Asian Economic and Financial Review

TRADE LIBERALIZATION AND FORMAL-INFORMAL SECTOR WAGE DIFFERENTIAL IN NIGERIA

MATTHEW A. Oluwatoyin

Department of Economics & Development Studies, College of Development Studies, Covenant University,

Ota, Nigeria

AZUH Dominic

Department of Economics & Development Studies, College of Development Studies, Covenant University,

Ota, Nigeria

ABSTRACT

This study assessed the role of trade liberalization on the formal-informal sector of Nigeria. It examined whether or not the trade liberalization process have any effect on both the reduction in the wage differential between registered and non-registered (roughly formal and informal) workers and the decrease in the proportion of registered workers. The study used both secondary and primary data via the administration of questionnaires to discuss the channels through which trade liberalization could affect these two variables and put forward an empirical approach to test the existence of any correlation between them. The results from the study revealed that the fall in the wage gap between registered and non-registered workers in the manufacturing sector was affected by trade-related variables, particularly, by the import penetration ratio. However, the study did not find robust evidence that trade liberalization had a substantial effect on the decrease in the proportion of registered workers.

Keywords: Trade Liberalization, Registered and Non-registered workers, Manufacturing Sector.

1. INTRODUCTION

One thing that is common with several middle-income developing countries such as Botswana, Nigeria, Zambia and Cote d'Ivoire in the late 1980s and early 1990s was the undertaking of several structural reforms, particularly trade liberalization reforms. Many recent studies have tried to assess the impact of these reforms on the labour market of these countries. Basically, researchers have looked for evidences of any of the Hecksher-Ohlin/Stolper-Samuelson (HOSS) framework's implications in developing country labour markets. Aleman-Castilla (2006) and Bosch *et al.* (2007) have looked for evidence that trade liberalization has triggered the following sequence of events: (1) increases in the relative price of unskilled intensive products/firms/industries; (2) a positive

effect of these price increases on the demand for unskilled workers; (3) a reduction in the wage premium of skilled workers, leading to lower wage inequality in these countries and finally (4) an increase in the share of skilled workers in all sectors due to the increase in the relative price of unskilled workers.

Besides this interest on the distributional consequences of trade liberalization based on the HOS framework, Avirgan *et al.* (2005) and Bairagya (2010) have also tried to measure the impact of trade liberalization on employment and on the wage structure as a way to assess the importance of rent-sharing in the protected sectors. Despite these numerous studies on the impact of trade liberalization on developing country labour markets, some pertinent questions remain to be explored. Behrman (1999) and Gonzaga *et al.* (2002) examined the impact of trade liberalization on the "informal" manufacturing sector and the existence of possible spillover effects on the rest of the economy. This is important because if dual labour markets are important in developing countries, then to overlook the implications of trade liberalization for the wage differential between "formal" and "informal" workers (Behrman, 1999; Gonzaga *et al.*, 2002), and on their mobility pattern may yield an incomplete description of its impact on the entire labour market. The wage structure in Nigeria's informal sector is difficult to get but we relied on the data sourced primarily.

The objective of this paper is to fill the gap from the empirical literature using the Nigerian trade liberalization experience as a quasi-natural experiment. From literature, it is obvious that there is a wide disparity between employees' wages in the formal and informal sectors; this is due to the fact that informal businesses are not registered so they are not regulated by the government authorities. We assess whether trade liberalization can be considered a serious factor to explain both the fall in the wage differential between registered (formal) and non-registered (informal) workers, and the fall in the proportion of registered workers in the economy. The incident of trade liberalization in Nigeria is particularly interesting for this task because it implied a huge fall in tariff and non-tariff barriers and it occurred during a short period of time, basically within three years. Besides, the schedule of tariff reduction announced in 1990 was brought forward several times, making a strong case for the exogeneity of the trade reforms.

The structure of the paper is as follows: First, the evolution and description of the proportion of registered workers and of the wage gap between registered and nonregistered workers in the manufacturing sector during 1980 to 2010 will be done. Second, literature on the impact of the trade liberalization on the labour market of developing countries, and the channels through which trade liberalization could affect both the wage differential between registered and non-registered workers and the proportion of registered workers will be discussed. Third, the paper puts forward a procedure to identify whether or not trade liberalization had any impact on the fall in the wage differential between registered and non-registered workers and on the increase of the proportion of non-registered workers. This procedure is based on exploiting industry variation of trade-related measures such as effective tariffs, import penetration and export orientation ratios for a panel of 10 tradable manufacturing industries.

2.   REGISTERED   AND   NON-REGISTERED   WORKERS   IN   THE MANUFACTURING   SECTOR IN NIGERIA

The proportion of non-registered workers increased – at least, for non-farming activities – and the wage differential between the two groups diminished during the 1990s. The proportion of non-registered workers increased from 30 percent in 1981 to about 60 percent in 2008, and the bulk of this increase was concentrated after 1990, just after the country started the market-oriented reforms, such as the programmes of privatization and the process of trade liberalization. While the proportion of non-registered workers increased, the raw wage gap between registered and non-registered workers fell between 1981 and 2008. In 1981, the raw ratio of log real hourly-wage between registered and non-registered workers was 1.08, but in 2008 it was down to 0.71. As non-registered workers are less likely to be found in the manufacturing sector, one could associate the fall in the proportion of registered workers with the reduction in the number of workers in the manufacturing sector. A lower proportion of "manufacturing jobs" would lead to a higher proportion of non-registered jobs in the whole economy (Adewuyi, 2006).

2.2 The Impact of Trade Liberalization on Developing Country Labour Market

The Hecksher-Ohlin theorem states that a country will tend to export goods that are relatively intensive in the abundant factor. The Stolper-Samuelson theorem shows that changes in the output price have a more than proportional effect on the return of the relatively abundant factor in the industry where the shock occurred. The combination of these two theorems yields the prediction that trade policy changes that lead to a higher relative price of unskilled-intensive goods should bring about an increase in the relative wage of unskilled workers. Assuming the special case where the functional form of the production functions for all sectors and for the aggregate utility function is Cobb-Douglas, the proportional change in the relative wage rate between skilled workers (s) and unskilled workers (u) in an open economy can be expressed as:

$$\left\{ \frac{\hat{W_s}}{W_u} \right\} = \frac{1}{\beta_1 - \beta_2} \left\{ \frac{\hat{P_1 A_1}}{P_2 A_2} \right\} \text{------------------------------------- (1)}$$

where β_1 and β_2 are the proportion of skilled workers in the skilled-intensive sector and in the unskilled-intensive sector, respectively; A_1 and A_2 are technology parameters in these same sectors, and P_1 and P_2 the respective product prices. Since $\beta_1 > \beta_2$ changes in prices and/or technology have a more than proportional effect on changes in the relative wage, an increase in P_2, the price of the product in the unskilled-intensive sector, should lead to a more than proportional fall in the relative wage of the skilled workers. However, the above result only holds if we assume that: (1) the economy is small so that it cannot affect the international price of the product, which is assumed to be exogenous, (2) the economy is inside the cone of diversification, meaning that tradable goods intensive in both factors, skilled and unskilled labour, are produced in that economy; (3) there is no product differentiation, i.e., foreign and domestic goods are perfect substitutes; and (4) there are no mobility barriers for workers to respond to wage changes. A

corollary of this theory is that changes in the supply of different factors do not alter their relative prices (as changes in the relative price do). Changes in the factor endowment of a country would increase the production in the industries intensive in the factor, without altering its relative price (Johnson and Stafford, 1999). So far the empirical literature on the developing countries has found at best mixed results regarding HOS predictions.

For the Mexican experience in the mid-1980s, Hanson and Harrison (1999) show that the reduction in tariff protection unreasonably affected low-skilled industries, contrary to what one would expect for a developing country. This is so, because the Mexican import substitution strategy extended trade protection preferentially to industries that made relatively intensive use of unskilled labour. The relative higher protection of industries in which the countries would, in principle, have comparative advantage was also noticed by Currie and Harrison (1997) for the Moroccan manufacturing sector. Goldberg and Pavcnik (2003) also found that the structure of tariff protection benefited more the industries with a higher share of unskilled workers in Colombia and in Brazil. These studies highlight the necessity to understand the previous structure of protection before assuming that any trade liberalization reform would trigger a reduction in wage inequality, as measured by the relative wage between skilled and unskilled workers. If the protected sectors were the ones in which the country already had comparative advantage, then the openness measures could lead to a fall in their product prices and then trigger an increase in the relative demand for the scarce factor (skilled workers).

Behrman *et al.* (2001) do not find evidence that trade liberalization has any overall widening effect on wage differentials for a panel of 18 Latin American countries - including Brazil - for the period 1977 to 1998. The reason ascribed for this is inaccessibility to all the data needed for the variables used in the study. Robbins (1996a) did not find any relationship between trade liberalization and wage inequality for Colombia. Robbins and Gindling (2001) find evidences consistent with a positive correlation between trade liberalization and higher returns to education in Chile. Galiani and Sanguinetti (2001) find that manufacturing sectors where the import penetration increased the most, wage inequality also widened relatively more in favour of the most skilled workers in Argentina.

According to Pavcnik *et al.* (2002), they showed that the increase in the return of the college-educated workers coincides with the trade liberalization in Brazil. They do not find any relationship between trade related measures and the increase in wage premium in sectors more affected by the reform, but they do find that the sector specific skill premium did rise for skilled workers. Green *et al.* (2001) also stress the coincidence between trade liberalization in Brazil and the increase in the relative wage of college-educated workers, but fail to find any causal relationship. Unlike Pavcnik *et al.* (2002), however, they do find that the wage premium increased in sectors more affected by the trade reform. Dickerson *et al.* (2001) using a pseudo panel approach find that the returns on education for college-educated workers fell after the trade liberalization in Brazil, but do not find any correlation between trade measures and the return on education for college workers. Note that this result contradicts Green *et al.* (2001). This is so due to the fact that the pseudo-cohort approach

adopted by Dickerson *et al.* (2001) points to an overestimation of the returns on education yielded by the Ordinary Least Square (OLS) method employed by Green *et al.* (2001). Arbache *et al.* (2004) reinforce the results in Green *et al.* (2001) and argue that within the traded sector, increasing openness was associated with lower wages but the downward impact of openness on wages was insignificant at the highest two education groups.

Gonzaga *et al.* (2002) in a study carried out in Brazil, argued that the wage differential between skilled and non-skilled workers fell after trade liberalization and that the mechanism of transmission of this fall through tariff to prices and prices to wages is in line with HOSS predictions. The lack of strong evidence for HOSS implications in developing countries has been rationalized via three hypotheses. The first is related to the perception that developing countries with higher proportion of semi-skilled workers may have been suffering strong competition from countries with a higher proportion of unskilled workers (Wood, 1997; Hanson and Harrison, 1999). This halfway position of some industrialized developing countries, mainly in Latin America, would prevent HOSS framework from working. The second hypothesis assumes that trade may have caused a higher contact with leading-edge technology. In order to install this newly available technology, firms might have demanded more skilled workers to operate them and to adapt the production process to this more efficient technology. Such reasoning is advocated by the skill-enhancing trade hypothesis due to capital-skill complementarity (Robbins, 1996b) and by the learning-by-trade hypothesis (Pissarides, 1997).

The third hypothesis argues that empirical studies fail to find any HOSS trade related impact on income distribution because of global/pervasive skill biased technological change (Berman and Machin, 2000). In this case, no correlation between trade measures and the increase in the premium of skilled workers would be observed, since this would be an economy-wide phenomenon. A second point that has been emphasized in the literature is the role of trade liberalization in changing institutional features of industrial relations and then indirectly affecting the wage and employment structure (mainly in the manufacturing sector) of countries that have undertaken trade reforms. The main hypothesis has to do with the loss of union power triggered by trade reforms. Both the fall of trade barriers and tariff reductions increase the price elasticity of product demand, hence reducing rents that sustained the union wage premium. We will briefly report some results of empirical studies on the impact of trade reforms on relative wages. Driffill *et al.* (1998) showed that when non-tariff barriers were reduced in Britain, the wages in the relevant establishments fell significantly Revenga (1992) observed a similar effect associated with falls in import prices in the United States of America. Lang (1998) argued that the small effect of trade liberalization in New Zealand on the composition of employment suggested that the effect of tariffs on wages and firms' monopoly power, reducing both of them, eliminated any effect on the distribution of employment.

Borjas and Ramey (1995) showed that the impact of international trade on relative wages (skilled/unskilled wages) depends on the market structure of the industry affected. They argued that many industries producing durable goods in the United States of America in the 1980s that employed a disproportionate share of less educated workers were highly concentrated, earned

significant rents, and shared those rents with their workers by paying them higher-than-average wages. Their empirical evidence shows that employment changes in a small group of trade-impacted concentrated industries can explain not only part of the aggregate rise in wage inequality in the United States of America, but also some of the differences in trends in wage inequality across metropolitan areas. Somewhat against those findings, Johnson and Stafford (1999) in their review of the impact of trade on labour market institutions argued that despite the theoretical negative relationship between increased international competition and "monopoly rents" enjoyed by the firms protected in the past, there is no strong evidence of a negative effect of increased trade on unionism either in the United States of America or in the United Kingdom.

The findings on the impact of trade-related variables on wages and on employment for developing countries also tend to place this sort of rent-sharing argument as a possible explanation for decreases in the average wage, at least, in the manufacturing sector. Arbache (1999) argues that the marked-oriented reforms in Brazil, and particularly trade liberalization, led to a higher demand for skilled workers that ended up increasing union power. This happened because unlike developed countries, the unionized workers are relatively more educated in Brazil than non-unionized workers. Revenga (1997) finds evidences that the (negative) impact of trade liberalisation on wages in Mexico was higher than the (negative) effect on employment. She argued that this fact may be explained by the prevalence of rent-sharing schemes in the period previous to trade liberalization. Such schemes would have allowed unions and firms to agree in cutting "excessive wages" rather than adjusting the employment margin after the reforms. Similarly, Currie and Harrison (1997) analyzing the Moroccan trade liberalization argue that in an imperfect competitive framework where some rents were captured by workers in the form of higher wages, firms could also respond to their rent loss by cutting wages and substituting temporary workers for permanent ones. Menezes-Filho and Arbache (2002) show evidences of rent-sharing for unionized workers in the manufacturing sector in Brazil. However, they also find that the increase in quasi-rents brought about by trade liberalization was not shared with unionized workers.

2.3 Trade Liberalization and the Segmented Labour Market

The impact of trade liberalization on the informal sector is less understood and less documented. Behrman (1999) pointed out that most studies focused on the impact of trade liberalization on the formal manufacturing sector, but less is known about its effect on the informal sector, both in the manufacturing sector17 and in the entire labour market. In this section, we will highlight possible effects of trade liberalization on segmentation – in terms of the registered *versus* non-registered classification – in Brazil. The first thing to notice about the relationship between trade liberalization and the relative wage of registered and non-registered workers is that such a classification is an institutional feature and not a skill-based classification. Unlike the classifications by educational attainment; occupational categories; production and non-production workers as traditionally used in the literature and that are based on productivity related features; the classification between registered and non-registered workers parallels the classifications between

union/non-union workers and/or temporary/permanent workers, which are much more related to institutional features of the labour market. The second thing to notice is that the informal sector has been traditionally linked to the non-tradable sector, leading to the view that the informal sector would not be affected directly by trade liberalization. The presence of a non-tradable sector where non-registered status is prevalent, however, would not affect the predictions according to the model we presented in the last section, that is, the world prices of goods 1 and 2 would still determine the relative wage as in equation (1). Nevertheless, the presence of a non-tradable sector with such characteristic would make the cone of diversification of that country thinner, and more likely that a fall in the relative price of the "non-registered" prevalent good would lead that industry to close down so that non-registered workers would be employed only in the non-tradable sector (Johnson and Stafford, 1999). In this case, equation (1) would no longer represent the skilled/unskilled (or registered/nonregistered) wage rate. The relative wage would be determined as in the case of a closed economy:

$$\left\{\frac{\hat{W_s}}{W_u}\right\} = \frac{\beta_4}{1-\beta_4}\left\{\frac{U_4}{S_4}\right\} \text{-------------------------------- (2)}$$

where the subscript 4 stands for the non-tradable sector 4, which is "non-registered" prevalent and unskilled intensive. It is clear from equation (2) that regardless of the changes in prices in the tradable sector, the relative wage would be unaffected. In this context, one should not expect to find any effect of trade-related variables on the relative wage of skilled/unskilled workers or registered/non-registered workers.

Midway situations between the result of the closed model represented by equation (2) and the open model in equation (1) arise if one assumes that: a) domestic and foreign goods are not perfectly substitutes and b) labour types cannot move in response to wage changes (Johnson and Stafford, 1999). In fact, some commentators have used the tradable *versus* non-tradable approach to explain the dichotomy between formal *versus* informal sector in Nigeria. The idea behind this correspondence is that the earnings of workers in the informal (non-tradable sector) is determined by supply and demand in that sector, whereas the earnings of workers in the formal sector is determined by the external demand for the export goods. The demand for the national manufactured product would be lower after the trade reform due to the access to cheaper products, whereas the non-tradable sector would be protected from that competition. The difficulty in such argument is how to justify the lack of mobility between workers from the formal to the informal sector. It could be argued that the informal sector would act as a cushion for workers displaced from the tradable sector, leading to a downward pressure on wages in that sector. Therefore, it is not clear how trade liberalization would affect the wage of the employees in the tradable sector, but would not affect the wage of the employees in the non-tradable sector.

This sort of argument would be more justifiable in a context of imperfect competition where one would focus on the effect of trade reforms on institutional features of developing country labour markets. In this framework, trade reform would squeeze rents that would have been captured

by protected firms and shared with their employees. As seen above, if the protected firms were the ones abundant in the scarce factor (skilled labour) then one should expect under HOS assumptions that the reduction or elimination of trade barriers would reallocate resources to the now more competitive firms based on the abundant factor and hence increase the demand for unskilled labour. However, as many authors have shown this is not necessarily the case, and the protected sector may have been in fact the one that had a higher proportion of the abundant factor. Alternatively, if the protected sector cannot be characterized as perfectly competitive, then there is space for some sort of rent sharing. Therefore, workers in most affected industries would experience a reduction in their bargaining power –and so in their wages - since the ground for rent sharing would be reduced. Assuming that the most protected sectors are the ones with a higher proportion of registered workers, or where registered workers profit more from rents thanks to the market power of their firms, one should observe a reduction in the wage premium for registered workers after the reforms.

In Nigeria, registered workers are more likely to be unionized and to work in large firms, which are more likely to have market power and therefore to have some loss due to trade liberalization.

Therefore, it would be reasonable to assume that the degree of segmentation, as measured by the wage premium for registered workers, is positively correlated with trade protection measures. The process of trade liberalization should hence curb the wage differential between registered and non-registered workers. Besides this direct effect, skilled workers displaced from registered jobs may have joined the pool of non-registered workers, increasing their average skill level and contributing to the reduction in the wage differential due to changes in the composition of the two groups.

So far, we have focused on wage differential, but as mentioned above, trade liberalization can also affect the allocation of different type of workers between and within industries. In particular, Nigerian firms may have reacted to the trade liberalization shock not only by substituting non-registered workers for registered workers, but also sub-contracting part of the tasks that they could have performed earlier in an attempt to reduce costs. The reallocation of part of the production to smaller firms may have led to a higher participation of the non-registered workers in the pool of manufacturing employee. Similarly, the reduction in absolute terms of the number of jobs in the manufacturing sector due to adjustments in the size and composition of its workforce may have led to an increase in the proportion of nonregistered workers in the entire economy. Most of these channels are hard to assess since there is no available and compatible data on "informal firms" in Brazil that would allow one to compare its performance over the recent period with the performance of medium to large firms.

Data from the Brazilian annual household survey (PNAD) shows that the proportion of non-registered workers increased in the manufacturing sector from 15 percent to 24 percent from 1981 to 2008, which is a clear indication of a possible lower degree of compliance within the manufacturing sector. Furthermore the proportion of workers in small firms (up to ten employees)

increased from 40 percent to 50 percent in the entire economy and from 15 percent to 23 percent in the manufacturing sector during the same period. These changes may have two causes: (a) more firms decided to contract workers illegally; (b) the balance on the birth and death of firms favoured smaller firms that are more likely to employ non-registered workers. Somewhat supporting this latter hypothesis, Muendler (2001), based on an unbalanced panel of medium to large size manufacturing firms, finds that in the period 1992-1998, the probability of transition from active status to extinct (shut down), and from suspended to extinct had increased considerably in comparison to the period 1986-1990. This evidence lends some support to the argument that there was a cleanup effect among medium to large firms after trade liberalization that may have led to a reduction in the proportion of registered workers.

3. METHODOLOGY

3.1 Model Specification

To test whether or not trade liberalization had any impact on the fall in the wage differential between the registered and non-registered workers and on the increase in the proportion of the non-registered workers in the pool of manufacturing employees between 1981 and 2008, we run a fixed-effect model for both the coefficient of the "registered worker" dummy variable obtained from a standard semi-log Mincerian wage equation and the proportion of registered workers on a set of variables related to trade: effective tariff, nominal tariff, import penetration ratio and export orientation for a panel of 10 industries. The industry classification was developed in order to make the data from the household survey compatible with the trade-related data used in this paper. The sample is restricted to employed individuals between 14 and 65 years old with positive earnings and who worked more than 20 hours per week. In the case of the effect of trade openness measures on the wage differential, we first estimate the following log wage equation for each pair of industry j and year t separately between 1981 and 2008. The time frame is due to the fact that trade liberalization policies were implemented from the 1980s.

$$w_{ijt} = \alpha_{jt} + \Gamma_{jt}X_{ijt} + \beta_{jt}\,\mathrm{Re}\,g_{ijt} + \varepsilon_{ijt} \text{ --- (3)}$$

where w_{ijt} is the log of the real hourly-wage for the individual i in industry j and year t and Γ is a vector of coefficients of the following independent variables X: region, gender, education (6 groups), experience, experience squared and metropolitan area, and β_{jt} is the coefficient for the dummy variable Reg that indicates whether the individual is a registered worker. In a second step, we regress the estimate coefficient β_{jt} on the trade-related variables:

$$\beta_{jt} = \alpha + \delta TM_{jt} + \phi_j + \theta_t + \varepsilon_{jt} \text{ --- (4)}$$

where; TM_{jt} stands for trade measure variables in period j and time t and ϕ_j are industry dummies and θ_t are time period dummies and ε_{jt} is assumed to be a white noise. The second reduced-form estimates refer to the impact of trade-related measures on the proportion of registered workers in the industries:

$$\Pr eg_{jt} = \alpha_2 + \lambda TM_{jt} + \phi_j + \theta_t + \varepsilon_{jt} \text{-- (5)}$$

where; $Pregjt$ is the proportion of registered worker in industry j and year t and the remaining variables are as stated in equation (4). The fixed-effect regression versions of equation (4) are weighted by the inverse of the sampling variance of the dependent variable.

Saxonhouse (1976) shows that estimations where the dependent variable is estimated in a first step and then regressed against a set of variables intended to explain it, suffer from heteroskedasticity because the stochastic term in the first stage is individual specific (in our case, industry specific). Similarly, equation (5) is estimated using the share of the industry in the total manufacturing employment as weight. Besides this weighting scheme, the standard errors in both equations are Huber-White corrected for any other source of general heteroscedasticity. We run separate regressions for each trade measure and a joint one with effective tariff, import penetration and export orientation; we also include other variables related to the structure of the industry in order to test the robustness of the results. These variables are value-added and the proportion of workers who earn less than the minimum wage. Additionally, we run one specification adding the industry specific nominal exchange rate to the joint specification. The set of regressions also contains year dummies aimed at capturing aggregate shocks that may have had some impact on all manufacturing industries.

4. THE SURVEY AREA

The survey for this study is carried amongst micro and small scale enterprises in Ado Odo/Ota Local Government Area of Ogun State. Eighty-five enterprises were visited but only eighty (80) responses are obtained from the enterprises, yielding a response rate of 94.1 percent. For the employees, 210 questionnaires are administered but only 200 responses are obtained yielding a response rate of 95.2 percent.

4.1. Socio-Demographic Characteristics of Employers and Workers in the Sampled Enterprises

From the study sample which is 80 enterprises (employers) and 200 employees picked out from the 200 enterprises interviewed, some socio-economic characteristics of both the entrepreneurs (employers) and employees are explained in Table1.

Table-1. Socio-Demographic Characteristics of both Employers and Employees

Variables	Frequency	Percentage
Employers Educational Qualification		
Secondary	10	12.5
Tertiary	65	81.25
Others	3	3.75
No response	2	2.5
Total	80	100.0
Sex of Employees		
Male	130	65
Female	70	35

Total	200	100.0
Age of Employees		
Less than 20 years	25	12.5
20-30 years	115	57.5
31-40 years	40	20
Above 40 years	20	10
Total	200	100.0
Marital Status of Employees		
Single	140	70
Married	50	25
Divorced	10	5
Total	200	100.0
Religion of Employees		
Christianity	150	75
Islam	50	25
Total	200	100.0
Nationality of Employees		
Nigerian	190	95
Non-Nigerian	10	5
Total	200	100.0
Educational Qualification of Employees		
Primary	30	15
Secondary	60	30
Tertiary	85	42.5
Others	25	12.5
Total	200	100.0

Source: Field Survey, 2012

As shown in Table 1, 12.5 percent of the interviewed business owners have secondary school education, 85.25 percent of them have tertiary education such as OND, HND, B.Sc, 3.75 percent of them have other professional qualifications, while the remaining 2.5 percent did not respond to the question. It is noticed that majority of the business owners have education up to the tertiary level and this could be linked to the high unemployment rate in Nigeria that led some of them to taking up self-employment in the SME sub-sector of the informal economy of Nigeria. All other information in the Table can be interpreted in the same manner.

4.2. Types of Enterprises Surveyed and their Characteristics

The 80 enterprises and 200 employees interviewed are engaged in different economic activities in five different types of businesses which are Bread Bakeries, Pure Water businesses, Soap Making businesses, Poultry businesses and Printing businesses. The dominant type of business among the respondents of this survey is Poultry Farm Businesses in which about 37.5 percent are engaged, followed by bread Bakery and Pure Water Making businesses with 18.75 percent respondents each, 15 percent in Soap making and the remaining 10 percent are engaged in Printing businesses as shown in Table 2.

Table-2. Characteristics of Enterprises Surveyed

Variables	Frequency	Percentage
Types of Enterprise		
Bread Bakery	15	18.75
Pure Water Making	15	18.75
Soap Making	12	15
Poultry Farm	30	37.5
Printing Press	8	10
Total	80	100.0
Years of Organisation's Establishment		
Less than a year	15	18.75
1-4 years	25	31.25
5-9 years	27	33.75
10 years and above	13	16.25
Total	80	100.0
Organisation's Initial Capital		
Less than N49,999	15	18.75
N50,000-N99,999	34	42.5
NI00,000-N249,999	20	25
N250,000 and above	11	13.75
Total	80	100.0
Organisation's Present Capital		
Less than N49,999	1	1.25
N50,000-N99,999	2	2.5
NI00,000-N249,999	24	30
N250,000 and above	53	66.25
Total	80	100.0
Average weekly turnover at Business Start		
Less than N24,999	51	63.75
N25,000-N49,999	16	20
N50,000-N99,999	10	12.5
N100,000 and above	3	3.75
Total	80	100.0
Average weekly turnover now		
Less than N24,999	4	5
N25,000-N49,999	25	31.25
N50,000-N99,999	30	37.5
N100,000 and above	21	26.25
Total	80	100.0
Average profit margin for the first month of Business		
Less than N19,999	39	48.75
N20,000-N29,999	20	25
N30,000-N49,999	14	17.5
N50,000 and above	7	8.75
Total	80	100.0
Current average profit margin		
Less than N19,999	2	2.5
N20,000-N29,999	10	12.5
N30,000-N49,999	18	22.5
N50,000 and above	50	62.5
Total	80	100.0

Source: Field Survey, 2012

4.3. Analysis and Interpretation of Results

The results in Table 3 (see the appendix) suggest that trade liberalization as measured by the import penetration ratio had a diminishing effect on the wage differential between registered and nonregistered in the manufacturing sector. Overall something between 10 percent and 14 percent of the 42 percent decrease in the wage gap in the manufacturing sector can be attributed to the 10 percent increase in the import penetration ratio observed in the period. As for the other trade measures directly affected by the reform, the coefficients for nominal and effective tariff is correctly signed as we would expect based on our discussion in the last section, i.e., they have a positive impact on the registered workers wage premium, but they are very small and not statistically significant. The regressions for the proportion of registered workers in the pool of employees were weighted by the share of workers in the industry for each industry/year pair. The standard errors are Huber-White corrected. Table 4 shows the results for the fixed effect specifications with time dummies. Both effective and nominal tariffs have a negative effect on the proportion of registered workers for all specifications, and their coefficients are significant for most of them. The coefficients for the import penetration ratio and for the export orientation are not significant, but while the import penetration ratio shows a negative impact in most specifications, the export orientation has a positive impact in all specifications. The proportion of workers earning below the minimum wage is, as expected, negatively correlated with the proportion of registered workers. Including the industry-specific exchange rate does not change the coefficient (column [6]) of the other variables.

The results in Tables 3 and 4 (see the appendix) are somewhat puzzling. Whereas the import penetration ratio seems to have had a negative impact on the wage differential, it has not affected (significantly) the proportion of registered workers, despite its negative sign in most specifications. The effective tariff has had no effect on the wage differential (despite its positive sign), but it has had a negative impact on the proportion of registered workers. Thus, industries most affected by the reduction in effective tariff were the same that witnessed an increase in the proportion of registered workers. Therefore, at least for the manufacturing sector, trade liberalisation may have had an impact on cutting the wage *premia* of registered workers, but if anything, it had the effect of increasing the proportion of registered workers in the most affected industries. In order to check the robustness of these results, allowing for some delay in the adjustments to the new tariffs and to the more competitive environment, and also to avoid problems of simultaneity between import penetration ratio and export orientation and the wage differential, we re-run equations (4) and (5) using lagged regressors rather than contemporaneous.

As for the results for the wage premium, Table 5 reveals that the main difference is that the coefficient of effective tariff is negative in most specifications, but again it is never statistically significant. The coefficients of export orientation turn out to be positive for most the fixed-effect specifications with time dummies, but they are not significant either. The coefficients for import penetration are negative and show a point estimate somewhat higher than the one with

contemporaneous effect, ranging from −0.0048 to −0.0064. The inclusion of the lagged industry-specific exchange rate does not change this result (see column 6).

In summary, our results suggest among others that trade liberalization had a statistically significant negative impact on the reduction of the wage differential between registered and non-registered workers in the manufacturing sector. However, we do not find evidence of spillover to entire economy.

4.4. Main Findings and Discussion

The major findings of the study are discussed below:

Firstly, we found evidence that the trade liberalization process is behind the fall in the wage gap in the manufacturing sector. It seems that rents that went to registered workers were cut due to the more competitive environment in the economy. This result was found in strategy used in this study. The strategy used only within-manufacturing industry variation and revealed a negative effect of import penetration on the wage gap.

Secondly, the fall in the proportion of registered workers, however, does not seem to be correlated with trade liberalization. The strategy did not yield robust evidence that the trade measures were correlated with the fall in the proportion of registered workers. The evidence found in the strategy that effective tariff led to an increase in the proportion of registered workers in the manufacturing sector was not robust to the use of lagged regressors in the specification with additional controls. Similarly, the evidence yielded by the strategy that the increase in the import penetration ratio led to a fall in the proportion of registered workers in the entire labour market is not robust to the use of lagged regressors.

Lastly, the study found out that the weak evidence for the effect of trade liberalization on the proportion of registered workers suggests that the fall in the proportion of registered workers was due to macroeconomic factors or institutional changes that had affected in a homogenous way regions and industries within the country.

5. RECOMMENDATIONS AND CONCLUSION

Based on the findings of this study, the following recommendations are made:

Firstly, the Government should encourage the informal sector by providing the needed financial and infrastructural facilities to facilitate their smooth operations. If this is done these micro enterprises will be able to employ more people and pay the required wages to their employees and compete with their counterparts in the advanced countries.

Secondly, the formal manufacturing sector should also be provided with the necessary logistics- in terms of the access to raw materials and infrastructural/social amenities to make their operations effective, this way they will be able to employ more and pay commensurate salaries to their workers.

Thirdly, the gap between the wages earned by registered and non-registered workers should be narrowed as much as possible. One of the ways to do this is via trade liberalization which opens up

the economy to international trade, where informal sector enterprises will be able to export their goods and earn income with which they can pay their employees.

Therefore, based on the findings of this study, we conclude that since the fall in the wage differential between registered and non-registered workers as well as the fall in the proportion of registered workers are two stylized facts of the Nigerian labour market in the 1990s and 2000s, the Government should encourage the informal sector by lending out money to its operators in order to be able to set up enterprises that will compete favourably with their counterparts abroad. Furthermore, since the wage differential is one of the main determinants of the queue for formal jobs, it is reasonable to infer that the size of the queue can be reduced after trade liberalization by narrowing of the wage gap between formal and informal workers.

REFERENCES

Adewuyi, A.O., 2006. Wage and employment effects of macroeconomic policy reforms: Evidence from Nigeria's manufacturing sector's final report of individual research project (IRP). NISER, Ibadan.

Aleman-Castilla, B., 2006. The effect of trade liberalization on informality and wages: evidence from Mexico. Centre for Economic Performance Discussion Paper 763.

Arbache, J.S., 1999. Trade liberalization and inside power: The Case of Brazil. Mimeo.

Arbache, J.S.A., Dickerson and F. Green, 2004. Trade liberalization and wages in developing countries. The Economic Journal, 114(2): F73-F96.

Avirgan, T., L.J. Bivens and S. Gammage, 2005. Good jobs, bad Jobs, no Jobs – labour markets and informal work in Egypt, El Salvador, India, Russia, and South Africa. Economic Policy Institute, Washington.

Bairagya, I., 2010. Liberalization, informal sector and formal-informal sectors' relationship: A study of India.A paper prepared for the 31st geneva conference of the International Association for Research in Income and Wealth.

Behrman, J., R., 1999. Labour markets in developing countries in handbook of labour economics, Ed. O. Ashenfelter and D. Card. Elsevier Science, 3.

Behrman, J.R., N. Birdsall and M. Szekely, 2001. Economic policy and wage differential in Latin America, Penn Institute for Economic Research, Working Paper 01-048.

Berman, E. and S. Machin, 2000. Skill-Biased technology transfer: Evidence of factor biased technological change in developing countries, Mimeo.

Borjas, G.J. and V.A. Ramey, 1995. Foreign competition, market power and wage inequality. Quarterly Journal of Economics, 110(1): 1075-1110.

Bosch, M., E. Goni and W. Maloney, 2007. The determinants of rising informality in Brazil: Evidence from gross worker flows. Institute for the Study of Labour (IZA) Working Paper 2970.

Currie, J. and A. Harrison, 1997. Sharing costs: The impact of trade reform on capital and labour in Morroco. Journal of Labor Economics, 15(3): S44-S71.

Dickerson, A., F. Green and J.S. Arbache, 2001. Trade liberalization and the returns to education: A Pseudo-Panel Approach. Mimeo.

Driffill, J., M. Meschi and A. Ulph, 1998. Product market integration and wages: Evidence from a cross-section of manufacturing establishments in the United Kingdom. CEPR Discussion Paper No. 1818.

Galiani, S. and P. Sanguinetti, 2001. Wage inequality and trade liberalization: Evidence from Argentina. Universidad Torcuato Di Tella, Mimeo.

Goldberg, P.K. and N. Pavcnik, 2003. The response of the informal sector to trade liberalization. NBER Discussion Paper No. 9443.

Gonzaga, G., N. Menezes-Filho and M.C. Terra, 2002. Earnings differentials and trade liberalization in Brazil. Fundacão Getúlio Vargas. Mimeo.

Green, F., A. Dickerson and J.S. Arbache, 2001. A picture of wage inequality and the allocation of labour through a period of trade liberalization: The case of Brazil. Mimeo.

Hanson, G.H. and A. Harrison, 1999. Trade liberalization and wage inequality in Mexico. Industrial and Labor Relations Review, 52 (4): 271-288.

Johnson, G. and F. Stafford, 1999. The labour market implications of international trade. In handbook of labour economics, Ed. O. Ashenfelter and D. Card. Elsevier Science B. B., 3.

Lang, K., 1998. The effect of trade liberalization on wages and employment: The case of New Zealand. Journal of Labor Economics, 16(4): 792-814.

Menezes-Filho, N. and J.S. Arbache, 2002. Trade liberalization, product markets and labor markets in Brazil. Mimeo.

Muendler, M.-A., 2001. Trade, technology and productivity: A study of Brazilian manufacturers, 1986-1998. University of California, Berkeley. Mimeo.

Pavcnik, N., A.B.P. Goldberg and N. Schady, 2002. Trade liberalization and labour market adjustment in Brazil, Dartmouth College. Mimeo.

Pissarides, C.A., 1997. Learning by trading and returns to human capital in developing countries, World Bank Economic Review, 11(2): 17-32.

Revenga, A., 1992. Exporting jobs? The impact of import competition on employment and wages in U.S. manufacturing. Quarterly Journal of Economics, 107(4): 255-284.

Revenga, A., 1997. Employment and wage effects of trade liberalization: The case of Mexican manufacturing. Journal of Labour Economics, 17(3): S20-S43.

Robbins, D.J., 1996a. Stolper-samuelson in the tropics? Trade liberalization and wages in Colombia: 1976-1994. Development Discussion Paper No. 557, Harvard Institute for International Economics.

Robbins, D.J., 1996b. HOS hits facts: Facts win; Evidence on trade and wages in the developing countries. Development discussion Paper No. 557, Harvard Institute for International Economics.

Robbins, D.J. and T.H. Gindling, 2001. Pattern and sources of changing wage inequality in chile and costa rica during structural adjustment, World Development, 25(3): 725-745.

Saxonhouse, G.R., 1976. Estimated parameters as dependent variables. American Economic Review, 66(1): 178-183.

Wood, B., 1997. Openness and wage Inequality in developing countries: The latin American challenge to East Asian conventional wisdom. World Bank Economic Review, 11(2): 33-58.

BIBLIOGRAPHY

Arbache, J.S. and C.H. Corseuil, 2003. Liberalizacao comercial e estrutura de empregoe salarios. Mimeo.

Barros, R.P., J.M. Camargo and S. Firpo, 1998. Uma avaliacao da evolucao recente do diferencial de rendimentos formal/informal. Ministerio do Trabalho. Mimeo.

Beyer, H., P. Rojas and R. Vergara, 1999. Trade liberalization and wage inequality. Journal of Development Economics, 59(3): 103-123.

Davis, D., 1996. Trade liberalization and income distribution. NBER Working Paper 5693.

Deaton, A., 1985. Panel data from time series of cross-sections. Journal of Econometrics, 30(2): 109-126.

Fonseca, R., 2000. A orientacao externa da industria de transformacao brasileira apos a liberalizacao commercial. Revista de Economia Politica, 20(3): 22-38.

Haguenauer, L.R. Markwald and H. Pourchet, 1998. Estimativa do valor da producao industrial e elaboracao de coeficientes de exportacao e importacao da industria brasileira (1985-96). IPEA, Texto Para Discussao No. 563.

Kume, H., G. Piani and C.F. Souza, 2000. Instrumentos de politica comercial no periodo 1987-1998. Mimeo. IPEA.

Maloney, W.F., 1997. The structure of labor market in developing countries: Time series evidence on competing views. Mimeo. World Bank.

Marquez, G. and C. Pages, 1997. Trade and employment: Evidence from Latin America and the Caribbean. Mimeo. Inter-American Development Bank.

Moreira, M.M. and P.G. Correa, 1998. A first look at the Impacts of trade liberalization on Brazilian manufacturing industry, World Development, 26(3): 1859-1874.

Oliveira-Junior, M., 2000. A liberalizacao comercial brasileira e os coeficientes de importacao – 1990/95. IPEA, Texto Para Distrucao No.703.

Ribeiro, E.P., 2004. Trade liberalization, the exchange rate and job and worker flows in Brazil Available from http://www.anpec.org.br/encontro2004/artigos/A04A153.pdf.

Robbins, D.J. and T.H. Gindling, 1999. Trade liberalization and the relative wages for more- skilled workers in Costa Rica, Review of Development Economics, 3(1): 140-154.

Slaughter, M.J., 2001. International trade and labour-demand elasticities. Journal of International Economics, 54(11): 27-56.

Soares, F.V., 2004. Do informal workers queue for formal jobs in Brazil? Mimeo. IPEA.

Appendix

Table-3. Nominal Tariff and Import Penetration Coefficient (in %)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Effective Tariff	0.0008 [0.0007]				0.0007 [0.0007]	0.0008 [0.0007]	-0.0003 [0.0009]
Nominal Tariff		0.0009 [0.0013]					
Import Penetration			-0.0042 [0.0013]**		-0.0039 [0.0013]**	-0.0033 [0.0015]*	-0.0064 [0.0015]**
Export Orientation				-0.0011 [0.0016]	-0.0009 [0.0016]	-0.0004 [0.0017]	-0.0004 [0.0021]
% workers w<mw							0.6548 [0.3437]
Value							0.0131
Constant	0.4076 [0.0604]**	0.4152 [0.0844]**	0.4669 [0.0327]**	0.4711 [0.0323]**	0.4132 [0.0600]**	0.2252 [0.1876]	0.0640 [0.3437]
N	170	170	170	170	170	170	153
Adj. R2	0.71	0.71	0.72	0.71	0.72	0.72	0.73
F test : industry	19.18	18.48	21.24	16.20	19.62	19.86	15.33
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Researcher's Computations   Robust standard errors in brackets

* Significant at 5%; ** Significant at 1%

Industry and time dummy variables not shown

Note: As we do not have data on value-added for 1998, specifications that include it have their sample size reduced form 170 to 153.

Table-4. Regressions for Wage Premium: Fixed Effect with Time Dummies (Contemporaneous Regressors)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Effective Tariff	-0.0003 [0.0001]**				-0.0004 [0.0001]**	0.0004 [0.0001]**	-0.0002 [0.0001]
Nominal Tariff		-0.0003 [0.0002]					
Import Penetration			-0.0002 [0.0003]		-0.0003 [0.0002]	-0.0003 [0.0003]	0.0001 [0.0002]
Export Orientation				0.0006 [0.0004]	0.0008 [0.0004]*	0.0008 [0.0004]	0.0006 [0.0004]*
% workers w<mw							-0.2753 [0.0709]**
Value							-0.0021
Constant	0.3861 [0.0116]**	0.5788 [0.0116]**	0.4703 [0.0087]**	0.4693 [0.0090]**	0.3928 [0.0118]**	0.3931 [0.0421]**	1.2582 [0.0197]**
N	170	170	170	170	170	170	153
Adj. R2	0.97	0.97	0.97	0.97	0.97	0.97	0.97
F test : industry	289.99	280.66	226.76	302.16	203.35	203.19	46.03
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Researcher's Computations Robust Standard Errors in brackets. * Significant at 5%; ** Significant at 1%. Industry and Time Dummy Variables not shown. Note: As we do not have data on value-added for 1998, column [7] specification has only 153 observations.

Table-5. Regression for Wage Premium: Fixed Effect with Time Dummies (Lagged Regressors)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Effective Tariff	0.0002 [0.0008]				-0.0001 [0.0008]	-0.0000 [0.0008]	-0.0003 [0.0009]
Nominal Tariff		-0.0005 [0.0014]					
Import Penetration			-0.0048 [0.0016]**		-0.0061 [0.0016]**	-0.0055 [0.0019]**	-0.0064 [0.0022]**
Export Orientation				-0.0001 [0.0019]	0.0013 [0.0022]	0.0018 [0.0023]	0.0018 [0.0026]
% workers w<mw	[0.6606]						-0.1119
Value							0.0418
Constant	0.3861 [0.0349]**	0.5788 [0.0979]**	0.4703 [0.0328]**	0.4693 [0.0321]**	0.3928 [0.0367]**	0.3931 [0.1704]*	1.2582 [0.0235]
N	153	153	170	170	153	153	119
Adj. R2	0.71	0.71	0.72	0.71	0.72	0.72	0.70
F test : industry	16.32	15.26	20.32	15.00	17.75	18.05	9.0
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Researcher's Computations   Robust standard errors in brackets. * Significant at 5%; ** Significant at 1%. Industry and Time Dummy variables not shown. Note: As we do not have data on value-added for 1998, column [7] sp