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## The impact of exporting and export destination on manufacturing wages: Evidence for sub-Saharan Africa

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**Chris Milner and Verena Tandrayen**

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# **The Impact of Exporting and Export Destination on Manufacturing Wages: Evidence for Sub-Saharan Africa**

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**Chris Milner and Verena Tandrayen**

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## **Abstract**

Since the late 1980's many Sub-Saharan African governments, under the auspices of the World Bank and IMF, have embarked on substantial reform programmes aimed at liberalising trade and expanding exports. There has been a large literature exploring aggregate export and growth response to trade liberalisation, but relatively little empirical work on the labour market effects of these programmes. This paper seeks to provide insights into the individual wage effects of the trade-status of firms. Specifically, it provides a micro-econometric analysis of the implications for African manufacturing worker's earnings of being employed in an exporting firm. Using a rich employer-employee matched data set for manufacturing firms in six Sub-Saharan countries over the period 1993 to 1995; we find a positive association between individual earnings and the export status of the firm. Moreover, it appears that the skill wage premium in exporting firms is significantly higher. These results are consistent with either trade inducing higher wages, or with more productive (higher wage) firms, self-selecting themselves into export activity. The results also reveal however, that export destination matters and that the wage premium varies across export markets. In particular, exports to competitive markets outside Africa generate a negative export wage premium whereas exporting to the less competitive African market yields a positive effect on wages. This suggests that there is a greater disciplining effect on wages when exporting is to more competitive markets.

## **Outline**

1. Introduction
2. Trade and Wages: Theory and Evidence
3. Data and Empirical Methodology
4. Evidence on the Wage and Skill Premium for African Exporters
5. Is the Wage Premium Constant Across Export Destinations?
6. Conclusion



## 1. INTRODUCTION

Whilst labour markets are widely seen as a major channel through which trade-induced growth is transmitted to improve workers' welfare and reduce poverty, there is very limited evidence about the implications of exports for African workers at a micro level. This paper aims to fill this gap by examining the role of exports in determining individual workers' earnings in Africa, using an employer-employee matched data from the World Bank's Africa Regional Programme for Enterprise Development (RPED). The data set covers a panel of manufacturing firms over three waves for the period 1993 to 1995 in six Sub Saharan countries namely, Cameroon, Ghana, Kenya, Tanzania, Zambia and Zimbabwe.

We find a positive and significant wage premium for workers in exporting firms, even after controlling for firm and individual characteristics. The results also reveal that it is the skilled and more educated workers who tend to benefit more from the exporting status of the firm, thereby widening the skilled-unskilled earnings differential. The rising wage is in line with the Heckscher-Ohlin expectations about the effects of trade where the economy is labour abundant. But when the economy is unskilled labour abundant, the trade effect may not necessarily be simply explained by the traditional endowment arguments. However, once we disaggregate exports by destination, the wage effect of trade is clearly more complicated. When taking into account, where producers sell, we observe that exports to other African countries, which essentially lie behind regional (policy and 'natural') barriers, generate a significant and positive wage premium. In contrast, firms exporting outside the continent appear to have a negative influence on earnings, consistent with a greater discipline effect of international competition in these markets on wage setting.

The structure of the paper is as follows. Section 2 presents a review of the theory and empirical evidence on the effects of international trade on wages. Section 3 analyses the data and develops the methodology to be used. Section 4 discusses the results on the wage premium paid to workers in African exporting firms and also distinguishes between the export premium of skilled and unskilled labour. Section 5 shows whether the export destinations of African products influence the wage premium, while section 6 concludes.



## 2. TRADE AND WAGES: THEORY AND EVIDENCE

### *Theoretical literature*

Rising wages and wage inequality in many countries occur mainly through changes in the relative demand for skilled labour. Most of the literature explains changes in the structure of labour demand by a rise in international trade or advancement in new technologies. The perspective that technological change has the strongest impact on wages stems from the fact that it is essentially skill-biased, raising the relative demand for skilled labour and saving on less-skilled workers (Berman, Bound and Griliches, 1994; Berman, Bound and Machin, 1998; Machin and Van Reenen, 1998 and Haskel and Heden, 1999). In contrast another explanation put forward to explain wage inequality is the opening up of the economy to international trade (Sachs and Shatz, 1994; Leamer, 1996; Abrego and Whalley, 2000; Baldwin and Cain, 2000; Haskel and Slaughter, 2001)<sup>1</sup>.

The theoretical explanation for expecting an effect of trade on wages and wage disparity originates from the standard Heckscher-Ohlin trade model and more precisely the Stolper-Samuelson theorem. The basic theory asserts that countries export goods that use intensively factors of production that are relatively abundant at home and import commodities that use intensively relatively scarce factors. With greater trade, demand for the abundant factors increases while demand for the scarce factors falls, with corresponding effects on factor prices. In the context of relative capital to labour endowment, one would expect trade to raise the return to labour in a developing country.

The H-O-S framework can be extended to accommodate skill intensity differences between products and skill endowment differences between countries (Wood, 1994). For expected endowment differences one would expect increased trade to cover the skill premium in a developing country. However the inclusion of non-traded goods may reverse the outcome when there are particular patterns of substitution between consumption of traded and non-traded goods (Leamer, 1995). For instance, in the developing economy with an abundant supply of unskilled labour, labour-intensive non-traded goods may be close substitutes for the more skill-intensive traded commodities. Greater openness thus reduces the price of the more skill-intensive traded good, causing its demand to rise while

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<sup>1</sup>Other causes to explain the rise in wage disparity include the decline of institutions, especially union density and bargaining power (Gosling and Machin, 1995), reductions in minimum wage (Fortin and Lemieux, 1997) and the migration of less skilled workers (Borjas et al., 1992). However, these tend to be complementary to the two main causal factors – trade and technology.

demand for the non-traded good falls. Consequently, demand for unskilled labour in the non-traded sector falls, which may more than offset the rise in demand for unskilled labour in the traded sector (Wood, 1997). As a result, relative wage of unskilled workers drops in the developing world, widening the relative wage gap.

At the micro-level, however, the effect of trade and more specifically of exports on the determination of individual wages is mainly explained by the observable characteristics of exporting firms. It is widely viewed that exporting firms are self-selected into the export market based on their higher productivity and efficiency. In other words, 'good firms become exporters' (Clerides et. al, 1996, Bernard and Jensen, 1999a, b). The export market, in effect, offers increased profit opportunities reaped by the more productive firms capable of covering the marginal and sunk costs of entry<sup>2</sup> (Melitz, 2002). Similarly Bernard et al. (2002) contend that exporting imposes a higher efficiency hurdle since the costs of entering the export market far exceeds those of selling at home. As a consequence, only a fraction of firms, typically those with high levels of productivity, can achieve the exporting status.

Having entered the export market, firms may acquire knowledge of efficient management styles, new production methods, inputs and product designs from their international buyers and competitors. This learning process leads to reductions in marginal costs of production and enhances productivity (Aw et. al, 1999; Girma et. al, 2002). Moreover, supplying the international market very often requires the manufacture of high quality goods. This is achieved through investment in modern technologies, capital-intensive methods as well as managerial and technical expertise that are not available to firms, producing for the domestic market. It also implies that the demand for more educated and skilled labour in the export sector is likely to be higher. Accordingly, Manasse and Turrini (2001) examine the implication of exporting on the earnings of the skilled worker by modelling skilled pay as a function of the worker's abilities, the firm's level of technology and the quality of its products. They effectively show that the relatively high wage rate paid to skilled employees rises even more if the firm is exporting given the higher quality of export products and better technology of the exporting firm.

Feder (1982) argues that greater competition in export markets forces firms to be more flexible, adaptable and innovative while inducing a better and more efficient use of their resources. In addition, exporters are usually large firms and so, benefit from advantages of scale economies. Additionally, with their large size, they may also pay more in order to reduce monitoring costs, labour turnover and the threat of unionisation.

Clearly then, the above arguments lend support to the proposition that exporting firms are likely to have higher productivity levels than their non-exporting counterparts. Zhang and Felmingham (2002) postulate that

$$\frac{\partial Y_X}{\partial L_X} / \frac{\partial Y_{NX}}{\partial L_{NX}} = 1 + \delta \quad (1)$$

where  $L$  is labour,  $Y$  is output and the subscripts  $X$  and  $NX$  stand for exporter and non-exporter respectively. Equation (1) shows that the ratio of the marginal productivity of labour in the exporting and non-exporting firm differs by a positive constant  $\delta$ . Now, in a competitive model, the higher marginal productivity in exporting firms can be expected to translate into positive wage premium for workers. Thus, greater productivity and efficiency may encourage exporters to pay higher wages as this is an incentive for workers to continue and enhance the good performance of the firm.

However, it is evident that exporting firms are exposed to intense global competition and also subject to variations in the international economy. As a consequence, cost reductions, including wages, may be necessary in order to perform successfully on the international scene (Greenaway et al, 1999). As Wood (1997) argues, the effects of any trade liberalisation on wages are likely to be fashioned by the timing and by complementary policy developments.

### *Empirical evidence*

Most of the empirical work on trade and wages focuses on developed countries and the recent work on developing nations relates mainly to East Asia and Latin America. Very

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<sup>2</sup> Exporting entails additional per unit costs in terms of transport and tariffs and sunk costs such as informing foreign buyers about their products, learning about the foreign market, conforming to international standards and setting

few studies cover the African continent. The evidence on developed countries covers work, from Bernard and Jensen (1995) for US, Bernard and Wagner (1997) for Germany, Girma et al. (2002) for UK. They all find a positive export premium on wages ranging from 4.5 per cent, 2.6 per cent and 2.4 per cent, respectively. Moreover, the export mark up is greater for white-collar employees compared to blue-collar workers. The authors also find a negative impact of exports on wage growth, which is attributed to the decline in average wages caused by firms exiting the export market.

The studies on Latin America show that increased international trade or higher exports have a positive impact on wages and appear to widen the skilled-unskilled wage differential. For instance, Robbins (1996) finds a positive association between the relative demand for skilled labour and imports of capital goods for Argentina, Chile, Colombia, Costa Rica, Malaysia and the Philippines. Also, Robbins and Gindling (1999) observe a positive skill premium after trade reforms in Costa-Rica. Similarly, Beyer et al (1999) find a long term positive effect of openness on the skilled-unskilled wage differential in Chile. The widening wage disparity across the Latin American economies is explained by a rise in the demand for skilled labour which is caused by an increased inflow of skill-biased technology. However, due to the high level of aggregation of these analyses, the results need to be treated with caution.

Using more disaggregated data, Isgut's (2001) work on Colombian firms, generates a significant and positive export wage premium of 12.2 per cent on overall wages and the premium is relatively greater for white-collar workers. A more recent study by Arbache, Dickerson and Green (2004) differentiates between the traded and non-traded sector of the Brazilian economy. They show that wages in the traded sector decline substantially with increasing trade, consistent with the view that reforms raised the degree of competition in traded industries and thereby reduce rent sharing. Wages in the non-traded sector also decline, though by less. This results from possible spillover effects from the traded industries. Though trade reforms cause rents to fall and hence wages, highly educated workers are protected with a rise in their earnings.

In contrast, most of the evidence on the trade – wage link for the East Asian region, indicates that strong export orientation reduces the skilled-unskilled wage gap. Wood

(1994) finds rising demand for unskilled labour and a decline in wage disparity following trade liberalisation in Singapore, South Korea and Taiwan. Likewise, in their study on Taiwan, Chen and Hsu (2001) observe that net exports to less developed countries benefit blue-collar workers and reduce wage inequality while net exports to OECD economies raise relative wages of white-collar workers. As the developed world has a comparative advantage in conducting innovation, trade with this region has induced Taiwan to produce high quality products to service the advanced markets. There are pressures and incentives to upgrade their technology and employ more skilled labour while the same can not be said for trade with developing economies.

With firm level data, Tan and Batra (1997) show that, although foreign exports tend to have a positive effect on wages in Taiwan, it is less important relative to investment in research and training. Aw and Batra (1999) find that all workers in exporting firms in Taiwan earn a positive wage premium in excess of 30 per cent for skilled workers and up to 14 per cent for the unskilled. Li and Xu (2003) however, consider both the direct and indirect impact of export intensity of firms in China on the relative share of the firm's wage payment to skilled workers. While the direct impact of exports on wage inequality is negative, exports yield a positive indirect effect on the wage gap via skilled-biased technologies.

Econometric work that attempts to relate the movement in relative wages to trade for the African continent is severely limited. Evidence on the trade-wage link, can be traced to Deininger and Squire's (1996) work, where increased trade liberalisation in the late 1980s, caused rising wage inequality in Uganda and Zambia but the opposite held for Ghana and Tanzania. Using firm level data for Ghana, Gorg and Strobl (2001) use the export status of the firm to capture the impact of technology on the demand for skilled labour. Export share however does not appear as a good proxy for technology. It has no influence on the skill structure of the firm and on earnings differential. Manda (2002) finds that real earnings for all workers declined during the trade reform period in Kenya but increased later. In particular, high skilled workers benefited more from increased openness compared to the less skilled.

### 3. DATA AND EMPIRICAL METHODOLOGY

#### *Data and descriptive statistics*

We use an employer-employee matched data set that contains individual and firm-level information. The survey is conducted by the World Bank's Africa Regional Programme on Enterprise Development (RPED) and covers around 80 per cent of the manufacturing sector in six Sub-Saharan African countries namely, Cameroon, Ghana, Kenya, Tanzania, Zambia and Zimbabwe. There are three waves corresponding to the years 1993 to 1995. In each of the six countries, over 200 enterprises across four main industries<sup>3</sup> are surveyed. Firms are sampled on the basis of size to create a sample representative of the complete size distribution of establishments in the manufacturing sector. Detailed information on several aspects of the firms is gathered. Additionally, a random sample of around 10 workers is interviewed within each firm in order to generate the individual level data. One limitation of the data set is that interviewed workers are not necessarily the same across the three waves. It is not possible therefore to construct a panel of individual employees.

Other studies on Africa using this data set are Mazumdar and Mazaheri (2000) who examine the impact of labour productivity on the firm size effect for Ghana, Kenya, Zambia and Zimbabwe. Te Velde and Morrissey (2001) measure the impact of foreign ownership on wages across the same four countries and Cameroon, while Gorg et al. (2002) identify that foreign firms in Ghana pay more because of more effective on-the-job training. Strobl and Thornton (2002) and Te Velde and Morrissey (2002) use data for the same five SSA countries to evaluate the firm size wage effect and the spatiality inequality on wages, respectively.

Our variable of interest is however, the export status of firms and table 1 shows the distribution of exporters across industries in each country.

**Table 1: Percentage of exporting firms across industries**

	Cameroon	Ghana	Kenya	Tanzania	Zambia	Zimbabwe
No of firms	239	215	276	257	257	203
Exporters (%)	36.82	15.35	27.90	12.45	10.89	86.21
<b>By industry: (%)</b>						
Food	38.64	18.18	41.59	28.13	25	46.86
Textile	10.23	6.06	14.29	34.38	50	18.29
Wood	21.59	48.48	6.49	18.75	10.71	16
Metal	28.41	21.21	37.67	18.75	14.29	17.71

Source: Computed

Note the high presence of exporting firms in the food sector in three out of six countries. During the period 1993 to 1995, Cameroon's most important commodity in terms of exports was banana, followed by cocoa and coffee. Similarly, international trade plays an important role in Zimbabwe's economy where exports turn mostly around tobacco, maize and coffee. Kenya in turn is a huge exporter of coffee and tea.

On the other hand, the wood sector appears to be attractive for exporters in Ghana. Though Ghana's commodity trade is heavily concentrated on gold, other important exporting products include logs and timber supplies. Producers in the textile industry tend to export more in Tanzania and Zambia. Tanzania and Zambia have export processing zones providing incentives in terms of subsidies and tax holidays to exporters.

Exporters across the four sectors are likely to differ from non-exporting establishments. We thus examine some of the main characteristics of the exporting and non-exporting firms in table 2 below:

**Table 2: Characteristics of exporters**

	Cameroon		Ghana		Kenya		Tanzania <sup>†</sup>		Zambia		Zimbabwe	
	X	NX	X	NX	X	NX	X	NX	X	NX	X	NX
MEAR	626	381	210	163	498	256	28.5	19.0	299	157	368	308
VAD	7.7	0.7	1.3	0.3	5.9	0.7	225	137	2.0	0.5	6.4	5.0
LABP	32.2	11.5	7.0	4.7	35.0	16.1	2.1	0.8	7.0	5.4	14.6	13.4
KL	35.4	21.2	18.8	5.6	31.7	14.3	5.4	3.6	29.5	17.1	23.1	17.0
EMP	242	35	123	35	226	39	322	50	248	61	329	277
SKILL	44.0	36.8	33.4	33.2	22.4	11.0	55.4	42.0	51.5	43.9	28.5	29.2
USKILL	12.6	11.1	66.3	66.7	9.3	8.4	44.6	58.0	13.4	18.6	7.5	5.1
FOR	60.2	23.7	32.6	14.6	39.0	8.0	17.7	9.6	16.1	12.6	27.4	20.7

Source: Computed

Notes: (a) MEAR: monthly individual earnings; VAD: value-added; LABP: labour productivity; KL: capital intensity, the value of capital stock per worker; EMP: level of employment; SKILL and USKILL are the % of skilled and unskilled workers respectively; FOR: % of foreign ownership structure;

(b) X denotes exporting firms while NX are non-exporting establishments;

(c) All variables are in US PPP unless otherwise stated;

(d) †-Monthly earnings in thousands and constant 1992 Tanzanian shillings;

(e) VAD figures are in millions, LABP and KL are in thousands.

As expected, we find substantial differences between exporters and non-exporters. For instance, exporters exhibit higher value-added and labour productivity. They also tend to be more capital intensive as shown by their higher capital-labour ratios and are substantially larger in size. Moreover, they employ more skilled labour and are more likely to be foreign-owned as compared to non-exporting firms. In essence, these attributes may be important in determining wages in exporting firms.

### *Econometric modelling*

The descriptive statistics from table 2 show that exporters on average pay higher wages. This does not necessarily imply a causal link since wages are typically determined by a number of factors which must be controlled for. The starting point for estimating the effect of exports on individual wages is Mincer's (1974) basic wage determination model:

$$\ln(w_{it}) = \alpha_0 + \alpha_1 X_{it} + time + \varepsilon_{it} \quad (2)$$

where

$$i = 1, \dots, N$$



$t = 1993-95$

$w_{it}$  is the monthly wage of individual  $i$  at time  $t$ .  $X_{1it}$  is a vector of individual and human capital characteristics such as gender, age, job tenure, occupation and education.  $Time$  contains year dummies and control for time specific effects while  $\varepsilon_{it}$  is a random error term.

We include a vector of firm specific characteristics to obtain,

$$\ln(w_{it}) = \alpha_0 + \alpha_1 X_{1it} + \alpha_2 X_{2it} + time + \varepsilon_{it} \quad (3)$$

where  $X_{2it}$  denotes the characteristics of the firm in which individual  $i$  is employed. For instance, the ownership structure, firm size, location and sector dummies.

Finally, equation (3) is augmented to incorporate the export status of the firm:

$$\ln(w_{it}) = \alpha_0 + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \alpha_3 Export_{it} + time + \varepsilon_{it} \quad (4)$$

The variable  $Export$  is a dummy variable taking the value 1 when the firm exports and zero otherwise. And so,  $\alpha_3$  gives the export wage premium after controlling for the other important determinants of wages. Table A in the appendix presents all the variables used in the analysis.

#### *Estimation methodology*

The estimation of equation (4) proceeds as follows. First, we perform preliminary checks, in particular, detecting the presence of major outliers and testing for heteroscedasticity<sup>4</sup>. As no major problems are found, we apply simple OLS and specify robust<sup>5</sup> standard errors to correct for any minor deviations from the classical assumptions of least squares regressions.

Furthermore, in order to examine the potential endogenous nature of the firm's export status we carry out an augmented regression test for endogeneity (also known as the

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<sup>4</sup> This is done using the Cook and Weisberg (1983) test. We also use the Shapiro-Wilk test for normal data and the Kernel density estimates from STATA to test for the normality of the residuals.

Durbin-Wu-Hausman test, see Davidson and Mackinnon, 1993). The hypothesis of endogeneity is supported at the 1 per cent level and so, we use the Instrumental Variable (IV) methodology using the lagged export status and the value of capital stock per employee to instrument<sup>6</sup> the variable *Export* in equation (4). Robust standard errors are again specified.

#### 4. EVIDENCE ON THE WAGE AND SKILL PREMIUM FOR AFRICAN EXPORTERS

##### *Wage Premium*

In order to obtain the estimated OLS coefficients from equation 4, we first run a benchmark regression of individual earnings on export status and time dummies only. The set of other explanatory variables is then added in a stepwise manner. The results are tabled below.

**Table 3: Sensitivity of export coefficients (OLS)**

Export coefficients	Cameroon	Ghana	Kenya	Tanzania <sup>†</sup>	Zambia	Zimbabwe
No controls except time	0.471	0.443	0.482	0.360	0.367	0.164
+ Age, age-sq, tenure, tenure-sq	0.296	0.236	0.446	0.342	0.277	0.140
+ Education	0.188	0.239	0.341	0.214	0.127	0.112
+ Occupation	0.188	0.169	0.316	0.244	0.159	0.123
+ Foreign	0.148	0.150	0.272	0.143	0.261	0.104
+ State, Capital city	0.122	0.182	0.213	0.142	0.215	0.097
+ Size	0.074	0.130	0.150	0.266	0.142	0.051
+ Industry	0.085	0.152	0.129	0.176	0.171	0.040*

Notes: (a) Dependent variable is log of monthly earnings in US PPP;

(b) Robust absolute t-statistics in parentheses; all coefficients are significant at 1%, 5% and 10%;

(c) † Monthly earnings in constant 1992 Tanzanian shillings;

(d) \* Significant at 12 %.

Thus, with no controls except for time specific factors, we observe a high positive and significant wage premium on exporting in all cases. The magnitude of the export coefficient drops considerably with individual controls and falls even more when firm

<sup>5</sup> Huber/White/Sandwich estimate of standard errors from STATA.

<sup>6</sup> The choice of instruments was motivated by the very high correlation with earnings. Other variables were also considered as potential instruments (e.g. firm age and value added) but we found that export lag and capital per employee performed better.

characteristics and industry dummies are included. For instance, the export premium for Cameroon is reduced from 47.1 per cent to 18.8 per cent with individual controls and again to 8.5 per cent when the firm specific variables are added. Similarly, for Ghana and Kenya, the export premium declines from 44.3 per cent and 48.2 per cent to 15.2 per cent and 12.9 per cent respectively with the inclusion of individual and firm controls. In the case of Tanzania and Zambia, the coefficients are more than halved with 17.6 per cent and 17.1 per cent respectively. Nonetheless, in five out of the six countries, we find that a large positive and significant exporting wage premium still remains even after controlling for the other important determinants of individual wages<sup>7</sup>. The detailed findings are as follows:

**Table 4: OLS Regression Results**

	Cameroon	Ghana	Kenya	Tanzania <sup>†</sup>	Zambia	Zimbabwe	Pooling
<b><u>Individual effects</u></b>							
Male	0.057 (1.47)	0.221 (4.53)***	0.165 (5.22)***	0.229 (2.78)***	0.016 (0.35)	0.164 (4.85)***	0.086 (4.55)***
Age	0.096 (5.08)***	0.046 (4.59)***	0.034 (3.30)***	0.033 (1.48)	0.044 (3.53)***	0.091 (8.21)***	0.105 (19.38)***
Age-sq	-0.001 (3.58)***	-0.001 (4.03)***	-0.0003 (1.82)*	-0.0002 (1.13)	-0.0004 (2.49)**	-0.001 (7.37)***	-0.001 (16.09)***
Tenure	0.014 (2.45)**	0.006 (1.01)	0.001 (0.18)	-0.009 (0.67)	0.027 (3.04)***	-0.010 (1.72)*	0.001 (0.52)
Tenure -sq	-0.0001 (0.47)	-0.0000004 (0.00)	0.0000004 (0.02)	0.0003 (0.48)	-0.001 (2.59)***	0.0004 (2.19)**	0.00005 (0.55)
Primary	0.101 (1.98)**	0.106 (1.85)	0.073 (2.73)***	-0.050 (0.60)	0.267 (4.90)***	0.032 (0.84)	0.102 (5.25)***
Secondary	0.456 (8.44)***	0.221 (3.59)***	0.285 (8.98)***	0.097 (1.07)	0.579 (8.95)***	0.306 (5.83)***	0.347 (15.74)***
University	1.158 (14.77)***	0.743 (6.37)***	1.162 (10.74)***	0.439 (2.63)***	1.336 (10.83)***	0.804 (4.29)***	1.045 (21.18)***
Management	0.616 (8.07)***	2.162 (25.46)***	0.903 (6.37)***	0.764 (7.60)***	0.916 (11.77)***	1.294 (12.98)***	0.966 (24.29)***
Supervisor	0.302	1.686	0.303	0.284	0.208	0.446	0.396

<sup>7</sup> The effect of alternative specifications of export status, e.g. with alternative dummies for the share of exports in total sales, produce qualitatively similar results.

	(4.91)***	(25.00)***	(7.25)***	(4.07)***	(4.22)***	(11.45)***	(18.56)***
Master	-0.018	1.442	-	-	-0.140	-	-
	(0.11)	(21.15)***	-	-	(0.82)	-	-
Administration	0.343	1.646	0.411	0.327	0.358	0.887	0.434
	(6.97)***	(22.11)***	(7.09)***	(3.30)***	(5.60)***	(3.75)***	(16.11)***
Sales staff	0.234	1.536	0.109	0.339	0.218	0.582	0.391
	(6.02)***	(20.88)***	(1.68)*	(2.56)**	(3.95)***	(12.75)***	(17.43)***
Technician	0.016	1.457	-	0.133	-	0.454	0.247
	(0.36)	(24.07)***	-	(1.59)	-	(6.90)***	(12.36)***
Production	-	1.294	-	-	-	-	-
	-	(22.98)***	-	-	-	-	-
<b><u>Firm effects</u></b>							
Exporter	0.085	0.152	0.129	0.176	0.171	0.040	0.090
	(2.64)***	(4.33)***	(5.00)***	(1.88)*	(2.82)***	(1.55)	(6.12)***
Foreign	0.073	0.145	0.119	0.011	0.280	0.128	0.178
	(2.20)**	(5.47)***	(4.31)***	(0.13)	(6.20)***	(3.76)***	(12.42)***
State	0.135	0.089	-0.002	0.005	0.325	0.111	0.166
	(2.41)**	(2.30)**	(0.01)	(0.07)	(5.32)***	(1.78)*	(6.40)***
Capital city	0.184	0.196	0.280	0.050	0.144	0.123	0.211
	(5.55)***	(6.74)***	(13.52)***	(0.87)	(3.90)***	(4.77)***	(15.65)***
Small firm	0.176	0.069	0.071	0.110	-0.080	0.594	0.049
	(2.58)***	(0.91)	(1.65)*	(0.81)	(1.11)	(4.01)***	(1.57)
Medium firm	0.249	0.205	0.189	0.547	0.039	0.947	0.223
	(3.50)***	(2.74)***	(4.39)***	(4.13)***	(0.55)	(6.38)***	(7.24)
Large firm	0.396	0.320	0.304	0.126	0.194	1.041	0.363
	(4.65)***	(3.96)***	(6.46)***	(0.84)	(2.37)**	(7.02)***	(11.06)***
Constant	2.606	2.090	3.861	8.090	2.582	2.044	2.359
	(7.81)***	(13.09)***	(22.15)***	(20.44)***	(12.29)***	(8.49)***	(24.57)***
Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	-	-	-	-	-	-	Yes
Obs.	1638	2235	3081	447	1594	1875	10423
R-squared	0.56	0.68	0.40	0.46	0.49	0.51	0.57

Notes: (a) Dependent variable is log of monthly earnings in US PPP;  
(b) Robust absolute t-statistics in parentheses;  
(c) \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;  
(d) † Monthly earnings in constant 1992 Tanzanian shillings.

On the whole, the results show that our model performs well and that the other estimated coefficients are as expected. For instance, we find that male workers earn significantly more than their female counterparts and that wages rise with experience (proxied by age and tenure). The higher the level of education, the greater the pay. Similarly, managers, supervisors and administrators benefit from a higher wage premium relative to sales staffs, technicians and production workers.

Differences across firms also drive wages. Foreign-owned firms appear to pay higher earnings than domestic establishments<sup>8</sup>. Similar results are obtained, by Mazumdar and Mazahari, (2000), Te Velde and Morrissey (2001) and Gorg et al. (2002). Foreign firms typically pay more as they possess firm specific assets, modern technology and use capital-intensive methods making them more productive and efficient (Aitken et al, 1996). We find a positive link between state ownership and wages and in addition, firms located in the capital city tend to pay more, presumably due to higher cost of living and greater labour market rigidities (Te Velde and Morrissey, 2002). In general, workers in large firms tend to earn more than elsewhere, supporting the firm size wage effect hypothesis (see for example, Strobl and Thornton, 2002).

Table 4 also shows results from a pooled sample of the SSA economies. A positive and significant export wage premium of 9 per cent is obtained. Other main determinants of wages are foreign ownership and large firm size, which yield wage premiums to the tune of 17.8 per cent and 36.3 per cent respectively. Education and the type of occupation are also important factors in determining individual earnings.

As suggested in the previous section, the export status of the firm is likely to be endogenously determined, making OLS inconsistent. Hence, in table 5 below we generate IV estimates. The results show that the estimated IV coefficients on the export status variable have larger magnitudes relative to OLS. The average export premium for the pooled sample is 24.1 per cent, while the estimates for individual countries are as follows: 25.8 per cent for Cameroon, 15.5 per cent for Ghana, 14.0 per cent for Kenya and 48.0 per cent for Zambia. Tanzania and Zimbabwe do not yield significant results.

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<sup>8</sup> Except in Tanzania where we find no significant relationship between foreign ownership and wages.

**Table 5: Instrumental Variable (IV) Regression Results**

	Cameroon	Ghana	Kenya	Tanzania <sup>†</sup>	Zambia	Zimbabwe	Pooling
<b><u>Individual effects</u></b>							
Male	0.059 (1.05)	0.177 (4.33)***	0.215 (5.05)***	0.275 (2.87)***	-0.020 (0.28)	0.138 (3.48)***	0.059 (2.37)**
Age	0.081 (3.26)***	0.045 (4.32)***	0.023 (1.80)*	0.020 (0.60)	0.081 (5.06)***	0.093 (7.96)***	0.119 (16.35)***
Age – sq	-0.001 (1.94)*	-0.001 (3.72)***	-0.0002 (1.06)	-0.0001 (0.28)	-0.001 (4.44)***	-0.001 (-7.21)***	-0.001 (14.00)***
Tenure	0.019 (1.82)*	0.015 (2.38)**	0.012 (1.74)*	-0.002 (0.10)	0.025 (1.95)*	-0.012 (-1.98)**	0.005 (1.18)
Tenure – sq	-0.0004 (0.85)	-0.0002 (0.90)	-0.0003 (0.96)	-0.0001 (0.21)	-0.001 (1.95)*	0.0004 (2.37)**	-0.00002 (0.15)
Primary	-0.007 (0.08)	0.204 (2.84)***	0.014 (0.40)	-0.028 (0.25)	0.136 (1.71)*	0.032 (0.76)	0.073 (2.58)***
Secondary	0.327 (4.04)***	0.263 (3.37)***	0.126 (3.18)***	0.111 (0.97)	0.380 (3.86)***	0.308 (5.31)***	0.255 (8.03)***
University	0.887 (7.76)***	0.929 (7.44)***	0.999 (7.72)***	0.470 (2.26)**	0.960 (4.70)***	0.848 (4.56)***	0.904 (13.32)***
Management	0.578 (4.67)***	2.316 (22.77)***	1.039 (6.28)***	0.794 (6.24)***	1.119 (8.14)***	1.315 (13.16)***	1.057 (17.11)***
Supervisor	0.272 (2.55)**	1.775 (23.58)***	0.344 (7.33)***	0.224 (2.51)**	0.301 (4.36)***	0.436 (10.7)***	0.404 (13.26)***
Master	- -	1.528 (20.00)***	- -	- -	- -	- -	- -
Administration	0.290 (4.85)***	1.775 (22.04)***	0.525 (8.40)***	0.349 (2.81)***	0.522 (4.50)***	0.795 (3.25)***	0.456 (12.44)***
Sales staff	0.053 (0.76)	1.609 (21.46)***	0.205 (2.62)***	0.258 (1.88)*	0.239 (3.30)***	0.564 (11.21)***	0.359 (10.89)***
Technician	-0.070 (1.15)	1.484 (22.29)***	- -	0.154 (1.63)	- -	0.458 (6.73)***	0.218 (9.00)***
Production	- -	1.347 (26.29)***	- -	- -	- -	- -	- -
<b><u>Firm effects</u></b>							
Exporter	0.258	0.155	0.140	-0.073	0.480	-0.191	0.241

	(2.17)**	(1.66)*	(3.21)***	(0.36)	(2.63)***	(-0.76)	(5.36)***
Foreign	0.046	0.149	0.177	0.040	0.327	0.147	0.206
	(0.88)	(3.90)***	(4.64)***	(0.40)	(4.66)***	(3.64)***	(9.30)***
State	0.287	0.189	-0.105	0.029	0.389	0.096	0.235
	(3.15)***	(3.44)***	(0.78)	(0.28)	(4.18)***	(1.45)	(5.46)***
Capital city	0.085	0.107	0.303	0.043	0.185	0.134	0.192
	(1.56)	(2.98)***	(11.17)***	(0.59)	(3.45)***	(4.81)***	(9.85)***
Small firm	0.132	0.049	0.076	0.256	-0.096	0.668	0.006
	(1.54)	(0.56)	(1.15)	(1.38)	(0.96)	(4.08)***	(0.13)
Medium firm	0.254	0.118	0.160	0.620	0.066	1.051	0.150
	(2.71)***	(1.35)	(2.35)**	(3.55)***	(0.60)	(5.69)***	(3.37)***
Large firm	0.441	0.280	0.319	0.367	0.016	1.152	0.259
	(3.38)***	(2.95)***	(4.48)***	(1.67)*	(0.11)	(6.05)***	(5.13)***
Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country	-	-	-	-	-	-	Yes
Constant	2.652	1.985	4.320	8.147	2.316	2.036	2.405
	(6.68)***	(10.81)***	(19.91)***	(13.61)***	(8.28)***	(8.11)***	(18.48)***
<b>Obs.</b>	<b>749</b>	<b>1323</b>	<b>1649</b>	<b>345</b>	<b>650</b>	<b>1820</b>	<b>4865</b>
<b>R-squared</b>	<b>0.58</b>	<b>0.76</b>	<b>0.48</b>	<b>0.42</b>	<b>0.57</b>	<b>0.49</b>	<b>0.61</b>

Notes: (a) Dependent variable is log of monthly earnings in US PPP;  
(b) Robust absolute t-statistics in parentheses;  
(c) \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;  
(d) † Monthly earnings in constant 1992 Tanzanian shillings.

### *Skill Premiums*

While exporting firms pay higher wages, on average, when compared to non-exporting firms, it appears that the export premium is even greater for the more educated and skilled workers. We interact the export status of the firm with the five education dummies on the one hand and the eight occupation dummies on the other. We subsequently also group the occupation dummies into the skilled and unskilled categories in order to specifically quantify the effect of exports on the skilled-unskilled wage gap. The results are shown in tables 6 and 7.

**Table 6: Estimates of interacting exports with occupation and education dummies**

	Cameroon	Ghana	Kenya	Tanzania <sup>†</sup>	Zambia	Zimbabwe
Interaction terms with occupation dummies						
Exports * management	0.468 (3.35)***	0.255 (1.64)*	0.397 (1.34)	0.576 (2.36)**	-0.061 (0.34)	0.267 (1.48)
Exports * supervisor	0.226 (2.05)**	0.216 (2.18)**	0.204 (2.77)***	0.210 (1.42)	-0.091 (0.86)	0.129 (1.86)*
Exports * master	-0.459 (2.70)***	-0.091 (0.88)	- -	- -	- -	- -
Exports * administration	0.203 (2.54)**	0.278 (2.91)***	0.340 (3.55)***	0.190 (0.87)	0.510 (3.47)***	- -
Exports * sales staff	0.095 (1.52)	0.020 (0.21)	0.378 (2.42)**	0.402 (1.38)	0.226 (1.27)	0.082 (1.02)
Exports * technician	0.142 (1.80)*	0.259 (2.70)***	0.078 (1.47)	0.203 (1.12)	0.362 (3.03)***	0.021 (0.16)
Exports * production	- -	0.070 (1.77)	- -	0.013 (0.12)	- -	- -
Exports * apprentice	- -	0.315 (2.23)**	- -	- -	- -	0.284 (1.67)*
Interaction terms with education dummies						
Exports * none	-0.228 (1.19)	0.190 (1.33)	0.145 (0.32)	-0.160 (1.05)	- -	- -
Exports * some primary	-0.093 (0.82)	- -	-0.192 (3.90)***	-0.002 (0.01)	0.217 (1.14)	0.038 (0.63)
Exports * primary	0.062 (1.30)	0.193 (4.96)***	0.077 (2.27)**	0.027 (0.25)	0.110 (1.79)*	0.006 (0.17)
Exports * secondary	0.108 (2.38)**	0.049 (0.71)	0.157 (3.98)***	0.153 (1.31)	0.192 (2.05)**	0.024 (0.48)
Exports * university	0.101 (0.96)	-0.419 (1.28)	0.620 (2.90)***	0.561 (2.06)**	0.343 (1.49)	0.786 (2.44)**

Notes: (a) Dependent variable is log of monthly earnings in US PPP;

(b) Robust absolute t-statistics in parentheses;

(c) \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;

(d) † Monthly earnings in constant 1992 Tanzanian shillings.



**Table 7: Differentiating between skilled and unskilled labour**

	Cameroon	Ghana	Kenya	Tanzania <sup>†</sup>	Zambia	Zimbabwe
<b><u>Individual effects</u></b>						
Male	0.058 (1.48)	0.222 (4.55)***	0.158 (4.99)***	0.226 (2.75)***	0.019 (0.40)	0.164 (4.85)***
Age	0.098 (5.16)***	0.046 (4.61)***	0.033 (3.24)***	0.033 (1.48)	0.043 (3.51)***	0.091 (8.17)***
Age - sq	-0.001 (3.64)***	-0.001 (4.05)***	-0.0002 (1.73)*	-0.0003 (1.13)	-0.0004 (2.48)**	-0.001 (7.31)***
Tenure	0.014 (2.40)**	0.005 (1.00)	0.001 (0.20)	-0.009 (0.64)	0.026 (3.01)***	-0.010 (1.63)
Tenure - sq	-0.0001 (0.44)	0.000002 (0.01)	-0.00002 (0.08)	0.0002 (0.44)	-0.001 (2.57)**	0.0004 (2.10)**
Primary	0.101 (1.97)**	0.106 (1.84)*	0.078 (2.91)***	-0.044 (0.52)	0.266 (4.90)***	0.032 (0.83)
Secondary	0.457 (8.47)***	0.221 (3.59)***	0.296 (9.32)***	0.099 (1.09)	0.572 (8.83)***	0.304 (5.82)***
University	1.158 (14.78)***	0.742 (6.36)***	1.160 (10.47)***	0.418 (2.49)**	1.337 (10.81)***	0.817 (4.37)***
Management	0.556 (7.33)***	2.159 (25.22)***	0.800 (5.79)***	0.744 (7.39)***	0.917 (11.54)***	1.227 (11.96)***
Supervisor	0.232 (3.66)***	1.682 (24.62)***	0.159 (3.31)***	0.255 (3.41)***	0.208 (4.02)***	0.377 (8.02)***
Master	-0.090 (0.48)	1.439 (20.89)***	- -	- -	-0.148 (0.86)	- -
Administration	0.268 (5.22)***	1.642 (21.85)***	0.258 (4.41)***	0.286 (2.70)***	0.360 (5.44)***	0.779 (3.22)***
Sales staff	0.170 (4.06)***	1.531 (20.50)***	0.030 (0.46)	0.298 (2.22)**	0.220 (4.01)***	0.520 (9.87)***
Technician	-0.031 (0.64)	1.457 (24.03)***	- -	0.138 (1.66)*	- -	0.395 (4.20)***
Production	- -	1.295 (22.97)***	- -	- -	- -	- -
<b><u>Firm effects</u></b>						
Export*skilled	0.187	0.162	0.291	0.247	0.123	0.128

	(4.16)***	(3.03)***	(5.04)***	(2.10)**	(1.43)	(2.43)**
Export *unskilled	0.140	0.139	0.077	0.078	0.365	0.106
	(1.78)*	(3.38)***	(1.46)	(0.75)	(3.06)***	(1.00)
Foreign	0.078	0.145	0.139	0.010	0.274	0.126
	(2.37)**	(5.41)***	(5.18)***	(0.13)	(6.10)***	(3.69)***
State	0.132	0.088	-0.015	0.011	0.330	0.113
	(2.36)**	(2.29)**	(0.14)	(0.14)	(5.40)***	(1.81)*
Capital city	0.180	0.195	0.287	0.056	0.145	0.123
	(5.35)***	(6.71)***	(13.81)***	(0.99)	(3.94)***	(4.74)***
Small firm	0.178	0.070	0.078	0.108	-0.075	0.601
	(2.61)***	(0.92)	(1.82)*	(0.81)	(1.04)	(4.14)***
Medium firm	0.257	0.206	0.227	0.551	0.048	0.955
	(3.65)***	(2.75)***	(5.34)***	(4.17)***	(0.68)	(6.58)***
Large firm	0.387	0.322	0.345	0.132	0.217	1.046
	(4.60)***	(3.99)***	(7.56)***	(0.89)	(2.74)***	(7.21)***
Time	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Constant	2.605	2.085	3.871	8.109	2.583	2.058
	(7.82)***	(13.03)***	(22.30)***	(20.62)***	(12.31)***	(8.61)***
<b>Obs.</b>	<b>1638</b>	<b>2235</b>	<b>3081</b>	<b>447</b>	<b>1594</b>	<b>1875</b>
<b>R-squared</b>	<b>0.56</b>	<b>0.68</b>	<b>0.40</b>	<b>0.46</b>	<b>0.49</b>	<b>0.51</b>

Notes: (a) Dependent variable is log of monthly earnings in US PPP;  
 (b) Robust absolute t-statistics in parentheses;  
 (c) \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;  
 (d) † Monthly earnings in constant 1992 Tanzanian shillings.

As such, we find that managers, supervisors and administrators in exporting firms, earn higher wages relative to technicians and production workers. Likewise, there is a significantly bigger export mark up for the highly educated workers. This is consistent with the argument that exporting firms employ relatively more technology and capital-intensive methods and as a result the demand and wage rate of skilled and educated workers are higher. In addition, greater international trade serves to upgrade the technology level of developing countries through learning by doing, thus inducing firms' demand for skilled labour (Chuang, 1998). One might argue that the skilled premium is due to skilled workers being more productive or because of the high capital intensity of the firm. In which case, the higher premium has nothing to do with the export status of the firm. However, we control for capital intensity and labour productivity by capital-labour ratio and value-added as a share of employment, respectively (results not shown) and still

find a positive and relatively higher export premium for skilled workers. More importantly, our results appear to robustly confirm Manasse and Turrini's (2001) argument that the skill wage premium will be higher in exporting than non-exporting firms.

## **5. IS THE WAGE PREMIUM CONSTANT ACROSS EXPORT DESTINATIONS?**

Up till now, our analysis of the export behaviour of the African firm and its corresponding impact on wages and the skilled-unskilled wage differential is limited to whether the firm exports or not. We have so far ignored where the African firm sells its products. Our estimates show a positive export premium ranging from 8.5 per cent to 17.6 per cent, with a more pronounced premium for skilled workers. On average, white-collar workers earn from 12.8 per cent to 29.1 per cent more than the unskilled. These results are consistent with previous studies on the export – wage link, specifically with the evidence on developing countries (Aw and Batra, 1999 and Isgut, 2001) where the export premium is higher relative to developed nations. This might be interpreted as evidence of African firms being particularly sensitive to export effects or of self-selection only by the very productive firms into risky and competitive markets.

In order to explore this interpretation further, we extend on the above analysis by examining the behaviour of exporting firms on wages when they supply different export markets. We decompose the exporting status of firms into exports to other African countries and exports outside the African continent<sup>9</sup>. In general, African markets are likely to be relatively more protected and less competitive. Intra-African trade often occurs in the context of preferential regional trading arrangements, combined with substantial 'natural' protection from extra-regional competition associated with distance and poor infrastructure. For instance, Kenya, Tanzania, Zambia and Zimbabwe are member countries of the Common Market for Eastern and Southern Africa (COMESA), and with the exception of Kenya, they also form part of the Southern African Development Community (SADC). Kenya and Tanzania are also members of the East African Community (EAC). In addition, Zimbabwe has several bilateral trading agreements with other African countries namely South Africa, Namibia and the Democratic Republic of

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<sup>9</sup> Data on the destination of exports is available for all countries in our study except Ghana.

Congo. Cameroon is in turn a member country of the Central Africa Customs and Economic Union (CACEU). A high proportion of all these countries exports to the African region are to relatively close regional markets rather than other and more distant African markets. Limaõ and Venables (2002) show that some (e.g. East-West) transport costs on intra-African trade are higher than on extra-African trade. Thus much intra-African trade does not involve highly competitive conditions with a large number of potential intra-African suppliers for the particular export market. Rather the exports might be viewed as being the product of regional import substitution generated by regionally discriminatory tariff and trade costs.

Firms exporting to the regional market are likely to face less competitive market conditions than firms exporting to non-African markets, both from local and foreign suppliers. The relative smallness of the domestic market and incidence of barriers to entry will tend to reduce competition from local suppliers in African markets. Similarly higher policy and natural barriers will tend to reduce international competition in African markets. From these differences in competitiveness, we argue that the impact of exporters whose primary market is located within Africa on wages is likely to differ from that of exporters outside the continent. Our estimates reveal that intra-African exporters tend to pay a high and positive wage premium. From table 8 we see that the dummy on intra-African exporting is significantly positive in all five countries. This is consistent with the view that these firms can afford to pay more because they face relatively low levels of competition in regional markets. By contrast, exporting to outside African markets produces a wage discount in the majority of cases, except for Cameroon<sup>10</sup>. Thus for four of the five countries the evidence is consistent with greater competitive pressures applying in these more distant markets, and with this resulting in pressures for wage cost reductions. This clearly indicates the lack of robustness of the earlier finding about the effect of exporting on wages. In this context of African manufacturing firms, it is necessary to distinguish export destination as well as export status in order to appropriately capture the effect of exporting on wages<sup>11</sup>.

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10 Cameroon exports outside Africa are mainly destined towards the French market and are based on preferential trade agreements. Cameroon benefited from an increase in the quota for its products on the European market, under the Lomé Convention 1995.

11 Alternative specifications which distinguish between the extent or importance of exporting produce qualitatively similar results; the wage premium being greater for intra-African exporting as the share of exports in total sales increases and the discount on extra-African exporting increases as export propensity increases.

**Table 8: Results by export destination**

	Cameroon	Kenya	Tanzania <sup>†</sup>	Zambia	Zimbabwe	Pooling
<b><u>Individual effects</u></b>						
Male	0.068 (1.66)*	0.084 (1.19)	0.373 (2.38)**	-0.164 (1.70)*	0.108 (1.36)	0.038 (1.14)
Age	0.100 (4.74)***	0.122 (4.07)***	-0.056 (1.83)*	0.037 (1.46)	0.109 (4.25)***	0.096 (7.22)***
Age – sq	-0.001 (3.43)***	-0.001 (3.48)***	0.001 (2.76)***	-0.0003 (1.02)	-0.001 (3.83)***	-0.001 (5.77)***
Tenure	0.021 (3.35)***	-0.005 (0.49)	0.052 (1.69)*	0.038 (1.84)*	-0.021 (1.45)	0.009 (1.64)
Tenure- sq	-0.0003 (1.14)	0.0005 (1.11)	-0.002 (1.36)	-0.001 (1.81)*	0.001 (1.77)*	-0.0001 (0.39)
Primary	0.090 (1.64)	-0.013 (0.18)	0.240 (0.88)	0.125 (0.93)	0.022 (0.25)	0.090 (2.34)**
Secondary	0.457 (7.90)***	0.147 (1.87)*	0.461 (2.20)**	0.472 (3.11)***	0.424 (3.21)***	0.398 (9.38)***
University	1.154 (13.88)***	1.005 (6.17)***	0.598 (1.47)	0.991 (5.09)***	1.155 (2.86)***	1.108 (15.11)***
Management	0.523 (6.16)***	1.010 (4.33)***	1.455 (3.86)***	0.674 (3.89)***	1.734 (8.71)***	0.768 (9.72)***
Supervisor	0.223 (3.34)***	0.359 (5.47)***	0.131 (0.74)	0.139 (1.65)*	0.462 (5.21)***	0.347 (8.75)***
Master	0.195 (1.45)	- -	- -	- -	- -	- -
Administration	0.308 (6.24)***	0.551 (6.11)***	0.325 (2.36)**	0.424 (3.95)***	0.845 (2.84)***	0.384 (8.23)***
Sales staff	0.197 (4.56)***	0.358 (2.45)**	0.466 (2.22)**	0.187 (1.85)*	0.669 (5.78)***	0.318 (8.6)***
Technician	-0.049 (1.01)	- -	-0.006 (0.03)	- -	0.494 (5.21)***	0.171 (5.16)***

<b>Firm effects</b>						
Exports within	0.112	0.132	1.799	0.199	0.221	0.120
Africa	(2.40)**	(1.86)*	(3.41)***	(1.79)*	(2.39)**	(3.49)***
Exports	0.116	-0.117	-0.080	-0.312	-0.162	-0.043
outside Africa	(1.81)*	(1.87)*	(0.52)	(1.94)*	(1.71)*	(-1.18)
Foreign	0.062	0.280	0.281	0.146	0.013	0.169
	(1.71)*	(5.85)***	(0.76)	(1.65)*	(0.17)	(6.26)***
State	0.201	-0.225	-1.458	0.294	0.146	0.140
	(3.19)***	(1.94)*	(3.10)***	(3.13)***	(0.47)	(2.74)***
Capital city	0.216	0.273	-0.926	0.249	0.111	0.242
	(5.82)***	(4.74)***	(2.46)**	(2.63)***	(1.66)*	(8.75)***
Small firm	0.175	-0.043	-	0.207	0.133	0.202
	(2.54)**	(0.18)	-	(1.71)*	(1.10)	(3.36)***
Medium firm	0.243	0.090	0.718	0.296	-	0.300
	(3.36)***	(0.41)	(2.48)**	(2.24)**	-	(4.93)***
Large firm	0.399	0.197	1.463	0.479	0.134	0.443
	(4.34)***	(0.87)	(4.73)***	(3.98)***	(1.81)*	(6.62)***
Time	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Country	-	-	-	-	-	Yes
Constant	2.608	2.869	8.972	2.711	2.697	2.66
	(7.12)***	(5.92)***	(9.86)***	(6.37)***	(5.75)***	(11.94)***
Obs.	1380	723	79	267	331	2701
R-squared	0.56	0.49	0.82	0.54	0.50	0.51

Notes: (a) Dependent variable is log of monthly earnings in US PPP;  
 (b) Robust absolute t-statistics in parentheses;  
 (c) \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;  
 (d) † Monthly earnings in constant 1992 Tanzanian shillings.

## 6. CONCLUSION

This paper uses a rich employer-employee data set for six African countries over the period 1993 to 1995 to analyse the impact of exports on individual earnings in Africa. Overall, our analysis yields three main findings. Firstly, our estimates reveal a positive and significant export premium when no allowance is made for differences in export destination. This appears to be consistent with the view that exporters have higher productivity and efficiency, use more intensively capital and advanced technology and benefit from scale economies. Thus, we appear to find support for the efficiency-

enhancing effects of competitive trade (exporting) on wages. Second, our results show that exporters in Africa effectively widen the skilled-unskilled earnings differential. White-collar workers seem to benefit relatively more than the blue-collar workers when employed in exporting firms. This positive effect on wage disparity is traced to the higher capital-intensity of exporters and thus higher demand for skilled labour relative to non-exporting establishments.

However we also find that the market destination of exports matters. Once we differentiate between exporting to African and non-African markets, the wage impact of the export-status of firms' changes. Specifically, we find that exports within the regional African market generate a positive wage premium for workers. This is consistent with the view that the African market is more protected by regional trade policy and natural barriers and is therefore less competitive. In contrast, firms exporting to the markets outside Africa pay lower wages, having controlled for other factors. In contrast to the findings for exporting to all destinations, the results suggest that exporting in these circumstances does have a disciplining effect on wage costs.

In an African context it appears to be important to distinguish between exporting to the more protected regional market and exporting to the less protected non-regional market, if we are to understand how exporting affects workers' wages. This need to distinguish between alternative market destinations may be particularly important in an African context, given the relatively high incidence of regional trading agreements (RTAs) and of high transport and other trade costs. However, RTAs and relatively high trade costs may also fashion exporting behaviour in other parts of the developing world. In which case it may be necessary in these instances also to identify the competitiveness of export markets on the wage setting behaviour of export firms.

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## Appendix

**Table A: Variable definitions**

Variables	Definitions
ln (w)	Log value of monthly earnings converted to PPP US\$
Male	Dummy=1 if worker is male
Age	Age of the worker
Age-sq	Age of the worker squared
Tenure	No of years worked in the current firm
Tenure-sq	No of years worked in the current firm squared
None	Dummy=1 if worker has no education
Some primary	Dummy=1 if worker has some primary education
Primary	Dummy=1 if worker has completed primary education
Secondary	Dummy=1 if worker has completed secondary education
University	Dummy=1 if worker has completed university education
Management	Dummy=1 if worker is a manager
Supervisor	Dummy=1 if worker is a supervisor
Master	Dummy=1 if worker is a master
Administration	Dummy=1 if worker is in administration
Sales staff	Dummy=1 if worker is a sales staff
Technician	Dummy=1 if worker is a technician
Production	Dummy=1 if worker is a production or support worker
Apprentice	Dummy=1 if worker is an apprentice
Skilled	Dummy=1 if worker is skilled (manager, supervisor, master, administrator or sales staff)
Unskilled	Dummy=1 if worker is unskilled (technician, production or apprentice)
Foreign	Dummy=1 for any firm with some degree of foreign ownership
Exporter	Dummy=1 for any firm exporting
State	Dummy=1 for any firm with some degree of state ownership
Capital city	Dummy=1 for firm located in the capital city
Micro firm	Dummy=1 for micro enterprises employing 1-5 employees inclusive
Small firm	Dummy=1 for small firms employing 6-29 employees inclusive
Medium firm	Dummy=1 for medium-sized firms employing 30-99 employees inclusive
Large firm	Dummy=1 for large firms employing 100 or more employees
Exports inside Africa	Dummy=1 for firms exporting to countries within the African continent
Exports outside Africa	Dummy=1 for firms exporting to countries outside the African continent
Time	Dummies for the three waves: first, second and third waves
Industry	Dummies for the four sectors: Food; Metal; Textiles and Wood and Furniture
Country	Dummies for Cameroon, Ghana, Kenya, Tanzania, Zambia and Zimbabwe



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- 04/06 **Arijit Mukherjee and Soma Mukherjee**, “Domestic vs. Foreign Competition with Licensing”



## Members of the Centre

### Director

**Oliver Morrissey** - aid policy, trade and agriculture

### Research Fellows (Internal)

**Simon Appleton** – poverty, education, household economics

**Adam Blake** – CGE models of low-income countries

**Mike Bleaney** - growth, international macroeconomics

**Indraneel Dasgupta** – development theory, household bargaining

**Norman Gemmell** – growth and public sector issues

**Ken Ingersent** - agricultural trade

**Tim Lloyd** – agricultural commodity markets

**Chris Milner** - trade and development

**Wyn Morgan** - futures markets, commodity markets

**Tony Rayner** - agricultural policy and trade

### Research Fellows (External)

**David Fielding** (*University of Leicester*) – investment, monetary and fiscal policy

**Ravi Kanbur** (*Cornell*) – inequality, public goods – Visiting Research Fellow

**Henrik Hansen** (*University of Copenhagen*) – aid and growth

**Stephen Knowles** (*University of Otago*) – inequality and growth

**Sam Laird** (*UNCTAD*) – trade policy, WTO

**Robert Lensink** (*University of Groningen*) – aid, investment, macroeconomics

**Scott McDonald** (*University of Sheffield*) – CGE modelling, agriculture

**Mark McGillivray** (*WIDER, Helsinki*) – aid allocation, aid policy

**Andrew McKay** (*University of Bath*) – household poverty, trade and poverty

**Doug Nelson** (*Tulane University*) - political economy of trade

**Shelton Nicholls** (*University of West Indies*) – trade, integration

**Farhad Noorbakhsh** (*University of Glasgow*) – inequality and human development

**Robert Osei** (*Institute of Economic Affairs, Ghana*) – macroeconomic effects of aid

**Alberto Paloni** (*University of Glasgow*) – conditionality, IMF and World Bank

**Eric Strobl** (*University of Louvain*) – labour markets

**Finn Tarp** (*University of Copenhagen*) – aid, CGE modelling