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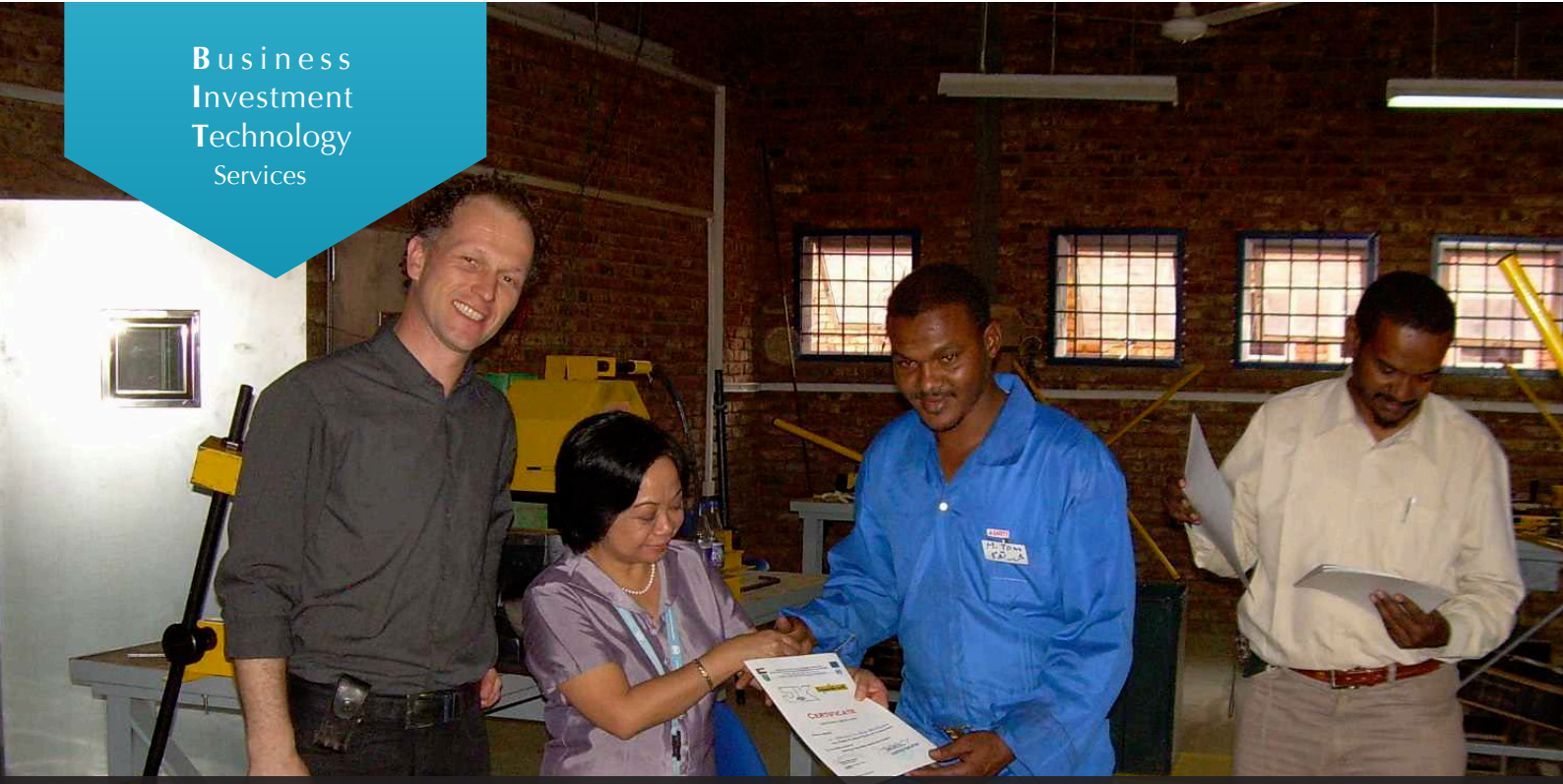

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Foreign Ownership and Labour Markets in sub-Saharan African Manufacturing and Services Firms

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Foreign Ownership and Labour Markets in sub-Saharan African Manufacturing and Services Firms♦

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Abstract

We examine whether foreign-owned firms pay higher wages and have higher employment than domestically-owned firms using survey data from 19 sub-Saharan African (SSA) countries and data on both manufacturing and services firms. Our results indicate that foreign-owned firms tend to pay higher average wages than domestically-owned firms conditional on other factors such as firm size and country and sector effects, with the wage premium found to be higher for white-collar workers. Foreign-owned firms are also found to employ more workers, an effect that tends to be larger in manufacturing firms, and for blue-collar workers in manufacturing in particular.

Keywords: Foreign-ownership, Wage Premium, Sub-Saharan Africa

JEL Classification: J21, J31, F23,

♦ The views expressed herein are those of the author(s) and do not necessarily reflect the views of the United Nations Industrial Development Organization.

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1. Introduction

The affiliates of foreign firms are likely to differ from their domestic counterparts in a number of important ways. In particular, they are likely to possess proprietary technology and knowledge that provides them with a firm-specific advantage allowing them to compete with other MNCs and local firms, which presumably have superior knowledge of local markets, consumer preferences and business practices (Blomström and Kokko, 1998). These differences may include specialised knowledge about production, superior management and marketing capabilities, export contacts, and relationships with buyers and suppliers. The differences between foreign and domestically owned firms have led researchers to address the issues of whether foreign-owned firms perform better than their domestic counterparts, and whether the presence of foreign-owned firms has spillover effects on domestic firms. Without the above-mentioned differences between foreign and domestic firms it is difficult to envisage significant spillovers occurring from foreign to domestically-owned firms. Empirical results tend to support the view that foreign-owned firms perform better in terms of productivity than domestically-owned ones (see for example Harris and Robinson, 2003; Foster-McGregor et al, 2012), though the evidence of spillovers to domestically-owned firms is less strong (see Görg and Greenaway, 2004). In this paper we move away from considering the relationship between foreign-ownership and productivity to consider whether labour market outcomes differ between foreign- and domestically-owned firms. The main focus of the paper is on the question of whether foreign-owned firms employ more people and whether they pay higher wages than their domestic counterparts.

Lipsey et al (2010) identify a number of arguments linking foreign-ownership to employment. Firstly, evidence suggests that foreign-owned firms are relatively efficient, and that they therefore may have access to foreign markets that domestically-owned firms do not. Secondly, they may also have wider contacts and knowledge of world markets and better access to financing. Both of

these advantages could have a positive effect on employment levels by enhancing firm output. On the other hand, foreign-owned firms may tend to be more capital-intensive than domestically-owned firms, and more intensive in the use of imported intermediate products, so that an increase in their sales adds less to employment than a corresponding increase by domestically-owned firms. In the context of Sub-Saharan Africa (SSA) one motivation for inward FDI may also be the large pool of unskilled labour that is available, which would further suggest that the activities of foreign-owned firms in SSA may be relatively labour-intensive.

Little empirical evidence on the relationship between foreign-ownership and employment in developing countries exists. A number of studies consider the impact of foreign acquisition on employment in developed countries however. Girma and Görg (2004) find evidence of reduced employment growth in domestic plants taken over by foreigners in the electronics sector but not in the food sector in the UK, while Girma (2005) also using UK data finds no impact of foreign acquisitions on employment in acquired domestic firms. Huttenen (2007) finds that foreign acquisition has a negative effect on the share of highly educated workers among the plant's employees, again in the UK. Bandick and Karpaty (2007) consider the effects of foreign acquisition on employment in Swedish manufacturing and find some evidence to indicate that foreign acquisition leads to increased employment, particularly so for high-skilled labour. An exception that does consider a lesser-developed country is the study of Lipsey et al (2010), which finds that employment growth in Indonesian firms was more rapid for those that were foreign-owned. Given the larger size of foreign-owned firms on average the effects on employment were pronounced.

With respect to foreign ownership and wages, commentators have long suggested that foreign-owned firms pay lower wages, particularly in developing countries, as a means of reducing costs

and increasing productivity. Empirical studies however provide strong evidence of a wage premium in foreign-owned firms (Aitken et al, 1996; Feliciano and Lipsey, 1999; Griffith and Simpson, 2003; Lipsey, 2004). Foreign firms pay higher wages in both developed and developing countries, and after controlling for firm specific characteristics. A small number of papers consider the impact of foreign-ownership on wages in SSA. Velde and Morrissey (2003) consider this relationship in five SSA countries and find that foreign-owned firms pay wages that are between 8 and 23 percent higher than their domestic counterparts. Strobl and Thornton (2004) also find that foreign owned firms pay higher wages in the same five countries as considered by Velde and Morrissey (2003). Görg et al (2002) consider the case of Ghana and show that foreign firms do pay higher wages, but only to those workers that have been in the firm some time and that have undergone on the job training. From this, they conclude that firm specific human capital accumulation is likely to explain the foreign wage premium in Ghana.

Arguments put forward to explain this positive association between foreign-ownership and wages include the arguments that foreign-owned firms possess specific advantages and assets that lead to them being more productive, that they are more capital-intensive, that they use the latest technology and that they invest more heavily in on the job training. Tandrayen et al (2008) argue further that part of the wage effect of foreign-ownership may be due to export market knowledge advantages, which increase the probability of foreign firms exporting. To the extent that exporting increases firm-level performance and wages this export-propensity effect may impact upon wages. Using data for six SSA countries they find evidence to suggest that wages are higher in foreign-owned exporting firms than in foreign-owned non-exporting firms. Foreign-owned exporters are also found to pay more than domestically-owned exporters. Interestingly, they find that foreign-owned firms exporting to other African countries pay more, whilst the premium of foreign-owned exporters exporting outside is generally insignificant, a result in line with those found by Milner and Tandrayen (2007).

In this paper we examine whether foreign-owned firms have higher levels of employment and pay higher wages in a cross-section of SSA firms using data from 19 SSA countries. While many of the above mentioned studies are able to use matched employer-employee datasets in their analysis, this option isn't open to us Instead we use firm level data on total employment, employment by type, average wages and average wages by type to examine whether foreign-owned firms pay higher wages and employ more workers in this large cross-country firm-level dataset, controlling for firm characteristics and country and sector specific heterogeneity in our analysis. Using information on employment and wages by employer type we are able to address whether the wage and employment effects of foreign ownership impact more strongly on blue-collar (i.e. production workers) or white-collar workers (i.e. non-production workers). A major difference compared to much of the existing literature in general and to the existing literature on developing countries in particular is that the data allow us to consider both manufacturing and services firms, reporting results for both sectors separately. Our results indicate that foreign-owned firms tend to pay higher average wages than domestically-owned firms, and that this wage premium is found to be higher for white-collar workers, and also tends to be larger in services than in manufacturing. Foreign-owned firms are also found to employ more people. In this case, the effects of foreign ownership are found to be larger in the case of manufacturing, with the premia often disappearing in the case of services, especially at higher quantiles. Within manufacturing the foreign ownership premium is found to be larger for blue-collar workers, with the premium found to be largest for white-collar workers in the case of services.

The remainder of the paper is laid out as follows. Section 2 discusses the empirical methodology used; Section 3 describes the data and provides some initial descriptive statistics and results from initial comparison tests; Section 4 reports the main econometric results; Section 5 reports results from the tests for wage spillovers; and Section 6 concludes.

2. Data and Descriptive Statistics

The data are drawn from the most recent UNIDO Africa Investor Survey (AIS) which was conducted in 2010 and which surveys over 6,000 agricultural, manufacturing and services firms in 19 sub-Saharan African countries. In our analysis we consider the sample of manufacturing and services firms. This gives a maximum of 5,029 firms, of which 2,816 are manufacturing firms and 2,213 are services firms. Tables A1 and A2 in the appendix report a breakdown of firms by country and sector, as well as reporting the number of foreign-owned firms and foreign-owned exporting firms. The tables indicate that 1,813 (36%) firms in the sample are foreign-owned[1], with 1,013 being in manufacturing and 800 in services sectors.

The UNIDO dataset is careful to ensure that the interviewed firms accurately represent the countries' economies by drawing samples from sampling frames which contain all available information about business activities in the surveyed countries. Furthermore, the sample was drawn by stratifying the sampling frames along the dimensions of size (10-49, 50-99 or 100+ employees), ownership (domestic or foreign) and sector (ISIC Rev. 3.1 2-digit level), and selecting companies randomly within each stratum. The data were collected mainly via face-to-face interviews between the respondent and a UNIDO enumerator, along with drop and pick on some occasions. The respondents were usually senior managers of the firm or – in case of foreign ownership – the local subsidiary. The UNIDO dataset is unique in that it covers a relatively large number of African countries and a large number of firms, and as far as we aware is the largest single survey for Africa in terms of both country and firm coverage and the only one to consider services firms. In addition, the survey is current with the survey having been conducted in 2010.

[1] Following much of the existing literature a firm is defined as foreign-owned if more than 10% of its equity is held by foreign residents.

The obvious drawbacks of the survey for our purposes are that it does not provide a matched employer-employee database and that it is a single cross-section with no time-series variation.

Table 1 reports the mean and median values of a number of labour-market variables. The variables considered are the average wage of all workers and the average wage of blue- and white-collar workers separately in US dollars[2], the relative wage of white- to blue-collar workers, the level of employment and employment of blue- and white-collar workers and the share of white-collar workers in total employment. Blue-collar workers are defined as production workers in the case of manufacturing firms and manual and sales staff in the case of services firms. White-collar workers in both types of firms are defined as technical, professional and managerial staff and clerical and administrative staff. The mean and median values are reported for all firms and for manufacturing and services firms separately, as well as for foreign- and domestically-owned firms. One characteristic of firm-level data is the prevalence of outlying observations that can have a large influence on the mean values of our variables of interest. This can be seen clearly in Table 1, with the mean and median values of our variables of interest often found to differ significantly, suggesting that outliers are a significant concern. The table also indicates that in the majority of cases the mean and median values of the variable of interest are larger for foreign-owned firms, suggesting that foreign-owned firms pay higher wages and employ more workers than domestically-owned firms. This is true for both services and manufacturing firms. The table further indicates that services firms tend to employ fewer workers than manufacturing firms, though they employ a higher share of white-collar workers. Wages on average are higher in services firms, both for blue- and white-collar workers.

Table 1 also reports results from statistical mean and median comparison tests of whether the mean and median values of our variables of interest differ significantly between domestic- and

[2] All values are converted to US dollars based on the average exchange rate of the three years prior to the survey.

foreign-owned firms. To account for heterogeneity in wages and employment across sectors and countries we first demean the variables before conducting these tests.[3] In particular, we construct a variable equal to the value of the variable of interest minus the mean of the value of the variable of interest of all firms in the same country and sector. In the majority of cases we find that there are significant differences in the mean and median values of the labour market indicators. This is particularly the case for the employment variables in the case of manufacturing firms, and for the wage variables in the case of services firms. Where significant differences in either the mean or median are found, they favour foreign-owned firms in the vast majority of cases. The exception to this is the mean of the share of white-collar workers in employment in manufacturing firms, which favours domestically-owned firms.

The results in Table 1 suggest that there are important and significant differences in wages and employment levels between domestic- and foreign-owned firms. The results only concentrate on two measures of location of the distribution however – the mean and median. In Table 2 therefore we report results from the non-parametric KS test, which considers all moments of the distribution (for details see Girma et al, 2004). Once again, when constructing these test statistics we first demean the data by country-sector to account for differences in performance across sectors and countries. The results in Table 2 indicate that in the majority of cases there are significant differences in the distributions of our variables of interest for domestic- and foreign-owned firms, the major exception being the share of white-collar in total employment. The table further indicates that with the exception of the share of white-collar workers in employment in manufacturing industries, the results indicate that the distribution of foreign-owned firms dominates that of domestically-owned firms. Consistent with the results in Table 1 therefore these results would tend to suggest that foreign-owned firms pay higher wages and employ more

[3] In unreported results we also centre the data by taking the difference from the median rather than the mean. Using this alternative centring procedure leads to very similar results. These results are available upon request.

workers than their domestic counterparts, a result that is true for both manufacturing and services firms.

Table 1: Descriptive Statistics and Mean and Median Comparison Tests

	All	Foreign-Owned	Domestically-Owned	Mean Comparison	Median Comparison
All Firms					
Average Wage	1651.3 (200.6)	2580.6 (252.7)	1128.7 (178.0)	-1.95*	31.99***
Average Wage of Blue-Collar Workers	707.7 (137.7)	911.1 (164.2)	593.2 (127.1)	-1.31	18.16***
Average Wage of White Collar Workers	1829.8 (317.8)	2845.9 (416.4)	1255.5 (265.3)	-1.95*	24.48***
Relative Wage of White to Blue Collar Workers	2.69 (2.06)	3.00 (2.25)	2.52 (2.00)	-3.27***	9.41***
Employment	126.9 (38.0)	186.5 (55.0)	93.4 (30.0)	-4.49***	16.19***
Employment of Blue-Collar Workers	77.8 (20.0)	118.5 (29.0)	54.8 (15.0)	-4.39***	11.50***
Employment of White Collar Workers	40.3 (11.0)	54.9 (16.0)	32.0 (9.0)	-3.76***	8.88***
Share of White Collar Workers in Total Employment	0.4 (0.3)	0.4 (0.3)	0.4 (0.3)	0.96	0.82
Manufacturing Firms					
Average Wage	635.9 (167.8)	610.7 (210.3)	649.9 (151.2)	0.12	17.14***
Average Wage of Blue-Collar Workers	525.5 (127.1)	476.2 (148.6)	553.1 (114.5)	0.33	12.16***
Average Wage of White Collar Workers	787.5 (265.1)	963.3 (373.2)	688.1 (226.6)	-0.46	16.76***
Relative Wage of White to Blue Collar Workers	2.62 (2.01)	3.00 (2.32)	2.41 (1.91)	-4.31***	13.38***
Employment	145.3 (47.0)	227.3 (72.0)	99.3 (35.0)	-4.27***	11.43***
Employment of Blue-Collar Workers	98.7 (30.0)	157.4 (50.0)	65.7 (21.0)	-5.11***	14.77***
Employment of White Collar Workers	36.3 (12.0)	51.3 (17.0)	27.9 (10.0)	-3.03***	10.56***
Share of White Collar Workers in Total Employment	0.3 (0.3)	0.3 (0.3)	0.3 (0.3)	1.97*	0.75
Services Firms					
Average Wage	2947.0 (268.5)	5063.3 (341.1)	1743.9 (235.9)	-2.02**	14.53***
Average Wage of Blue-Collar Workers	974.2 (164.3)	1544.9 (197.9)	651.9 (148.6)	-1.67*	5.12**
Average Wage of White Collar Workers	3160.9 (397.2)	5255.1 (497.8)	1979.5 (352.7)	-1.89*	10.71***
Relative Wage of White to Blue Collar Workers	2.80 (2.11)	3.01 (2.15)	2.69 (2.08)	-0.81	0.18
Employment	103.6 (28.0)	134.9 (33.0)	85.8 (25.0)	-1.85*	3.15*
Employment of Blue-Collar Workers	51.2 (10.0)	69.3 (12.0)	41.0 (10.0)	-1.40	0.15
Employment of White Collar Workers	45.3 (10.0)	59.4 (13.0)	37.3 (9.0)	-2.29**	0.35
Share of White Collar Workers in Total Employment	0.5 (0.4)	0.5 (0.5)	0.5 (0.4)	-0.33	1.21

Table 2: KS Test Results for Manufacturing Firms

	Alternative Hypothesis		
	Unequal Distributions	Difference favourable to foreign owned	Difference favourable to domestically owned
All Firms			
Average Wage	0.00***	0.98	0.00***
Average Wage of Blue-Collar Workers	0.00***	0.78	0.00***
Average Wage of White Collar Workers	0.00***	1.00	0.00***
Relative Wage of White to Blue Collar Workers	0.00***	0.66	0.00***
Employment	0.00***	0.43	0.00***
Employment of Blue-Collar Workers	0.00***	0.42	0.00***
Employment of White Collar Workers	0.00***	0.30	0.00***
Share of White Collar Workers in Total Employment	0.26	0.13	0.58
Manufacturing Firms			
Average Wage	0.00***	0.66	0.00***
Average Wage of Blue-Collar Workers	0.00***	0.69	0.00***
Average Wage of White Collar Workers	0.00***	0.82	0.00***
Relative Wage of White to Blue Collar Workers	0.00***	0.99	0.00***
Employment	0.00***	0.24	0.00***
Employment of Blue-Collar Workers	0.00***	0.47	0.00***
Employment of White Collar Workers	0.00***	0.54	0.00***
Share of White Collar Workers in Total Employment	0.06*	0.03**	0.71
Services Firms			
Average Wage	0.00***	0.99	0.00***
Average Wage of Blue-Collar Workers	0.00***	0.99	0.00***
Average Wage of White Collar Workers	0.00***	1.00	0.00***
Relative Wage of White to Blue Collar Workers	0.12	0.18	0.06*
Employment	0.08*	0.29	0.04**
Employment of Blue-Collar Workers	0.49	0.25	0.26
Employment of White Collar Workers	0.00***	0.51	0.00***
Share of White Collar Workers in Total Employment	0.90	0.52	0.54

Notes: Reported in the table are the p-values from the KS test. ***, ** and * indicate significance at the 1, 5, and 10 percent levels.

3. Methodology

We now turn to regression analysis which allows us to condition on other factors affecting labour market outcomes. In the regression analysis that follows we concentrate on the relationship between foreign ownership and both average wages and employment, as well as considering average wages and employment separately for blue- and white-collar workers. Our initial empirical specification is:

$$\ln Y_{ijk} = \beta_1 AGE_{ijk} + \beta_2 \ln SCALE_{ijk} + \beta_3 \ln KL_{ijk} + \beta_4 HK_{ijk} + \beta_5 FEMSH_{ijk} + \beta_6 EXP_{ijk} + \beta_7 FOREIGN_{ijk} + \theta_{jk} + \varepsilon_{ijk} \quad (1)$$

where Y is either a measure of average wages or a measure of employment in firm i in sector j in country k, AGE is firm age in years, $SCALE$ is defined as the ratio of firm output to average firm output in the industry and country in which the firm operates and is included as a measure of firm size, KL is the capital labour ratio, HK is a measure of human (the ratio of white to blue collar workers), $FEMSH$ is the share of females in total employment, EXP is a dummy taking the value 1 if the firm is an exporter, $FOREIGN$ is a dummy taking the value one if the firm is foreign-owned, and θ_{jk} are sector-country fixed effects. The inclusion of sector-country fixed effects controls for a potential endogeneity problem related to foreign ownership. In particular, we may expect that foreign owned firms select into high productivity sectors and countries, which may impact upon wages and employment and in turn may lead to a spurious foreign ownership premium. Including country-sector fixed effects will control for unmodelled differences across sectors and countries, including such differences in sector and country productivity levels, thus removing this potential endogeneity problem. This model is estimated on the average wages of all workers and total employment as well as the average wages and employment of white-collar and blue-collar workers separately. The model is further estimated for the full sample of firms and for manufacturing and services firms separately.

In a sample of heterogeneous firms values of some variables are likely to be far away from others. These outliers could be due to reporting errors or to idiosyncratic events and can have a large influence on the coefficients when estimating the regression model by Ordinary Least Squares (OLS). Given that outlying observations are likely to be an issue in the dataset used we choose

not to report results from (OLS) regression.[4] Instead we use robust regression methods. A number of robust regression methods have been developed that deal with the problem of outliers, examples including the M-estimator of Huber (1964), the class of S-estimators of Rousseeuw and Yohai (1987) and the MM-estimators of Yohai (1987). In a panel context, Bramatia and Croux (2007) have proposed two robust estimators, namely the Within Groups Generalized M-estimator and the Within Groups MS-estimator. These both involve centring the data in a manner similar to that used in the standard within-groups estimator, but centring by removing the median rather than the mean. Once centred a robust estimator is applied to deal with outlying observations. In this paper we follow a similar approach suggested by Verardi and Wagner (2012) which proceeds in three steps. The first step is to centre the variables, which in our case implies removing the country-industry specific median from each of our variables. In the second step we regress the centred dependent variable on the centred explanatory variables using the robust S-estimator. Using the residuals from this regression and the estimated standard error of the residuals, we then identify outlying observations by flagging those firms that have robust standardised residuals that are larger than 2. Finally, we run a standard fixed-effects regression model awarding a weight of zero to the outliers.

In addition to the fixed effects robust regression method described above we also report results using Quantile Regression (QR) methods. QR estimates the parameters of the regression model at different points on the (conditional) employment or wage distribution.[5] Estimation by QR has two main advantages over OLS for our purposes. Firstly, QR is robust with regard to outlying observations in the dependent variable. The QR objective function is a weighted sum of absolute deviations, which gives a robust measure of location, so that the estimated coefficient vector is not sensitive to outlier observations on the dependent variable. Secondly, potentially different

[4] Results from OLS estimation are found to be consistent with those reported below however, and are available upon request.
[5] For an introduction to quantile regression models see Buchinsky (1998) and Koenker and Hallock (2001).

solutions at distinct quantiles may be interpreted as differences in the response of the dependent variable to changes in the regressors at various points on the conditional distribution of the dependent variable. QR thus allows us to estimate different parameters on the foreign-ownership dummy for under-achievers (i.e. those firms at the lower end of the conditional employment or wage distribution) and over-achievers (i.e. those firms at the upper end of the conditional employment or wage distribution), thereby allowing for non-linear effects of foreign ownership on wages and employment. In our analysis we report QR results for all quantiles from the 10th to the 90th percentile, which allows us to examine whether there are heterogeneous effects of foreign ownership on wages and employment.

One problem with the use of QR arises when including a large number of fixed effects, such as in our case where we include sector-dummy fixed effects. In particular, the inclusion of a large number of fixed effects leads to an incidental parameters problem; with a large number of cross-sectional units (i.e. sector-country fixed effects) and a small number of observations for each cross-sectional unit the estimates of the fixed effects are likely to be poor. The poor quality of the estimates of the country fixed effects causes the estimates of the main parameters of interest to be badly behaved. Koenker (2004) discusses approaches to deal with such problems, including a class of penalised QR estimators, while Powell (2010) develops an unconditional QR estimator that allows for the inclusion of fixed effects. Both of these approaches are computationally intensive however. Recently, Canay (2011) has introduced an alternative method of estimating QR models with fixed effects that is easy to implement using standard software. The method is based upon the assumption that the fixed-effects in the model act like pure location shift effects, meaning that the fixed effects are constant across quantiles. Given this assumption, Canay proposes the following two-step estimator for a standard panel with N cross-section units and T time periods:

(i) Estimate the standard fixed effects regression at the conditional mean and using the estimated parameters from this model construct estimates for the individual fixed effects as $\hat{\alpha}_i = \frac{\sum_{t=1}^{T}(Y_{it} - X_{it}'\hat{\beta}_\mu)}{T}$, where $\hat{\alpha}_i$ are the estimated fixed effects, Y_{it} is the dependent variable, X_{it} are the explanatory variables, and $\hat{\beta}_\mu$ are the estimated parameters from the conditional mean regression.

(ii) Define $\hat{Y}_{it} \equiv Y_{it} - \hat{\alpha}_i$ and estimate the QR model using this newly defined variable as the dependent variable.

Canay (2011) also proposes a bootstrap procedure for estimating the variance-covariance matrix for this estimator. The bootstrap method is implemented by drawing with replacement a sample of size NT and computing the two-step estimator as described above. Repeating this a total of B times the estimated bootstrapped variance-covariance matrix at quantile τ is constructed as:

$$\frac{1}{B}\sum_{j=1}^{B}\left(\hat{\beta}_j^*(\tau) - \bar{\beta}^*(\tau)\right)\left(\hat{\beta}_j^*(\tau) - \bar{\beta}^*(\tau)\right)'$$

where $\hat{\beta}_j^*(\tau)$ are the estimated parameters from the jth bootstrap and the τth quantile, and $\bar{\beta}^*(\tau) = \frac{1}{B}\sum_{j=1}^{B}\hat{\beta}_j^*(\tau)$.

4. Regression Results

The discussion of the results is split into two subsections. In the first subsection we report results when considering the relationship between foreign ownership and different indicators of average wages, while in the second we report results when indicators of employment are our dependent variable. In each subsection we report results for all workers and for blue- and white-collar workers separately. We further report results separately for manufacturing and services firms to examine whether there are differences in the wage premium between these two types of firms.

4.1. Results for Wages

Table 3 reports results when estimating the wage equation using the fixed effects robust regression of Verardi and Wagner (2012). Beginning with the additional explanatory variables we find that age, scale and the capital-labour ratio tend to have a positive and significant relationship with the wage variables in both manufacturing and services firms. The results on firm size provide some support for the positive size-wage effect that has been found in earlier literature (see for example Strobl and Thornton (2004) in the context of SSA countries). The impact of scale and the capital-labour ratio tend to be stronger for the average wages of white-collar workers. The coefficients on human capital are found to be positive and significant for all workers and for blue-collar workers, but negative and significant for white-collar workers. The coefficient on the female employment share tends to be negative and significant, with the effects being larger for blue-collar workers. The exporter dummy is generally found to have a positive and significant coefficient, with the magnitude of the coefficient being larger for white-collar workers. Overall, despite some interesting differences between services and manufacturing firms and between blue- and white-collar workers, these results are largely as expected. They suggest that younger, larger, more capital and exporting firms pay higher wages. Evidence of discrimination against women in terms of wages is also found in some cases, consistent with existing results from Mincerian wages regressions.

Turning to our main variable of interest, the foreign ownership dummy, we observe positive and significant coefficients in all cases. The overall wage premium is found to be 23% for all firms, with a higher premium (28%) observed for services firms than for manufacturing firms (20%).[6] The wage-premia tend to be higher for white-collar than for blue-collar workers. The wage premium is 16% for blue-collar workers and 27% for white-collar workers when considering all

[6] The premia are calculated from the estimated coefficients on the foreign ownership dummies as $100(e^{\beta} - 1)$, where β is the estimated coefficient.

firms, and again these tend to be larger for white-collar than for blue-collar workers when considering manufacturing and services firms separately (25% versus 15% in the case of manufacturing and 18% versus 28% in the case of services). The results suggest therefore that the wage premium is higher for skilled relative to unskilled workers, a result consistent with others in the literature (see for example Tandrayen et al, 2008).

Table 3 only reports results at the mean of the conditional wage distribution. To shed more light onto the relationship between foreign ownership and wages we report further in figures 1-3 the estimated coefficients on the foreign ownership dummy at each quantile from the 10th to the 90th percentile of the conditional wage distribution. The figures report coefficients when considering average wages and average wages of blue- and white-collar workers for all firms, manufacturing firms only and services firms only respectively.[7] Figure 1 indicates that the coefficient on the foreign ownership dummy is larger in the case of white-collar workers across all quantiles. While the coefficient in the case of blue-collar workers remains fairly stable across quantiles, it increases as we move to higher quantiles in the case of white-collar workers, meaning that the difference in the foreign ownership premium between blue- and white-collar workers increases as we move to higher quantiles. In other words, the foreign ownership premium for white-collar workers tends to be larger for over-achieving firms than for under-achieving firms, with no such difference observed in the case of blue-collar workers. Results for manufacturing firms in Figure 2 are largely similar to those for all firms, though the foreign ownership premium for blue-collar workers declines as we move to higher quantiles. In the case of services (Figure 3) we again find that the foreign ownership premium is larger for white-collar workers, though in this case the premium increases as we move to higher quantiles for both white- and blue-collar workers.

[7] For ease of presentation confidence intervals are not included. In all cases the coefficients are significant at least at the 5 percent level however.

Table 3: Wage Regression Results – Fixed Effects Robust Regression

	All Firms			*Manufacturing Firms*			*Services Firms*		
	$\ln WAGE$	$\ln WAGE\ (BLUE)$	$\ln WAGE(WHITE)$	$\ln WAGE$	$\ln WAGE\ (BLUE)$	$\ln WAGE(WHITE)$	$\ln WAGE$	$\ln WAGE\ (BLUE)$	$\ln WAGE(WHITE)$
AGE	0.00350***	0.00282***	0.00316***	0.00338***	0.00358***	0.00276***	0.00317***	0.00118	0.00360***
	(0.000624)	(0.000625)	(0.000700)	(0.000745)	(0.000768)	(0.000849)	(0.00110)	(0.00109)	(0.00123)
$SCALE$	0.0419***	0.0375***	0.0484***	0.0406***	0.0325***	0.0431***	0.0495***	0.0532***	0.0635***
	(0.00627)	(0.00573)	(0.00688)	(0.00841)	(0.00690)	(0.00878)	(0.00815)	(0.00932)	(0.00970)
$\ln KL$	0.0481***	0.0319***	0.0423***	0.0385***	0.0280***	0.0324***	0.0603***	0.0349***	0.0514***
	(0.00682)	(0.00684)	(0.00753)	(0.0100)	(0.00990)	(0.0112)	(0.00924)	(0.00940)	(0.0102)
HK	0.00598***	0.00367***	-0.00151***	0.00686***	0.00273***	-0.00170**	0.00544***	0.00418***	-0.00143**
	(0.000415)	(0.000417)	(0.000451)	(0.000691)	(0.000675)	(0.000771)	(0.000526)	(0.000545)	(0.000572)
$FEMSH$	-0.00121**	-0.00206***	-2.07e-06	-0.00177***	-0.00250***	-0.00118*	-3.88e-05	-0.00144*	0.00140
	(0.000477)	(0.000472)	(0.000534)	(0.000562)	(0.000563)	(0.000650)	(0.000817)	(0.000851)	(0.000881)
EXP	0.0690***	0.0485*	0.0888***	0.0568**	0.0516*	0.0977***	0.124**	0.0494	0.0961*
	(0.0251)	(0.0250)	(0.0285)	(0.0279)	(0.0283)	(0.0329)	(0.0522)	(0.0515)	(0.0557)
$FOREIGN$	0.206***	0.153***	0.238***	0.186***	0.144***	0.227***	0.245***	0.166***	0.245***
	(0.0215)	(0.0209)	(0.0242)	(0.0291)	(0.0277)	(0.0330)	(0.0327)	(0.0325)	(0.0358)
Foreign Ownership Premia	22.875	16.532	26.871	20.442	15.488	25.483	27.762	18.057	27.762
Observations	4,326	4,029	4,266	2,438	2,409	2,400	1,887	1,620	1,867
R^2	0.636	0.603	0.557	0.565	0.539	0.515	0.641	0.645	0.555
F-Statistic	11.11***	9.14***	7.91***	9.21***	8.27***	7.44***	9.70***	8.66***	6.77***

All models include unreported country and sector fixed effects; Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Wage Regression Results by Quantile – All Firms

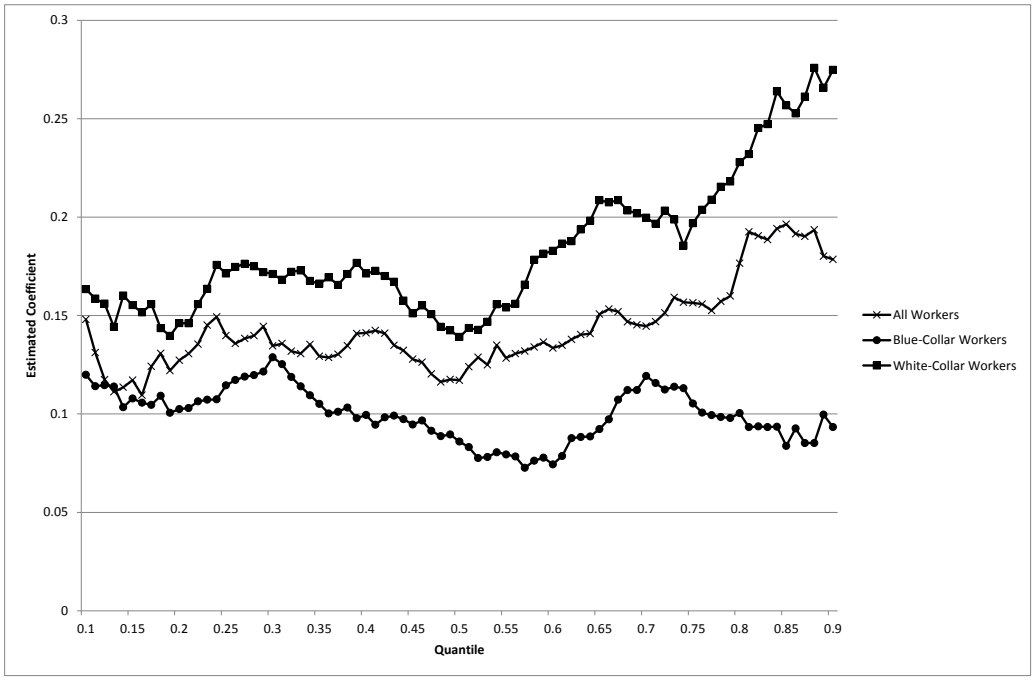


Figure 2: Wage Regression Results by Quantile – Manufacturing Firms

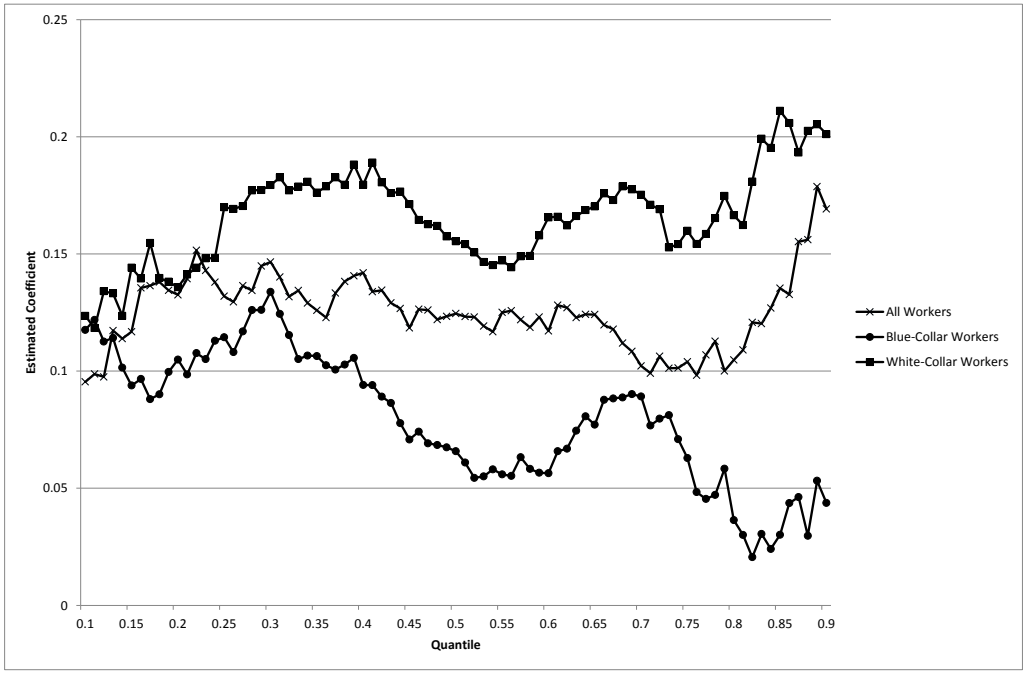
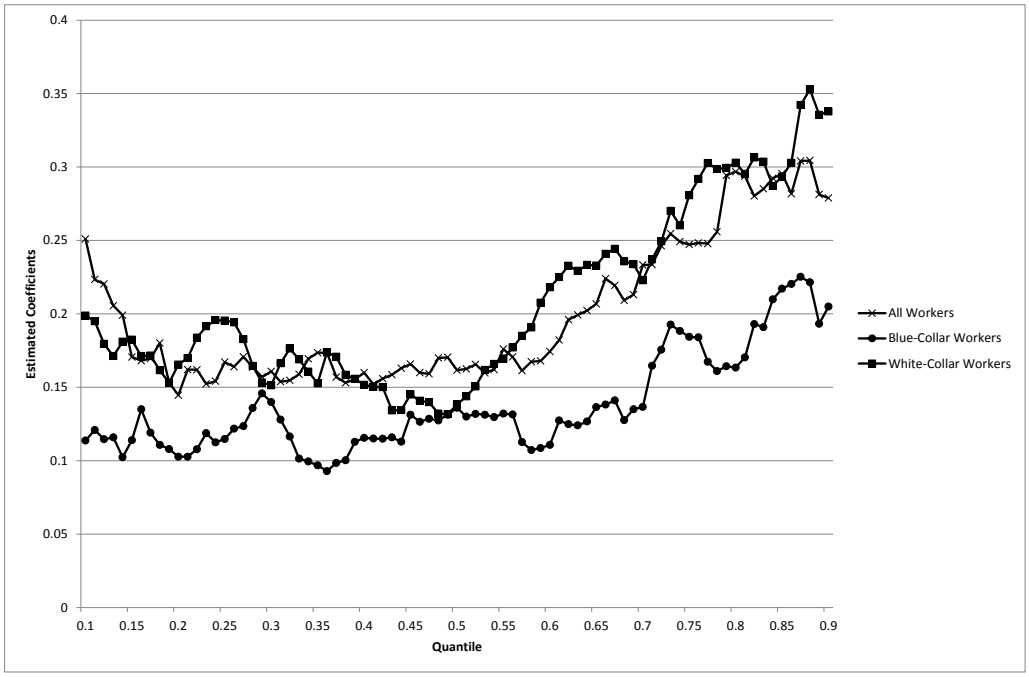


Figure 3: Wage Regression Results by Quantile – Services Firms



4.2. Results for Employment

Table 4 reports results from the fixed effects robust employment regressions, with results again reported for all firms, manufacturing firms only, and services firms only. The table also reports results for all workers and for blue- and white-collar workers separately. Coefficients on the control variables are largely as expected. Age is found to have a positive relationship with all types of employment, as does firm size. In the latter case, we find that the coefficients tend to be larger in the case of services firms, with the coefficients being fairly similar for blue- and white-collar workers. The coefficient on the capital-labour ratio tends to be negative, though is usually insignificant. This is also the case for the share of females in employment, except in the case of services where the coefficient is negative and significant for white-collar workers in particular. Given the definition of our human capital it is unsurprising that we observe a negative (positive) and significant coefficient on this variable for blue- (white-) collar workers. The coefficient on exporting tends to be positive and significant for all firms and for manufacturing firms only, but generally insignificant in the case of services firms. The coefficient on the exporter dummy tends

to be larger for blue-collar workers. Turning to the foreign ownership dummy we find coefficients that are generally positive and significant. In the case of all firms, we obtain a foreign ownership premium of around 28%, with the premium being somewhat larger for blue- (27%) relative to white-collar (23%) workers. The premia in manufacturing firms are found to be somewhat larger (42%), and are again higher for blue-collar workers (41% versus 30%). In services firms we find a much smaller foreign ownership premium, being just 11%, with the premium being larger for white-collar workers in this case (12% versus 6%).

As in the case of the wage regressions we also report results at different points on the conditional distribution of employment, using the approach of Canay (2011). These are reported in figures 4-6. The figures look somewhat different to those from the wage regressions. Considering all firms (Figure 4) we observe that the coefficients on the foreign ownership variable tend to decline as we move to higher quantiles, suggesting that the relationship between foreign ownership and employment is smaller for over-achievers (i.e. firms that have higher employment than expected given values of the explanatory variables). The foreign ownership premium is found to be higher for blue- than for white-collar workers, with this difference being greatest in middle quantiles. Results when considering manufacturing firms only (Figure 5) are similar to those for all firms, indicating a declining foreign ownership premium. The premium is again usually found to be larger in the case of blue-collar workers, except at lower quantiles where the premium in the case of white-collar workers is larger. Results for services firms (Figure 6) also indicate a declining premium as we move to higher quantiles. In this case, we observe coefficients after the 50th percentile that are very close to zero (and that are not found to be significant). In this case, there is no clear pattern when comparing the foreign ownership premium for blue- and white-collar employment.

Table 4: Employment Regression Results – Fixed Effects Robust Regression

VARIABLES	All Firms			Manufacturing Firms			Services Firms		
	$\ln EMP$	$\ln EMP(BLUE)$	$\ln EMP(WHITE)$	$\ln EMP$	$\ln EMP(BLUE)$	$\ln EMP(WHITE)$	$\ln EMP$	$\ln EMP(BLUE)$	$\ln EMP(WHITE)$
AGE	0.0153***	0.0133***	0.0161***	0.0153***	0.0145***	0.0160***	0.0150***	0.0110***	0.0163***
	(0.00120)	(0.00128)	(0.00119)	(0.00156)	(0.00159)	(0.00154)	(0.00185)	(0.00217)	(0.00190)
$SCALE$	0.206***	0.191***	0.191***	0.184***	0.177***	0.175***	0.239***	0.209***	0.213***
	(0.0240)	(0.0232)	(0.0229)	(0.0337)	(0.0330)	(0.0325)	(0.0263)	(0.0250)	(0.0254)
$\ln KL$	-0.0206*	-0.0205	0.00977	-0.0227	-0.0128	0.00600	-0.0204	-0.0252	0.0149
	(0.0120)	(0.0128)	(0.0120)	(0.0175)	(0.0176)	(0.0171)	(0.0156)	(0.0182)	(0.0163)
HK	-0.00963***	-0.0226***	0.0107***	-0.0123***	-0.0288***	0.0152***	-0.00747***	-0.0183***	0.00824***
	(0.000697)	(0.000834)	(0.000703)	(0.00114)	(0.00131)	(0.00116)	(0.000865)	(0.00105)	(0.000904)
$FEMSH$	-0.000303	0.00102	-0.00118	0.00109	0.00195	0.00146	-0.00371***	-0.00223	-0.00502***
	(0.000911)	(0.00100)	(0.000877)	(0.00120)	(0.00127)	(0.00114)	(0.00140)	(0.00165)	(0.00140)
EXP	0.413***	0.411***	0.383***	0.524***	0.518***	0.459***	0.114	0.0498	0.226***
	(0.0439)	(0.0482)	(0.0423)	(0.0534)	(0.0545)	(0.0502)	(0.0795)	(0.100)	(0.0827)
$FOREIGN$	0.248***	0.237***	0.203***	0.350***	0.341***	0.261***	0.108**	0.0588	0.115**
	(0.0392)	(0.0423)	(0.0380)	(0.0553)	(0.0560)	(0.0519)	(0.0511)	(0.0615)	(0.0526)
Foreign Ownership Premia	28.146	26.744	22.507	41.907	40.635	29.823	11.405	6.056	12.187
Observations	4,541	4,227	4,473	2,558	2,525	2,520	1,974	1,702	1,949
R-squared	0.566	0.598	0.578	0.559	0.603	0.562	0.563	0.530	0.610
F-test	8.54***	9.27***	8.91***	9.20***	10.93***	9.17***	17.26***	5.66***	8.81***

All models include unreported country and sector fixed effects; Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Figure 4: Employment Wage Regressions – All Firms

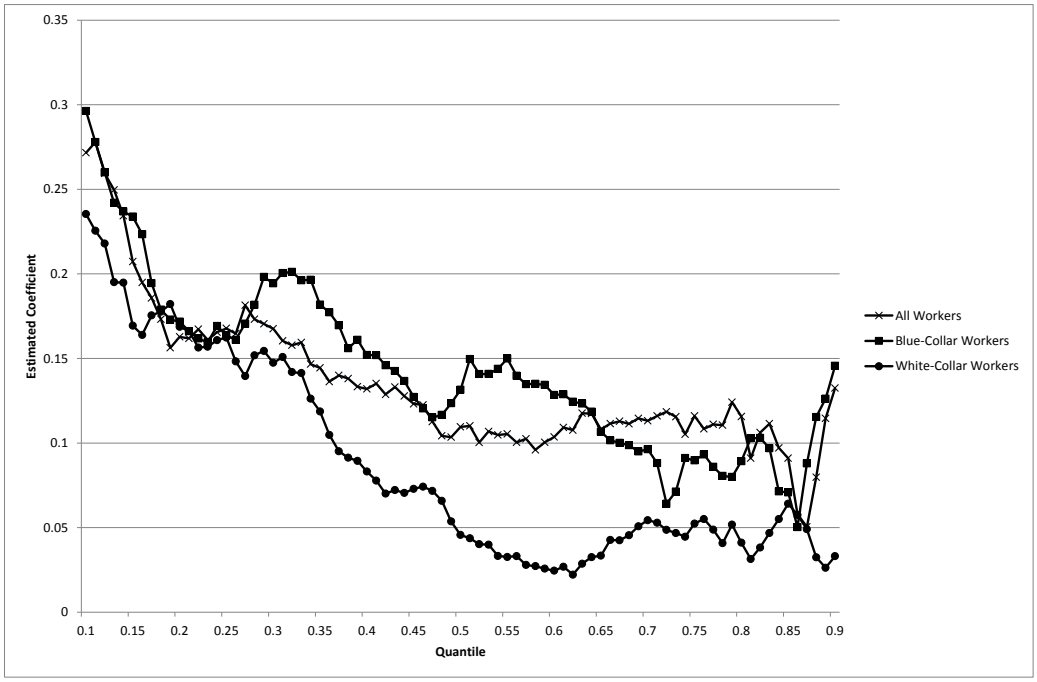


Figure 5: Employment Regression Results – Manufacturing Firms

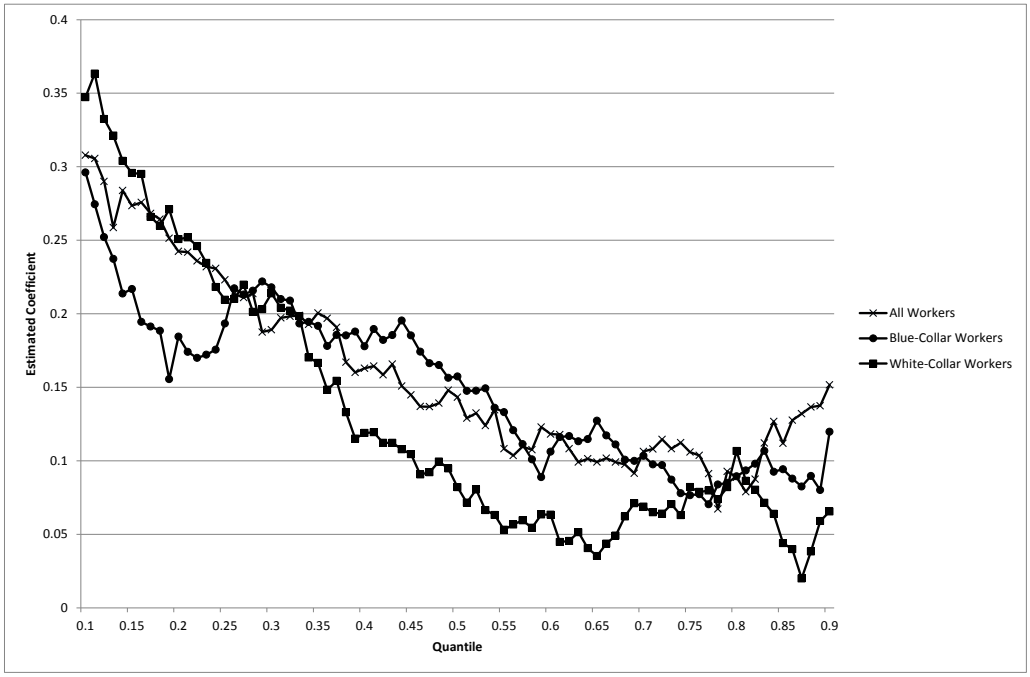
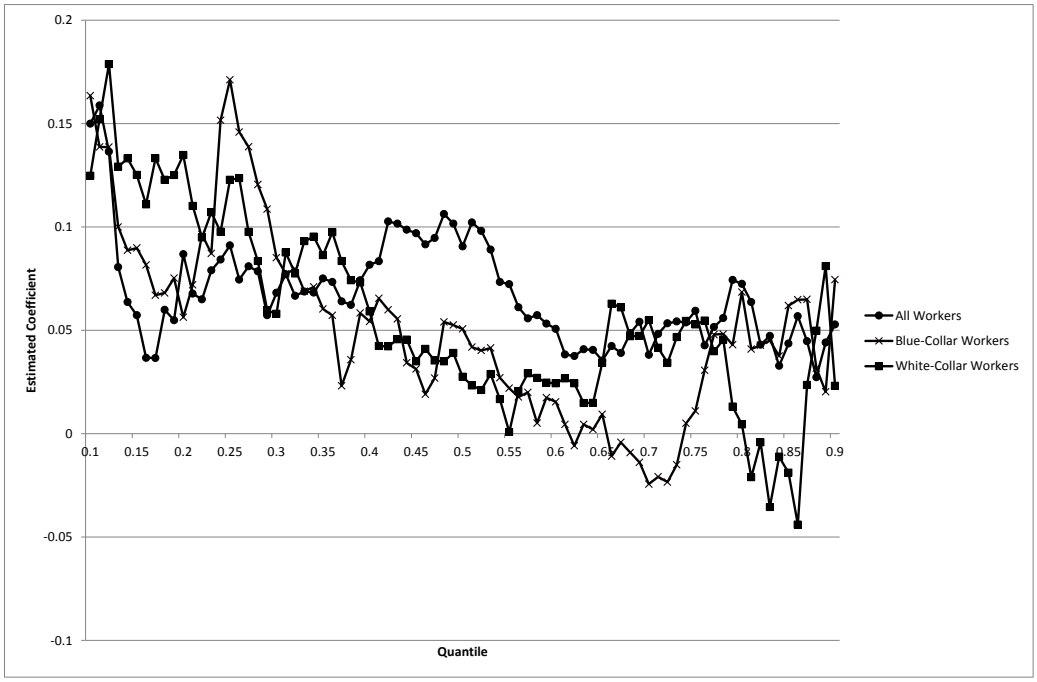


Figure 6: Employment Regression Results – Services Firms



5. Conclusions

This paper uses recent survey data at the firm-level to examine the impact of foreign-ownership on labour market outcomes in a relatively large sample of sub-Saharan African countries. Understanding the effects of foreign ownership on labour market outcomes is highly policy relevant. Policymakers often encourage inward FDI as a means of encouraging development through inward capital flows and through the transfer of technology and knowledge that can lead to productivity benefits for local firms. In addition, FDI may create earning and job opportunities that may not have been available to local workers otherwise. Such (potential) positive effects of inward FDI can be offset however if foreign-owned firms pay significantly lower wages, do not create employment opportunities, or push up costs – such as wages – for domestically-owned firms.

Our results indicate that foreign-owned firms tend to pay higher average wages than domestically-owned firms conditional on other factors such as firm size and country and sector effects. While this is true for all workers our regression results indicate that the wage premium is found to be higher for white-collar workers, and also tends to be larger in services than in manufacturing. The results reported in the paper further indicate that foreign-owned firms employ more people conditional on the other explanatory variables, a result that is true for both all workers and for blue- and white-collar employment separately. In this case, the effects of foreign ownership are found to be larger in the case of manufacturing, with the premia often disappearing in the case of services, especially at higher quantiles. Within manufacturing the foreign ownership premium is found to be larger for blue-collar workers, with the premium found to be largest for white-collar workers in the case of services.

Overall, the results paint a positive picture of foreign-ownership on labour markets in sub-Saharan Africa. A greater share of foreign ownership would be associated with higher average wages and greater employment. Such conclusions suggest that policy should be aimed at increasing the levels of inward investment into SSA, and that employment effects are likely to be greater if such investment is aimed at utilising the large pool of unskilled but trainable labour available in manufacturing. Despite this, there is the risk that in the short- to medium-term by paying higher wages – particularly to higher-skilled workers – foreign-owned firms may limit the availability of skilled workers for domestically-owned firms. In the longer-run perspective, an expanding domestic sector in need of skilled labour may have to offer an additional wage premium to attract these labour back from foreign firms.

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Appendix

Table A1: Breakdown of Manufacturing Firms by Country

Country	Frequency (Share in Total, %)	Foreign-Owned	Exporter	Foreign-Owned Exporter
Burkina Faso	87 (1.73)	20	23	8
Burundi	137 (2.72)	37	22	10
Cameroon	198 (3.94)	99	60	44
Cape Verde	320 (6.36)	85	22	10
Ethiopia	459 (9.13)	98	80	25
Ghana	340 (6.76)	147	81	43
Kenya	502 (9.98)	232	237	137
Lesotho	139 (2.76)	60	49	37
Madagascar	198 (3.94)	104	80	47
Malawi	101 (2.01)	33	24	10
Mali	241 (4.79)	70	41	21
Mozambique	220 (4.37)	95	11	7
Niger	69 (1.37)	17	5	2
Nigeria	452 (8.99)	95	47	15
Rwanda	134 (2.66)	54	37	18
Senegal	211 (4.20)	79	68	36
Tanzania	358 (7.12)	123	87	42
Uganda	624 (12.41)	300	165	111
Zambia	239 (4.75)	65	50	20
Total	5,029 (100)	1,813	1,189	643

Notes: Column 1 of the table reports the number of observations by country (with the share of the total number of firms in brackets). The remaining columns report the number of foreign-owned firms, exporting firms, and foreign-owned exporters in each country sample (along with the shares of these firm types in the total number of firms sampled in each country).

Table A2: Breakdown of Manufacturing Firms by Industry

Industry	Frequency (Share, %)	Foreign-Owned (Share, %)	Exporter (Share, %)	Foreign-Owned Exporter (Share, %)
Manufacture of food products and beverages	604 (12.01)	186	211	103
Manufacture of tobacco products	19 (0.38)	15	13	11
Manufacture of textiles	108 (2.15)	37	52	22
Manufacture of wearing apparel; dressing and dyeing of fur	173 (3.44)	78	97	66
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	81 (1.61)	25	57	19
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	121 (2.41)	31	41	17
Manufacture of paper and paper products	87 (1.73)	31	31	16
Publishing, printing and reproduction of recorded media	235 (4.67)	36	36	12
Manufacture of coke, refined petroleum products and nuclear fuel	10 (0.2)	7	7	7
Manufacture of chemicals and chemical products	264 (5.25)	124	108	66
Manufacture of rubber and plastics products	252 (5.01)	124	91	56
Manufacture of other non-metallic mineral products	148 (2.94)	47	19	13
Manufacture of basic metals	74 (1.47)	37	26	15
Manufacture of fabricated metal products, except machinery and equipment	293 (5.83)	101	55	32
Manufacture of machinery and equipment not elsewhere classified (n.e.c.)	77 (1.53)	26	21	8
Manufacture of Office, accounting and computing machinery	2 (0.04)	2	1	1
Manufacture of electrical machinery and apparatus n.e.c.	44 (0.87)	24	16	10
Manufacture of radio, television and communication equipment and apparatus	6 (0.12)	6	4	4
Manufacture of medical, precision and optical instruments, watches and clocks	13 (0.26)	5	5	3
Manufacture of motor vehicles, trailers and semi-trailers	25 (0.50)	12	11	7
Manufacture of other transport equipment	13 (0.26)	5	6	3
Manufacture of furniture; manufacturing n.e.c.	157 (3.12)	48	40	20
Recycling	10 (0.2)	6	5	3
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	199 (3.96)	66	25	17
Wholesale trade and commission trade, except of motor vehicles and motorcycles	347 (6.90)	148	68	36
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	326 (6.48)	105	31	12
Hotels and restaurants	271 (5.39)	84	4	2
Land transport; transport via pipelines	137 (2.72)	39	22	11
Water transport	19 (0.38)	12	3	2
Air transport	20 (0.40)	12	4	1
Supporting and auxiliary transport activities; activities of travel agencies	81 (1.61)	22	8	2
Post and telecommunications	79 (1.57)	43	13	12
Financial intermediation, except insurance and pension funding	170 (3.38)	87	9	7
Insurance and pension funding, except compulsory social security	85 (1.69)	38	7	3
Activities auxiliary to financial intermediation	19 (0.38)	5	0	0
Real estate activities	63 (1.25)	22	0	0
Renting of machinery and equipment without operator and of personal and household goods	15 (0.30)	5	1	0
Computer and related activities	34 (0.68)	11	9	6
Research and development	1 (0.02)	0	0	0
Other business activities	257 (5.11)	85	28	17

Public administration and defence; compulsory social security	4 (0.08)	0	1	0
Education	21 (0.42)	6	0	0
Heath and social work	9 (0.18)	1	0	0
Sewage and refuse disposal, sanitation and similar activities	30 (0.60)	2	2	0
Recreational, cultural and sporting activities	18 (0.36)	6	1	1
Other service activities	7 (0.14)	1	0	0
Activities of private households as employers of domestic staff	1 (0.02)	0	0	0
Total	5,029 (100)	1,813	1,189	643

Notes: Column 1 of the table reports the number of observations by manufacturing sector (with the share of the total number of firms in brackets). The remaining columns report the number of foreign-owned firms, exporting firms, and foreign-owned exporters in each sector (along with the shares of these firm types in the total number of firms sampled in each sector).

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