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WIDER Working Paper 2017/11

**Labour demand and the distribution of wages in
South African manufacturing exporters**

Marianne Matthee,¹ Neil Rankin,² and Carli Bezuidenhout¹

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Abstract: This paper contributes to the understanding of the linkages between exporting, labour demand, and wages in South Africa. We disentangle labour market differences between exporters and non-exporters and find that exporters employ more people and pay higher wages. Given these higher wages we investigate how this wage premium is distributed within the exporting firm. There appears to be a wide dispersion of wages within exporters (particularly international/non-African exporters). However, almost all of that dispersion (particularly amongst continuing exporters) is explained by the labour productivity and size of these firms. This suggests that there is thus a large degree of dispersion for these variables for these firm groups (relative to non-exporters). Wage inequality within exporters is not driven by exporting but rather by characteristics associated with the types of firms which participate in the export market.

Keywords: exporters, firm-level data, labour demand, wages, inequality, South Africa

JEL classification: F10, F14

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1 Introduction

Exporting is associated with positive economic outcomes: faster economic growth, higher productivity, and more employment (Foster 2006) and it is often advocated by policy makers as a means to generate 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) emphasized this point and indicated ‘...that increasing exports, particularly in manufacturing, may be crucial for low-skilled job creation needed to substantially reduce high overall unemployment’.

The question that arises though, is what do we know about the linkages between exporting, labour demand, and wages in South Africa? In terms of the South African literature, limited work has been done. One example is Rankin and Schöer (2013) which uses the World Bank’s Investment Climate Assessment Survey conducted in 2004 to investigate how labour demand and wages differ by export destination. More recently (although not having a specific labour focus), Matthee et al. (2016) and Edwards et al. (2016) use South African Revenue Service (SARS) administrative data and illustrate the complexity within the behaviour of South African manufacturing exporters. Exporter heterogeneity in terms of whether they are two-way traders, the number of products they export, the number of destinations exported to, and the type of destinations exported to all contribute to different levels of labour demand and wages.

Considering the heterogeneity within South African manufacturing exporters, it is useful to investigate the differences within labour demand and wages between exporters and non-exporters as well as within different types of exporters in more detail. This will broaden our understanding of the linkages that exporting has in the South African economy and to further the exporting debate, as Rankin (2013: 5) in an earlier paper states that ‘much of the South African debate on exporting, however, occurs in an environment devoid of fact, based on anecdote and prejudice’.

This paper, as part of the Labour Market Analysis project initiated by UNU-WIDER and the South African National Treasury, therefore contributes to the above by using SARS administrative data. The aim of the paper is to disentangle the differences between exporters and non-exporters in terms of labour demand and wages and to investigate how exporter heterogeneity affects these aspects. Moreover, the paper also investigates how exporters grow employment and provides a depiction of their within-firm wage distribution.

We employ three datasets made available by SARS, namely company income tax records (ITR and ITR14), employer–employee data (IRP5 or PAYE), and customs data. Our results are threefold. Firstly, in terms of labour demand and wages, it is evident that 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 it is an entrant, a continuous exporter, or exiting the export market) and their export destination (Southern African Customs Union (SACU), Africa, or non-African markets). Secondly, using employment growth over a four-year period, our results indicate that exporters grow employment of more experienced (older), better-paid workers.

These results suggest that South African manufacturing exporters’ behaviour is similar to stylized findings in the international literature. They employ more people and pay higher wages (also taking their heterogeneous behaviour into account). However, there is limited work on how these higher

wages are distributed within the exporting firm—are all employees better off, or only some of them? This is our third set of results on wage distribution and inequality.

When considering the wage distribution within an exporting firm, our results show that the export premium on wages gradually increases from the 5th to 95th percentiles (the distribution is bigger as an exporter exports to destinations that are further away—i.e. to SACU countries only, then to African countries only, and finally also exporting to non-African or international countries). This hierarchy appears to be across all parts of the distribution, is larger at the top end (see Figure 3), and clearly shows a form of wage inequality within exporting firms.

We investigate potential explanations for this apparent wage inequality and consider the effect of firm characteristics, in particular capital per worker, output per worker, and firm size (number of employees). When controlling for capital per worker and output per worker, the results show an export premium across the wage distribution. This premium increases in magnitude towards the top end of the distribution. Exporters, relative to non-exporters, pay much higher wages at the top end than at the bottom end. The premium is also larger when exporting outside of Africa and the distribution shape is relatively similar for continuing and entering exporters. However, when controlling for firm size (number of employees) as well, the wage premium does not increase in magnitude with earnings (as illustrated by Figure 6). This may suggest that the inequality is driven by the distribution of firm size within exporters compared to non-exporters and much of the observed inequality is because larger firms are more likely to be exporters. After controlling for firm characteristics wages at the 5th percentile shows that continuing exporters pay the highest wages, whereas that of the 75th percentile indicates that the highest wages are paid by entering firms (for the international market).

Finally, before controlling for firm size, there appears to be a wide dispersion of wages within exporters (particularly international/non-African exporters). However, almost all of that dispersion (particularly amongst continuing exporters) is explained by the labour productivity and size of these firms. This suggests that there is thus a large degree of dispersion for these variables for these firm groups (relative to non-exporters). Therefore, we also consider the characteristics of the destination economy (proxied by GDP) and quality of exports as explanations of the remaining, albeit lower, levels of inequality, but find little evidence that the results are driven by these. This might suggest that the remaining inequality has got something to do with the process of exporting or being in the export market. There appears to be this specific type of firms who have these type of wage distributions to start off with.

The rest of the paper is outlined as follows: section 2 contains a broad discussion of the literature, section 3 places the literature in a South African context, section 4 provides the empirical analysis, and section 5 concludes.

2 Broad literature review

Since the seminal work on heterogeneous firms by Melitz (2003), a rich literature of empirical research has emerged on the differences between exporters and non-exporters. One robust finding is that exporters are more productive relative to non-exporters in developed and developing countries alike. Some examples of these studies include Delgado et al. (2002), Wagner (2002), Girma et al. (2004), Mengistae and Pattillo (2004), Hallward-Driemeier et al. (2005), Van Biesebroeck (2005), Fariñas and Martín-Marcos (2007), De Loecker (2007), Bernard et al. (2007), Serti and Tomasi (2008), and Sinani and Hobdari (2010). Exporters are not only more productive

than their non-exporting counterparts, but there are two further prominent differences: they are larger (the employment premium) and pay better (the wage and skills premium).

2.1 Employment premium

The employment premium indicates that exporters are, on average, larger than non-exporting firms in terms of number of employees (Brambilla et al. 2015). Country-specific examples showing this employment premium include Bernard and Wagner (1997) for German plants, Ah and Hwang (1995) for Taiwanese firms, Blalock and Gertler (2004) for Indonesian firms, and Van Biesebroeck (2005) for African firms. To illustrate the magnitude, Bernard and Jensen (1995) show that US manufacturing exporters have 94 per cent higher employment (after controlling for plant size, industry, and location) than their domestic counterparts. Using similar controls, Isgut (2001) finds that the average number of manufacturing employees is 123 per cent higher in Colombian exporting firms. Van Biesebroeck (2005), while controlling for size, notes that Sub-Saharan African (SSA) manufacturing exporters employed 213 per cent more workers than non-exporters (which is about three times more). It is also interesting to highlight the magnitude in differences in employment numbers in absolute terms. In a study on African (i.e. Cameroon, Kenya, Ghana, and Zimbabwe) firms, Bigsten et al. (2004) observe that an average manufacturing exporter employs 342 workers, as opposed to only 51 by non-exporters. Similarly, for a set of five countries within SSA, Rankin et al. (2006) show the average number of employees by exporters as 273 and that of non-exporters 67.

Apart from employing more workers, Bernard and Jensen (1999) show that exporters also experience higher growth rates in their plant sizes. The authors note that this, together with the fact that exporters' plant survival rates are higher than non-exporters', translates into more sustainable jobs in an economy. Biscourp and Kramaz's (2007) work on French manufacturing firms echo this finding. Moreover, they emphasize that it is the large firms that contribute more to employment creation. The dynamic relationship between exporting and employment can also be observed in the African context, where Rankin (2005) finds that exporters in Ghana, Kenya, and Tanzania are able to grow employment by 56 per cent within eight years of exporting. When firms exhibit high export (and import) intensity levels, as in the Turkish manufacturing case, they also experience higher employment growth rates (Lo Turco and Maggioni 2013).

While exporters employ more workers, and have faster employment growth rates, their labour demand is also influenced by the level of skills that the workers possess, thus they demand a certain type of worker (Brambilla et al. 2015). Typically, the skills levels are classified into two groups of jobs, namely blue collar jobs (low-skilled) and white collar jobs (highly skilled jobs) (Klein et al. 2013). Distinguishing between white and blue collar jobs can be made in terms of education level (as in the case of Klein et al. (2013) using a German database, Brambilla et al. (2010) using a database on Latin American and Caribbean firms, and Rankin and Schöer (2013) using a South African database) or in terms of worker status, in particular production and non-production workers (for example Bernard and Jensen (1997) using US data).

Exporters already display superior characteristics in terms of export premia years before they start exporting. This, according to Isgut (2001: 79), suggests a barrier to entry which might relate to that and an 'accumulation of a critical mass of managerial and technical skills' is necessary for exporting. Therefore, due to the complex nature of exporting—in, for example, quality upgrading that may be necessary, the need for more operational services, or the use of technology which can be required—exporters hire more white collar (or skilled) workers (Bas 2012; Brambilla et al. 2015). However, Fanjnzylber and Fernandes (2009: 564) argue that some countries 'play to their strengths'. China serves as an example of this: they have an abundance of low-skilled labour and specialize in low-skilled, labour-intensive manufacturing of export goods.

Export expansion therefore, has a certain effect on the employment of certain types of workers, or the so-called skill upgrading process. Lo Turco and Maggioni (2013) find that Turkish manufacturing exporters increasing their export intensity acquire more highly skilled workers. In the case of French manufacturing exporters, Biscourp and Kramaz (2007) find that continuous exporters are more likely to destroy unskilled production jobs, thus creating more skilled production jobs. As exports therefore expands, a higher demand for skilled workers may come from changes in technology used by exporters, or due to an increase in demand of goods that require skills in their production (Bernard and Jensen 1997). For example, Bernard and Jensen (1997) find that in-between plant skill upgrading took place in US manufacturing firms as a result of changes in export sales. Within-plant upgrading of skills, however, took place as a result of technology upgrading. Bustos (2011) confirm the effect of export expansion on the demand for skilled labour when she considers the effect of trade liberalization in Argentina. The demand for skilled labour within industries also stemmed from the adoption of new technology by firms. Moreover, new entrants to the export market had a much faster growth rate of skilled labour than non-exporting firms. The Italian case, as explained by Manasse et al. (2004), is interesting in that although they show that technological upgrading account for within-firm changes for skilled workers, it is changes in export demand that has led to a relative reduction in the demand for skills. Exporters, they find, have a large degree of influence on the type of workers employed in the Italian labour market, both through demand and technological changes.

2.2 Wage (and skills) premium

As indicated, exporters are different to non-exporters in that they employ more workers (usually skilled) than non-exporters (Serti et al. 2010). This is also directly related to the wage premium, i.e. that exporters pay higher wages than non-exporters (Bernard and Jensen 1997; Verhoogen 2008). Again, empirical evidence supporting this is substantial. Schank et al. (2007) provide a synopsis of these type of studies where different types of wage variables (e.g. average wage, average labour costs, and wage per employee) are used to estimate the wage premium. Once more, the differences between exporters and non-exporters are significant. For example, Bernard et al. (2007) find that exporters in the US pay 6 per cent higher wages when controlling for industry and size. In developing country contexts, Brambilla et al. (2015) find the wage differential between Chilean exporters and non-exporters to be 31 per cent. Also, Isgut (2001) establishes that the wages paid (and number of workers employed) by Colombian exporters increase faster for exporters (from when they start exporting) than for non-exporters over time.

Brambilla et al. (2015) discuss possible mechanisms through which exporters pay higher wages than non-exporters. Firstly, as described above, exporters employ more skilled workers (due to the quality requirements and skills necessary for the complex processes involved in exporting as well as the management thereof). In order to retain their services, exporters pay skilled workers a premium. Brambilla et al. (2015) assert that exporters are able to do so because they are paid a premium when they sell their products to foreign markets. This relates to a second mechanism, which is profit-sharing or productivity rent sharing (Fafchamps 2007). This means that the more profitable firms share their profits with their workers and thus they pay higher wages (Brambilla et al. 2010; Amiti and Davis 2011; Baumgarten 2013). A third mechanism that also relates to the first, involves technology upgrades. In an exporting firm, use of technology requires a certain level of skilled workers. Firms have been shown to upgrade their technology, or invest in R&D when tariffs decrease (trade liberalization) (as shown by, for example, Bustos (2011) for Argentinian firms and Aw et al. (2011) for Taiwanese firms). These investments have productivity gains which over time allows more firms to self-select into exporting, resulting in more productivity gains (Aw et al. 2011).

With the differences in wages between exporters and non-exporters (see for example Baumgarten (2013)), Klein et al. (2013) assert that because of expanding global trade, wage inequality between these types of firms become more pronounced. Indeed, Schank et al. (2007) show with German employer–employee data that both blue and white collar workers in exporting plants earn more than employees in similar non-exporting plants. This is, however, only true if the exporting plant exports more than 60 per cent of its total sales. Verhoogen (2008), in his study on the impact of the peso crisis in 1994 in Mexico, finds that due to the devaluation, a within-industry wage dispersion resulted due to more productive firms being able to increase exports, quality, and wages while the less-productive firms were not able to do so. In a more detailed analyses on German manufacturing plant data that matches employer–employee data, Klein et al. (2013) compare wages of different skills groups utilized by exporters. They argue that wage inequality does not only exist between skilled and unskilled workers, but is further exacerbated by wage disparities within different levels of skills. The authors find a considerable export wage dispersion between highly skilled workers (receiving a ‘wage premium’) and low-skilled workers (receiving a ‘wage discount’). Moreover, exporting contributes to wage inequality for as much as 30 per cent within and between the skills group.

Finally, it is worth noting that exporting does not necessarily lead to higher wages (or more employees) (Brambilla et al. 2015). Although the literature on this is still limited, there are two noteworthy papers on the topic. Frias et al. (2012) consider the within-firm distribution of wages in exporters compared to non-exporters. Their findings show that in Mexico there is no evidence of an effect of exporting on wages at the bottom of the distribution (the 10th percentile) or at the top (in the top quartile) but in between the wage effects of exporting increase with earnings. Similarly, Bernini et al. (2015) consider within-firm wage distribution of French exporting firms relative to non-exporters. Their findings, however, show that there is a wage premium throughout the distribution and that the magnitude of the distribution increases towards the top end of the wage distribution.

2.3 Exporter heterogeneity

Wages and employment are also affected by heterogeneity that occurs within exporters. For example, the geographical location of exporters matter. In China, Fu and Wu (2013) find that exporters who are situated along the coast pay higher wages than those situated inland. The level of productivity within an exporter also matter. Bas (2012) studies the plant-level data of the Chilean manufacturing sector. She finds that within the productivity distribution of exporters, those who are in the upper range, will be more likely to use ‘high’ technology and are more skill-intensive than those exporters on the lower range.

Products and destinations also influence an exporters’ wages and number of employees. This is illustrated by Bernard et al. (2009) using US manufacturing data. They compare exporters who export numerous products and who export to numerous destinations. They conclude that so-called multi-product and multi-destination exporters employ more workers and pay higher wages than single-product and single-destination exporters. Moreover, the higher the number of products exported and destinations exported to, the higher these levels. In a more recent US manufacturing study, Kruz and Senses (2016: 160) consider the employment volatility of exporting firms (among others). Their findings indicate that higher levels of volatility occur when exporters export ‘a higher share of exports, fewer number of export destinations and, export destinations that are further away, and with lower average incomes’.

Product quality and the destination country characteristics also influence wages and type of employee employed. For example, Verhoogen (2008) finds that Mexican exporters, when exporting to high-income countries, require skilled workers for the necessary quality upgrades that

have to be made. In a similar vein, Brambilla et al. (2012), in their study of Argentinian manufacturing firms, determine that there is indeed a type of ‘skills-bias’ in export destinations. Firms exporting to high-income countries require workers with higher levels of skills, thus higher wages are paid than when exporting to middle-income countries or selling in the domestic market. Brambilla and Porto (2016) further confirms this finding in a broader dataset on 82 countries, namely high-income countries demand higher quality goods (and firms exporting to these destinations subsequently pay higher wages).

Apart from the type of country, the destination’s location also plays a role in wages. For example, Alcalá and Hernández (2010) use Spanish data and while controlling for worker and firm characteristics, find that wage premia increases the further the destination country is located (‘remoteness’ increases). Serti et al. (2010) find similar results for Italian firms in their analysis of firms trading with ‘distant’ markets. Milner and Tandrayen (2007) consider African countries and provide contradictory results. In their findings, African exporters exporting to the rest of Africa experience a wage premium whereas exporting to non-African countries have a negative influence. The authors argue that the African market is less competitive than the international market and therefore does not impose ‘a disciplining effect on wage costs’. Moreover, regional trade agreements and natural barriers also contribute to this effect.

3 South African literature review

The literature on South African firm-level characteristics studies have been growing steadily over the last few years. Until recently, studies were limited to the use of sample survey data (see, for example, Naudé (2000); Rankin (2001, 2013); Edwards et al. (2008); Matthee and Krugell (2012); Naughtin and Rankin (2014)). New studies, however, are emerging using administrative data on the population of firms in South Africa. The studies on international trade by Edwards et al. (2016) and Matthee et al. (2016) provide insight into the dynamics of exporter (and importer) behaviour over time. Stylized facts on manufacturing firms that have emerged from this body of work is that exporters are rare, are larger (in terms of number of employees), pay better, and are more productive than non-exporters (Matthee et al. 2016).

Literature related to this paper is, however, still limited. Apart from the stylized facts mentioned above, Matthee et al. (2016) also investigate exporter heterogeneity in terms of wages and number of employees. Similarly to international evidence, they find that multi-destination and multi-product exporters have more employees and pay higher wages than their single-destination and single-product counterparts. The authors also find that the destination of exports matter. Firms exporting to non-African countries have higher wages and a higher number of employees than those only trading within the African market, which is in contrast to the findings of Milner and Tandrayen (2007). Rankin and Schöer (2013) also confirm these results in an earlier paper where they consider the link between export destination and wages in the South African context. More specifically, their results indicate that workers of exporters exporting to non-African (SADC) markets have a wage premium of 17 per cent. Workers from firms that export to the SADC region earn even less than those who only serve the domestic market. Furthermore, Rankin and Schöer (2013) examine the relationship between exporting, destinations, and skills. A premium is placed on skills when exporting to international markets but not on exporting to the SADC region. Their findings are supported by international evidence that exporters’ whose destination countries are high-income countries have higher skilled workers (related to product quality) and therefore pay higher wages.

4 Empirical analysis

4.1 Data

We use a panel dataset created through combining three different administrative datasets collected by the South African Revenue Service (SARS). These are the Company Income Tax (CIT) return data, the Pay as You Earn (or Personal Income Tax employee data (PAYE, or IRP5), and customs transactions data.

The customs data reports the export transactions of South African firms from 2010 to 2014 on a monthly basis. From this database we used the following variables: trader id, tariff code (HS6-digit level), country of destination (market), country of origin (SA), customs value of the transaction, and the statistical value. Two adjustments were made. First, duplicate transactions (see Table A1 in the Appendix) were removed. Second, only exporters trading more than R10 000 per year were included in the dataset (this, however, still covers 99 per cent of export data). After the adjustments, the transaction data was collapsed on a firm level, in order to be able to work with total trade per firm.

The IRP5 dataset contains IRP5 certificates completed by employers on behalf of their employees. This dataset is on a job level and provides information on the period an individual worked in a specific job (in days), their income, age, and the sector in which they work ((ISIC 4 classification). The raw IRP5 data was adjusted to remove duplicate certificates, multiple job spells, and invalid periods worked (see Table A2 in the Appendix). To create a measure of firm size we weight the number of employees by the duration of their job. This is done by calculating the length of employment (in days) for each worker within a year, totalling within the firm and divided by 365. The aim is to essentially generate the stock of worker inputs into production per firm for the whole year. Weighted wages per person was calculated by once again calculating the total period worked by employee and dividing their income (for that year by the period worked). Weighted wages per firm was calculated by adding the weighted wages per person of all employees. Therefore, the individual IRP5 dataset was also collapsed on a firm level.

From the CIT data, variables describing firm characteristics were obtained from the balance sheet and income statement items. An obstacle with the CIT data is that the form which firms use to complete their income tax changed in May of 2013. The IT14 was replaced with the ITR14 (for differences and how this was adjusted see Table A3 in the Appendix). The variables from the CIT data used include property plant and equipment (to measure capital intensity), employee expenses including directors (to measure labour cost), and gross income (as a measure of sales).

In order to create a panel containing all three datasets, we firstly used a conjunction table (provided by SARS) to link the various datasets through different identifiers. Secondly, we aligned the dates of the datasets, as all three datasets work on different reporting years/periods (see Table A4 in the Appendix). Finally, we used the 4-digit ISIC classification used by SARS to select the firms in the manufacturing sector (ISIC 4 classification: codes 1010–1033), as this study only focuses on the manufacturing sector. The final panel dates from 2010 to 2014 tax year (February 2009–March 2014) (for an illustration of the number of firms per sector in the dataset, see Table A5 in the appendix).

4.2 Descriptive statistics on manufactured exporters

4.2.1 *Exporter dynamics*

We first provide a broad overview of the data on the manufacturing sector to illustrate the number of exporters and non-exporters and the destination of exports. Table 1 shows that our data includes (for example in 2011) 32 429 manufacturing firms from which 21 per cent (6 868) are exporters. In terms of the destination of exports, 1 726 firms export only to the SACU,¹ 2 284 export only to African countries (excluding SACU exporters), and 2 858 export to international markets (export to both countries outside and inside Africa).

Table 1: 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
Exporter	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 manufacturing firms	29 916	32 429	32 013	35 373	30 249

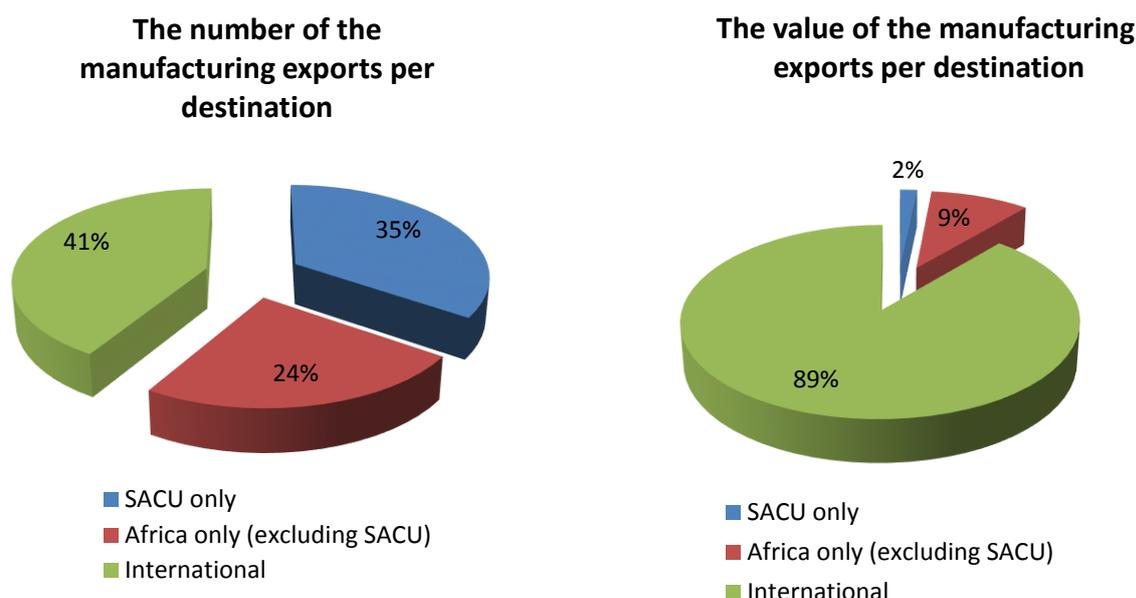
Source: Authors' own calculations.

Figure 1 provides an overview of the number of exporters and the value of exports (in percentage terms) to each of these different destinations.

The left side of Figure 1 corresponds with Table 1, where exports to SACU only (35 per cent) and Africa only (24 per cent) make up a more than 59 per cent of South Africa's manufacturing exporting firms, but they only export 10 per cent of the value. Around 41 per cent of exporting firms export to the international market and these firms contribute to 89 per cent of total export value.

¹ SACU is a customs union between Botswana, Lesotho, Namibia, Swaziland, and South Africa

Figure 1: The average number and value of the manufacturing exports per destinations (2010–14)



Source: Authors' own calculations.

As we know from the literature that there is a lot of churning in terms of exporter dynamics. Table 2 provides an overview of the number of firms entering, continuing, or exiting the export market. The figures are also decomposed in terms of destination, indicating where entering, exiting, or continuing exports occur. Entrants are defined as firms that did not export in $t-1$, but export in t , continuing firms are firms that export both in year $t-1$ and t , and exiting firms are firms that exported in $t-1$, but not in t . The percentage of exporting firms in each dynamic category is indicated in brackets.

Around 70 per cent of exporting firms continue to export year on year and the remainder (30 per cent) are new or entering firms. The number of firms that exit the export market is quite small (around 8 per cent). There is more churning in the African market than in the international market. The total number of firms declined in 2014; this is due to data availability as some firms have not submitted the CIT forms for 2014.²

² As the total number of firms declined in 2014 (due to data availability) we ran all regressions with and without including 2014 (see Appendix Tables A7–A10).

Table 2: Exporter dynamics per destination

	2010	2011	2012	2013	2014
Non-exporter	24 959	25 561	24 868	27 256	22 992
Exporter	4 957	6 868	7 145	8 117	7 257
	-	(100%)	(100%)	(100%)	(100%)
Continuous	-	3 956	5 396	5 234	5 663
		(58%)	(76%)	(64%)	(78%)
<i>Africa only</i>	-	2 338	3 010	2 845	3 143
		(34%)	(42%)	(35%)	(43%)
<i>International</i>	-	1 618	2 386	2 389	2 520
		(24%)	(33%)	(29%)	(35%)
Enter	-	2 912	1 749	2 883	1 594
		(42%)	(24%)	(36%)	(22%)
<i>Africa only</i>	-	1 672	1 214	1 901	1 083
		(24%)	(17%)	(23%)	(15%)
<i>International</i>	-	1 240	535	982	511
		(18%)	(7%)	(12%)	(7%)
Exit ³	-	457	570	519	663
		(7%)	(8%)	(7%)	(9%)
<i>Africa only</i>	-	300	401	374	456
		(4%)	(6%)	(5%)	(6%)
<i>International</i>	-	157	169	145	207
		(2%)	(2%)	(2%)	(3%)
Total	29 916	32 429	32 013	35 373	30 249

Source: Authors' own calculations.

4.2.2 Firm characteristics

Secondly, we provide descriptive statistics on exporters, employees, and wages. Table 3 provides an overview of firms exporting to these different destinations and their labour demand (number of employees) and wages (per firm and per person).

Table 3: Number of employees, wages, and wages per person (average for 2010–14)⁴

	Number of employees	Wages per person	Firm wages
Non-export			
<i>Mean</i>	19	201 976	2 116 382
<i>Median</i>	7	96 468	667 673
Exporters			
<i>Mean</i>	82	262 130	16 260 000
<i>Median</i>	20	144 725	2 771 373
- International			
<i>Mean</i>	137	324 834	31 340 000
<i>Median</i>	28	164 132	4 294 574
- Africa only			
<i>Mean</i>	47	233 918	6 660 803
<i>Median</i>	18	149 071	2 588 920

Source: Authors' own calculations.

³ The percentages for exits are based on the number of exporters in the previous period.

⁴ The number of employees and wage figures are all weighted.

Exporting firms employ, on average, four times (82 versus 19) more workers than non-exporters. By distinguishing between export destinations (Africa versus international) it is clear that firms serving the international market employs the most workers and pay the highest wages (per person and per firm). The median figures give a picture of a ‘typical’ exporter in each category. Here, the international exporters are still the largest (in terms of number of employees and wages), followed by African exporters and then non-exporters.

Table 4 considers the firm characteristics in terms of capital per worker and output per worker for exporter dynamics within and outside of Africa. Relative to non-exporters and African exporters, continuing and entering international exporters are larger (number of employees, capital per worker) and more productive (output per worker).

Table 4: Exporter dynamics within and outside Africa

	Number of employees	Capital per worker	Output per worker
Non-exporters	7	22 677	545 235
International exporters			
<i>Continue</i>	32	55 492	1 185 082
<i>Enter</i>	22	48 397	1 050 613
<i>Exit</i>	11	38 249	750 550
African exporters			
<i>Continue</i>	19	32 426	962 327
<i>Enter</i>	14	32 072	920 840
<i>Exit</i>	12	27 257	758 971

Note: These are the median figures of these six groups for 2010–14.

Source: Authors’ own calculations.

4.3 Regression results

The regression results are provided in three sections. The first focuses on labour demand and wages, the second on the type of jobs that are created by exports and the third on wage inequality.

4.3.1 Labour demand and wages

Impact of export destination on labour demand and wages

From the above tables, there is a clear difference in labour demand and wages between exporters and non-exporters as well as within exporters (illustrating exporter heterogeneity). This difference may be due to exporters just being larger than non-exporters or serving different industries, therefore it needs to be tested in terms of simple regressions using control variables.

Following the methodology used by Bernard and Jensen (1995), export premia and exporter heterogeneity for firm characteristic (number of employees and wages) are estimated by using regressions of the general form

$$\ln(X)_i = \alpha + \beta_1 \text{Exporter}_i + \beta_2 \text{No. dest}_i + \beta_3 \text{No. prod}_i + \beta_4 \text{kl}_i + \beta_5 \text{Industry}_i + \beta_6 \text{year}_i + u_i \quad (1)$$

Where:

X_i – firm characteristics (number of employees, wages per person, wages)

$Exporter_i$ – dummy variable of export status (exporter=1 and non-exporter=0)

$No. dest_i$ – Number of destinations exported to by firm (this is 0 if the firm does not export)

$No. prod_i$ – Number of products exported by firm

lkl_i – ln capital per worker

$Industry_i$ – control dummy (4-digit ISIC classification) to account for heterogeneity

$year_i$ – control dummy for the years 2010 to 2014⁵

β_i – export premia

μ_{it} – Error term

Table 5 illustrates the differences between exporters and non-exporters and how exporters themselves differ (in terms of destination served, number of destinations served, and number of products exported).

Table 5: Labour demand and wage: exporters within and outside Africa and SACU

	No of employee s (1)	Wages per person (2)	Total wages (3)	No of employee s (4)	Wages per person (5)	Total wages (6)
Export dummy	1.434***	0.410***	0.685***	0.737***	0.231***	0.383***
	-0.0127	-0.00897	-0.00905	-0.0161	-0.0116	-0.0112
Africa only (excluding SACU)	-0.518***	-0.0864***	-0.185***	-0.135***	0.00663	-0.0207*
	-0.0174	-0.0124	-0.0119	-0.0183	-0.0132	-0.0126
SACU only	-0.727***	-0.281***	-0.420***	-0.174***	-0.141***	-0.176***
	-0.0195	-0.0138	-0.0133	-0.0209	-0.0151	-0.0144
Number of destinations				0.0677***	0.0154***	0.0297***
				-0.00135	-0.000975	-0.000942
Number of products				0.00435***	0.00172***	0.00263**
				-0.000177	-0.000127	-0.000122
lkl	-0.0123***	0.0583***	0.0560***	-0.0166***	0.0572***	0.0538***
	-0.00135	-0.000959	-0.000923	-0.00132	-0.000957	-0.000916
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm size control			Yes			Yes
Observations	130 654	128 189	128 189	130 654	128 189	128 189

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

Source: Authors' own calculations.

Table 5 confirms the results found in the literature in that exporters are larger (in terms of number of employees) and pays more than non-exporting firms. Furthermore, destination matters, as an exporter exporting only to African countries are smaller than international exporters (who export both to countries outside and inside Africa). Comparing columns 5 and 2, African exporters seem to pay higher wage per person than their international counterparts (column 5), but this is due to

⁵As the total number of firms declined in 2014 (due to data availability) we ran all regressions with and without including 2014 (see Appendix Tables A7–A10)

the fact that we controlled for number of products and destinations (as African firms are exporting fewer products to fewer destinations). If the product and destination control is removed (column 2), the international exporters pay higher wages than both African and SACU exporters. When differentiating between firms exporting within Africa, there is a small, but significant⁶ difference between firms exporting only to SACU versus firms exporting to the rest of Africa (for example Nigeria). Therefore, there is a hierarchy in both size (number of employees) and wages for international countries, African countries, and SACU countries as an export destination.

Not only does the destination matter, but also the number of destinations served. In terms of number of employees and wages, the number of destinations served and number of products exported matters. As Table 5 reports, there is a higher marginal effect to adding one destination (6.77 per cent more in terms of number of employees), than adding one product (0.43 per cent more in terms of number of employees). Table 6 delves further into the relationship between the number of products and destinations of an exporting firm and their employment and wages.

Table 6: Labour demand and wage: number of products and destinations

	No of employees (1)	Wages per person (2)	Total wages (3) ⁷
Export dummy	-0.219*** (0.0379)	0.0911*** (0.0274)	0.0454* (0.0262)
Africa only (excluding SACU)	-0.0585*** (0.0190)	0.00398 (0.0137)	-0.00798 (0.0131)
SACU only	0.0873*** (0.0239)	-0.119*** (0.0173)	-0.100*** (0.0165)
Number of destinations	-0.0129*** (0.00384)	0.00812*** (0.00278)	0.00577** (0.00266)
Number of destinations ^{^2}	0.0793*** (0.00723)	0.0413*** (0.00522)	0.0584*** (0.00499)
Number of products	0.549*** (0.0272)	0.0348* (0.0197)	0.149*** (0.0188)
Number of products ^{^2}	-0.000126 (0.000412)	-0.000466 (0.000297)	-0.000507* (0.000284)
lkl	-0.0163*** (0.00132)	0.0573*** (0.000957)	0.0539*** (0.000915)
Year control	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes
Firm size control			Yes
Observations	130 654	128 189	128 189

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

Source: Authors' own calculations.

From Table 6 it is clear that the number of products and destinations have a significant influence on how many workers an exporting firm employs (column 1) and how much they are paid (columns 2 and 3). The number of destinations served is responsible for a lot of the effect (is highly correlated) on employment levels and wage. Wage is positively and significantly related to the number of destinations at an increasing rate (there is no turning point in this relationship). With employment, the relationship with the number of destinations is also increasing at an increasing rate (results switch between a quadratic and a linear function).

⁶ See t-test in Table A6 in the Appendix.

⁷ Total wages refer to total labour cost.

Even though the effect of number of products on employment and wages is smaller than of number of destinations, there is an exponential relationship. The relationship appears to be quadratic relationship, but the turning point is close to zero (very small), which would suggest that there is an exponential relationship.

Impact of exporter dynamics on employment and wages

Table 7 illustrates the dynamics of exporting firms. Our results corroborate with the literature in that firms that enter and exit is smaller (in terms of number of employees) and pay less (per person column 2 and 5, as well as overall columns 3 and 6) than the continuing firms. Interestingly, when controlling for number of products and number of destinations (column 2), the wage per person is 2.5 per cent higher for entering firms than continuing firms. Without the control (column 5) the continuing firms pay 2.8 per cent higher wage per person. From this we can derive that when firms enter the exporting market they are exporting fewer products (on average 16 versus 25) to fewer destinations (on average 4 versus 6) than continuing firms. Therefore, as firms continue exporting, they grow in terms of number of products exported and destinations served.

Table 7: Labour demand and wage: exporter dynamics (enter, exit, and continue)

	No of employees (1)	Wages per person (2)	Total wages (3)	No of employees (4)	Wages per person (5)	Total wages (6)
Continue	1.239*** -0.011	0.353*** -0.0078	0.564*** -0.00799	0.735*** -0.0127	0.198*** -0.00916	0.340*** -0.00895
Enter	0.759*** -0.0157	0.325*** -0.0111	0.453*** -0.0109	0.428*** -0.0159	0.223*** -0.0115	0.306*** -0.0111
Exit	0.539*** -0.0301	0.204*** -0.0212	0.295*** -0.0206	0.419*** -0.0294	0.168*** -0.0212	0.249*** -0.0204
lkl	-0.00651*** -0.00147	0.0574*** -0.00104	0.0564*** -0.00101	-0.0133*** -0.00143	0.0554*** -0.00104	0.0528*** -0.001
No. dest & prod control	No	No	No	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm size control			Yes			Yes
Observations	108 546	106 680	106 680	108 546	106 680	106 680

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

Source: Authors' own calculations.

We also consider the location of the export destination when a firm enters, exits, or continues exporting. Table 8 and Figure 2 report on the exporter dynamics per export destination.

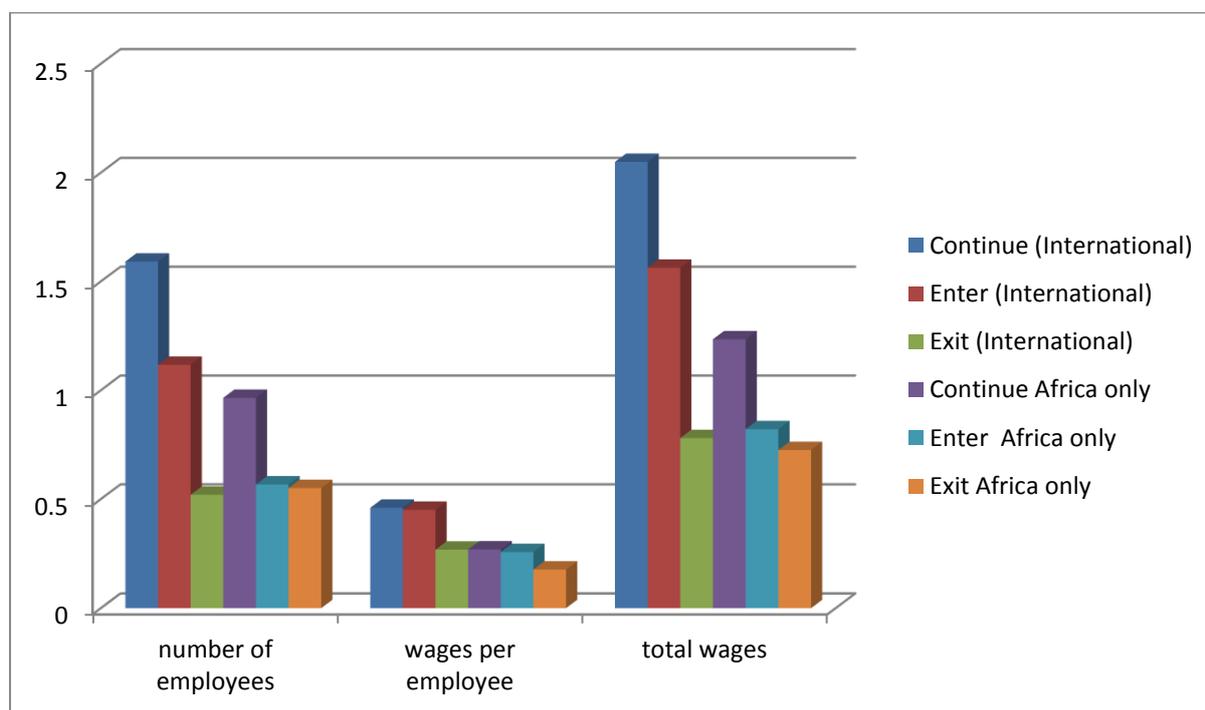
Table 8: Labour demand and wage: non-exporters versus exporters (within and outside Africa)

	No of employees (1)	Wages per person (2)	Total wages (3)	No of employees (4)	Wages per person (5)	Total wages (6)
Continue international	1.591***	0.460***	2.049***	0.850***	0.239***	1.080***
	-0.0155	-0.011	-0.0167	-0.0193	-0.0139	-0.0206
Continue Africa only	0.965***	0.269***	1.234***	0.694***	0.184***	0.875***
	-0.0139	-0.00989	-0.015	-0.0143	-0.0103	-0.0152
Enter international	1.117***	0.451***	1.563***	0.563***	0.286***	0.840***
	-0.0252	-0.0179	-0.0271	-0.0263	-0.019	-0.028
Enter Africa only	0.567***	0.257***	0.821***	0.383***	0.200***	0.579***
	-0.019	-0.0135	-0.0205	-0.0189	-0.0136	-0.0201
Exit international	0.520***	0.268***	0.780***	0.384***	0.229***	0.604***
	-0.0536	-0.0381	-0.0577	-0.0526	-0.038	-0.0561
Exit Africa only	0.551***	0.177***	0.725***	0.446***	0.146***	0.587***
	-0.0358	-0.0253	-0.0384	-0.0351	-0.0253	-0.0373
lkl	-0.00912***	0.0566***	0.0478***	-0.0136***	0.0553***	0.0419***
	-0.00146	-0.00104	-0.00158	-0.00143	-0.00104	-0.00154
No. dest &prod control	No	No	No	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm size control			Yes			Yes
Observations	108 546	106 680	106 680	108 546	106 680	106 680

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

Source: Authors' own calculations.

Figure 2: Labour demand and wages: non-exporters versus exporters (within and outside Africa)



Note: Premium relative to non-exporters.

Source: Authors' own calculations.

From Table 8 and Figure 2,⁸ it is clear that when considering the difference between domestic-oriented firms and those who enter, exit, or continue in the export market, the destination exported to when they enter, exit, or continue does matter. The results, linked with destinations, show differences between exporters exporting to the international market and those exporting only to the African market. In terms of size (number of employees), firms continuing to export in the international market are the largest, followed by firms entering the international market, firms continuing in the African market, entering Africa, exiting Africa, and exiting the international market. Therefore, overall the *Africa only* type firms size, average wage, and total labour cost is on average lower than *international* type firms (for ‘continue’ compare blue and purple, ‘enter’ maroon and light blue, and ‘exit’ green and orange). This agrees with the earlier results of Table 5 international exporters are larger and pay more (alluding to the hierarchy that exist when export destinations are further away).

There does seem to be some sort of threshold, that firms on average need to be larger (relative to non-exporters) to enter the export market but that entrants may grow over time (since they are smaller than continuous exporters). An alternative explanation is that in the past firms were larger when they entered exporting but recent entrants are, for some reason, smaller. Disentangling these explanations requires following these firms over time. Wages do not seem to grow with exporting. Firms which enter exporting are already higher paying and have average wages which are similar to firms already exporting (this is true for African as well as international firms). This suggests that firms that enter are relatively large (compared to a non-exporter) when they enter the export market and, if the difference in size between entrants and continuous exporters can be interpreted as employment growth, then, because average wages are the same, entrants are adding similar workers to what they had working there previously (the distribution of wages does not change, it is just becoming bigger).

4.3.2 *Employment growth by exporters*

Exports can grow either through the intensive or the extensive margin. In this section, we consider the types of employment (for young/old or low/high paid) that are added or lost by exporters who enter the export market (extensive margin) or who continues exporting (intensive margin). In order to measure the employment growth, we followed Biscoup and Kramarz (2007: 34) by using a simple first-difference regression:

$$\Delta E_i = \alpha + \beta_1 \text{Exporter}_i + \beta_2 \Delta \text{lkl}_i + \beta_3 \text{No. dest}_i + \beta_4 \text{No. prod}_i + \beta_5 \text{Industry}_i + u_i \quad (2)$$

Where:

ΔE_i – Growth in employment⁹ (number of employees, above and below age 30, above and below R6 500pm)

⁸ Figure 2 is a representation of the interaction result of Table 8 (based on log estimations), where a general picture of the average of each type of firm is displayed. We did not control for number of products and destinations in this graph.

⁹ The growth is calculated by taking the logged number of employees in 2013 minus the logged number of employees in 2010. The same equation is used to calculate growth in the number of employees above and below the age of 30 as well as the number of employees earning above and below R6 500 pm.

$Exporter_i$ – dummy variable of export status (Africa, international, continue,¹⁰ enter,¹¹ exit¹²)

$\Delta \ln k$ – growth in capital

$No. dest_i$ – control dummy (number of destinations exported to by firm)

$No. prod_i$ – control dummy (number of products exported by firm)

$Industry_i$ – control dummy (4-digit ISIC classification)

μ_{it} – Error term

$_i$ – the sample period of 2010 to 2013.¹³

Tables 9 to 10 present the growth in overall employment, but also decompose the growth into different types of jobs (employment growth of workers above and below 30 and workers earning above or below R6 500 per month).

Table 9: 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*** (0.0301)	0.157*** (0.0288)	0.251*** (0.0297)	0.0583* (0.0322)	0.408*** (0.0265)
Africa only	-0.143*** (0.0312)	-0.116*** (0.0298)	-0.165*** (0.0308)	-0.0440 (0.0334)	-0.196*** (0.0275)
$\Delta \ln k$	0.150*** (0.00111)	0.102*** (0.00106)	0.143*** (0.00109)	0.136*** (0.00119)	0.0958*** (0.000974)
No. dest & 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

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

Source: Authors' own calculations.

Table 9 provides an overall picture of the employment growth of exporters and Africa only exporters relative to non-exporters. From column 1 we can see that exporters are growing employment faster than Africa only and non-exporters. For exporters, the growth in employment of people above 30 years of age is almost 10 percentage points higher than below 30 (columns 2 and 3). This suggests that exporters grow employment by employing more experienced workers. Africa only exporters also show higher growth (at a slower rate) in employment of people above 30 (8.6 per cent), than below 30 (4.1 per cent). The growth in employment of people earning more than R6 500 per month is 35 percentage points higher than people earning below R6 500 per month, which confirms that when exporters grow employment they employ more skilled/higher qualified workers. For African only exporters, column 5 also shows growth in employment of people earning above R6 500, but the growth in employment of people earning below R6 500 per month is and not significantly more than non-exporters.

¹⁰ Continuing firms are firms that export in 2010, 2011,2012, and 2013

¹¹ Entrants are firms that did not export in 2010, but export in 2013.

¹² Exit are firms that did export in 2010, but not in 2013

¹³ In order to calculate employment growth, we use a longer period (2010–13), to get rid of short-term fluctuations.

Table 10 illustrates the types of jobs (young/old or low/high paid) are added or lost by exporters who enter the export market (extensive margin) or who continues exporting (intensive margin).

Table 10: Employment growth: exporter dynamics

	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)
Continue	-0.0531** (0.0292)	-0.0123** (0.0282)	-0.0051*** (0.0287)	-0.131*** (0.0316)	0.185*** (0.0255)
Exit	-0.385*** (0.0210)	-0.208** (0.0203)	-0.335*** (0.0207)	-0.425*** (0.0228)	-0.12205*** (0.0184)
Enter	0.579*** (0.0431)	0.365*** (0.0416)	0.575*** (0.0424)	0.334*** (0.0467)	0.739*** (0.0377)
Δ lkl	0.148*** (0.00112)	0.102*** (0.00109)	0.141*** (0.00111)	0.135*** (0.00122)	0.094*** (0.000983)
No. dest & 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

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

Source: Authors' own calculations.

Firms that entered the export market (extensive margin) between 2010 and 2013 show the largest growth in total employment (57 per cent). These firms have higher growth in the employment of more experienced (column 2 versus 3) and higher skilled (column 4 versus column 5) workers. When a firm exits the export market, their employment growth is negative relative to non-exporting firms. Interestingly, the decrease in employment of workers earning below R6 500 pm is the largest (42.5 per cent). The continuing firms (intensive margin) seem to grow their employment a bit slower (5 per cent) than non-exporting firms, but this might be influenced by the destination served. Table 11 therefore combines exporter dynamics with destination served.

Table 11: Employment growth: exporter dynamics 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)
Continue (International)	0.0397* (0.0348)	0.0592* (0.0333)	0.110*** (0.0343)	-0.0856** (0.0373)	0.304*** (0.0306)
Continue (Africa only)	-0.146*** (0.0264)	-0.0838*** (0.0252)	-0.120*** (0.0260)	-0.176*** (0.0283)	0.0649*** (0.0232)
Exit (International)	-0.287*** (0.103)	-0.0825 (0.0989)	-0.234** (0.102)	-0.384*** (0.111)	-0.0221 (0.0910)
Exit (Africa only)	-0.483*** (0.0667)	-0.333*** (0.0639)	-0.436*** (0.0658)	-0.466*** (0.0715)	-0.222*** (0.0588)
Enter (International)	0.426*** (0.0425)	0.276*** (0.0407)	0.416*** (0.0420)	0.224*** (0.0456)	0.547*** (0.0374)
Enter (Africa only)	0.305*** (0.0298)	0.177*** (0.0285)	0.318*** (0.0294)	0.220*** (0.0320)	0.384*** (0.0263)
Δ lkl	0.147*** (0.00112)	0.100*** (0.00107)	0.140*** (0.00110)	0.133*** (0.00120)	0.0939*** (0.000985)
No. dest & 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

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

Source: Authors' own calculations.

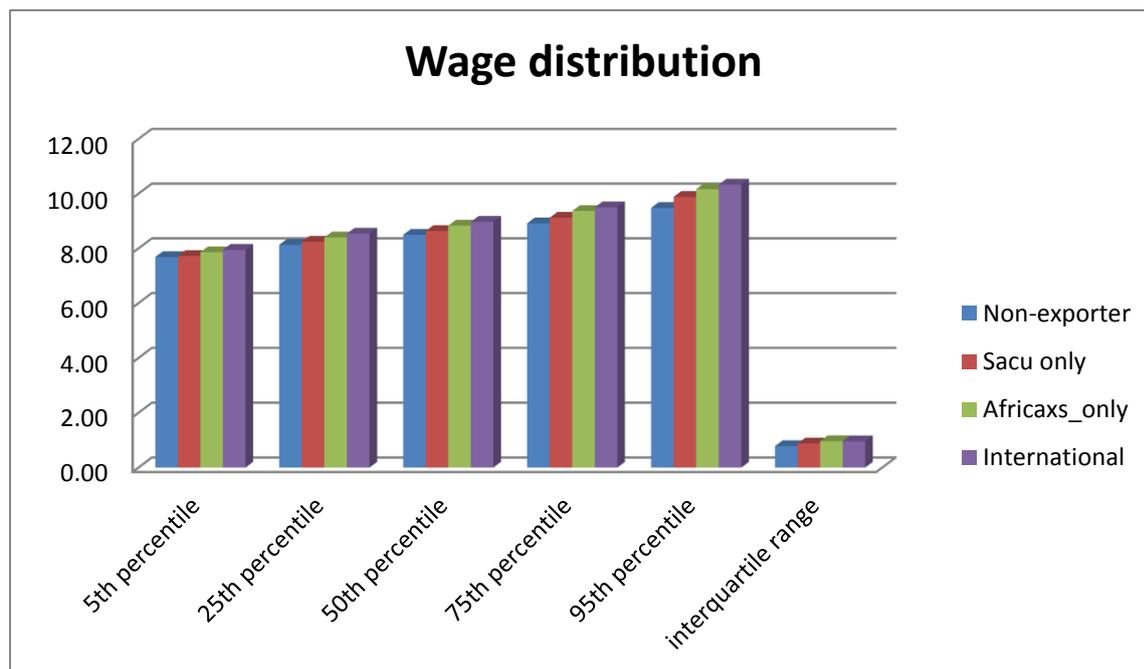
When distinguishing between the destination (Africa/international) of the intensive margin (continuing firms), international firms have a 4 per cent higher growth than non-exporting firms. They grow more experienced (above 30 years of age), higher skilled/qualified (above R6 500) jobs. Firms continuing to export to the African market shows negative employment growth relative to non-exporters, as do the exiting firms. It is the firms entering the international market that have the largest growth in employment, followed by firms entering the African only market.

4.3.3 Wage distribution and inequality

Distribution of wages within an exporting firm

The results above suggest that South African manufacturing exporters' behaviour is similar to stylized findings in the international literature (see section 4.3.1). They employ more people and pay higher wages (also taking their heterogeneous behaviour into account). However, there is limited work on how these higher wages are distributed within the exporting firm—are all employees better off, or only some of them? When considering wage distribution within an exporting firm, it is useful to first provide a visual presentation of the distributions (see Figure 3).¹⁴ From Figure 3, it is clear that the 5th to 95th percentiles increase as an exporter exports further away (to SACU countries only, then to African countries only, and finally also exporting to international countries). The hierarchy appears to be across all parts of the distribution and is larger at the top end.

Figure 3: Wage distribution: non-exporters versus exporters (within and outside Africa)



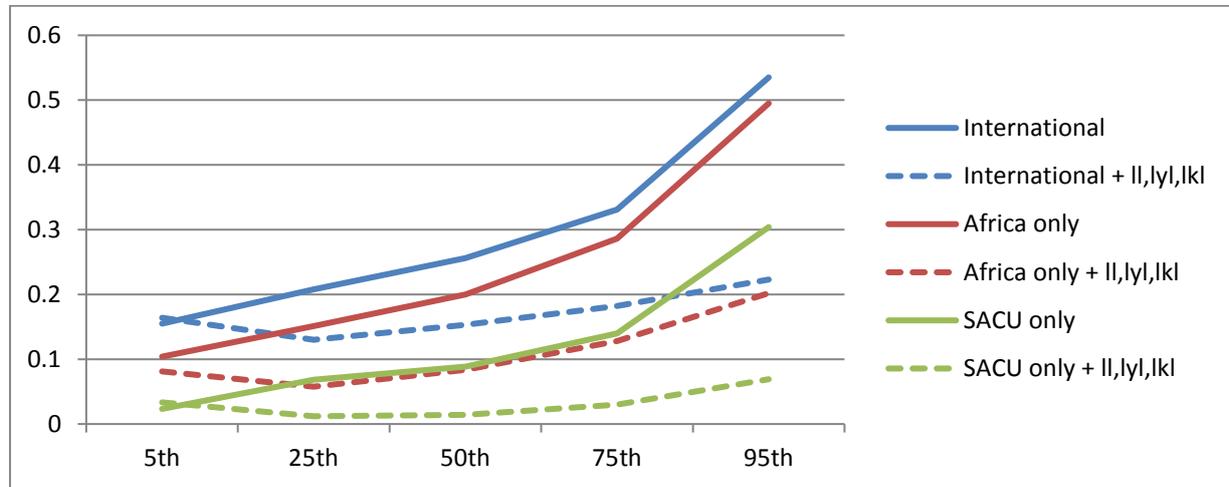
Source: Authors' own calculations.

In Figure 4 the blue, red, and green lines illustrates the within-firm wage distribution of international, African, and SACU exporters relative to non-exporters (controlling for capital per worker); here we clearly see the export premium. This premium increases in magnitude towards the 75th and 95th percentiles (indicating inequality). When adding firm characteristics (firm size

¹⁴The wage distribution is average figures for descriptive purposes.

and output per worker) as a control, the distribution changes shape (see the dotted lines). Essentially this shows that inequality is mostly due to firm characteristics (different types of firms export internationally compared to regionally).

Figure 4: Wage distribution: exporters within and outside Africa and SACU, with different controls



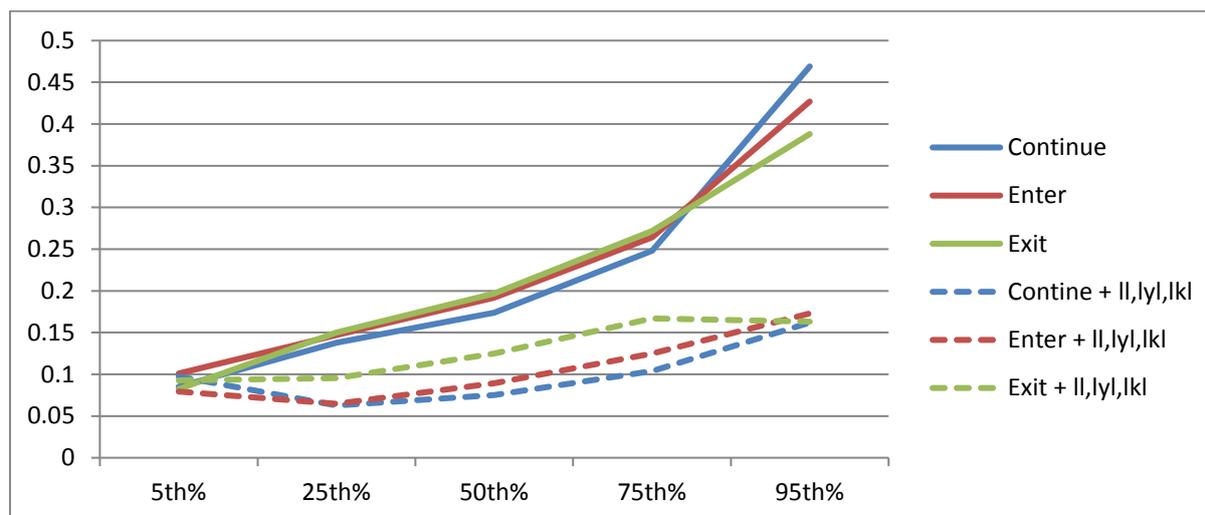
Note: Premium relative to non-exporters.

Source: Authors' own calculations (see Appendix Tables A11 and A12).

Comparing firms that enter into exporting (red solid line) with the firms that continue to export (blue solid line), provides an indication of what happens to an exporting firm's wage premium over time. Figure 5 and Table A13 show that when a firm enters, the bottom 5th percentile on average earns 10.1 per cent more than those in non-exporting firms and for the continuous firms it is 8.52 per cent more. But, when a firm enters the export market, the top 95th percentile on average earns 42.7 per cent more than those in non-exporting firms and for the continuous firms it is 46.9 per cent more. Therefore, relative to entering firms, continuing firms pay more as one moves up the distribution. There is however, not a big difference between entering and continuing firms. Overall, Figure 5 and Table A13 suggest that actually prior to or within the first year of entry, we already see these higher wages and higher inequality right through the distribution. Potentially over time, as the entering firms turn into continuing firms, they pay a bit more (the distribution is moving downwards).

Furthermore, from Figure 5 we can see that relative to non-exporters the wage premium of firms in the export market increases in magnitude towards the top end of the distribution. But, when controlling for firm characteristics (number of employees, output per worker, and capital per worker) the distribution changes shape and the large wage inequality at the 75th and 95th percentiles drops (see dotted lines). Therefore inequality is mostly explained by firm characteristics.

Figure 5: Wage distribution: exporter dynamics (enter, exit, and continue), with different controls



Note: Premium relative to non-exporters.

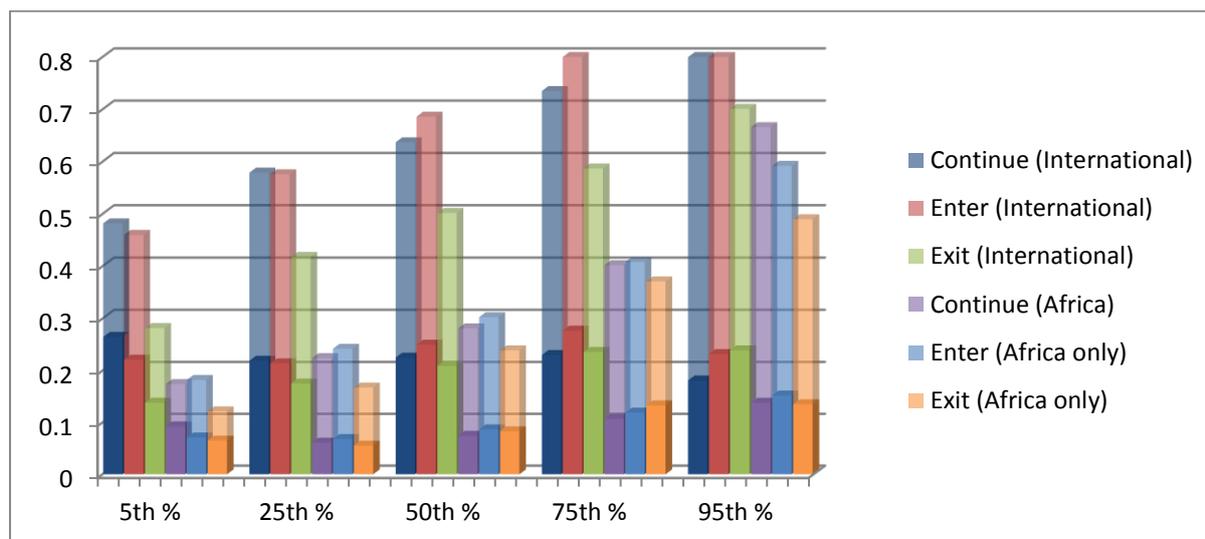
Source: Authors' own calculations (see Appendix Tables A13 and A14).

Figure 6 combines the exporter dynamics with the destination served. It is clear that before controlling for firm characteristics (number of employees, output per worker, and capital per worker) as illustrated by each bar (lower and upper end), one can see that there is an export premium across the wage distribution. Relative to non-exporters, higher wages are paid throughout the distribution. This premium increases in magnitude towards the top end of the distribution. Exporters, relative to non-exporters, pay much higher wages at the top end than at the bottom end. The premium is larger when exporting outside of Africa and the distribution shape is relatively similar for continuing and entering exporters.

However, when controlling for firm size (number of employees, output per worker, and capital per worker) the wage distribution does not increase in magnitude (the lower end of each bar). It is interesting to note that on the 5th percentile, continuing firms pay the highest wages, whereas in the 75th percentile the highest wages are paid by entering firms for the international market.

In Figure 6, the lower end of each bar is the premium controlling for firm characteristics and the upper end is the additional premium without the controls. Overall, this indicates that inequality is driven by the distribution of firm size within exporters compared to non-exporters (see Table 4) and much of the observed inequality is because larger firms are more likely to be exporters.

Figure 6: Wage distribution: exporter dynamics within and outside Africa

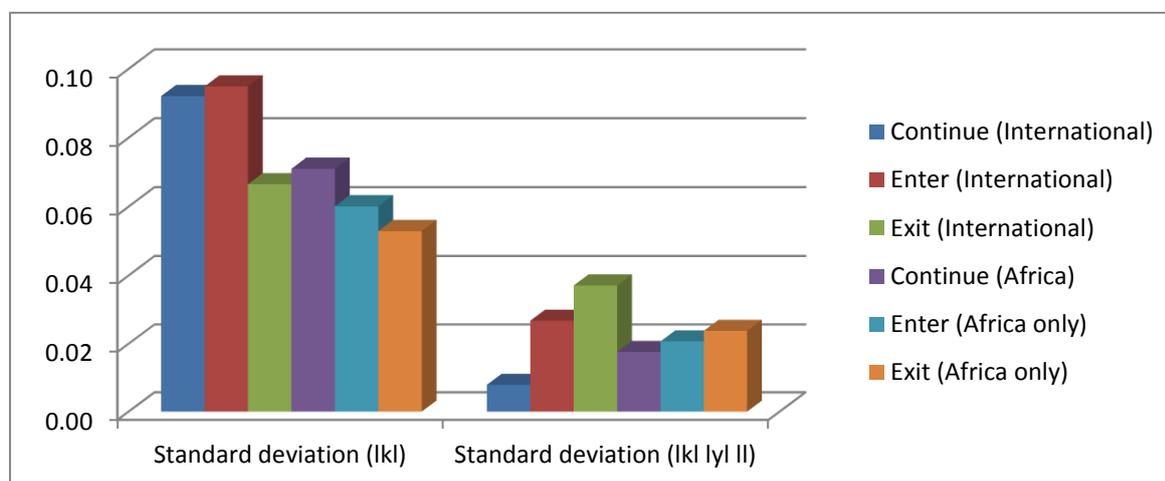


Note: Premium relative to non-exporters—the lower end of each bar is the premium controlling for firm.

Source: Authors' own calculations (see Appendix Tables A15 and A16).

In addition to Figure 6, Figure 7 shows the standard deviation of each of these groups before and after controlling for firm characteristics. On the left-hand side we see that there is a wide dispersion of wages within exporters (particularly international exporters). However, almost all that dispersion (particularly amongst continuing exporters) is explained by the labour productivity and size of these firms (on the right-hand side). This suggests that there is thus a large degree of dispersion for these variables for these firm groups (relative to non-exporters).

Figure 7: Wage inequality in terms of exporter status



Note: Premium relative to non-exporters.

Source: Authors' own calculations (see Appendix Tables A15 and A16).

Wage inequality

Even though the standard deviation (Figure 7) is substantially smaller after controlling for firm size, capital per worker, and output per worker, there is still a difference in the within-firm wage distribution of exporters relative to non-exporters, as well as within exporters. The literature suggests that it may be due to heterogeneous exporter behaviour—i.e. the type of product (high-

quality versus low-quality products) exported, or by the type of destination (high or low income per capita) exported to (see section 2). We investigate this further by taking the customs transactions for all the firms in the panel—the panel is limited to exporters (since there is no data on the amount transacted for non-exporting firms). By using the customs data from 2010 to 2014 on transaction level (per exporter, HS6-product, GDP per capita of the country of destination, price),¹⁵ we are able to see if the type of product or destination influences inequality. We estimated regressions of the general form:

$$\ln(X)_i = \alpha + \beta_1 \text{Exporter}_i + \beta_2 \text{No. dest}_i + \beta_3 \text{No. prod}_i + \beta_4 \text{Industry}_i + \beta_5 \text{firm}_i + \beta_6 \text{year}_i + \beta_7 \text{control}_i + u_i \quad (3)$$

Where:

X_i – within-firm wage distribution (5th percentile, 25th percentile, 75th percentile, 95th percentile)

Exporter_i – dummy variable of export status (SACU, Africa, international)

No. dest_i – control dummy (number of destinations exported to by firm)

No. prod_i – control dummy (number of products exported by firm)

Industry_i – control dummy (4-digit ISIC classification) to account for heterogeneity

firm_i – control for firm characteristics (ln capital per worker, ln number of employees, ln output per worker)

year_i – control dummy for the years 2010 to 2014

control_i – control for HS6 product price/GDP per capita/adding product fixed effects

β_i – export premia

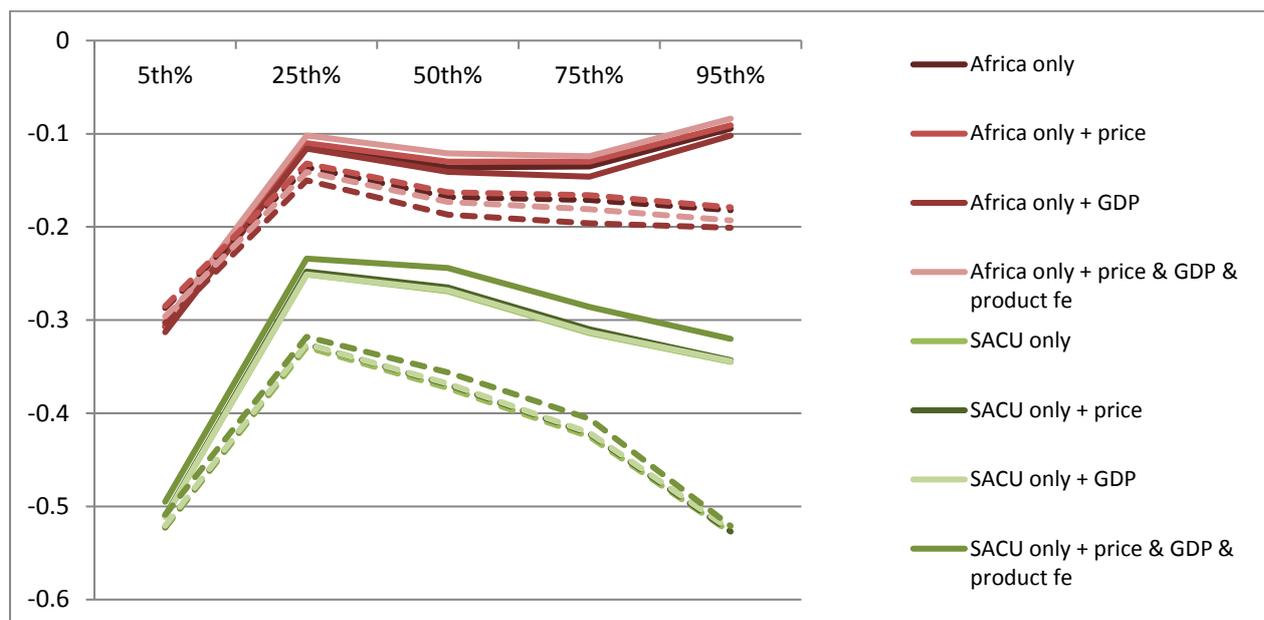
μ_{it} – Error term.

We first ran a regression without any controls (to see the wage distribution/inequality), then added price control, GDP control, and product fixed effects one by one (see Tables A17–A37 in the Appendix) to see whether these controls change the distribution. Subsequent to the findings in Figures 4–6, we also ran all regressions with and without firm controls.

Figure 6 shows that inequality is higher among international exporters than in African exporters, the same is true for entering versus continuing exporters. Therefore the following figures represent the distributions within and outside Africa (Figure 8), for exporter dynamics (Figure 9), and a combination of destinations and dynamics (Figure 10).

¹⁵ The price was calculated as follows: $\text{HS6_price} = \text{customs value per transaction} / \text{statistical quantity}$. Next we took the difference between the HS6_price and the average price of all products with the same HS6 code. Therefore the price is a measure of the deviation from the average price per product.

Figure 8: Wage distribution (inequality): within and outside Africa



Note: Relative to international firms—the dotted lines are the premium controlling for firm characteristics; the solid lines are without controlling.

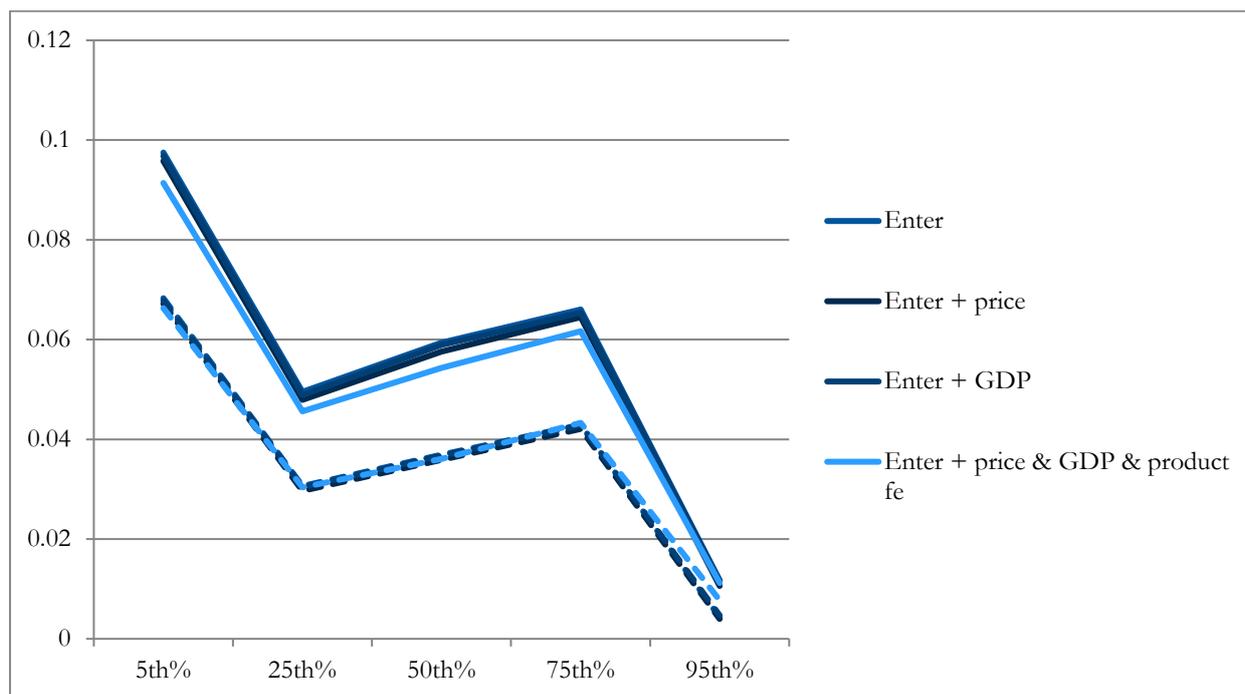
Source: Authors' own calculations.

Figure 8 shows the wage distribution within a firm for African (green) and SACU (red) exporters relative to international exporters. It tells us that international firms have higher premia. In terms of the wage distribution (inequality), each line represents a type of regression. Firstly, the Africa only and SACU only lines are regression 1 without controls. When adding price (Africa only + price; SACU only + price), the distribution does not change shape, so it does not seem to be a product quality effect. If we add GDP, it remains more or less the same, therefore it does not seem to be due to destination country GDP. Finally, when adding product fixed effects on an HS6 level, the distribution stays similar. Thus, the inequality is not due to a specific product type, or within-product type. Therefore the inequality has little to do with either the destination country or the quality of the product.

The dotted lines in Figure 8 illustrate the repeated process (adding price, GDP, and product fixed effects), but adding here firm characteristics (number of employees, output per worker). From the graph we can see a difference in the shape of the distribution. The difference between international and African exporters is smaller from the 25th and especially at the 95th percentiles (as explained in Figure 4), but the type of product or destination does not change the shape of the distribution.

Figure 9 shows the wage distribution of entering firms relative to continuing firms; there are no exiting firms as we are working on custom transaction level. Firstly, we confirm what is illustrated in Figure 5: there is a premium with entrants to start off with or as they enter (between 2010 and 2013). As in Figure 8, the distribution does not change with a price control, a GDP control, and/or product fixed effects, confirming that within entrants, inequality is not caused by the type of product or destination. When controlling for firm characteristics (dotted lines) the distribution shifts down, indicating a smaller difference in wages (as seen in Figure 5), but the type of product or destination still does not change the shape of the distribution.

Figure 9: Wage distribution (inequality): exporter dynamics



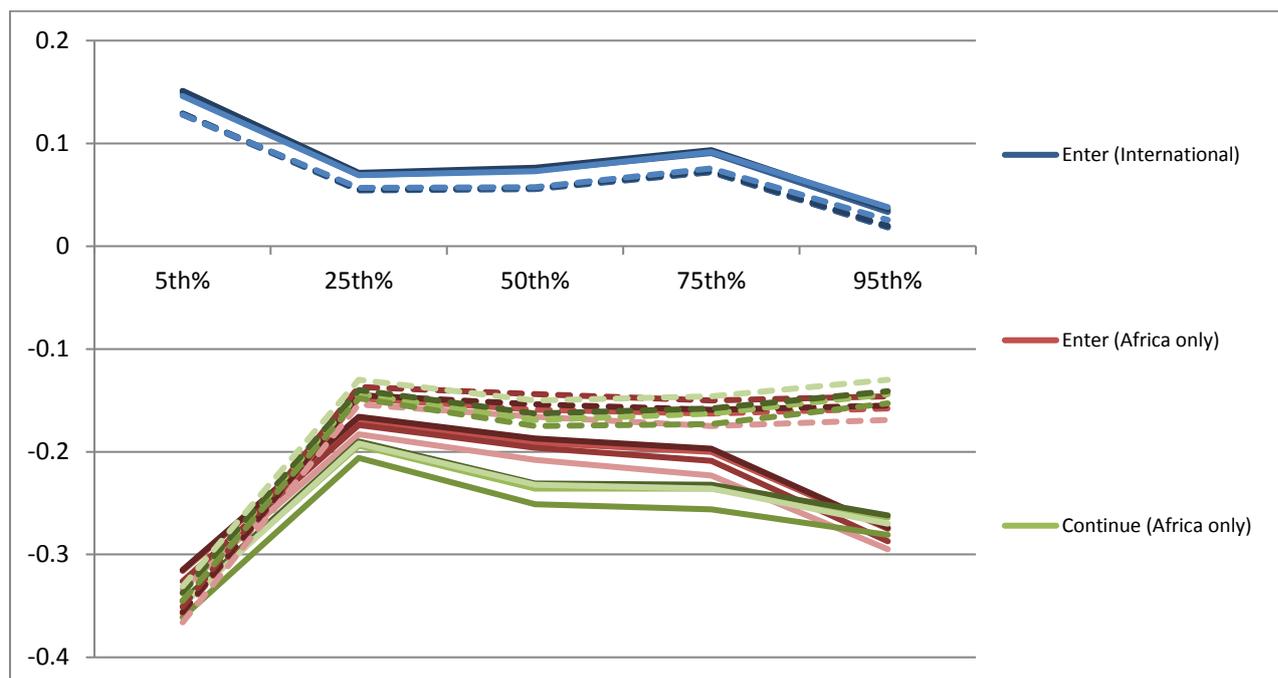
Note: Relative to continuing firms—the dotted lines are the premium controlling for firm characteristics; the solid lines are without controlling.

Source: Authors' own calculations.

From Figure 10, it is clear that relative to firms continuing in the international market, continuing or entering firms in Africa do not have a premium, but entrants in the international do (see blue lines). Comparing entering (Africa only) with continuing (Africa only) exporters, they have a slight premium as well.

From this picture it seems that as firms enter the export market, they have more inequality than continuous firms and this can be for two reasons. The first is that the firms entering now are a different type of firm, or with time, the inequality becomes less. If we think the continuous firms are the same types of firm (on average an entrant is going to show the same trajectory and end up as a continuous firm), it suggests that the inequality is higher to start off with and exporting reduces it (as seen in Figure 7). But this is a large assumption to make. With further investigation one could track an entering firm and see how inequality changes as it continues.

Figure 10: Wage distribution (inequality): exporter dynamics within and outside Africa



Note: Relative to continue international firms—the dotted lines are the premium controlling for firm characteristics; the solid lines are without controlling.

Source: Authors' own calculations.

Comparing the dotted lines (the premium controlling for firm characteristics) with the solid lines (the premium without controlling for firm characteristics), the premium of entering firms (blue) relative to continuing firms (base) in the international market got smaller, but did not change shape. Looking at the red (enter Africa only) and green (continue Africa only) solid lines vs the dotted lines, we can see that relative to the base (continue international firms) the difference in the wage distribution gets smaller and changes shape when controlling for firm characteristics (especially at the top end of the distribution), showing less inequality (this corroborates Figure 6).

Furthermore, the inequality of entering firms (4 solid blue lines) relative to continuing firms did not change with a product control, a GDP control, or product fixed effects. Therefore, the remaining inequality seems to have little to do with the destination country or the quality of the product. It might suggest that it has something to do with the process of exporting or being in the export market. There appear to be these specific types of firms who have these types of wage distributions to start off with.

5 Conclusion

South Africa is a country that is plagued by economic malaise—most notably high unemployment and inequality. Exports have been identified as a key driver of growth that would lead to employment creation. However, the South African literature on the linkages between exporting, labour demand, and wages is limited. In this paper, our aim was two-fold. First, to investigate manufacturing exporters using newly available administrative data, and second, to broaden the literature to understand more about labour demand and exporter premium present in exporting. We present our results in three broad categories: labour and demand, employment growth, and wage distribution and inequality.

From the results, it is evident that South African manufacturing exporters employ more workers and pay higher wages than non-exporters—they create more and better jobs. Within exporters, labour demand and wages are affected by exporter status as well as destination served, number of products exported, and number of destinations exported to. Moreover, exporters tend to grow employment of more experienced (older), better-paid workers.

Considering that higher wages are paid by exporting firms, the question that has not been investigated is how these higher wages paid are distributed within the exporting firm. Our paper makes a particular contribution in our analysis of the within-firm distribution of wages in exporters compared to non-exporters. This is particularly important in the South African context given the high degree of wage inequality which already exists. There appears to be a wide dispersion of wages within exporters (particularly international/non-African exporters). However, almost all of that dispersion (particularly amongst continuing exporters) is explained by the labour productivity and size of these firms. This suggests that there is thus a large degree of dispersion for these variables for these firm groups (relative to non-exporters).

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Appendix

Data issues:

Table A1: Customs data issues

Duplicate transactions	There we duplicated transactions (exact same trader id, tariff code (HS6-digit level), country of destination (market), country of origin (SA), customs value of the transaction, statistical value and month. We kept the first 20 and dropped the rest (3% of data). The reason for these duplicates seems to be that as the products sit at the border the paperwork needs to be resubmitted due to an exchange rate or date change.
Country of destination and country of origin	Dropped the data where: Country of destination states 'Origin Of The Goods Is Unknown' Country of origin is not 'South Africa' (kept 93% of data).
Merge	When merging the customs data onto the conjunction table 87% of the firms matched.

Source: Authors' illustration.

Table A2: IRP5 data issues

Keep individual	In the IRP5 we only focused on workers/employees, therefore we kept the ones where their nature of person is 'Individual'.
Periods worked	Some of the data on the 'period employed from' and 'period employed to' has 'invalid periods' reported, this was corrected: 1. For instance 1910 instead of 2010 2. End date 27 February instead of 28 February 3. End date before start date 4. End date in the month before year end and then start again a few days after the start of the year.
Multiple job spells	There are individuals with 'multiple job spells', therefore 1 individual working multiple jobs at the same firm. When adding the number of days of each job spell 3% adds to more than 365 days (which is impossible). Because we work on firm-level, we took the average of the worker's multiple job spells at the firm.
Duplicate certificates	Each job is assigned a certificate number, we dropped the duplicate certificates, to avoid double counting.
Age 15–64	There were individuals found to be 90 years of age, therefore, we kept to the South African labour force definition and kept workers of the age 15–64.
Income	There are various ways to calculate income, we used the Gross remuneration (by adding 3 variables named: 'GROSSNTAXABLEINCOMEAMNT', 'GROSSRETFUNDINCOMEAMNT' and 'GROSSNRETFUNDINCOMEAMNT').

Source: Authors' illustration.

Table A3: CIT data issues

IT and ITR14 forms	In May of 2013 the IT form changed to the ITR14. The major difference between these two forms is the level of detail. The ITR14 form distinguishes between the size of a firm and goes into more detail for medium to large firms. The problem is that with the transition from the IT14 to the ITR14, some firms filled in one or the other and therefore we needed to collapse these forms to have a panel from 2010–2014.
Employee expenses including directors	Because of the differences in the IT and ITR14 forms, we used 'employee expenses including directors' as an indicator of wage per firm.

Source: Authors' illustration.

Aligning periods of the three datasets

All three datasets work on different reporting years. The CIT data is per firm's financial year. Each firm has its own financial year end (89 per cent of firms' financial years end in February). The IRP5 is reported by South African tax year (for example February 2010 to March 2011) and the customs transactions data is based on a calendar year (January to December). In order to align the dates, we took the customs data (reported on a monthly basis) and matched it to the IRP5 tax year. For the CIT data, we kept the firms whose financial years end in February (see Table A4 below), and for the remaining 11 per cent, we moved the firms whose financial years end after September (3.28 per cent) to the next tax year.

Table A4: Financial year end of firms in our panel

	Number of firms	% of firms
January	3 941	0.27%
February	1 281 245	88.96%
March	34 944	2.43%
April	10 447	0.73%
May	6 219	0.43%
June	38 391	2.67%
July	6 148	0.43%
August	11 903	0.83%
September	9 764	0.68%
October	4 397	0.31%
November	3 829	0.27%
December	29 096	2.02%

Source: Authors' own calculations.

Table A5: Classification of industries by ISIC 4 code (number of firms per sector)

Classification	2010	2011	2012	2013	2014
Agriculture, forestry and fishing	4 539	5 399	5 443	5 927	5 246
Mining and quarrying	621	745	808	1 342	1 198
Manufacturing	29 916	32 429	32 013	35 373	30 249
Electricity, gas, steam and aircon supply	722	816	843	1 012	878
Water supply, sewerage, waste and remediation activities	131	157	165	203	176
Construction	10 958	11 295	10 821	11 204	9 653
Wholesale and retail	29 719	31 471	29 273	25 735	21 948
Transport and storage	5 878	6 372	6 333	6 783	5 839
Accommodation and food service	5 484	5 857	5 717	5 862	5 023
Information and communication	1 558	1 707	1 705	1 956	1 733
Financial and insurance activities	23 038	25 857	23 776	16 102	13 794
Real estate activities	5 275	5 694	5 561	5 707	5 320
Professional, scientific and technical activities	7 111	7 642	7 717	8 448	7 606
Admin and support services	2 544	2 697	2 548	2 460	2 113
Education	1 765	2 155	2 253	2 438	2 116
Human health and social work	2 882	3 160	3 215	3 757	3 409
Arts, entertainment and recreation	1 358	1 482	1 457	1 563	1 360
Other service act	2 179	2 331	2 381	2 789	2 411
Activities of extra-territorial organization	6 512	7 112	7 257	8 801	7 581
TOTAL	142 190	154 378	149 286	147 462	127 653

Source: Authors' own calculations.

Table A6: T-test

Two-sample t-test with unequal variances						
Group	Obs	Mean	Std Err	Std Dev	[95% Conf Interval]	
Africa xs	11 554	11.89434	0.008739	0.939327	11.87721	11.91147
SACU only	8 076	11.65059	0.010879	0.977644	11.62927	11.67192
combined	19 630	11.79406	0.006872	0.962754	11.78059	11.80753
diff		0.243748	0.013954		0.216397	0.2711
diff = mean(1) - mean(2)				t = 17.4679		
Ho: diff = 0		Satterthwaite's degrees of freedom = 16930.9				
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 1.0000		Pr(T > t) = 0.0000		Pr(T > t) = 0.0000		

Source: Authors' own calculations.

From the t-test, if we compare the means, there is a 0.2437484 difference in the mean (with a standard deviation of 0.216397) income per person of firms exporting to African market only and the SACU only firms. The standard error of the mean is 0.013954. The t-value is 17.4679, with 16930.9 degrees of freedom. The statistical significance (Ha: diff != 0) is less than 0.05, therefore there is a statistically significant difference between the wage per person of an Africa only and SACU only firm.

Table A7: Labour demand and wage: exporters within and outside Africa and SACU (see Table 5)

	No of employees (1)	Wages per person (2)	Total wages (3)	No of employees (4)	Wages per person (5)	Total wages (6)
Export dummy	1.498*** (0.0143)	0.328*** (0.0100)	0.626*** (0.0101)	0.771*** (0.0182)	0.191*** (0.0130)	0.356*** (0.0125)
Africa only (excluding SACU)	-0.559*** (0.0198)	-0.0278** (0.0139)	-0.139*** (0.0133)	-0.160*** (0.0207)	0.0387*** (0.0148)	0.00502 (0.0141)
SACU only	-0.756*** (0.0220)	-0.202*** (0.0153)	-0.352*** (0.0148)	-0.181*** (0.0236)	-0.0987*** (0.0168)	-0.136*** (0.0160)
Number of destinations				0.0724*** (0.00154)	0.0105*** (0.00110)	0.0264*** (0.00106)
Number of products				0.00435*** (0.000203)	0.00171*** (0.000145)	0.00265*** (0.000138)
Lkl	-0.0112*** (0.00152)	0.0544*** (0.00107)	0.0523*** (0.00102)	-0.0154*** (0.00149)	0.0536*** (0.00107)	0.0504*** (0.00102)
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm size control			Yes			Yes
Observations	103 359	101 249	101 249	103 359	101 249	101 249

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

Source: Authors' own calculations.

Table A8: Labour demand and wage: number of products and destinations (see Table 6)

	No of employees (1)	Wages per person (2)	Total wages (3)
Export dummy	-0.203*** (0.0429)	0.111*** (0.0306)	0.0682** (0.0291)
Africa only (excluding SACU)	-0.287*** (0.0378)	0.140*** (0.0270)	0.0786*** (0.0257)
SACU only	-0.122*** (0.0322)	0.0159 (0.0230)	-0.00927 (0.0219)
Number of destinations	-0.0114*** (0.00440)	0.00899*** (0.00315)	0.00685** (0.00300)
Number of destinations^2	0.570*** (0.0310)	-0.00552 (0.0221)	0.117*** (0.0211)
Number of products	-7.04e-05 (0.000477)	-0.000436 (0.000340)	-0.000463 (0.000323)
Number of products ^2	0.0772*** (0.00827)	0.0404*** (0.00589)	0.0575*** (0.00560)
lkl	-0.0152*** (0.00149)	0.0537*** (0.00107)	0.0506*** (0.00102)
Year control	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes
Firm size control			Yes
Observations	103 359	101 249	101 249

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

Source: Authors' own calculations.

Table A9: Labour demand and wage: exporter dynamics (enter, exit and continue) (see Table 7)

	No of employees (1)	Wages per person (2)	Total wages (3)	No of employees (4)	Wages per person (5)	Total wages (6)
Continue	1.290*** -0.013	0.290*** -0.009	0.515*** -0.00922	0.756*** -0.0149	0.168*** -0.0105	0.318*** -0.0103
Enter	0.528*** -0.0365	0.187*** -0.0252	0.277*** -0.0244	0.399*** -0.0355	0.159*** -0.0251	0.237*** -0.0241
Exit	0.848*** -0.0174	0.318*** -0.0121	0.466*** -0.0118	0.473*** -0.0178	0.233*** -0.0126	0.327*** -0.0122
Lkl	-0.00380** -0.00171	0.0518*** -0.00119	0.0513*** -0.00115	-0.0107*** -0.00166	0.0504*** -0.00119	0.0484*** -0.00114
No. dest & prod control	No	No	No	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm size control			Yes			Yes
Observations	81 251	79 740	79 740	81 251	79 740	79 740

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

Source: Authors' own calculations.

Table A10: Labour demand and wage: non-exporters versus exporters (within and outside Africa) (see Table 8)

	No of employees (1)	Wages per person (2)	Total wages (3)	No of employees (4)	Wages per person (5)	Total wages (6)
Continue International	1.678*** (0.0183)	0.346*** (0.0128)	2.022*** (0.0195)	0.901*** (0.0225)	0.170*** (0.0160)	1.062*** (0.0238)
Continue Africa only	0.987*** (0.0165)	0.246*** (0.0115)	1.235*** (0.0175)	0.702*** (0.0168)	0.174*** (0.0119)	0.875*** (0.0177)
Enter International	1.239*** (0.0276)	0.433*** (0.0192)	1.668*** (0.0294)	0.618*** (0.0291)	0.293*** (0.0207)	0.904*** (0.0307)
Enter Africa only	0.628*** (0.0213)	0.253*** (0.0148)	0.880*** (0.0227)	0.428*** (0.0211)	0.203*** (0.0150)	0.629*** (0.0223)
Exit International	0.522*** (0.0651)	0.182*** (0.0453)	0.691*** (0.0693)	0.376*** (0.0638)	0.152*** (0.0453)	0.513*** (0.0673)
Exit Africa only	0.533*** (0.0433)	0.189*** (0.0300)	0.716*** (0.0459)	0.423*** (0.0424)	0.164*** (0.0300)	0.580*** (0.0446)
lkl	-0.00649*** (0.00170)	0.0513*** (0.00119)	0.0455*** (0.00182)	-0.0110*** (0.00166)	0.0503*** (0.00119)	0.0399*** (0.00176)
No. dest & prod control	No	No	No	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm size control			Yes			Yes
Observations	81 251	79 740	79 740	81 251	79 740	79 740

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

Source: Authors' own calculations.

Table A11: Wage distribution: exporters within and outside Africa and SACU (see Figure 4)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
International	0.0584*** (0.00537)	0.155*** (0.0147)	0.208*** (0.0104)	0.256*** (0.00943)	0.331*** (0.00992)	0.535*** (0.0111)	0.123*** (0.00815)
Africa only (excluding SACU)	0.0656*** (0.00471)	0.104*** (0.0129)	0.151*** (0.00912)	0.200*** (0.00824)	0.286*** (0.00867)	0.495*** (0.00967)	0.135*** (0.00712)
SACU only	0.0357*** (0.00532)	0.0233 (0.0145)	0.0684*** (0.0103)	0.0888*** (0.00931)	0.140*** (0.00979)	0.304*** (0.0109)	0.0715*** (0.00804)
Number of destinations	0.00259*** (0.000446)	0.00588*** (0.00123)	0.0136*** (0.000872)	0.0135*** (0.000789)	0.0147*** (0.000830)	0.0204*** (0.000926)	0.00111 (0.000681)
Number of products	0.000398*** (5.85e-05)	7.68e-05 (0.000161)	0.000527*** (0.000114)	0.000856*** (0.000103)	0.00119*** (0.000109)	0.00130*** (0.000121)	0.000665*** (8.92e-05)
lkl	0.00366*** (0.000459)	0.0273*** (0.00121)	0.0251*** (0.000855)	0.0257*** (0.000773)	0.0280*** (0.000813)	0.0292*** (0.000907)	0.00288*** (0.000668)
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	122 868	130 640	130 640	130 640	130 640	130 640	130 640
R-squared	0.015	0.038	0.092	0.143	0.163	0.156	0.023

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

Source: Authors' own calculations.

Table A12: Wage distribution: exporters within and outside Africa and SACU (controlling for firm characteristics) (see Figure 4)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
International	0.0163*** (0.00540)	0.164*** (0.0143)	0.130*** (0.0101)	0.153*** (0.00891)	0.182*** (0.00933)	0.223*** (0.0101)	0.0518*** (0.00818)
Africa only (excluding SACU)	0.0268*** (0.00474)	0.0814*** (0.0125)	0.0576*** (0.00883)	0.0837*** (0.00780)	0.128*** (0.00817)	0.202*** (0.00881)	0.0703*** (0.00716)
SACU only	0.00419 (0.00532)	0.0336** (0.0140)	0.0120 (0.00989)	0.0142 (0.00874)	0.0298*** (0.00915)	0.0691*** (0.00986)	0.0178** (0.00802)
Number of destinations	-0.000689 (0.000448)	0.0111*** (0.00119)	0.0106*** (0.000842)	0.00887*** (0.000744)	0.00645*** (0.000779)	-0.00279*** (0.000840)	-0.00417*** (0.000683)
Number of products	0.000129** (5.82e-05)	3.51e-05 (0.000155)	-2.40e-05 (0.000109)	0.000158 (9.65e-05)	0.000215** (0.000101)	-0.000636*** (0.000109)	0.000239*** (8.86e-05)
lkl	0.000379 (0.000468)	0.00248** (0.00119)	0.00310*** (0.000841)	0.00120 (0.000743)	0.00120 (0.000778)	0.00538*** (0.000839)	-0.00191*** (0.000682)
ll	0.0392*** (0.00104)	-0.138*** (0.00253)	-0.0152*** (0.00178)	0.00153 (0.00157)	0.0460*** (0.00165)	0.264*** (0.00178)	0.0613*** (0.00144)
lyl	0.0391*** (0.00122)	0.238*** (0.00309)	0.229*** (0.00218)	0.259*** (0.00193)	0.291*** (0.00202)	0.298*** (0.00217)	0.0621*** (0.00177)
Industry control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0399** (0.0172)	4.306*** (0.0441)	4.559*** (0.0311)	4.429*** (0.0274)	4.269*** (0.0287)	4.368*** (0.0310)	-0.290*** (0.0252)
Observations	122 110	129 720	129 720	129 720	129 720	129 720	129 720
R-squared	0.031	0.121	0.173	0.256	0.281	0.324	0.041

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

Source: Authors' own calculations.

Table A13: Wage distribution: exporters' dynamics (enter, exit and continue) (see Figure 5)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Continue	0.0538*** (0.00418)	0.0852*** (0.0115)	0.138*** (0.00810)	0.174*** (0.00733)	0.248*** (0.00771)	0.469*** (0.00860)	0.110*** (0.00633)
Exit	0.0574*** (0.00984)	0.0823*** (0.0269)	0.150*** (0.0190)	0.197*** (0.0172)	0.272*** (0.0181)	0.388*** (0.0202)	0.121*** (0.0148)
Enter	0.0567*** (0.00450)	0.101*** (0.0123)	0.147*** (0.00868)	0.192*** (0.00785)	0.264*** (0.00825)	0.427*** (0.00920)	0.117*** (0.00677)
Number of des	0.00292*** (0.000406)	0.00916*** (0.00112)	0.0171*** (0.000796)	0.0176*** (0.000719)	0.0190*** (0.000757)	0.0249*** (0.000844)	0.00191*** (0.000621)
Number of prod	0.000406*** (5.83e-05)	5.39e-05 (0.000161)	0.000496*** (0.000114)	0.000832*** (0.000103)	0.00118*** (0.000108)	0.00127*** (0.000121)	0.000681*** (8.90e-05)
lkl	0.00364*** (0.000459)	0.0274*** (0.00121)	0.0252*** (0.000855)	0.0258*** (0.000773)	0.0281*** (0.000813)	0.0293*** (0.000907)	0.00286*** (0.000667)
Constant	0.625*** (0.00673)	6.893*** (0.0180)	7.357*** (0.0128)	7.631*** (0.0115)	7.994*** (0.0121)	8.740*** (0.0135)	0.637*** (0.00997)
Observations	122 868	130 640	130 640	130 640	130 640	130 640	130 640
R-squared	0.015	0.038	0.092	0.142	0.163	0.156	0.024

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

Source: Authors' own calculations.

Table A14: Wage distribution: exporters' dynamics (enter, exit and continue) controlling for firm characteristics (see Figure 5)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_rang e
Continue	0.0128*** (0.00424)	0.0975*** (0.0112)	0.0627*** (0.00791)	0.0750*** (0.00699)	0.104*** (0.00732)	0.162*** (0.00789)	0.0411*** (0.00642)
Exit	0.0280*** (0.00977)	0.0927*** (0.0257)	0.0956*** (0.0181)	0.125*** (0.0160)	0.167*** (0.0168)	0.163*** (0.0181)	0.0711*** (0.0147)
Enter	0.0227*** (0.00452) (0.00404)	0.0793*** (0.0119) (0.0105)	0.0647*** (0.00839) (0.00738)	0.0895*** (0.00741) (0.00652)	0.125*** (0.00776) (0.00682)	0.173*** (0.00836) (0.00736)	0.0601*** (0.00680) (0.00598)
lkl	0.000371 (0.000468)	0.00261** (0.00119)	0.00322*** (0.000841)	0.00132* (0.000743)	0.00130* (0.000778)	0.00544*** (0.000839)	-0.00192*** (0.000682)
ll	0.0391*** (0.00104)	-0.138*** (0.00253)	-0.0153*** (0.00178)	0.00144 (0.00158)	0.0458*** (0.00165)	0.264*** (0.00178)	0.0611*** (0.00145)
lyl	0.0391*** (0.00122)	0.238*** (0.00310)	0.229*** (0.00218)	0.258*** (0.00193)	0.291*** (0.00202)	0.298*** (0.00218)	0.0620*** (0.00177)
Number of des	-0.000544 (0.000410)	0.0146*** (0.00109)	0.0139*** (0.000772)	0.0126*** (0.000682)	0.0102*** (0.000714)	0.000457 (0.000769)	-0.00365*** (0.000626)
Number of prod	0.000142** (5.81e-05)	-2.60e-05 (0.000155)	-7.01e-05 (0.000109)	0.000121 (9.63e-05)	0.000195* (0.000101)	* (0.000109)	0.000265*** (8.84e-05)
Constant	0.0396** (0.0172)	4.309*** (0.0442)	4.560*** (0.0311)	4.430*** (0.0275)	4.270*** (0.0288)	4.369*** (0.0310)	-0.290*** (0.0252)
Observations	122,110	129,720	129,720	129,720	129,720	129,720	129,720
R-squared	0.031	0.121	0.173	0.255	0.281	0.324	0.041

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

Source: Authors' own calculations.

Table A15: Wage distribution: exporters' dynamics within and outside Africa (see Figures 6 and 7)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_rang e
Continue (International)	0.0928*** (0.00504)	0.214*** (0.0139)	0.357*** (0.00983)	0.410*** (0.00890)	0.503*** (0.00937)	0.790*** (0.0105)	0.146*** (0.00767)
Continue (Africa only)	0.0717*** (0.00456)	0.0795*** (0.0125)	0.162*** (0.00886)	0.205*** (0.00801)	0.294*** (0.00843)	0.529*** (0.00941)	0.133*** (0.00691)
Exit (International)	0.0668*** (0.0177)	0.143*** (0.0481)	0.241*** (0.0341)	0.291*** (0.0309)	0.351*** (0.0325)	0.463*** (0.0363)	0.110*** (0.0266)
Exit (Africa only)	0.0534*** (0.0118)	0.0556* (0.0321)	0.111*** (0.0228)	0.155*** (0.0206)	0.237*** (0.0217)	0.356*** (0.0242)	0.126*** (0.0178)
Enter (International)	0.0951*** (0.00664)	0.197*** (0.0182)	0.314*** (0.0129)	0.381*** (0.0116)	0.483*** (0.0123)	0.691*** (0.0137)	0.169*** (0.0100)
Enter (Africa only)	0.0631*** (0.00523)	0.102*** (0.0142)	0.167*** (0.0101)	0.211*** (0.00913)	0.284*** (0.00961)	0.460*** (0.0107)	0.117*** (0.00787)
lkl	0.00387*** (0.000458)	0.0277*** (0.00121)	0.0259*** (0.000855)	0.0266*** (0.000774)	0.0289*** (0.000814)	0.0304*** (0.000909)	0.00303*** (0.000667)
Constant	0.623*** (0.00673)	6.891*** (0.0180)	7.351*** (0.0128)	7.625*** (0.0116)	7.986*** (0.0122)	8.730*** (0.0136)	0.635*** (0.00997)
Observations	122 868	130 640	130 640	130 640	130 640	130 640	130 640
R-squared	0.014	0.038	0.089	0.139	0.158	0.150	0.023

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

Source: Authors' own calculations.

Table A16: Wage distribution: exporters' dynamics within and outside Africa, controlling for firm characteristics (see Figures 6 and 7)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Continue (International)	0.00721 (0.00533)	0.269*** (0.0141)	0.221*** (0.00997)	0.227*** (0.00881)	0.230*** (0.00922)	0.177*** (0.00994)	0.00841 (0.00808)
Continue (Africa only)	0.0175*** (0.00466)	0.0947*** (0.0123)	0.0620*** (0.00871)	0.0752*** (0.00769)	0.106*** (0.00805)	0.135*** (0.00868)	0.0443*** (0.00706)
Exit (International)	0.0371** (0.0175)	0.140*** (0.0461)	0.175*** (0.0325)	0.209*** (0.0287)	0.236*** (0.0301)	0.237*** (0.0324)	0.0602** (0.0263)
Exit (Africa only)	0.0238** (0.0117)	0.0666** (0.0307)	0.0555** (0.0217)	0.0832*** (0.0191)	0.132*** (0.0200)	0.133*** (0.0216)	0.0769*** (0.0176)
Enter (International)	0.0279*** (0.00673)	0.219*** (0.0178)	0.195*** (0.0125)	0.226*** (0.0111)	0.257*** (0.0116)	0.215*** (0.0125)	0.0614*** (0.0102)
Enter (Africa only)	0.0194*** (0.00526)	0.0769*** (0.0138)	0.0624*** (0.00976)	0.0813*** (0.00862)	0.108*** (0.00902)	0.140*** (0.00973)	0.0455*** (0.00791)
lkl	0.000349 (0.000468)	0.00274** (0.00119)	0.00336*** (0.000841)	0.00140* (0.000743)	0.00133* (0.000778)	0.00533*** (0.000838)	-0.00203*** (0.000682)
ll	0.0393*** (0.00102)	-0.133*** (0.00247)	-0.0105*** (0.00174)	0.00604*** (0.00154)	0.0496*** (0.00161)	0.261*** (0.00174)	0.0601*** (0.00141)
lyl	0.0393*** (0.00120)	0.242*** (0.00306)	0.233*** (0.00216)	0.262*** (0.00191)	0.294*** (0.00200)	0.295*** (0.00215)	0.0614*** (0.00175)
Constant	0.0361** (0.0170)	4.242*** (0.0435)	4.498*** (0.0307)	4.368*** (0.0271)	4.218*** (0.0284)	4.407*** (0.0306)	-0.279*** (0.0249)
Observations	122,110	129,720	129,720	129,720	129,720	129,720	129,720
R-squared	0.031	0.120	0.172	0.255	0.281	0.324	0.041

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (ls significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Tables A17–A37 are the regressions to test if inequality is caused by the type of product (high-quality versus low-quality products) exported, or by the type of destination (high or low income per capita) exported to. Therefore, we first ran a regression without any controls to see the wage distribution/inequality (A17, A24, A31), then added price (product quality), control (A18, A25, A32), GDP control (A19, A26, A33), product fixed effects (A20, A27, A34), combination of price product and fixed effects (A21, A28, A35), combination of GDP and fixed effects (A22, A29, A36), and finally a regression with price, GDP, and fixed effects (A23, A30, A37). Tables A17–A23 look at the distributions within and outside Africa (Figure 8), Tables A24–A30 focus on exporter dynamics (Figure 9) and Tables A31–A37 present a combination of destination and dynamics (Figure 10). The same regressions (Tables 17–37) are run with firm controls (number of employees, output per worker and capital per worker). These tables are available on request.

Table A17: Wage distribution (inequality): within and outside Africa (regression without price or GDP control) (see Figure 8)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Africa only (excluding SACU)	0.0493*** (0.00104)	-0.287*** (0.00321)	-0.136*** (0.00162)	-0.168*** (0.00157)	-0.171*** (0.00159)	-0.182*** (0.00163)	-0.0354*** (0.00123)
SACU only	0.0440*** (0.00164)	-0.523*** (0.00506)	-0.329*** (0.00255)	-0.373*** (0.00247)	-0.425*** (0.00251)	-0.528*** (0.00257)	-0.0964*** (0.00193)
lkl	0.00564*** (0.000198)	0.0332*** (0.000609)	0.0451*** (0.000307)	0.0475*** (0.000298)	0.0483*** (0.000302)	0.0458*** (0.000309)	0.00322*** (0.000233)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1 004 035	1 013 994	1 013 994	1 013 994	1 013 994	1 013 994	1 013 994

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A18: Wage distribution (inequality): within and outside Africa (regression with price control) (see Figure 8)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Africa only (excluding SACU)	0.0500*** (0.00104)	-0.285*** (0.00322)	-0.132*** (0.00162)	-0.163*** (0.00157)	-0.166*** (0.00159)	-0.179*** (0.00163)	-0.0343*** (0.00123)
SACU only	0.0445*** (0.00165)	-0.522*** (0.00507)	-0.326*** (0.00255)	-0.369*** (0.00247)	-0.422*** (0.00251)	-0.527*** (0.00257)	-0.0958*** (0.00194)
lprice	0.00155*** (0.000216)	0.00945*** (0.000669)	0.0163*** (0.000337)	0.0225*** (0.000326)	0.0215*** (0.000331)	0.0126*** (0.000339)	0.00514*** (0.000255)
lkl	0.00572*** (0.000198)	0.0331*** (0.000610)	0.0452*** (0.000307)	0.0477*** (0.000297)	0.0486*** (0.000302)	0.0460*** (0.000309)	0.00335*** (0.000233)
No. dest &prod control	Yes						
Year control	Yes						
Industry controls	Yes						
Observations	1 002 162	1 012 103	1 012 103	1 012 103	1 012 103	1 012 103	1 012 103

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A19: Wage distribution (inequality): within and outside Africa (regression with GDP control) (see Figure 8)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Africa only (excluding SACU)	0.0459*** (0.00106)	-0.303*** (0.00327)	-0.150*** (0.00165)	-0.187*** (0.00160)	-0.196*** (0.00162)	-0.201*** (0.00166)	-0.0463*** (0.00125)
SACU only	0.0450*** (0.00164)	-0.521*** (0.00506)	-0.326*** (0.00255)	-0.368*** (0.00247)	-0.421*** (0.00250)	-0.525*** (0.00256)	-0.0944*** (0.00194)
IGDP	-0.00525*** (0.000298)	-0.0226*** (0.000924)	-0.0198*** (0.000466)	-0.0275*** (0.000451)	-0.0352*** (0.000457)	-0.0266*** (0.000468)	-0.0154*** (0.000354)
lkl	0.00552*** (0.000198)	0.0329*** (0.000610)	0.0446*** (0.000308)	0.0469*** (0.000298)	0.0476*** (0.000302)	0.0453*** (0.000309)	0.00301*** (0.000233)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1 002 162	1 012 103	1 012 103	1 012 103	1 012 103	1 012 103	1 012 103

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A20: Wage distribution (inequality): within and outside Africa (regression with product fixed effects)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Africa only (excluding SACU)	0.0492*** (0.00104)	-0.288*** (0.00322)	-0.138*** (0.00161)	-0.169*** (0.00155)	-0.172*** (0.00156)	-0.186*** (0.00161)	-0.0336*** (0.00123)
SACU only	0.0425*** (0.00165)	-0.514*** (0.00506)	-0.325*** (0.00252)	-0.366*** (0.00243)	-0.418*** (0.00245)	-0.528*** (0.00253)	-0.0926*** (0.00194)
lkl	0.00471*** (0.000199)	0.0335*** (0.000612)	0.0434*** (0.000305)	0.0457*** (0.000294)	0.0466*** (0.000297)	0.0433*** (0.000307)	0.00314*** (0.000234)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1 004 035	1 013 994	1 013 994	1 013 994	1 013 994	1 013 994	1 013 994

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A21: Wage distribution (inequality): within and outside Africa (regression with price and product fixed effects)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Africa only (excluding SACU)	0.00482*** (0.000199)	0.0336*** (0.000613)	0.0438*** (0.000305)	0.0462*** (0.000293)	0.0471*** (0.000295)	0.0436*** (0.000306)	0.00334*** (0.000235)
SACU only	0.0502*** (0.00104)	-0.285*** (0.00323)	-0.132*** (0.00161)	-0.161*** (0.00154)	-0.164*** (0.00156)	-0.181*** (0.00161)	-0.0317*** (0.00123)
Dev_price	0.0433*** (0.00165)	-0.512*** (0.00507)	-0.320*** (0.00252)	-0.360*** (0.00242)	-0.411*** (0.00244)	-0.524*** (0.00253)	-0.0912*** (0.00194)
lkl	0.00284*** (0.000225)	0.0150*** (0.000695)	0.0248*** (0.000346)	0.0333*** (0.000332)	0.0332*** (0.000335)	0.0220*** (0.000348)	0.00843*** (0.000266)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1 002 162	1 012 103	1 012 103	1 012 103	1 012 103	1 012 103	1 012 103

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A22: Wage distribution (inequality): within and outside Africa (regression with GDP and product fixed effects)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Africa only (excluding SACU)	0.0462*** (0.00106)	-0.299*** (0.00327)	-0.147*** (0.00163)	-0.182*** (0.00157)	-0.189*** (0.00158)	-0.199*** (0.00164)	-0.0427*** (0.00125)
SACU only	0.0432*** (0.00165)	-0.511*** (0.00506)	-0.323*** (0.00253)	-0.362*** (0.00243)	-0.413*** (0.00245)	-0.525*** (0.00254)	-0.0902*** (0.00194)
IGDP	-0.00469*** (0.000303)	-0.0169*** (0.000937)	-0.0131*** (0.000468)	-0.0205*** (0.000450)	-0.0272*** (0.000454)	-0.0187*** (0.000470)	-0.0141*** (0.000360)
lkl	0.00467*** (0.000200)	0.0332*** (0.000613)	0.0431*** (0.000306)	0.0453*** (0.000294)	0.0461*** (0.000297)	0.0429*** (0.000307)	0.00300*** (0.000235)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	997 911	1 007 827	1 007 827	1 007 827	1 007 827	1 007 827	1 007 827

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A23: Wage distribution (inequality): within and outside Africa (regression with price, GDP and product fixed effects) (see Figure 8)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Africa only (excluding SACU)	0.0472*** (0.00106)	-0.296*** (0.00328)	-0.141*** (0.00163)	-0.173*** (0.00157)	-0.181*** (0.00158)	-0.193*** (0.00164)	-0.0407*** (0.00126)
SACU only	0.0441*** (0.00165)	-0.509*** (0.00507)	-0.318*** (0.00253)	-0.356*** (0.00242)	-0.406*** (0.00244)	-0.521*** (0.00254)	-0.0887*** (0.00194)
IGDP	-0.00471*** (0.000303)	-0.0170*** (0.000938)	-0.0133*** (0.000467)	-0.0208*** (0.000448)	-0.0275*** (0.000452)	-0.0189*** (0.000469)	-0.0142*** (0.000360)
Dev_price	0.00283*** (0.000225)	0.0150*** (0.000696)	0.0248*** (0.000347)	0.0334*** (0.000333)	0.0333*** (0.000336)	0.0219*** (0.000348)	0.00846*** (0.000267)
lkl	0.00478*** (0.000200)	0.0333*** (0.000613)	0.0435*** (0.000306)	0.0458*** (0.000293)	0.0467*** (0.000296)	0.0433*** (0.000307)	0.00321*** (0.000235)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	996 078	1 005 976	1 005 976	1 005 976	1 005 976	1 005 976	1 005 976

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A24: Wage distribution (inequality): exporter dynamics (regression without price or GDP control) (see Figure 9)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0166*** (0.00112)	0.0975*** (0.00348)	0.0495*** (0.00172)	0.0594*** (0.00171)	0.0660*** (0.00173)	0.0117*** (0.00178)	0.0166*** (0.00128)
lkl	0.00598*** (0.000209)	0.0342*** (0.000647)	0.0442*** (0.000320)	0.0484*** (0.000317)	0.0506*** (0.000322)	0.0486*** (0.000331)	0.00642*** (0.000237)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	908 536	916 992	916 992	916 992	916 992	916 992	916 992

Note: Premium relative to international exporters. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A25: Wage distribution (inequality): exporter dynamics (regression with price control) (see Figure 9)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0164*** (0.00113)	0.0958*** (0.00349)	0.0479*** (0.00172)	0.0576*** (0.00171)	0.0645*** (0.00173)	0.0106*** (0.00178)	0.0166*** (0.00128)
Dev_price	0.000530** (0.000231)	0.0149*** (0.000720)	0.0195*** (0.000355)	0.0258*** (0.000352)	0.0247*** (0.000357)	0.0157*** (0.000368)	0.00519*** (0.000264)
lkl	0.00601*** (0.000209)	0.0342*** (0.000647)	0.0443*** (0.000320)	0.0486*** (0.000316)	0.0508*** (0.000321)	0.0487*** (0.000331)	0.00651*** (0.000237)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	907 098	915 539	915 539	915 539	915 539	915 539	915 539

Note: Premium relative to continuing firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A26: Wage distribution (inequality): exporter dynamics (regression with GDP control) (see Figure 9)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0164*** (0.00112)	0.0968*** (0.00349)	0.0489*** (0.00173)	0.0589*** (0.00171)	0.0654*** (0.00174)	0.0116*** (0.00179)	0.0164*** (0.00128)
GDP	-0.00706*** (0.000313)	-0.0143*** (0.000974)	-0.0166*** (0.000482)	-0.0224*** (0.000478)	-0.0308*** (0.000485)	-0.0248*** (0.000498)	-0.0142*** (0.000357)
lkl	0.00589*** (0.000209)	0.0341*** (0.000648)	0.0439*** (0.000321)	0.0481*** (0.000318)	0.0503*** (0.000322)	0.0482*** (0.000332)	0.00636*** (0.000238)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	902 923	911 338	911 338	911 338	911 338	911 338	911 338

Note: Premium relative to continuing firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A27: Wage distribution (inequality): exporter dynamics (regression with product fixed effects)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0154*** (0.00112)	0.0939*** (0.00345)	0.0480*** (0.00168)	0.0570*** (0.00166)	0.0643*** (0.00168)	0.0128*** (0.00175)	0.0164*** (0.00127)
lkl	0.00500*** (0.000211)	0.0344*** (0.000649)	0.0425*** (0.000317)	0.0464*** (0.000312)	0.0486*** (0.000316)	0.0458*** (0.000328)	0.00609*** (0.000239)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	908 536	916 992	916 992	916 992	916 992	916 992	916 992

Note: Premium relative to continuing firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A28: Wage distribution (inequality): exporter dynamics (regression with price and product fixed effects)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0152*** (0.00112)	0.0919*** (0.00345)	0.0460*** (0.00168)	0.0548*** (0.00165)	0.0623*** (0.00167)	0.0113*** (0.00174)	0.0163*** (0.00127)
Dev_price	0.00142*** (0.000241)	0.0231*** (0.000748)	0.0302*** (0.000364)	0.0389*** (0.000358)	0.0385*** (0.000362)	0.0267*** (0.000378)	0.00826*** (0.000275)
lkl	0.00505*** (0.000211)	0.0346*** (0.000649)	0.0428*** (0.000316)	0.0469*** (0.000310)	0.0490*** (0.000314)	0.0461*** (0.000328)	0.00623*** (0.000239)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	907 098	915 539	915 539	915 539	915 539	915 539	915 539

Note: Premium relative to continuing firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A29: Wage distribution (inequality): exporter dynamics (regression with GDP and product fixed effects)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0153*** (0.00112)	0.0933*** (0.00345)	0.0476*** (0.00169)	0.0565*** (0.00166)	0.0638*** (0.00168)	0.0127*** (0.00175)	0.0162*** (0.00127)
IGDP	-0.00627*** (0.000319)	-0.0103*** (0.000989)	-0.0110*** (0.000484)	-0.0168*** (0.000476)	-0.0242*** (0.000481)	-0.0182*** (0.000501)	-0.0132*** (0.000365)
lkl	0.00499*** (0.000211)	0.0343*** (0.000649)	0.0423*** (0.000318)	0.0462*** (0.000313)	0.0483*** (0.000316)	0.0456*** (0.000329)	0.00607*** (0.000239)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	902 923	911 338	911 338	911 338	911 338	911 338	911 338

Note: Premium relative to continuing firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A30: Wage distribution (inequality): exporter dynamics (regression with price, GDP and product fixed effects) (see Figure 9)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Enter	-0.0151*** (0.00112)	0.0914*** (0.00346)	0.0456*** (0.00169)	0.0543*** (0.00165)	0.0617*** (0.00167)	0.0112*** (0.00175)	0.0161*** (0.00127)
IGDP	-0.00630*** (0.000319)	-0.0107*** (0.000989)	-0.0115*** (0.000482)	-0.0174*** (0.000473)	-0.0248*** (0.000478)	-0.0187*** (0.000500)	-0.0133*** (0.000364)
Dev_price	0.00144*** (0.000242)	0.0232*** (0.000750)	0.0304*** (0.000365)	0.0391*** (0.000359)	0.0387*** (0.000363)	0.0268*** (0.000379)	0.00835*** (0.000276)
lkl	0.00504*** (0.000211)	0.0344*** (0.000650)	0.0426*** (0.000317)	0.0466*** (0.000311)	0.0488*** (0.000314)	0.0459*** (0.000328)	0.00622*** (0.000240)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	901 525	909 925	909 925	909 925	909 925	909 925	909 925

Note: Premium relative to continuing firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A31: Wage distribution (inequality): exporter dynamics within and outside Africa (regression without price or GDP control) (see Figure 10)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Continue (Africa only)	0.0481*** (0.00116)	-0.346*** (0.00358)	-0.194*** (0.00177)	-0.236*** (0.00175)	-0.236*** (0.00177)	-0.264*** (0.00182)	-0.0425*** (0.00132)
Enter (International)	-0.0303*** (0.00142)	0.151*** (0.00438)	0.0706*** (0.00216)	0.0753*** (0.00214)	0.0917*** (0.00217)	0.0341*** (0.00223)	0.0211*** (0.00162)
Enter (Africa only)	0.0513*** (0.00177)	-0.316*** (0.00543)	-0.169*** (0.00268)	-0.191*** (0.00265)	-0.200*** (0.00269)	-0.275*** (0.00276)	-0.0312*** (0.00200)
lkl	0.00677*** (0.000209)	0.0291*** (0.000644)	0.0415*** (0.000318)	0.0451*** (0.000314)	0.0473*** (0.000319)	0.0448*** (0.000327)	0.00581*** (0.000237)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	908 536	916 992	916 992	916 992	916 992	916 992	916 992

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A32: Wage distribution (inequality): exporter dynamics within and outside Africa (regression with price control) (see Figure 10)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Continue (Africa only)	0.0487*** (0.00116)	-0.345*** (0.00359)	-0.190*** (0.00177)	-0.231*** (0.00174)	-0.232*** (0.00177)	-0.262*** (0.00182)	-0.0416*** (0.00132)
Enter (International)	-0.0300*** (0.00142)	0.149*** (0.00439)	0.0692*** (0.00217)	0.0739*** (0.00213)	0.0906*** (0.00217)	0.0333*** (0.00223)	0.0214*** (0.00162)
Enter (Africa only)	0.0518*** (0.00177)	-0.315*** (0.00544)	-0.166*** (0.00268)	-0.187*** (0.00264)	-0.197*** (0.00269)	-0.274*** (0.00276)	-0.0305*** (0.00201)
Dev_price	0.00106*** (0.000231)	0.0113*** (0.000715)	0.0176*** (0.000353)	0.0235*** (0.000348)	0.0224*** (0.000353)	0.0131*** (0.000363)	0.00477*** (0.000264)
lkl	0.00681*** (0.000210)	0.0292*** (0.000644)	0.0416*** (0.000318)	0.0454*** (0.000313)	0.0475*** (0.000318)	0.0450*** (0.000327)	0.00591*** (0.000238)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	907 098	915 539	915 539	915 539	915 539	915 539	915 539

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A33: Wage distribution (inequality): exporter dynamics within and outside Africa (regression with GDP control) (see Figure 10)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Continue (Africa only)	0.0462*** (0.00117)	-0.361*** (0.00361)	-0.206*** (0.00178)	-0.251*** (0.00176)	-0.256*** (0.00178)	-0.281*** (0.00183)	-0.0500*** (0.00133)
Enter (International)	-0.0297*** (0.00142)	0.151*** (0.00439)	0.0714*** (0.00217)	0.0764*** (0.00214)	0.0934*** (0.00217)	0.0360*** (0.00223)	0.0219*** (0.00162)
Enter (Africa only)	0.0490*** (0.00178)	-0.333*** (0.00545)	-0.183*** (0.00270)	-0.208*** (0.00266)	-0.223*** (0.00269)	-0.295*** (0.00277)	-0.0399*** (0.00201)
IGDP	-0.00493*** (0.000315)	-0.0301*** (0.000975)	-0.0254*** (0.000482)	-0.0328*** (0.000475)	-0.0417*** (0.000482)	-0.0366*** (0.000495)	-0.0163*** (0.000360)
lkl	0.00666*** (0.000210)	0.0288*** (0.000644)	0.0410*** (0.000319)	0.0445*** (0.000314)	0.0466*** (0.000318)	0.0443*** (0.000327)	0.00564*** (0.000238)
No. dest &prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	902 923	911 338	911 338	911 338	911 338	911 338	911 338

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A34: Wage distribution (inequality): exporter dynamics within and outside Africa (regression with product fixed effects)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Continue (Africa only)	0.0479*** (0.00116)	-0.343*** (0.00358)	-0.192*** (0.00175)	-0.232*** (0.00171)	-0.232*** (0.00173)	-0.264*** (0.00180)	-0.0403*** (0.00133)
Enter (International)	-0.0284*** (0.00141)	0.147*** (0.00434)	0.0705*** (0.00212)	0.0740*** (0.00208)	0.0917*** (0.00210)	0.0376*** (0.00218)	0.0212*** (0.00161)
Enter (Africa only)	0.0509*** (0.00176)	-0.317*** (0.00539)	-0.170*** (0.00263)	-0.190*** (0.00258)	-0.199*** (0.00261)	-0.278*** (0.00271)	-0.0297*** (0.00200)
lkl	0.00577*** (0.000211)	0.0295*** (0.000645)	0.0398*** (0.000315)	0.0432*** (0.000309)	0.0453*** (0.000312)	0.0421*** (0.000324)	0.00552*** (0.000239)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	908 536	916 992	916 992	916 992	916 992	916 992	916 992

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A35: Wage distribution (inequality): exporter dynamics within and outside Africa (regression with price and product fixed effects)

	Std_dev	5th %	25th %	50th %	75th %	95th %	inter_q_range
Continue (Africa only)	0.0488*** (0.00116)	-0.340*** (0.00359)	-0.184*** (0.00174)	-0.222*** (0.00171)	-0.223*** (0.00173)	-0.258*** (0.00180)	-0.0385*** (0.00133)
Enter (International)	-0.0281*** (0.00141)	0.146*** (0.00435)	0.0690*** (0.00211)	0.0724*** (0.00207)	0.0905*** (0.00209)	0.0368*** (0.00218)	0.0215*** (0.00161)
Enter (Africa only)	0.0517*** (0.00177)	-0.314*** (0.00540)	-0.165*** (0.00262)	-0.184*** (0.00257)	-0.193*** (0.00260)	-0.274*** (0.00271)	-0.0283*** (0.00200)
Dev_price	0.00208*** (0.000241)	0.0186*** (0.000744)	0.0279*** (0.000362)	0.0361*** (0.000354)	0.0356*** (0.000358)	0.0234*** (0.000373)	0.00776*** (0.000276)
lkl	0.00583*** (0.000211)	0.0297*** (0.000646)	0.0402*** (0.000314)	0.0437*** (0.000307)	0.0459*** (0.000311)	0.0424*** (0.000324)	0.00568*** (0.000239)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	907 098	915 539	915 539	915 539	915 539	915 539	915 539

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A36: Wage distribution (inequality): exporter dynamics within and outside Africa (regression with GDP and product fixed effects)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Continue (Africa only)	0.0462*** (0.00117)	-0.353*** (0.00360)	-0.199*** (0.00176)	-0.242*** (0.00172)	-0.245*** (0.00174)	-0.276*** (0.00181)	-0.0463*** (0.00134)
Enter (International)	-0.0279*** (0.00141)	0.148*** (0.00436)	0.0709*** (0.00213)	0.0745*** (0.00208)	0.0927*** (0.00211)	0.0388*** (0.00219)	0.0218*** (0.00162)
Enter (Africa only)	0.0488*** (0.00177)	-0.328*** (0.00541)	-0.179*** (0.00264)	-0.203*** (0.00259)	-0.216*** (0.00261)	-0.291*** (0.00272)	-0.0368*** (0.00201)
Dev_price	-0.00441*** (0.000321)	-0.0240*** (0.000988)	-0.0185*** (0.000482)	-0.0256*** (0.000473)	-0.0335*** (0.000477)	-0.0285*** (0.000496)	-0.0150*** (0.000367)
lkl	0.00573*** (0.000211)	0.0292*** (0.000646)	0.0395*** (0.000315)	0.0428*** (0.000309)	0.0449*** (0.000312)	0.0418*** (0.000324)	0.00541*** (0.000240)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	902 923	911 338	911 338	911 338	911 338	911 338	911 338

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.

Table A37: Wage distribution (inequality): exporter dynamics within and outside Africa (regression with price, GDP and product fixed effects) (see Figure 10)

	Std_dev	5 th %	25 th %	50 th %	75 th %	95 th %	inter_q_range
Continue (Africa only)	0.0471*** (0.00117)	-0.349*** (0.00361)	-0.192*** (0.00176)	-0.232*** (0.00172)	-0.236*** (0.00173)	-0.270*** (0.00181)	-0.0445*** (0.00134)
Enter (International)	-0.0276*** (0.00142)	0.146*** (0.00436)	0.0693*** (0.00212)	0.0730*** (0.00208)	0.0914*** (0.00210)	0.0380*** (0.00219)	0.0221*** (0.00162)
Enter (Africa only)	0.0496*** (0.00177)	-0.326*** (0.00542)	-0.174*** (0.00264)	-0.196*** (0.00258)	-0.209*** (0.00260)	-0.287*** (0.00271)	-0.0355*** (0.00201)
IGDP	-0.00443*** (0.000321)	-0.0241*** (0.000988)	-0.0187*** (0.000481)	-0.0259*** (0.000470)	-0.0337*** (0.000475)	-0.0287*** (0.000495)	-0.0150*** (0.000367)
Dev_price	0.00207*** (0.000242)	0.0187*** (0.000745)	0.0279*** (0.000363)	0.0362*** (0.000354)	0.0357*** (0.000358)	0.0234*** (0.000373)	0.00778*** (0.000276)
lkl	0.00580*** (0.000211)	0.0294*** (0.000646)	0.0399*** (0.000315)	0.0434*** (0.000308)	0.0454*** (0.000311)	0.0421*** (0.000324)	0.00558*** (0.000240)
No. dest & prod control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product fe (HS6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	901 525	909 925	909 925	909 925	909 925	909 925	909 925

Note: Premium relative to continue international firms. ***p<0.01 **p<0.05 *p<0.1 (Is significant at the 1% level, 5% level and 10% level respectively.)

Source: Authors' own calculations.