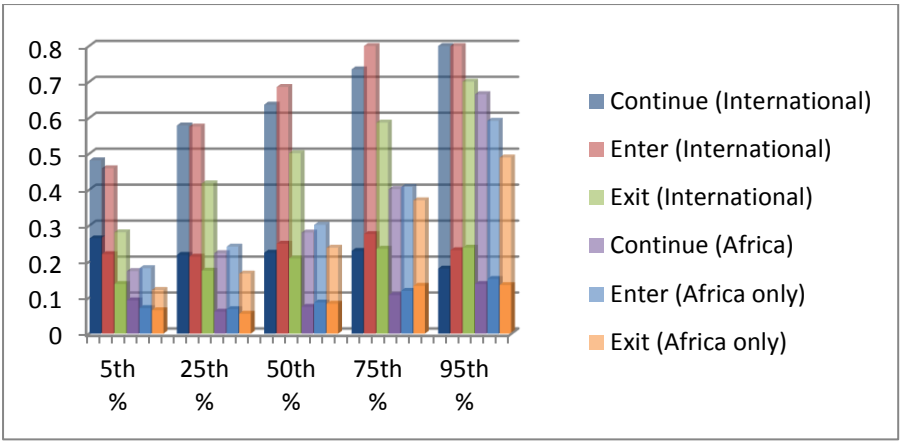

Figure 7: Wage distribution: Exporter dynamics within and outside Africa

Source: Matthee et al. (2017: 22)

Note: Premium relative to non-exporters – the lower end of each bar is the premium controlling for the firm.

Overall conclusion and policy recommendations

Arriving at an understanding of exports from South Africa requires in-depth research into the various aspects associated with the location of exporters, as well as the characteristics of exporters themselves. These research insights make it easier to formulate pointed and specific policy recommendations.

There are two broad policy recommendations from the various contributions made to the literature on sub-national exports. First, export policy should pay more attention to the spatial location of firms. Patterns of firm location differ among sectors, and over time. And in South Africa, location matters. Therefore, the costs of accessing a port (export hub)

should be a key concern of export promotion agencies. Improving the efficiency of export hubs and even creating additional export hubs (e.g. through dry ports) are therefore obvious policy recommendations.

Another, perhaps more tentative, policy implication is that regional/ spatial development in African countries may benefit from trade liberalisation if accompanied by policies that reduce the costs of accessing international markets[23]. Secondly, openness to trade is beneficial for local economic development. Export specialisation through firm clustering/agglomeration and strengthening of the human capital base of localities may be good strategies for local economic development[24].

The policy recommendations evident from the contributions to the South African literature on firm-level exports are threefold. First, productivity matters for exporting, particularly when exporting to multiple destinations outside of Africa. (It should be noted that the estimates do not distinguish the direction of causality between productivity and exporting, or whether it runs both ways.) Firms with intermediate productivity levels can export to regional markets. Therefore, an environment that enables firms to become more productive is likely to encourage more firms to

[23] This is drawn from: Naudé, W.A. & Matthee, M. 2010. The location of manufacturing exporters in Africa: Empirical evidence. African Development Review, 22(2): 276–291.

[24] This is drawn from: Naudé, W.A., Bosker, M. & Matthee, M. 2010. Export Specialization and Local Economic Growth in South Africa. The World Economy, 33(4): 552–572.

enter exporting, expand their markets and grow the range of products exported[25].

Secondly, policies need to support specific types of exporting firms (the firms that have the potential to become the larger, more productive exporters). Specific interventions might include: providing financial support and market information (using tools such as the TRADE-Decision Support Model/DSM®) so that firms are better equipped to take advantage of available export opportunities; targeting investment in sectors with strong export growth potential; adapting trade and investment policy to allow cost-effective sourcing from abroad and to stimulate knowledge/technology transfer; and encouraging more competition in the local market.

Thirdly, at a more fundamental level, if the wage gap between exporting and non-exporting companies is to be narrowed (and indeed wage inequality within firms is to be addressed), much more serious attention needs to be paid at the policy level to improving education and skills development in the country. This would involve driving high-quality teaching and learning by building capacity and accountability in schools and other education/training institutions, reducing government red tape in the education and training sectors to encourage greater participation by providers and quicker and better results; and providing greater (including financial) incentive to firms to engage in staff training and development. The education/training sector should be opened up to more foreign participation,

[25] This is drawn from: Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2018. Understanding manufactured exporters at the firm-level: New insights from using SARS administrative data. *South African Journal of Economics*, 86(S1): 96–119.

and the regional exchange of expertise and cross-recognition of qualifications to encourage a more mobile workforce in southern Africa should be promoted. Furthermore, accentuated within-firm wage inequality (as a result of trade liberalisation) might be addressed by ensuring that low-skilled individuals participate in life-long learning opportunities, thereby creating a more skilled cohort of workers and prompting a more inclusive approach to productivity enhancement.

Ultimately, through these various measures, the supply of skilled workers would increase, thereby reducing the premium paid to scarce skilled workers and spreading the workload and commercial benefits more evenly throughout society[26].

Further research

In conclusion, there is much scope for further research to be done in order to develop a better understanding of exports on a spatial and firm level. An avenue for further research would be to combine these two fields by using the geographical location indicator made available in the SARS administrative data. This would give insight into spatial dynamics at a firm-level and could contribute to spatial and industrial development in order to contribute to enhancing exports.

Ultimately, more intensive research should give greater impetus to South Africa's efforts to boost its currently

[26] Bezuidenhout, C., Matthee, M. & Rankin, N.A. 2017. Inclusive growth and wage inequality: The case of
South African manufacturing exporters. WTO Public Forum 2017, Geneva, Switzerland. 27–29 September.

troubled export sector, particularly through job creation and/or enhancement.

References

Bezuidenhout, C., Matthee, M., & Rankin, N.A 2017. Inclusive growth and wage inequality: the case of South African manufacturing exporters. WTO Public Forum 2017, Geneva, Switzerland. 27–29 September.

Cuyvers, L., Dumont, M., Viviers, W., De Pelsmacker, P., Muller, M., Jegers, M. and Saayman, A. (2008). Export intensity and the competitive intelligence of exporting companies: Evidence from South Africa. *South African Journal of Economic and Management Sciences,* 11(1): 85-97.

De Pelsmacker, P.D., Muller, M., Viviers, W., Saayman, A., Cuyvers, L. & Jegers, M. (2005). Competitive intelligence practices of South African and Belgian exporters. *Marketing intelligence and planning,* 23(6): 606-620.

Edwards, L. & Behar, A. (2005). Trade liberalisation and labour demand within South African manufacturing firms. *Journal for Studies in Economics and Econometrics,* 30(2): 1-20.

Edwards, L. (2004). A firm level analysis of trade, technology and employment in South Africa. *Journal of International Development,* 16(1): 45-61.

Edwards, L., Rankin, N. & Schöer, V. (2008). South African exporting firms: What do we know and what should we know? *Journal of Development Perspectives,* 4(1): 67-92.

Gries, T., Naudé, W.A. & Matthee, M. 2009. The Optimal Distance to Port for Exporting Firms. Journal of Regional Science, 49(3): 513–528.

Gumedem, V. & Rasmussen, V. (2002). Small manufacturing enterprises and exporting in South Africa: a preliminary assessment of key export success factors. *Journal of Small Business and Enterprise Development,* 9(2): 162-171.

Koch, S.F. & Peet, M.A. (2007). Non-tariff barriers faced by South African firms: are there any lessons? *South African Journal of Economic and Management Sciences,* 10(4): 530-543.

Matthee, M. & Krugell, W.F. 2012. Barriers to internationalisation: Firm-level evidence from South Africa. Studia UBB Oeconomica, 57(1):3–20.

Matthee, M. & Naudé, W.A. 2008. Determinants of Regional Manufactured Exports from a Developing Country. International Regional Science Review, 31(4): 343–358.

Matthee, M. & Santana Gallego, M. 2017. Identifying the Determinants of South Africa's Extensive and Intensive Trade Margins: A Gravity Model Approach. *SAJEMS*, 20(1): 703–724;

Matthee, M. 2007. Essays in domestic transport costs and export regions in South Africa. North-West University.

Matthee, M. and Krugell, W.F. 2018. *Driving more inclusive growth through targeted investment: The location attractiveness index.* Alexander Forbes Benefits Barometer. *Forthcoming.*

Matthee, M., Farole, T., Naughtin, T. & Rankin, N.A. 2016. South African exporters and the global crisis: Intensive

margin shock, extensive margin hangover. South African Journal of Economics, 84(2):183–198.

Matthee, M., Naudé, W.A. & Krugell, W.F. 2006. *Domestic transport costs and the location of export- oriented manufacturing firms in South Africa: A cubic-spline density approach*. EcoMod conference on Regional and Urban Modeling, Brussels, May.

Matthee, M., Rankin, N.A. and Bezuidenhout, C. 2017. Labour demand and the distribution of wages in South African manufacturing exporters. UNU-WIDER Working Paper 2017/11.

Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout C. 2018. Understanding manufactured exporters at the firm-level: new insights from using SARS administrative data. *South African Journal of Economics*, 86(S1): 96–119.

Matthee, M., Rankin, N.A., Naughtin, T. & Bezuidenhout, C. 2016. *The South African Manufacturing Exporter Story*. UNU-WIDER Working Paper 2016/38.

May, C. & O'Neill, C. (2008). South African exporter performance: New research into firm-specific and market characteristics. *South African Journal of Economic and Management Sciences,* 11(1): 98-111.

Naudé, W.A. & Matthee, M. 2010. The location of manufacturing exporters in Africa: Empirical evidence. African Development Review, 22(2): 276–291.

Naudé, W.A., Bosker, M. & Matthee, M. 2010. Export Specialization and Local Economic Growth in South Africa. The World Economy, 33(4): 552–572.

Naudé, W.A., Oostendorp, R. and Serumaga-Zake, P. (2005). Determinants of manufacturing exports: results from a

regional firm-level survey in South Africa. *Journal for studies in Economics and Econometrics,* 29(2): 107.

Naughtin, T. & Rankin, N. (2014). South African super-exporters are they different and what does this mean for policy? http://www.tips.org.za/files/south_africas_super_exporters_-_naughtin_and_rankin.pdf .

Rankin, N. (2001). The export behaviour of South African manufacturing firms. Paper presented at the TIPS Annual Forum, Muldersdrift, 10-12 September 2001.

Rankin, N. (2013). Exporting and export dynamics among South African firms. *SAIIA*, Occasional paper No. 149.

Soontiëns, W. (2002). Managing international trade: an analysis of South African SMEs and regional exports. *Management Decision,* 40(7): 710-719.

Van Eldik, S. & Viviers, W. (2005). The measurement of export readiness of companies in South Africa. *Southern African Business Review,* 9(2): 1-11.

Viviers, W. & Calof, J.L. (1995). Internationalization behaviour of small and medium sized South African enterprises. Journal for Small Business Management, 33(4): 71-79.

Viviers, W. & Calof, J.L. (2002). International information seeking behaviour of South African exporters. *South African Journal of Information Management*, 4(3): 10.