Labour Market Segmentation within and between the Formal and Informal Manufacturing Sector in Zimbabwe

Godfrey P. Kamutando[†]

School of Economics, University of Cape Town

Work in Progress

Abstract

Segmented labour markets are one of the predominate features that characterise developing and emerging economies. The focus of this study is to provide new empirical insights to the debate on the extent and sources of segmentation within and between the formal and informal manufacturing sector in Zimbabwe. While there is a general consensus that labour market in the SSA are segment, there is still debate on the underlying sources of such segmentation. This study contributes to debates in the literature on the causes of segmentation that have been centred on rent sharing as the main source. The analysis of this study is based on the new existing matched employer-employee panel dataset of Zimbabwean informal manufacturing firms and workers that we collect under the "Matched Employee-Employer Panel Data for Labour Market Analysis in Zimbabwe" project between 2015 and 2018. Using employer-employee matched data set provides a solid base to test the segmented labour market theories by assessing the impact of firm characteristics on within and between sector segmentation. We group informal employment into two tiers; the lower tier (informal sector workers) and the upper-tier (informal sector firm owners-self-employed). We also group the formal sector worker into the lower-tier (informal workers working in the formal sector - casual and part-time workers) and upper-tier (formal employees-full time workers). Our empirical strategy starts by estimating the extent of segmentation by assessing the earnings differentials between labour markets segments and then model the relationship between firm profits and wages settings between the permanent and contact workers in the formal sector. The empirical results shows that the labour markets in Zimbabwe are highly segmented both across and within sectors. The results also show presents of labour market rigidities in the formal sector. The results points to the need for policy that address the rigidities in the labour markets and promotes the activities of informal sector workers that are subject to low wage earnings. Such policy may need the authorities to provide the incentives for informal sector firms to formalise their operations. More needs to be done to ensure equitable and fair wages that improve both worker and firm productivity.

Keywords: segmentation, formal and informal, wage differentials, firm characteristics

---

[†] Corresponding Author email: godfreykamutando@gmail.com

3.1 Introduction

Segmented labour markets are one of the predominate features that characterise developing and emerging economies (Bigsten et al., 2003; Maloney, 1999; Fields, 1990). Labour markets are said to be segmented if the variation in employment outcomes of workers is not fully explained by differences in workers' productivities. On one hand, segmentation is associated with a divide between the 'standard' forms of employment and 'atypical' forms of employment. Atypical employment relates to the part-time, fixed-term contracts and casual forms of employment. These atypical forms of employment are said to be inferior as compared to the standard forms of employment. On the other hand, segmentation can be identified as the divide between the 'formal' sector in which employment is regulated through institutional legislation and the 'informal' sector in which employment is not regulated. Thus, we could have two scenarios: segmentation between the informal and formal sector and segmentation within the formal. Segmentation within the formal sector may have spill-over effects on the informal sector.

Segmentation poses two challenges to economic development (Cazes & de Laiglesia, 2015; Deakin, 2013). First, it is associated with labour market outcome inequalities such as wage inequalities across the subgroups or segments and low rates of mobility between segments. For example, atypical and informal sector forms of employment are associated with inferior wages, high insecurity and protection, and low prospects of upward mobility as compared to standard forms of employment. Segmentation also implies that a subset of workers in the labour market earns wage premium which is not explained by differences in human capital and this is inconsistent with a competitive wage setting. With the increase in the share of atypical forms of employment in Zimbabwe, if there exist large wage differentials between segments then aggregate welfare might be declining.

Second, segmentation may induce second-best equilibrium outcomes from the efficiency perspective. Segmentation, as a result of institutional rigidities, may impede efficient contracts leading to both private and social costs. In the same vein, segmentation may be as a result of bargaining between employers and workers which may be privatively optimal but socially inefficient. Thus, segmentation may result in the misallocation of resources. It is argued that high labour costs as a result of employment and wage rigidities prevent worker productivity and compensation from matching thereby inducing the potential of allocative inefficiencies (Deakin, 2013). In addition, segmentation constrains adaptation of firms to business cycles thereby reducing firms' efficiency and ability to pay workers (Kalleberg, 2003). Thus, the

1

extent to which labour markets are segmented can be directly used to infer the inefficiency of labour allocations.

Wage differentials between labour market subgroups have been predominantly used in the mainstream literature to investigate the extent and sources of segmentation (Pratap & Quintin, 2006; Gong & Van Soest, 2002; Marcouiller, de Castilla & Woodruff, 1997). There are two broad alternative interpretations for the wage differentials between labour market segments. On one hand, segmented labour market theories predict wages between the segments to differ for workers with the same characteristics due to differences in firm characteristics and institutional rules. On the other hand, competitive labour market theories argue that earnings differentials arise as a result of differences in human capital endowments and not due to differences in institutional setup (El Badaoui, Strobl & Walsh, 2010; Pratap & Quintin, 2006). Hence the extent to which firm characteristics explains wage differentials can be used to infer the extent of segmentation.

Although there is a general consensus in the literature that SSA labour markets are segmented (see Fields, 1990), little is still unknown on what causes such labour market segmentation. Debates in the literature on the causes of segmentation have been centred on rent sharing as the main source (Gürtzgen, 2009; Hildreth & Oswald, 1997a; Blanchflower, Oswald & Sanfey, 1996). The argument is that persistent wage differentials either within or across sectors appear to be correlated with firms' ability to pay, that is firms' profits and this highlights the importance of bargaining in wage setting processes.

To this end, the knowledge of forces behind wage setting or wage differentials is key in developing policies targeting specific labour market subgroups. In this study, we concentrate on both within and between sector labour market segmentation. Specifically, we explore the divide between the formal and informal sector labour market segments and the within formal sector divide between permanent and contract (part-time) employees. This allows us to have an in-depth understanding of the labour markets segmentation in Zimbabwe. We also investigate segmentation within the informal sector, which is between, self-employed and informal sector wage employees. (Fields, 1990) argued that the informal sector is heterogeneous and it consists of an upper-tier that includes those who enter in informal sector activities based on their preferences and lower-tier consists of those who have no hopes of getting a formal job and enter the informal sector as survivalists. The general hypothesis is that upper-tier consists of self-employed while the lower-tier constitute the informal wage workers.

Therefore, in a segmented labour market informal worker are typically subject to lower earnings than their counterparts in the formal sector, where wages are set above market-clearing prices for institutional (Günther & Launov, 2012; Tansel, A. & Kan, 2012).

The primary focus of this studyis to provide new empirical insights to the debate on the extent and sources of segmentation within and between the formal and informal manufacturing sector in Zimbabwe. The analysis is based on the following research questions;

- Are labour markets within and between the formal and informal sector segmented in Zimbabwe and if so, why?

- How important is rent sharing as a source of segmentation within the formal sector?

Studying the extent and sources of labour market segmentation using our unique data in Zimbabwe provides many insights. First, it allows the identification of the adjustments taking place at the firm level in terms of wage-setting processes and how they attenuate or exacerbate segmentation. Wage setting process has a direct effect on employment, prices and competitiveness. Second, knowing the extent of segmentation allows us to directly review on inefficiencies within the labour markets in Zimbabwe. Thirdly, we are able to isolate the role of individual, job and firm characteristics as potential sources of segmentation. Lastly, our data allows to explore within and between sector heterogeneity. The characteristics of one segment may have some spillover effect on the other.

Zimbabwe provides some interesting new insights to explore. The Zimbabwe economy has undergone a period of wrenching structural change characterised by shrinking formal sector economy, underemployment, informalisation and high unemployment. It is argued that such structural change has altered the functioning of labour markets. One key feature is the increase in the relative proportion of atypical forms of employment. The relative expansion of atypical forms of employment may have some economic implications; may lead to wage differences that are not explained by differences in workers' productivity leading to dysfunction of labour markets through labour misallocation. Further, we have found evidence of large misallocation in product and capital markets in the preceding studyand it is important to find how the labour markets complement our earlier findings. With increased informalisation and atypical forms of employment in Zimbabwe, it remains an empirical question to find how this may have affected the labour returns within and between segments.

The study makes some fundamental contribution to the literature. First is the use of the recent employer-employee matched survey data set on informal and formal manufacturing sector firms and employees. One of the challenges in the literature on the analysis of the wage gaps between the formal and the informal sector workers is the availability of comparable data set. Although most studies in the literature have acknowledged the importance of firm characteristics in explaining wage gaps, most of these studies have failed to control for firm characteristics due to the limitations of the data sets used. As such, in addition to individual characteristics, we are able to control for firm characteristics. Using employer-employee matched data set provides a solid base to test the segmented labour market theories. To our knowledge, we are not aware of literature that has tested within and between formal and informal sector segmentation in the context of Zimbabwe. Our results can thus be generalised to other developing countries with big informal sectors.

Second, the study makes some methodological contributions by using the recently developed econometric methods to test the existence of the wage gap. A large body literature has been rationally using Oaxaca-Blinder decomposition in addition to the Mincerian model to test the existence of the wage gap. We expand this literature by employing the Recentered Influence Function (RIF) also known as the unconditional quantile regression approach. This provides a more comprehensive analysis and assessment of the earnings differentials within and between the formal and informal sector. Further, we extend the literature that has explored between formal and informal sector segmentation by unpacking the within sector segmentation. For example, we are able to explore the divide between permanent and contract workers within the formal or the upper and lower-tier workers within the informal sector. This provides us with more information on the extent and sources of segmentation within the Zimbabwe labour markets and provides a strong basis to test the segmentation theories.

The rest of the studyis structured as follows: Section 3.2 presents the overview of theoretical insights and related empirical literature review on sectorial wage differentials and rent-sharing. Section 3.3 discusses the methodological framework, which includes discussion on the theoretical model, estimation strategy and describes the data. The discussion of the empirical findings is done in section 1.4 and finally, section 1.5 concludes.

3.2 Theory and Empirical Evidence

3.2.1 Theoretical Insights

There are two broad theoretical models that have been used in literature to predict wage differentials between subgroups. The first is the competitive neo-classical model, also known as the human capital theory of labour markets. The neo-classical labour market theory is non-institutional in the sense that factors such as unions, collective bargaining, firms and governments do not play a role in deciding employee earnings. The wages, according to the competitive model are set aligned to the worker's marginal productivity. The theory argues that the differences in earnings amongst labour market subgroups are explained by differences in human capital endowments and job characteristics (Mincer, 1974). The theory further asserts that the employee's choice to work in a given labour market (for example in the informal sector) depends on employee's rational decision and preferences that seeks to maximise one's satisfaction. This implies that low paying jobs are characterized by low productivity workers who are unwilling or unable to acquire necessary skills that allow them to access higher-paying jobs. Thus, the neoclassical labour markets outcomes are efficient. The neo-classical models have, however, failed to predict real labour markets outcomes that are characterised by frictions and distortions.

Further, the Segmented Labour Market (SLM) theory is another non-competitive model which explains factors associated with differences in wages between labour market subgroups. It argues that the labour markets revolve around four inter-connected presumptions (Doeringer & Piore, 1971). First, the labour market can be dichotomised into two segments; the primary and the secondary sectors of employment opportunities. Second, there are differences in wages and employment mechanisms between the primary and secondary sectors. Third, job mobility between the two sectors is highly limited and therefore workers are essentially trapped in the secondary sector. Finally, the secondary sector is characterized by under-employment. As such, the SLM theory put much emphasis on 'good jobs' vs 'bad jobs' rather than 'skilled' vs 'unskilled' workers.

According to the SLM theory, the primary sector contains better-paying jobs, which are stable and are regarded as preferred in society. The workers in the primary sector possess secure jobs with opportunity for advancement, earn high wages, better working conditions and employment stability. On the contrary, the secondary sector contains marginal jobs that are

argued to be unattractive, self-terminating, provide little incentives for advancement and for workers to stick to them and pays low wages.

Over the years, a number of complementary models to the SLM models have been developed to explain labour market outcomes such as wage differentials. One of the non-competitive models includes the rent-sharing model (Hildreth & Oswald, 1997b; Blanchflower, Oswald & Sanfey, 1996). The model is linked to the bargaining power of workers in wage-setting processes and argues that more profitable firms pay higher wages to their workers in relation to the bargaining power of parties (Nickell, Stephen J. & Andrews, 1983). In this regard, the rent-sharing hypothesis implies that firms may pay different wages to their workers with the same productivity attributes due to differences in firms' ability to pay. Hence, depending on the bargaining power of workers, firms may pay wages that are higher than equilibrium and that are not related to workers' productivity. This model can be insightful in explaining wages differentials within and between sectors. For, example formal workers may earner high wages than informal workers due to high union influence in the formal sector. At the same time, permanent workers may have a wage premium as compared to contract workers within the formal sector due to the fact that contract workers normally have weak bargaining power.

The general prediction from the rent-sharing model is the positive correlation between firm profits and wages. However, other possibilities other than rent-sharing may explain such a positive relation. For example, a wage-setting process where firms and workers share the risk may also be associated with correlations between profits and wages. Further, the efficiency wage model-where firms may pay higher wages than equilibrium; to retain productive workers, to reduce shirking, to increase productivity and hence firm return-may explain the correlation between firm profits and wages (Shapiro & Stiglitz, 1984). Thus, it's a matter of empirical question to explore and justify the extent to which rent-sharing models explain wage differentials.

To this end, the above theoretical models have been linked to the earnings differentials within and between formal and informal sector. However, they differ in the mechanism through which they explain the wage gaps. Contrary to the neoclassical theory of labour markets, the SML theory query the argument that there exists a direct linkage between worker's productivity endowments and wages as well as the allocation of workers across jobs. In this regard, wage structures are differentiated by the employer characteristics rather than worker human capital endowments and productivity is an attribute of the job. The SLM argues that the primary sector

workers have higher productivity than secondary sector workers because of the differences in jobs in which they work rather than their personal attributes. The neo-classical theory, on the other hand, attests that earnings differentials are as a result of differences in workers' characteristics rather than the characteristics of the workplace.

In addition, the neo-classical theory assumes that individual employees can freely make a choice in the labour market, based on their personal tastes, preferences, abilities and skills and as a result, their labour earnings are based on their human capital endowments. SLM theory, on the contrary, argues that the labour market is composed of non-competing segments of which the returns to labour differ due to institutional barriers that prevent equal benefit from human capital. The primary sector earning structures are insulated from the forces of supply and demand, although this is not the case with the secondary sector wage structures. Thus, the supply-side explanations of human capital theory regarding labour markets and wage structures are rejected in the SLM theory and are replaced with the demand-side oriented theory.

The SLM theory is premised on the hypothesis that the labour market segments that exist are not as a result of differences in human capital attributes but rather as a result of institutional rules that substitute market processes. Consequently, competitive pressure to equalize differentials are absent. Thus, the segmented labour markets have a direct link to labour market inefficiencies that may lead to misallocation of labour resources. It remains an empirical question to test the extent to which the labour markets in Zimbabwe are segmented.

3.2.2 Review of Related Empirical Literature

The question on labour market segmentation has been the focus of much debate in the international literature. A large body of literature has focused on testing the existence of a segmented labour market by exploring the extent of wage differentials between the formal/informal sectors divide in developing countries. Although many studies have shown results in support of existence of dualistic models of segmented labour markets by confirming existence of large earnings gap (Nordman, Rakotomanana & Roubaud, 2016; Rand & Torm, 2012; Pratap & Quintin, 2006), some studies have also provided some evidence of integrated labour markets by providing evidence of wage premium in the informal sector (La Porta & Shleifer, 2014; El Badaoui, Strobl & Walsh, 2008; Maloney, 1999; Marcouiller, de Castilla & Woodruff, 1997). This section provides some review of literature on the stylised facts of segmentation, including different methods that have been used to test segmentation.

The empirical literature on what accounts for labour market segmentation has mainly two issues. First, there is the issue on the definition along which the labour markets are segmented. The conventional empirical literature has used the formal/informal sector divide as the base to test segmentation, assuming that workers within these sectors have homogeneous characteristics (Bargain & Kwenda, 2014; Günther & Launov, 2012; El Badaoui, Strobl & Walsh, 2008). Our study concurs with emerging literature arguing that the treatment of workers within the formal or informal sector may be misleading (Cazes & de Laiglesia, 2015; Maloney, 1999; Fields, 1990). This is because two workers in the same firm may have different wage-setting processes and maybe earning different wages. For, example it may be incorrect to assume that permanent workers and contract workers in the formal sector are homogenous. In addition, several studies have provided empirical evidence of highly heterogeneous informal sector that consists of an upper-tier (self-employed) and lower tier (wage workers) (Nordman, Rakotomanana & Roubaud, 2016; Tansel & Kan, 2012; Maloney, 1999). Thus, in this studyin addition to between sector segmentation we also explore within sector heterogeneity. More specifically, we explore wage differentials within and between the sectors, taking into account heterogeneity within sectors.

Secondly, the methodologies used to estimate the extent and sources of segmentation vary across relevant studies. Different types of data sets have been used to explore segmentation. Much of the literature has used the labour force or household data sets to explore sectoral wage differentials in order to test segmentation. For example, Badaoui *et al.,* (2008) in South Africa use the Labour Force Participation Survey panel data, Carneiro and Henley (2001) use the 1997 Brazilian household survey data. However, as argued by Rand & Torm (2012), Arai (2003) and Gong and Van Soest (2002) the key problem of using such data sets in analysing segmentation is that they fail to take into account the role of firm characteristics in the analysis of factors contributing to segmentation. To the extent that segmentation theories highlight institutional characteristics as the key factors in explaining labour market outcomes, studies relying on such datasets may provide biased results in explaining segmentation. This studythus contributes to this line of literature by using a rich and recent employer-employee matched dataset that includes both worker and firm characteristics in order to provide a robust analysis.

Furthermore, different estimation methods have been used. Traditionally most studies in literature estimated the earnings gaps at the mean of the wage distribution (El Badaoui, Strobl & Walsh, 2008; Pratap & Quintin, 2006; Gong & Van Soest, 2002). The approach includes the estimation of an OLS econometric model with a dummy variable for informality which

captures the wage gap. The approach allows one to identify the wage gap after controlling for a variety of factors that are thought to determine wages. An insignificant coefficient of informality variable would imply zero wage gap that is no segmentation. In relation to this, a technique such as Oaxaca-Blinder decomposition is then used to decompose the wage gap into two effects; the composition effect and the wage structure effects. The composition effect of the wage gap is the one that shows differences in observed productivity characteristics such as education, training and experience. The structure effect shows the differences in the structure of the labour markets, that is, unobserved characteristics. The extent to which the wage structure effect explains the wage gap determines the extent to which the labour market is segmented. The disadvantage of estimating the earnings gap at the mean is that important heterogeneity that may exist along the wage distribution may be concealed.

Recent literature has solved this issue by using the quantile regressions method that allows one to estimate the wage gap at each quantile along the wage distribution thereby giving more insights into the analysis of the sectorial wage gap (Bargain & Kwenda, 2014; Nguyen, Nordman & Roubaud, 2013; Botelho & Ponczek, 2011). In this study, we extend this literature by using recent techniques to decompose the wage gap such as those highlighted by Fortin et al. (2018) that includes the RIF and the re-weighting non-parametric approaches.

Most studies that have used quantile regressions have found that the wage gap is high at the lower quantiles and it disappears at the upper part of the wage distribution, signifying the existence of the two-tier informal labour markets which this studytakes into account. However, as highlighted by Tansel (2012), it is difficult to take into account econometric problems such as selection bias and unobserved heterogeneity when using the quantile regression methods. Studies in literature have attempted to overcome such a problem by using quantile regressions corrected for selection bias using instrumental variables (Tannuri-Pianto & Pianto, 2002). Other studies have used the fixed effects with quantile regressions (FEQR) estimation technique (Bargain & Kwenda, 2014; Nguyen, Nordman & Roubaud, 2013).

The studies cited above have generally shown that wage differences are a reality between agents with identical observed characteristics. However, the reasons for the existence of wage differentials remains a complex and unsolved puzzle. While most studies have offered evidence supporting theories of labour market segmentation to explain wage settings in developing countries, they hardly offer alternative models supporting the effects of firm (employer) characteristics in explaining wage differentials. With the emerging of the matched employer-

employee data sets, recent literature has explored the predictions of rent-sharing models in explaining wage differentials and thus segmentation. This study contributes to this literature by exploring the effect of rent-sharing as a possible source of segmentation in a developing country.

The empirical evidence from developed countries (Arai, 2003; Blanchflower, Oswald & Sanfey, 1996) has generally shown a positive and significant relationship between firm profits and wages, highlighting that wage differentials are largely explained by rent-sharing. For example, Plasman et al. (2007) show that firms share rent with workers in Belgium and rent sharing contributes a larger share of inter-industry wage differentials. Hildreth and Oswald (1997) use the UK firm data and GMM methods (use the lagged value of profit) to account for possible endogeneity. After controlling for firm characteristics and job characteristics they found evidence of a significant positive association between profits and wages. Similar evidence was found by Blanchflower et al. (1996) in the USA.

Empirical evidence of rent-sharing as a cause of within and between sectoral wage differentials is still emerging for developing countries. Such studies have been constrained by unavailability of relevant data sets. Using matched employer-employee survey data with 200 firms collected in Ghana between 1991 and 1994, Teal (Teal, 1995) test rent-sharing model for Ghana labour markets. The author found strong evidence supporting a positive correlation between firm profits and wages. Similar results regarding rent-sharing were found by Soderbom and Teal (2001) in Ghana. Further, they found a positive relationship between firm size and wages.

In a related study, Bigsten et al. (2003) used a matched employer-employee RPED data set for Cameroon, Ghana, Kenya and Zimbabwe to explore the impact of rent sharing and risk-sharing among other determinants of wage-setting in Zimbabwe. Both rent sharing and risk-sharing are linked to the correlations between profits and wages. Bigsten et al. (2003) argued that risk sharing is a short-run phenomenon where changes in valued-added (profits) are shared between workers and firms when a firm is exposed to shocks such that profits and wages move in the same direction. They found evidence suggesting that correlations between profits and wages reflect risk-sharing rather rent sharing. While rent sharing and risk-sharing are outcomes of inefficient labour markets, though risk-sharing can be interpreted as an efficient response to missing markets.

Velenchik (1997) use the RPED data for Zimbabwe to test the importance of rent-sharing for wage differentials. The data consists of 201 firms and 1609 workers from the formal manufacturing sector. The results show a large wage premium associated with employment in large firms and are not accounted for by differences in worker quality and job characteristics. The size premium was found to be large for white-collar jobs than for blue-collar ones. Evidence of rent-sharing has also been found by Teal (1995) in Ghana, Mazumdar and Mazaheri (1998) in Ghana, Kenya, Zambia and Zimbabwe using the RPED data set.

As highlighted by Blanchflower et al. (1996), the major problem in estimating rent-sharing models is the endogeneity of profits. Some studies have attempted to solve this problem by using instrumental variables (IV) models by finding an instrument for profits (Blanchflower, Oswald & Sanfey, 1996; Nickell & Andrews, 1983). Commonly used instruments are values of the share of intermediates inputs costs to total output, amount of foreign borrowing per employee, cost of energy, capital-labour ratios and lagged values of profits-per-worker amongst other possible instruments (see Matano & Naticchioni, 2017; Rusinek & Rycx, 2013; Card, Devicienti & Maida, 2013; Teal, 1996; Blanchflower, Oswald & Sanfey, 1996). Our study uses the cost of electricity and capital-labour ratio as instruments as they are available in our data set. In addition, another problem in the literature associated with the use of profits-per-worker is the treatment of firms with losses. To circumvent this issue, we follow conventional literature that has instrumented profits-per-worker with other measures of firm profitability such as sales-per-worker and value-added-per worker (Hildreth & Oswald, 1997; Nickell, Stephen & Wadhwani, 1990).

Further, one of the inherent problems in the estimation of wage differentials between the formal and informal sector is the issue of selection bias. While some studies have tried to mitigate this by applying the three-step Heckman model, the challenge comes with finding the right exclusion variable that explains selection into certain sector employment but no correlated to wages. Other studies have used an alternative methodology of using panel data sets and estimate the time fixed effects models to deal away with selection bias (Nguyen et al. 2013). A common result from such studies is that the informal wage penalty disappears or gets relatively small once one controls for fixed effects.

To this end, the literature above can be synthesised as follows. The extent of literature on rent-sharing and segmentation has largely been done in the context of developed countries. Further, very few studies have explored the within sector heterogeneity in analysing segmentation.

3.3 Theoretical Framework and Estimation Strategy

3.3.1 The Theoretical Model

This studyis based on the non-competitive theoretical model developed by Blanchflower et al. (1996) on rent-sharing. The model argues a positive correlation between a firm's ability to pay (profits) and employee wages and hence disapprove competitive theories of labour markets outcomes. Competitive labour markets imply that firms are wage-takers and their profitability do not affect wages as wages are only determined by human capital endowments. The implication is that a more profitable firm will pay the same wage to workers with the same human capital endowments relatively to a less profitable firm. Blanchflower et al. (1996) bargaining model argue that rents are shared between the firms and their employees. The model assumes that wages are determined at firm level through generalised Nash bargaining problem in which unions maximises the expected gains from workers;

$$u(\omega, \overline{\omega}) = u(\omega) - u(\overline{\omega}) \tag{1}$$

Where $u(\omega)$ is the employee's utility from wage ω, $\overline{\omega}$ is the wage from other alternative sources such as temporary work in the case of a breakdown in bargaining. On the other side firms seek to maximise their profits π;

$$\pi = pf(n) - wn \tag{2}$$

where p is the product market price, n is employment. The solution is to the maximises;

$$max\phi log\{[u(\omega) - u(\overline{\omega})]n\} + (1 - \phi)log\pi \tag{3}$$

Where ϕ measures the bargaining power of workers. The model relies on the assumption that if the bargaining is delayed or failed then firms earn zero profits and employees receive $\overline{\omega}$. The variable n also measures the profitability of employment defined as $pf(n) - \omega n$, where $pf(n)$ if the revenue function. Solving the problem for wages ω and employment n produces the following first-order conditions;

$$\omega: \frac{\phi u\prime(\omega)}{[u(\omega) - u(\overline{\omega})n]} - \frac{1 - \phi}{\pi} = 0 \tag{4}$$

$$n: \frac{\phi}{n} + \frac{(1 - \phi)[f\prime(n) - \omega]}{\pi} = 0 \tag{5}$$

Solving equation (4) and simplifying it produces;

$$\omega = \bar{\omega} + \left(\frac{\phi}{1-\phi}\right)\frac{\pi}{n} \qquad (6)$$

Equation (6) is very important. It depicts that the equilibrium wage is determined by outside wage received in the case where bargaining is not achieved, the relative worker bargaining power and, of importance, the profit-per-worker. The determinants of the outside wage can be described by the function $g(\omega^0, b, U)$, where ω^0 is the wage rate in other sectors of the economy, b is the level of income when unemployed and U measures the unemployment rate for the type of workers employed by the firms. The conceptual interpretation is that $\bar{\omega}$ is expected income. Thus, the equilibrium wage can be written as;

$$\omega = g(\omega^0, b, U) + \left(\frac{\phi}{1-\phi}\right)\frac{\pi}{n} \qquad (7)$$

The equilibrium wage is conceptually determined by external forces measured by $g(\omega^0, b, U)$ and internal forces measured by profit-per-employee π/n. Thus, the model with rent-sharing predicts a positive partial correlation between wages and profits-per-employee and a negative correlation between wages and unemployment. The concept behind this is that when sector unemployment increases the chances of getting a job elsewhere diminishes and hence wages claim reduces. Thus, this model argues that firms' ability to pay is the main source of wage differentials.

3.3.2 Estimation Strategy

The estimation strategy is in two folds. First, we explore the extent to which the labour markets are segmented in Zimbabwe by estimating the wage gap between segments. This allows us to answer our first research question. Secondly, we incorporate the rent sharing model discussed in the preceding section to analyse the extent to which differences in bargaining powers amongst labour market subgroups account for segmentation. This allows us to answer our second research question. To provide robust analysis, we complement our models with the Re-centred Influence Function (RIF) decomposition technique. This allows us to perform an in-depth analysis of the extent and sources of labour market segmentation along the wage distribution.

To estimate the wage gap within and between the formal and informal sector we use the standard OLS wage regression with an indicator dummy variable that captures different labour markets segments. The base or unadjusted earnings gap can be derived from estimating the below baseline wage regression model;

$$logW_i = \delta + \beta_1 D_i + \xi_i \tag{8}$$

Where $logW_i$ the logarithm of monthly wages is, δ is the intercept, D_i is an indicator dummy variable that indicates a worker's segment of employment[2], β_1 is the coefficient of importance that depicts the 'raw' wage gap, and ξ_i is the error term. A negative sign on the coefficient β_1 shows evidence of wage penalty. Although equation (8) is useful for estimating the wage gap, its weakness is that we do not know what accounts for that wage gap. As such, we expand equation (8) to control for other theoretical variables that explain differences in wages. The resulting model is shown in equation (9);

$$logW_i = Z_i'\gamma + \beta_1 D_i + \zeta_i \tag{9}$$

Where $logW_i, \beta$ and D_i are defined as in equation (8), Z_i denotes the vector of individual, human capital, job and firm characteristics and ζ_i is the error term. The coefficient β_1 captures the ultimate wage gap after controlling for other determinants of wages. In other words, it shows the wage structure effect on the wage gap, which is the differences in wages that is independent of individual human capital endowment or productivity. If β_1 is negative and statistically signification in equation (9), then the segmented labour market theory is confirmed.

We further expand our analysis by exploring the effects of rent-seeking behaviour on the wage-setting process within the formal sector[3]. We draw our empirical analysis from the Blanchflower et al. (1996) theoretical model discussed in the previous section as applied in Rycx & Tojerow (2004). We estimate the model specified below for separately for permanent and contract workers and compare the coefficients.

$$logW_i = \alpha + \theta_1 \left(\frac{\pi_i}{n_i}\right) + Z_i'\gamma + \eta_i \tag{10}$$

where W_i represents monthly wages, $\frac{\pi}{n}$ represents profits-per-employee i, Z_i denotes the vector of individual, human capital, job and firm characteristics and η_i is the error term. Our coefficient of importance is θ_1.

---

[2] The variable D_i is coded 1 if a worker is employed in the informal sector in the between sector specification. It is also coded 1 if a worker is a contract worker in the within formal sector model specification.

[3] We did not estimate the rent sharing model within the informal sector because; first, most of workers within the informal sector highlights that they are paid according to the firm sales and profits thus it's difficult to infer bargaining power under such scenario. Second, there is no union representation in the informal sector hence the workers do not have bargaining power over wages. Third, we do not have lagged values of sales or profits for the 2015 wave, hence we are not able to take account of some associated specification issues.

Theoretically, a positive coefficient of profits per-worker (θ_1) shows that an increase in profits is associated with an increase in wages, ceteris paribus. This implies that workers have the bargaining power to the extent that firms share their rents with their workers-thus highlighting rent-sharing. This would imply that beyond human capital endowments and job characteristics there are other non-market or institutional mechanisms that explain wage differentials and thus provides evidence of segmented labour markets. A negative coefficient, on the other hand, implies that an increase in firm profits is associated with a decrease in wages, hence highlighting the importance of firm monopsony power in setting wages, again this provides evidence of segmentation. Hence, a significant association between profits and wages confirms non-competitive labour markets.

However, the weakness of estimating and basing our analysis on equations specified above is that it is practically difficult to control for all variables that determine wages as some variables are not available in the data set or are unobserved. Further, the model does not take it into account the differences in returns between labour market segments. For example, the returns to education may be different between formal workers and informal sectors or between permanent and contract workers.

The solution to this problem includes the estimation of separate wage regressions for formal and informal sector sectors and decompose the resulting wage gap into two components; the one based on differences in observed human capital endowments and the other due to earnings determination process. To achieve this, our study will employ the RIF decomposition technique (see the appendix for details of the RIF). The key advantage of the RIF approach as mentioned by Firpo et al. (2011) is that the reweighting provides consistency nonparametric estimate of the counterfactual distribution. Further, knowing the contribution of each independent variable at different points of the wage distribution is key in justifying our theoretical predictions about the nature of the labour markets in Zimbabwe and this is key for policy framework.

In estimating a model specified in equation (10) where wages are determined by the level of profits-per-employer one needs to be cautious of endogeneity of profits (and other covariates). Endogeneity may arise in cases where firms offer efficient wages to increase workers' productivity which in turn increases firm profits. This implies that wages determine firm profits and not vice versa. Under such a scenario, the coefficient of profits-per-employee estimated using OLS will be biased downwards. Further, a product market shock may also affect labour productivity and firm profitability concurrently. Blanchflower et al (1996) proposed two ways

to deal with the problem. The first is to regress wages on the lagged value of profits. The second is to find a plausible instrumental variable that is correlated with profits-per-employee but not wages. In reality, it is difficult to find such an instrument. Thus, the study attempts to solve this problem by using the lagged values of sales per worker and value-added-per worker as instruments.

One of the major issues when decomposing the wage gap using non-experimental data between two groups is selection bias. Controlling for selection bias may be necessary for identification of the composition and the wage structure effects. To account for possible selection bias conventional method in literature is the use of the Heckman two-stage selection model. The procedure requires that an available valid instrument explaining formal-informal employment selection be included in the selection equation but not in the wage equation. The instrument to be valid should be correlated with participation decision and uncorrelated with the wages. It is however acknowledged in the literature that finding such an instrument is difficult (Casale & Posel, 2011). The use of inappropriate exclusion instruments may generate identification problems such as collinearity and high standard errors. Further, the selection procedure may lead to measurement errors given that the expected value of the error term is used in the second stage of the procedure. In addition, Burger (Burger & Walters, 2008) attested that the selection methods are sensitive to heteroskedasticity and the validity of the distribution assumptions discussed in the above section. In literature, no proposals have so far been suggested on how best to tackle the issue of the exclusion variable problem. Thus, given these shortfalls, our inability to find plausible instruments and lack of alternative methods to deal with the exclusion variable in literature we do not correct for the selection bias in this study. However, we acknowledge that this may bias our results and the direction of the bias is difficult to predict.

3.3.3 Data and Measuring of Key Variables

The studyis based on the existing matched employer-employee panel dataset of Zimbabwean manufacturing firms that were collected between 2015 and 2018 under the "Matched Employee-Employer Data for Labour Market Analysis in Zimbabwe" project. Wave 1 consists of 194 formal manufacturing firms and 1385 workers within these firms who were interviewed in 2015. In addition, 130 informal manufacturing firms (self-employed) plus 174 workers within these firms were also interviewed. Wave 2 consists of follow-up surveys that were contacted in 2016 to create a panel of workers and informal sector self-employed. Of the 1385 formal sector employee initially interviewed in 2015, 1065 were successfully re-interviewed. In addition, 99 workers of the 174 informal employees were successfully interviewed and

lastly, of the 130 informal self-employed workers, 76 were successfully re-contacted. In 2017 we further extend the sample for informal sector firms and workers by 74 and 92 respectively. In 2018, we re-interview informal sector firms. Of the informal firms and worker we initially interviewed in 2015, we successfully re-interview 108 firms and 104 workers. Of those initially interviewed in 2017, we only re-interviewed 68 firms and we did not re-interview the workers.

In summary, in wave 1 (of 2015) the total number of employees is 1689 (1385 formal workers+174 informal workers+130 self-employed). In wave 2 (of 2016) the aggregate number of respondents is 1240 (1065 formal emplyees+76 informal employees+99 self-employed). The wave of 2017 total number of respondents is 166 (92 informal workers + 74 self-employed) and finally, the wave of 2018 has a total of 280 respondents (104 informal workers + 176 self-employed). Pooling our data together gives us a sample size of 3375 workers (2450 form sector workers + 446 informal sector workers + 479 self-employed). Our sample is restricted to the individuals aged between 15 and 65 years as this is the conventional working age in literature.

The worker questionnaires include valuable information on individual human capital endowments variables such education, training, experience and job characteristics such as occupation type, mode of salary, monthly earnings, hours of work per week among other useful information. The information will allow us to estimate the wage gap decomposition in detail. Further, given that the data is employee-employer matched, one of the advantages of using such data is that we are able to control firm characteristics such as firm size, firm profits, firm age and industry of occupation among others.

The dependent variable used in the analysis is the individual monthly wages. The questionnaire has information on the wages a worker is supposed to earn the worker is paid according to his roles and grade of employment. But in many instances, due to the economic challenges affecting firms, some workers are paid less than what they are supposed to be paid. Our questionnaire has information on the actual wage that one gets under the prevailing economic situation[4]. As such, to give detailed wage gap decomposition we use both the actual and the contractual wage.

Consistent with the literature (Tansel & Kan, 2012; Rani & Belser, 2012) for self-employed workers we calculate monthly income based on their take-home profits after considering all business-related expenses. Furthermore, we adjust the self-employed income to account for

---

[4] Given the current harsh economic situation in Zimbabwe many firms are struggling to meet the wage bills. Some of them have resorted to pay workers less monthly wages than they should otherwise get.

labour returns and capital returns. We achieve this by following the standard way by Rani and Belsar (2012) who assume that two-thirds of the self-employed income is a result of labour returns and the other one-third as a result of capital returns. It should be important to emphasise that our data set also include contributing family workers (those that do not earn salaries). In a situation with a single-family worker, Rani and Belsar (2012) imputed the earnings of family workers by assuming that 30 percent of the enterprise owner's income goes to the contributing family worker. In a situation with more than one family member, the income from the enterprise is equally divided between the owner and the contributing family workers. However, in our analysis, we only included the wage earners and drop the family members due to the bias that can result from their wage imputations. One advantage of the reported wages in our dataset is that they are net of taxes hence we do not have the problem of overestimation of the formal sector wages that are subject to taxes.

Measuring independent variables

Our data set includes rich information on the other variables that are associated with the level of wages. We group these variables into four categories: individual; human capital; firm and job characteristics. Human capital characterises include; education, experience and training. Traditionally education is captured in the wage equation linearly as the number of completed years of schooling. The basic assumption is that each additional year of education has the same proportional effect on earnings. However, there is an argument in literature that there exist a non-linear relationship education and wages in especially in developing countries (Keswell & Poswell, 2004; Card, 1999). To take into account the non-linearity literature has suggested the use of education categories as compared to the years of completed education. Hence in our analysis education is categorised as 1. Primary education, 2. Secondary education and 3. Tertiary education. Experience is measured as the years of experience before starting to work at the current place of work. Further, we also include tenure in our analysis which is measured as the number of years the worker has spent on the current workplace. The competitive labour market theory such as the human capital theory predicts that differences in human capital endowments account entirely for the wage gap.

Individual worker's characteristics include; gender, marital status and age. Gender is a dummy variable that is coded 1 if a worker is a male and zero otherwise. The literature on discrimination argues that on average women earns less wages as compared to their male counterparts. Marital status is also a dummy variable coded 1 if one is married and zero otherwise. Marital status has also been included in the literature to control for worker's

productivity. The idea is that employers perceive married workers as motivated, stable and disciplined and hence more productive. The contribution of the marital status to the wage gap thus depends on the demography of workers within the sectors. Further, we control for individual age. There is a common agreement in the literature on non-linearity of age and as such, we included the square of age in our analysis.

Firm characteristics comprise of; firm size, firm age, firm industry and firm location. Firm size is a categorical variable that indicates if a worker works in a firm with between 1 and 4 employees, between 5 and 20, between 21 and 100 and at least 101. We also include the industry and location dummies in our analysis.

Job characteristics include; weekly hours of work, methods of payment (1=per time period, 2=piece rate, 3=percentage of firm sales, 4=commission), job allowance (1=yes and 0 otherwise), work type (1=permanent and zero otherwise) and union (1=yes).

Summary Statistics

Table 1 presents the summary statistics for the key variables used in our analysis for the earnings differentials within and between the formal and informal manufacturing sector. The results in table 1 show that on average formal sector workers (permanent and contract) earns higher wages as compared to informal sector wage earners. The mean wages for permanent workers are 5.73 log points while for contract workers are 5.43 log points. This is on average much higher as compared to informal sector wage earners (5.14 log points). However, a comparison of formal sector workers with informal self-employed workers shows that self-employed workers on average have higher labour returns (of 6.87 log points).

Further scrutiny on within sector wage differences in table 1 shows that permanent workers earn higher wages than contract (temporary) employees. To the extent that there exists wage differential in the formal sector, this might signify the within sector labour market segmentation. Further, the results show that informal wage workers earn less (5.14 log points) than informal self-employed (6.87 log points). These results are in line with literature that classifies informal wage earners as lower-tier workers in the informal sector (Nordman, Rakotomanana & Roubaud, 2016; La Porta & Shleifer, 2014; Maloney, 1999).

Table 1 also provides some statistics for the vector human capital characteristics which include education, and years of experience. The results show that on average there is no difference in the distribution of educational attainment between the formal and informal sector workers. For

example, a large proportion of workers have secondary school education across the labour market segments; 75 percent of permanent workers have secondary education, compared to 86 percent for the contract, 89 percent for informal wage workers and 79 percent for self-employed.

Table 1. Summary statistics on key variables

	Formal Sector				Informal Sector			
	Permanent		Contract		Informal_Worker		Self_Employed	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Monthly wages (log)	5.73	0.60	5.43	0.60	5.14	0.72	6.87	1.31
Education Level								
1. Primary	0.09	0.28	0.05	0.21	0.03	0.16	0.06	0.23
2. Secondary	0.75	0.44	0.86	0.35	0.89	0.31	0.79	0.40
3. Tertiary	0.17	0.37	0.09	0.29	0.08	0.27	0.15	0.36
Year of Experience	6.01	7.49	5.56	7.26	3.35	4.48	5.83	5.41
Age	44.30	10.58	39.15	11.80	30.47	9.00	40.52	8.88
Gender	0.86	0.34	0.76	0.43	0.84	0.36	0.84	0.00
Married	0.92	0.28	0.86	0.35	0.76	0.43	0.95	0.21
Weekly hours of work	44.05	5.27	44.07	4.88	48.33	12.44	53.44	11.20
Job allowance	0.63	0.48	0.49	0.50	0.48	0.50	0.00	0.00
Union	0.50	0.50	0.33	0.47	0.00	0.00	0.00	0.00
Other jobs	0.28	0.45	0.35	0.48	0.15	0.36	0.13	0.33
Labour productivity (log)	8.90	1.25	8.77	1.33	7.80	0.75	7.76	0.82
Firm Location								
1. Harare	0.61	0.49	0.52	0.50	0.86	0.35	0.82	0.38
2. Bulawayo	0.26	0.44	0.46	0.50	0.14	0.35	0.18	0.38
3. Mutare	0.02	0.15	0.02	0.14	0.00	0.00	0.00	0.00
4. Gweru	0.11	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Firm industry								
1. Metal	0.37	0.48	0.37	0.48	0.34	0.47	0.34	0.47
2. Textile	0.37	0.48	0.50	0.50	0.29	0.45	0.33	0.47
3. wood	0.26	0.44	0.13	0.34	0.37	0.48	0.33	0.47
Firm size								
1. Micro	0.01	0.09	0.02	0.13	0.75	0.43	0.81	0.39
2. Small	0.15	0.36	0.17	0.38	0.25	0.43	0.19	0.39
3. Medium	0.51	0.50	0.42	0.49	0.00	0.00	0.00	0.00
4. Large	0.33	0.47	0.38	0.49	0.00	0.00	0.00	0.00

In addition, 17 percent of permanent workers and 9 percent of the contract have tertiary education. Further, the results in table 1 show that there are no significant differences in average

years of experience between permanent workers (6 years) and the contract workers (5.56 years). Comparably, the informal sector wage earners have the only average of about 3 years of experience.

The results in table 1 further show that in terms of the vector of job characteristics, formal sector employees on average have fewer weekly hours (about 44 hours) as compared to the informal sector workers (48 hours for informal wage workers and 53 hours for self-employed). Theoretically, workers' hours of work should correlate with their wages. However, although the informal wage workers have more weekly working hours they are still subjected to lower average earnings as compared to formal workers with less working hours. Regard to union representation, the results in table 1 show that 50 percent of permanent workers are unionised workers while only 33 percent of contract workers have union presentation. In labour markets literature (especially rent sharing) unionism plays a pivotal role in bargaining for wages. We should expect to see unionised workers earn more wages than non-unionized workers.

3.3.4 Stylized Facts Emerging from our Data

In this section, we explore the stylized facts that emerge from our data on the earnings differentials and segmentation. We start by presenting and comparing the wage distributions within and between the formal and informal sector. While the summary statistics in table 1 show average wage differentials across labour segments, a distributional comparison will provide some more insights. Figure 1 below shows the earnings distributions between and within the formal and informal sectors.

Panel A in figure 1 shows the overall earnings gap between the formal sector (pooled permanent and contract workers) and the informal sector (pooled informal workers and self-employed). The distributions reveal that the informal sector earnings distribution is shifted to the left of the formal sector earnings distribution. This implies that informal sector workers earn less than their formal counterparts, depicting a wage penalty in the informal sector. This result is in line with a large body of literature on segmentation that has shown a wage penalty against informal sector workers. The differences in the shape of the formal and informal sector wage distributions imply that the wage-setting process in the two sectors may be different.

We also explore the within sector wage distributions. Panel B and panel C show the wage distributions of within formal sector segments (permanent vs contract) and within informal sector segments (informal wage workers vs self-employed) respectively.

Figure 1. Earnings distributions within and between the formal and informal sector
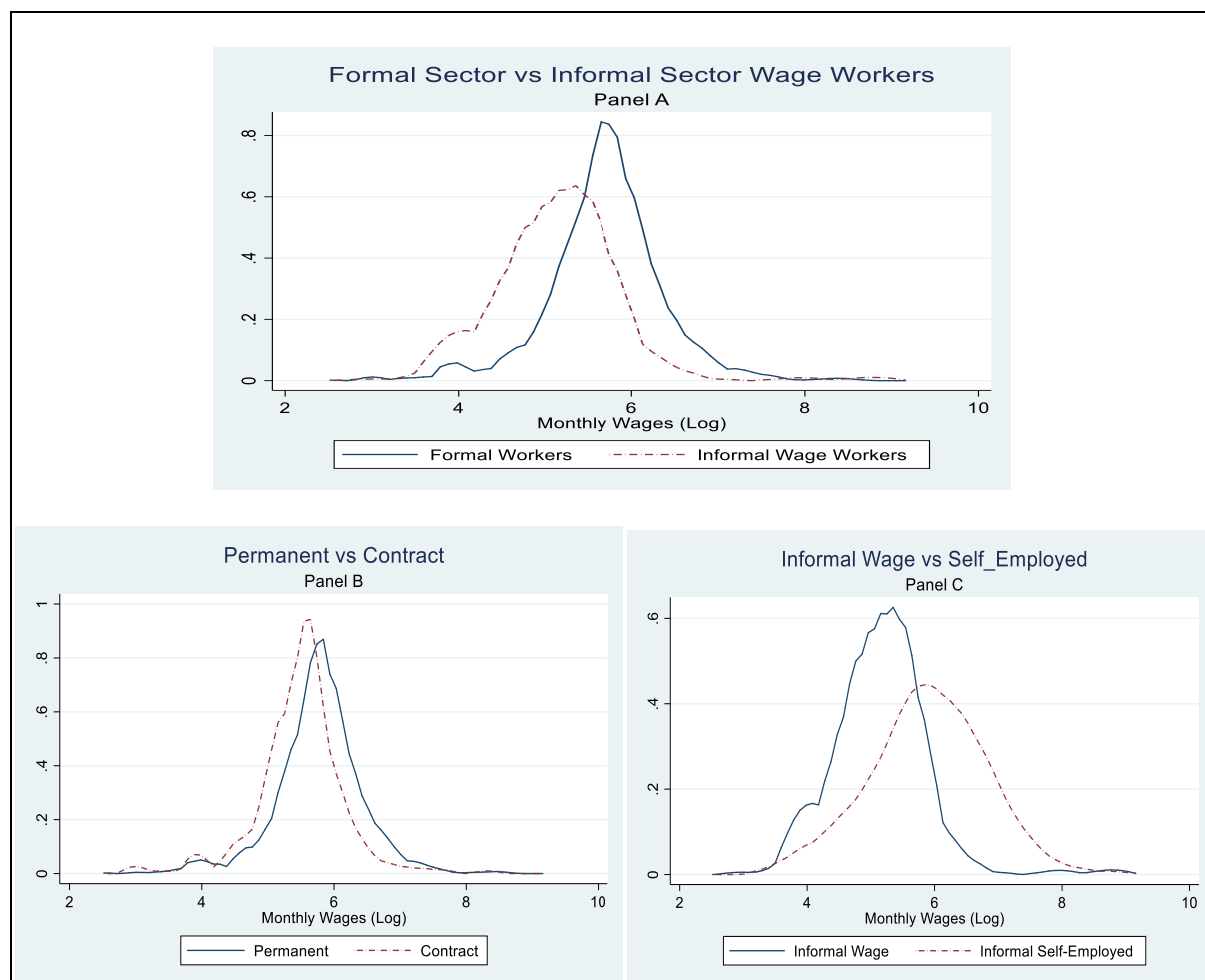
Notes: Differences in monthly wages between labour markets segments. Monthly wages are in logs. The dashed line represents informal wage workers, contract and self-employed in panel A, B and C respectively. Panel A shows wage differences between sectors, while panel B and panel C shows within sectors (formal and informal sectors respectively).

The results confirm that contract workers earn less than permanent workers in the formal sector. The similar shapes of the distribution signify that the wage-setting process is the same for permanent and contract workers. Further, panel C shows a huge wage gap between informal wage workers and self-employed.

A further decomposition of earnings distribution across the formal and informal sector provides some interesting results. Panel D in figure 2 shows the distributions for the formal upper-tier (permanent) informal sector upper-tier (self-employed). Surprisingly, while we find a wage penalty associated with working in the informal sector, panel D shows that at the upper wage distribution of self-employed have high labour returns as compared to formal sector workers. These results signify the importance of decomposing and scrutinizing wage differentials

analysis at the within sectors as the blanket analysis of formal vs informal sector may produce less informed results.

These results in panel D reveal a wage premium for informal self-employed at the upper part of the distribution. This is a striking contrast to the results in literature which shows that self-employed workers suffer a wage penalty (Nordman, Rakotomanana & Roubaud, 2016; Nguyen, Nordman & Roubaud, 2013). In addition, panel E shows a relatively large wage gap between the formal sector lower tiers (contract workers) and informal sector lower tiers (informal wage workers) at the lower part of the distribution but a much smaller gap at the upper part of the wage distribution. These results reveal the extent to which the labour markets in Zimbabwe are segmented.

**Figure 2. Comparison of the earnings distribution for the upper and lower tiers across sectors.**
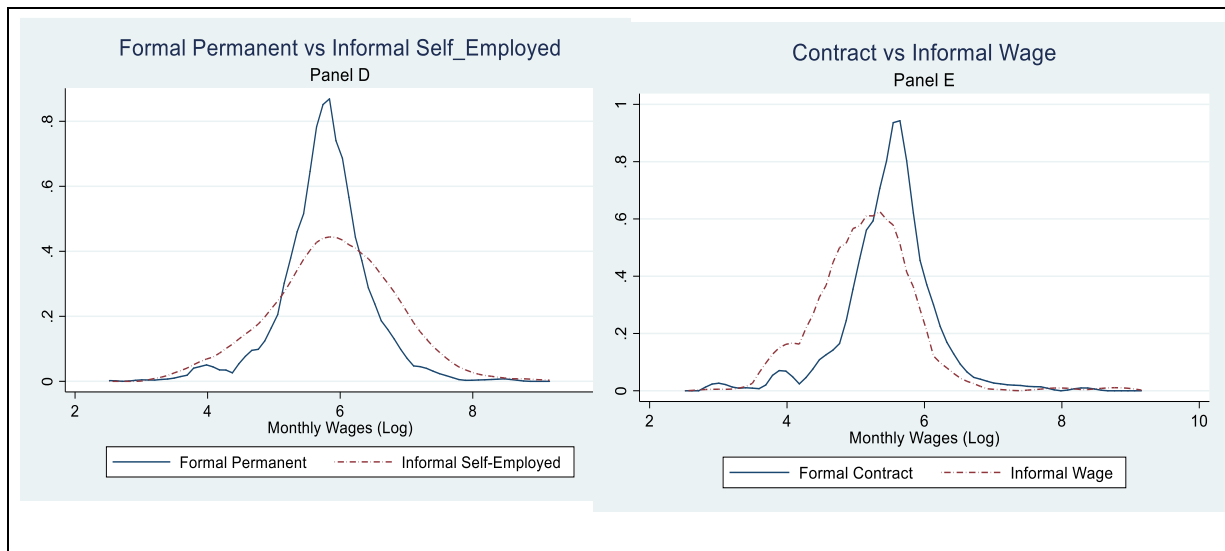
Notes: Differences in monthly wages between labour markets segments. Monthly wages are in logs. The dashed line represents self-employed and informal wage workers in panel D and E respectively. Panel D shows wage differences upper tiers (permanent and self-employed workers), while panel E presents wage differences for lower tiers (contract and informal wage workers).

While the results in figure 1 and figure 2 provide some important insights on the extent of segmentation in the labour markets, there is a need to expand and deepen our analysis of segmentation. We thus construct the quantile distribution of the wages within and between sectors. This allows us to deepen our understanding of the distribution of earnings along the wage distribution and determine at what quantiles is the earnings gap large. Figure 3 shows the quintile wage distributions.

Panel A shows the quantile wage distributions for formal sector workers and informal sector wage workers. Panel B and Panel C presents the distributions for formal sector workers

(permanent and contract) and informal sector workers (wage workers and self-employed) respectively. Panel A shows that the wage gap between the formal and informal sector is higher at the lower quintiles than it is at the higher quintiles. A comparison between the permanent and contract workers shows that the gap is small for workers at the lower distribution and increases along the wage distribution. The same pattern can also be depicted on the informal wage workers and self-employed wage distributions where the wage gap increases sustainably along the wage distributions.

Figure 3: Pen's Parade quantile function for the within and between sector earnings differentials
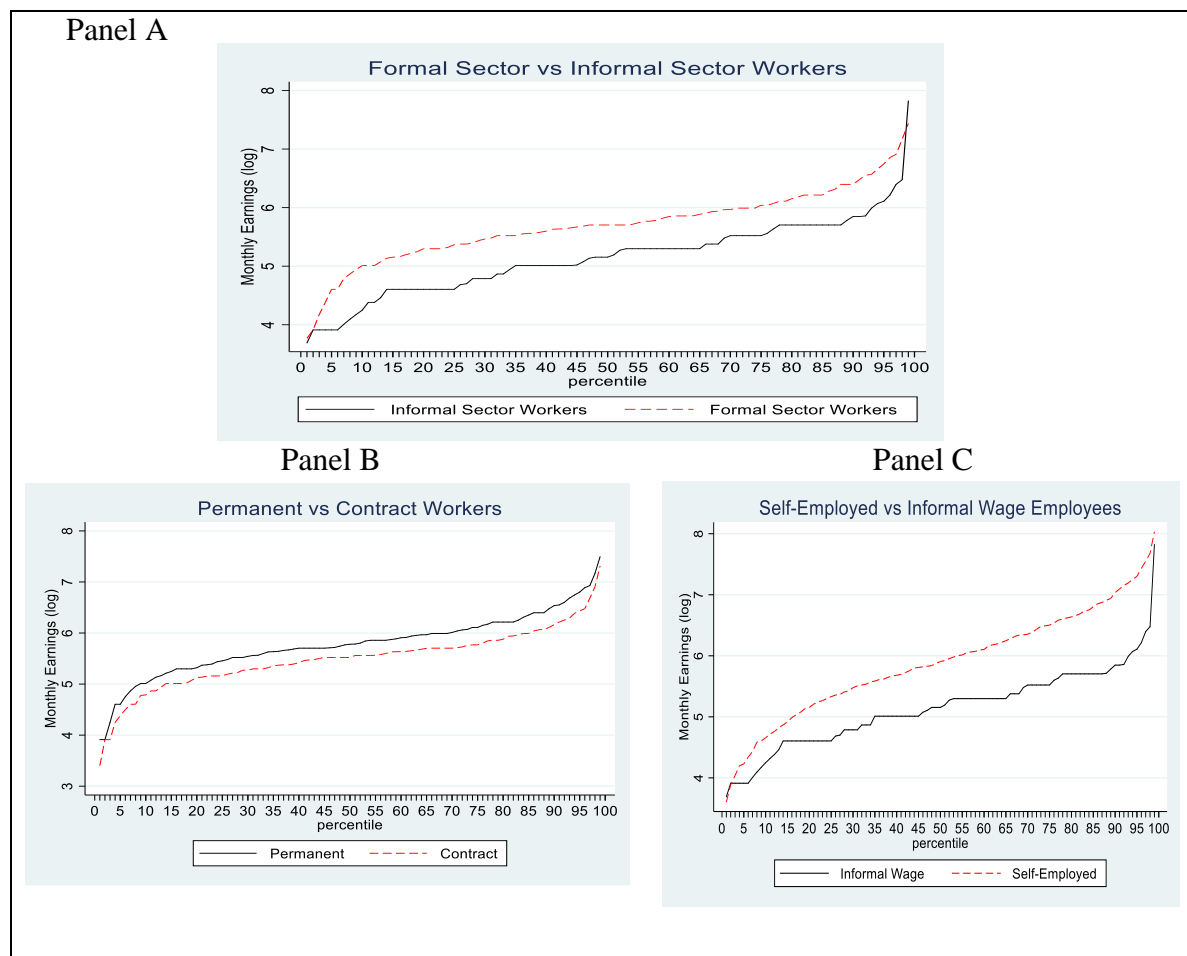
Notes: Pen's Parade quintile functions for the differences in monthly wages between labour markets segments. Monthly wages are in logs.

A further decomposition in figure 4 shows some interesting results between the upper-tiers (permanent vs self-employed). The results in panel D show that below the 40 percentile permanent workers have a wage premium but at higher than 40 percentile self-employed enjoy a wage premium. Panel E shows that formal sector contract workers enjoy the wage premium across the entire wage distribution but the premium shrinks as we move up the distribution.

24

The results in figure 3 and 4 imply that the wage gap is not constant across the wage distributions. Thus, using techniques that decompose the wage gap at the means may provide misleading results. These results affirm our method that encompasses quintile wage gap decompositions such as the RIF.

Figure 4: Pen's Parade quantile function earnings distribution for the lower and upper tiers.
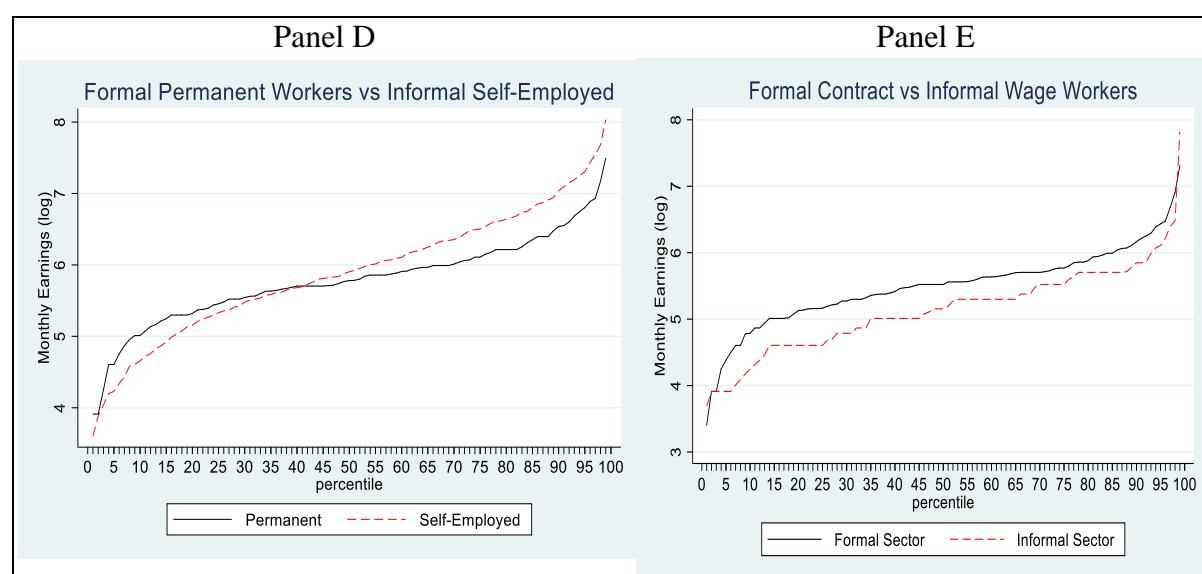
Notes: Pen's Parade quintile functions for the differences in monthly wages between the upper and lower tiers across sectors. Monthly wages are in logs.

As discussed in the preceding sections, one of the key features of segmented labour markets is the immobility of workers to the primary sector (formal sector) and may result in inefficient allocation of labour resources. Table 2 presents an assessment of the mobility of workers across labour markets segments between 2015 and 2016. The permanent and contract employment status forms the formal sector while the informal workers and self-employed forms the informal sector. The table presents the results for those workers who were successfully interviewed in both time periods.

The results in Table 2 column (1) shows that of the workers who were permanent in 2015, about 81 percent of them remain permanently employed. About 6 percent of them moved to the formal sector as self-employed. In addition, about 13 percent of them become unemployed. None of those who were permanent moved to be contract workers or informal sector wage workers. Further, the results in column (2) show that about 36 (11.92 +24.09) percent of those who were contract workers moved across the labour market segments. This proportion is much higher as compared to the proportion of permanent workers who moved (about 19 percent).

25

Table 2. Mobility of workers across different labour segments between 2015 and 2016

employment status	Formal Sector		Informal Sector	
	Permanent	Contract	Informal Workers	Self-Employed
	(1)	(2)	(3)	(4)
Permanent	81.27	0.00	0.00	0.00
Contract	0.00	63.99	9.21	0.00
Informal Workers	0.00	0.00	35.53	0.00
Self-Employed	6.20	11.92	50.00	98.98
Unemployed	12.53	24.09	5.26	1.02
Total	100.00	100.00	100.00	100.00

Notes: Movement of workers across different labour markets segments between 2015 and 2016.

Of the contract workers who moved, about 12 percent moved into the informal sector as self–employed while about 24 percent become unemployed. None of the contract workers moved to either permanent jobs or to the informal sector as wage workers. The main reasons why most permanent workers moved from their initial employment status is a result of company closure and retirement. For the contract workers the main reason, in addition to company closures, was the termination or non-renewal of their employment contracts.

Compared to the formal sector, the results for the informal sector in column (3) show relatively different mobility statistics. About 36 percent of informal sector wage did not change the employment status. However, about 50 percent of them moved to self-employment while only 5 percent become unemployed. The results on informal sector wage workers show that about 9 percent moved to the formal sector as contract workers. Further, self-employed workers mobility rates are very low. About 99 percent did not move from being self-employed.

The results in table 2 can be summarized as follows: first, there is little mobility for the upper-tiers in both the formal and informal sector (permanent workers and self-employed). Second, there are relatively higher mobility rates at lower-tiers of both sectors (contract and informal wage workers). The possible reasons why self-employees do not move is due to relatively higher average returns to labour as shown in table 1. When asked how much they are willing to receive as wages to forego self-employed, most of them mentioned high reservation wages that are above the average wages in the formal sector. This implies that self-employment in Zimbabwe provides higher returns as compared to other employment status. This is also confirmed by the proportions of workers who are moving into self-employed, especially the

informal sector workers (who might already have experience on how self-employment works and its associated returns).

Given the differences in the costs of retrenchment between the contract and permanent workers, if a firm suffers a negative shock, contract workers will be the first to be fired. This explains why the rates for contract workers mobility are relatively high as compared to permanent workers. Given the current economic situation in Zimbabwe, many firms are struggling to pay for labour costs to the extent that most firms are hiring contract workers whom they can fire when the need to do so arises without incurring some costs. Thus, flexible labour markets enhance firms to be more efficient and competitive. For instance, firms can get rid of surplus labour during recessions and this may help them to avoid bankruptcy. Given that firms find it difficult to fire permanent workers and further pay them relatively higher wages as a result of bargaining power and regulations, this may induce inefficiencies, where high wages paid, do not match labour productivity.

The immobility of permanent workers can be confirmed by the results in table 3. The results presented show the reasons why firms find it difficult to fire permanent workers should they wish to do so. The findings show that about 31 percent of formal sector firms highlight the difficultness of the redundancy procedure. This includes the regulation that requires the firms to seek approval from the trade unions and the government. Furthermore, about 38 percent of firms cite high severance pay as another main factor that prevents them from retrenching permanent workers. This signifies high labour market rigidities that triggers an inefficient allocation of labour resources. The rigidities prevent firms from employing optimal units of labour, leading to overstaffing workers that does not match productivity or output. This causes underemployment and high labour costs and hence leads to inefficient allocation of labour.

Table 3. Main factors preventing firms from laying permanent workers in the formal sector and informal sector.

	Formal Sector Firms	Informal Sector firms
No difficult	13.85	85.50
Difficulty redundancy procedure	30.72	0.00
High severance pay	37.35	0.00
Difficulties in rehiring workers	9.04	12.98
Other	9.04	1.52

Notes: Measures of employment flexibility in the formal and informal sector.

Given that firms find it difficult to fire permanent workers, this may show that permanent workers have higher bargaining power and firms may be paying them labour returns that are above the market equilibrium as predicted by rent sharing models. On the other hand, the relatively lower wages for contract workers may signal market equilibrium wages. Thus, the disparities between the permanent and contract workers within the formal sector may be signalling rent-sharing. Thus, the insecurity of contract workers may be used by employers as a way to reduce their rents while extracting the same level of worker productivity. It follows that firms pay contract workers less than permanent with similar characteristics due to differences in bargaining power and institutional rules and rigidities that prevents firms from laying off permanent workers.

As argued in the earlier sections, segmentation is as a result of labour markets inflexibility. Inflexibility takes two forms: wage flexibility and employment flexibility. In the above paragraphs, we have discussed the extent which employment is flexible and we have shown that upper-tiers of employment are inflexible. The inflexibility of employment, especially in the formal sector induces inefficiencies through under-employment. On the other hand, wage inflexibility refers to the extent to which real wages adjust to equilibrate demand and supply in the labour markets and the ability of the employer to affect a competitive wage rate. The results in table 4 show how firms have been adjusting wages in the light of the economic crisis Zimbabwe has been facing. Column (1) presents the average wages workers from different employment status should be earning according to their contractual agreements while column (2) shows the average actual wages that workers are receiving. Column (3) and (4) shows the most and the least average wages received, respectively.

Table 4. Wage flexibility across the labour markets segments

	(1)	(2)	(3)	(4)
	Supposed Pay ($)	Actual Pay ($)	Most Paid ($)	Least Paid ($)
Permanent workers	372.77	363.38	428.08	317.66
Contract workers	231.92	220.48	308.29	211.04
Informal wage workers	168.98	171.30	240.38	123.00

Notes: A comparison of wage flexibility amongst labour segments. Monthly wages are in dollars.

The table shows that actual wages are relatively lower than contractual wages for both permanent and contract workers. However, a comparison of the contractual wages and the least salary received showed a relatively larger gap, especially for permanent workers. These results imply that the wages are not that flexible although some firms have the leverage to pay workers

lower than agreed wages. Thus, some firms may have sought some flexibility by cutting wages to suit production levels and to avoid complete business bankruptcy. The inflexibility of both employment and wages have huge repercussions on the firm's efficiency and its ability to survive especially in episodes of economic crisis.

To this end, the data has shown the existence of the wage differentials between and within the formal and informal manufacturing sector. The data has shown that the informal sector wage workers have the least average wages while the self-employed have the highest average wages. Further, the information presented above shows that the labour markets in Zimbabwe are inflexible both in terms of employment and wages. Thus, these stylised facts signify that the labour markets in Zimbabwe are highly segmented in a manner that affects firms' efficiency. In the next section, we present econometric results. The essence of the econometric results is; first to test the significance and extent of segmentations and second to test the extent to which rent-sharing models explains wage differentials in the formal sector.

3.4 Empirical Results

3.4.1 Between sector wage differentials

We estimate the magnitude and significance of the earnings gap between formal and informal manufacturing workers. Table 5 presents the ordinary least square results from the Mincerian wage regression model equations 9 and 10. The indicator variable is 'informality' which takes a value of 1 if an employee works in the informal sector and zero otherwise.

Table 5. The earnings gap between the formal and informal manufacturing sector wage workers

VARIABLES	(1) model 1	(2) model 2	(3) model 3	(4) model 4
Informality	-0.529***	-0.384***	-0.356***	-0.183***
	(0.0422)	(0.045)	(0.045)	(0.063)
Constant	5.690***	4.518***	4.433***	4.341***
	(0.0154)	(0.183)	(0.181)	(0.196)
Observations	2,217	2,217	2,217	2,217
R-squared	0.070	0.196	0.207	0.241
Human Capital Charact.	NO	YES	YES	YES
Individual Charact.	NO	YES	YES	YES
Job Characteristics	NO	NO	YES	YES
Firm Characteristics	NO	NO	NO	YES

Notes: The dependent variable is the log of monthly wages. Informality is a dummy variable coded 1 if one is an informal wage worker. Column (1) shows the raw wage with no controls in the model. Column (2) shows the wage gap after controlling for human capital and individual characteristics. In column (3)

we add job characteristics. Column (4) is our full model after adding firm characteristics. Asterisk denotes level of significance (*** p<0.01, ** p<0.05, * p<0.1). Robust standard errors are in brackets.

Column (1) presents the raw wage gap without any controls. The results show a raw wage gap of about 53 percent that is significant at 1 percent level of significance. This implies that without controlling for anything, being an informal sector worker is associated with a wage penalty of about 53 percent. But this large penalty may be associated with differences in human capital endowments.

In column (2) we add human capital and individual characteristics as controls. The human capital characteristics include the level of education, years of experience and whether a worker has received some training or not. Having controlled for human and individual characteristics the wage gap falls to about 38 per cent. This wage gap is still high and statistically significant at 1 percent level of significance. These results suggest that even after controlling for human capital differences, the informal sector workers earn 38 percent less than formal sector workers. According to the competitive theories of labour markets, earnings differentials should be exclusively explained by differences in human capital endowments. To the extent that we observe a huge wage gap after controlling for human capital endowments is the first signal that the labour markets in Zimbabwe are segmented and the extent of segmentation is quite high.

Nevertheless, we understand that in addition to human capital endowments, job characteristics also play a key role in influencing the earnings. In column (3) we present the results of the earnings after controlling for both human capital and job characteristics. However, the wage gap slightly changes as shown by a reduction from 38 percent in column (2) to 36 percent in column (3). These results after controlling for human capital and job characteristics show that the wage penalty associated with being an informal sector employee is about 36 percent and is statistically significant at 1 percent level of significance

In column (4) we present the results of the earnings gap after controlling for firm characteristics in addition to human capital and job characteristics. As discussed earlier, the segmented theories of labour markets (including the rent-sharing models) argued that the firm characteristics play a critical role in the earnings determination processes. We thus control for firm size, firm age, firm industry and location in column (4) and the wage gap reduced to about 18 percent. The results show that after controlling for human capital, job and firm characteristics being an informal sector worker is associated with a wage penalty of 18 percent.

The results in column (4) signify the importance of firm characteristics in the determination of earnings. Hence, the results confirm the existence of segmented labour markets. The informal sector is associated with inferior wages even after controlling for firm characteristics. The possible explanation for the formal sector to earn higher wages than market equilibrium is due to institutional rigidities that impede firms in the formal sector to set-up market-oriented wage rates. We have shown earlier that the wages in the formal sector are relatively inflexible as compared to the informal sector. Thus, the higher wages in the formal sector may be explained by institutional rigidities such as stringent labour regulations. Hence although, the formal sector firms enjoy a higher wage premium this may have consequences on formal sector firm's efficiency and the capacity of these firms to create future jobs. These results are consistent with other studies in the literature. For example, Rand and Torm (2012) show that by adding firm characteristics the wage gap reduced from 17 percent to 10 percent in Vietnam. Tansel and Kan (2012) shows that even when one controls for firm characteristics the informal wage penalty remains significant. Our results contrast with Badaoui *et al.* (2010) who showed that the informal wage penalty disappears once one controls for firm characteristics.

To understand the wage gap further, the studyapplies the linear RIF decomposition technique as discussed in the sections above. The RIF shows the contribution of each independent variable at different points of the wage distribution and this is key in justifying our theoretical predictions about the nature of the labour markets in Zimbabwe. Table 6 shows the results for the RIF decomposition at the 10th, 50th and 90th quintiles.

Table 6. The RIF decomposition results for the wage differentials between formal and informal wage employees.

VARIABLES	(1) 10th percentile	(2) 50th percentile	(3) 90th percentile
Formal Workers	5.014***	5.738***	6.472***
	(0.0273)	(0.0134)	(0.0286)
Informal Wage Workers	4.385***	5.195***	5.855***
	(0.142)	(0.0401)	(0.0461)
Difference	0.629***	0.543***	0.617***
	(0.145)	(0.0423)	(0.0543)
Explained	0.392***	0.211***	0.497***
	(0.0850)	(0.0409)	(0.0870)
Unexplained	0.238	0.333***	0.120
	(0.166)	(0.0573)	(0.101)

Notes: Table presents the evolution of the earnings differentials for 10th (p10), median (p50) and 90th (p90) percentiles using the RIF decomposition. We control for human capital, individual, job and firm

characteristics in all columns. Asterisk denotes level of significance (*** p<0.01, ** p<0.05, * p<0.1). Robust standard errors are in brackets.

The results in table 6 show that the mean average wages of the informal sector are lower than the formal sector counterparts at every percentile shown. These results confirm to our earlier findings in figure 3 panel A. A comparison of the results in column 1-3 shows that the wage gap is higher at the 10th and 90th percentile of the wage distribution while relatively lower at the median. At the 10th percentile the wage differences are significantly explained by the composition wage effect, that is, the differences in worker observed characteristics while the unobserved characteristics are insignificant. However, at the median, the large part of the earnings differential (66 percent) is significantly explained by unobserved characteristics. These results confirm our argument that the labour markets in Zimbabwe are highly segmented and the extent of segmentation differs across the wage distribution.

As discussed in the earlier sections, one of the advantages of the RIF method is that we are able to determine the importance of each variable in explaining segmentation at different points on the wage distribution. Table 6A (in the appendix) provides detailed results for the between sector RIF decomposition. We classify the explanatory variables into the individual, job, human capital and firm characteristics. The goal is to unpack the extent to which these characteristics explain the wage gap at different intervals of the wage distribution. This allows us to provide some solid evidence on the extent to which labour markets are segmented in Zimbabwe.

The results in Table 6A shows that individual characteristics such as age, gender and marital status do not explain differences at the bottom of the wage distribution but are rather statistically significant in explaining wage distribution at the 50th and 90th percentile. The results further indicate that human capital characteristics are statistically significant in explaining wage differentials and the magnitude of importance is stronger at the 90th percentile. More importantly, the results reveal the significant importance of firm characteristics in explaining the wage disparities between the formal and informal sector workers at the entire wage distribution. To the extent that firm characteristics play a significant role in explaining wage differentials signal that the wage disparities go beyond the explanations of the competitive theoretical models. This, therefore, confirms that workers in the formal sector earn higher wages not because they have different human capital endowments, but because they work in firms with different characteristics. A number of studies in the literature have shown

that firm characteristics such as firm size are important in explaining wage differentials (El Badaoui, Strobl & Walsh, 2010; Gürtzgen, 2009; Pratap & Quintin, 2006).

3.4.2 Within Formal Sector Wage Differentials

This section looks at the extent to which the within formal sector labour markets are segmented. The aim is to unpack the extent to which firms in the formal sector pay permanent and contract workers different wages despite having the same human capital endowments. Temporal work contracts have traditionally been used by firms to seek some flexibility in employment and wages. Table 7 presents the results for the earnings differentials between the permanent and contract workers. The indicator which shows the presence of the within sector wage gap is the variable 'contract' that takes the value of one if the one is a contract worker and zero if one is a permanent employee.

Table 7. The earnings gap between the Permanent and Contract workers within the formal sector.

VARIABLES	(1) model 1	(2) model 2	(3) model 3	(4) model 4
Contract_workers	-0.283***	-0.214***	-0.178***	-0.164***
	(0.0337)	(0.034)	(0.034)	(0.034)
Constant	5.770***	4.884***	4.756***	4.569***
	(0.0179)	(0.209)	(0.207)	(0.216)
Observations	1,896	1,896	1,896	1,896
R-squared	0.036	0.170	0.185	0.227
Human Capital Charact.	NO	YES	YES	YES
Individual Charact.	NO	YES	YES	YES
Job Characteristics	NO	NO	YES	YES
Firm Characteristics	NO	NO	NO	YES

Notes: The dependent variable is the log of monthly wages. Contract_workers is dummy variable coded 1 if one is a contract worker. Column (1) shows the raw wage with no controls in the model. Column (2) shows the wage gap after controlling for human capital and individual characteristics. In column (3) we add job characteristics. Column (4) is our full model after adding firm characteristics. Asterisk denotes level of significance (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). Robust standard errors are in brackets.

Column (1) presents the results for the raw wage gap and shows a significant raw wage of about 28 percent. These results provide evidence that permanent workers and contract workers are paid differently. The argument is that such a gap may be explained by differences in human capital characteristics. Thus, in column (2) we present the results for the wage gap after controlling for workers' human capital and individual characteristics. The results show that the wage gap reduced to 21 percent and it is statistically significant.

In column (3) we further control for job characteristics while in column (4) we control for firm characteristics in addition to other controls. After controlling for job characteristics, the wage gap slightly reduced from 21 to 18 percent. The results in column (4), our full model, shows a statistically significant wage gap of about 16 percent. The key observation is that the wage gap did not change much after controlling for firm characteristics. This may be explained by the observation that there is no heterogeneity in firm characteristics between the permanent and contract workers as shown in table 1.

We further expand our analysis by decomposing the within formal sector wage gap using the RIF decomposition technique as in the previous section. The idea is to explore and unpack what accounts for the wage gap between permanent and temporal workers. Table 8 provides the RIF decomposition results.

Table 8. Within the formal sector labour market segmentation: The aggregate RIF decomposition results

VARIABLES	(1) 10th percentile	(2) 50th percentile	(3) 90th percentile
Permanent	5.108***	5.779***	6.511***
	(0.040)	(0.016)	(0.035)
Contract	4.813***	5.568***	6.170***
	(0.075)	(0.024)	(0.049)
difference	0.295***	0.211***	0.341***
	(0.085)	(0.028)	(0.060)
Total explained	0.097**	0.088***	0.224***
	(0.041)	(0.019)	(0.041)
Total unexplained	0.198**	0.123***	0.116*
	(0.091)	(0.031)	(0.066)

Notes: Table presents the evolution of the earnings differentials for 10th (p10), median (p50) and 90th (p90) percentiles using the RIF decomposition. We control for human capital, individual, job and firm characteristics in all columns. Asterisk denotes level of significance (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). Robust standard errors are in brackets.

The results show that permanent workers have a wage premium at the entire wage distribution and the wage premium is bigger at the 10th and 90th percentile of the wage distribution. The unexplained part of the wage is statistically significant, that is, all the specifications in columns 1-3. We see that at the 10th percentile the unexplained part contributes to about 67 percent (0.198/0.295) of the wage gap. In addition, at the 50th percentile, the unexplained part accounts for about 58 percent (0.123/0.211) of the wage while it accounts for about 34 percent (0.116/0.341) at the 90th percentile. These results reveal that the within formal sector labour markets are highly segmented to the extent that the large part of the wage gap is attributed to

the unobserved characteristics especially at the lower part of the wage distribution. In other words, the results show that observable characteristics such as human capital, job and firm characteristics do not play a big role in explaining wage differences for those below the 50th percentile of the wage distribution. Firms may be paying lower wages to temporal workers as a way of seeking some flexibility in the labour markets-implying that wages are lower for contract workers not because they have different attributes compared to permanent workers.

The detailed decomposition results in table 8A at the appendix shows how important specific observable variables explain the wage gap at the 10th, 50th and 90th percentile of the wage distribution within the formal sector. The results show that the vector of individual, job, human capital and firm characteristics is relatively important in explaining the wage gap at the 90th percentile as compared to the 10th percentile.

3.4.3 The importance of rent-sharing in explaining within formal sector segmentation

In the remainder of this study, we determine the importance of rent sharing in the formal manufacturing sector. The idea is to unpack the driving force behind the labour market segmentation. As we have established in the earlier sections, the Zimbabwe labour markets are inflexible highlighting that the standard competitive model of labour markets do not hold. Table 9 presents the results of the rent sharing model.

Table 9. Rent sharing and the with formal sector wage gap

	Overall		Permanent		Contract	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	OLS	IV	OLS	IV	OLS	IV
Profits/worker (lagged)	0.079***	0.093***	0.075***	0.066*	0.080***	0.148**
	(0.014)	(0.030)	(0.016)	(0.037)	(0.026)	(0.058)
Union	0.148***	0.149***	0.134***	0.135***	0.035	0.048
	(0.028)	(0.028)	(0.033)	(0.033)	(0.055)	(0.059)
Firm size	0.062***	0.056***	0.085***	0.086***	0.019	-0.011
	(0.014)	(0.018)	(0.016)	(0.020)	(0.024)	(0.035)
Constant	3.793***	3.691***	3.913***	3.979***	4.228***	3.759***
	(0.226)	(0.274)	(0.284)	(0.345)	(0.387)	(0.512)
Observations	1,902	1,902	1,358	1,358	544	544
R-squared	0.253	0.252	0.255	0.252	0.249	0.237
Individ. Characteristics	YES	YES	YES	YES	YES	YES
Human Capital	YES	YES	YES	YES	YES	YES
Job Characteristics	YES	YES	YES	YES	YES	YES

Firm Characteristics	YES	YES	YES	YES	YES	YES

Notes: The dependent variable is the log of monthly wages. The proxy for profit-per-worker is lagged sales per worker in logs. Asterisk denotes level of significance (*** p<0.01, ** p<0.05, * p<0.1). Standard errors are in brackets.

The table presents the results for the combined formal sector worker in column 1-2 and separately for the permanent and contract workers in column 3-4 and column 5-6 respectively. The robust OLS results serve as our benchmark results for the analysis. In this model, we regress logarithm of monthly wages on profit-per-worker as presented in equation (10). In all specifications, we control for individual, human capital and firm characteristics. Our benchmark regression results clearly support the hypothesis that individual wages are positively and significantly associated with the firm profits, that is the firm's ability to pay. Thus, confirming our story that the labour markets in Zimbabwe are not competitive. Surprisingly, a comparison of the benchmark results in column (3) and column (5) show that contract workers have a higher profit-per-worker coefficient than permanent workers. We would have expected permanent workers to have a higher coefficient on profit-per-worker since they have a higher union power than the contact workers. In the rent sharing model, neither union nor firm size is associated with contract workers wages.

As we have already mentioned earlier, our benchmark specifications might suffer from the endogeneity of profits. The OLS estimates might thus be biased and inconsistent. To minimise this problem, we improve the robustness of our specifications by using the instrumental variable regression. This method involves finding an instrument that is highly correlated with our endogenous variable but not correlated with the error term. Following Blanchflower and Oswald 1996, we use the cost of electricity and capital-per-worker as our instrument. It can be argued that the instruments we have used are inappropriate. A good instrument should be able to sufficiently explain the variation in the potential endogenous variable (profits-per-worker) but not the variation in the monthly outcomes. Using a two-stage least squares (2SLS) regression where, in the first step, we regress the value of profits-per-worker on the cost of electricity and the capital-per-worker (see table 10A in the appendix), the predicted value of profits-per-worker from the first step regression is included as the main regressor in equation (10). The coefficients of our instruments in table 10A are positive and significant at the 1 percent level of significance in all our specifications. These results, therefore, establish the requirement that the instrument is highly correlated with the explanatory variable is satisfied. Further, the results from the Sargan test of over-identification shows that the over-identifying

restrictions cannot be rejected at the 5 percent significance level. This suggests that the two instruments are valid and that our IV models are well specified.

The results from our 2SLS are reported in column (2), (4) and (6) of table 9. Unsurprisingly, we found that the wage-profit elasticity increased from 0.079 to 0.093 for the overall specification and 0.080 to 0.148 for contract workers which confirms the downward biasness of the OLS estimates. However, for the permanent worker, the wage-profit elasticity reduced from 0.075 to 0.066 highlighting the upward biasness of our benchmark results. Unionism and firm size are still insignificant in explaining wages for the contract workers in the 2SLS specification.

We further use the RIF method to decompose the rent sharing model for permanent and contract workers. The aim is to unpack the contribution of the profits-per-worker to the earnings gap between permanent and contract workers. The results in table 10 show that profits-per-worker contributes significantly to the wage gap, particularly at the 10th percentile.

Table 10. Rent sharing and the with formal sector wage gap RIF decompositions results

	(1) 10th percentile	(2) 50th percentile	(3) 90th percentile
Permanent Workers	5.108***	5.779***	6.511***
	(0.040)	(0.016)	(0.035)
Contract Workers	4.813***	5.568***	6.170***
	(0.075)	(0.024)	(0.049)
difference	0.295***	0.211***	0.341***
	(0.085)	(0.029)	(0.060)
explained	0.133***	0.096***	0.240***
	(0.042)	(0.019)	(0.042)
unexplained	0.162*	0.115***	0.101
	(0.089)	(0.031)	(0.066)
Explained by:			
Profits-per-worker	0.073***	0.013**	0.025**
	(0.018)	(0.005)	(0.011)
Other variables	0.061	0.083***	0.215***
	(0.038)	(0.018)	(0.041)
Unexplained by:			
Profits-per-worker	-0.325	-0.073	-0.177
	(0.483)	(0.160)	(0.331)
Other variables	1.605	0.843**	0.110
	(1.146)	(0.395)	(0.822)
Constant	-1.118	-0.655	0.168
	(1.237)	(0.424)	(0.882)
Observations	1,902	1,902	1,902

Notes: Decomposition of the rent sharing results at the 10th, 50th and 90th percentiles. Include controls for human capital, individual, job and firm characteristics in all columns. Asterisk denotes level of significance (*** p<0.01, ** p<0.05, * p<0.1). Robust standard errors are in brackets.

Overall, the results from the rent sharing model show a positive and significant relationship between profits-per-worker and employee monthly wages. To the extent that firms' profits are associated with individual monthly wages, confirms that the labour markets in Zimbabwe are segmented and that firm's ability to pay plays a critical role in explaining wage differentials.

A positive association between profits and wages is a feature of the non-competitive labour markets models that signify segmentation. There are three ways this positive link between profits and wages can be explained (Blanchflower et al., 1996). The first is the efficiency wage model that stipulates that firms pay higher wages to retain more productive workers. However, this may not be explained by our results as we have seen that permanent workers are on average more productive than contract workers in table 1. At the same time, the profit-per-worker coefficient is higher for contract workers. Another possible explanation is the bargaining power of permanent workers to negotiate for higher wages. This can be confirmed by our rent sharing results in table 9. The union variable is statistically and positively correlated with wages for permanent workers while it is insignificant for the contract workers. This implies that the permanent workers enjoy the union wage premium signifying that their higher wages are explained by their bargaining power relative to the contract workers. Lastly, the observation that contract workers have a higher wage-profit elasticity coupled with our earlier results that firms are undercutting wages implies that firms and workers are sharing the risk rather than sharing the rent. Thus, a reduction of the firm's profits due to negative shocks would directly flow into a reduction in firms wages. The above explanations are as a result of inefficient segmented labour markets. Our findings are similar to other results in literature from developing economies (Bigsten et al., 2003; Söderbom & Teal, 2001; Velenchik, 1997; Teal, 1995)

3.5 Conclusion

Earnings differentials between and within sectors have traditionally been used to test the extent to which the labour markets are segmented or integrated. Segmented labour markets are traditionally associated with inefficient outcomes for firms by failing to efficiently allocate labour. This study investigated the earnings differentials between and within the formal and informal manufacturing sector in Zimbabwe. The aim was to unpack the extent of segmentation and its sources. The study is based on the recent employee-employer matched data set we

collected in the manufacturing sector in Zimbabwe. The advantage of our dataset is that we were able to control for firm characteristics. We found evidence suggesting the following stylised facts. First, we find that permanent workers and self-employed workers (upper-tiers) have relatively lower rates of moving across jobs as compared to contract and informal wage workers (lower-tiers). Moreover, we find that the mobility of workers is unidirectional, that is towards the informal sector while the movement to the formal sector (especially on permanent jobs) is highly limited. In addition, we have found that firms in the formal sector face high rigidities in laying off workers should they wish to do so. These stylised facts imply immobility of workers to the primary sector, as thus, signalling labour market segmentation and inefficient allocation of labour as a result of overstaffing and underemployment by firms. Secondly, we also found evidence of wage inflexibility particularly for permanent workers in the formal sector. Lastly and more importantly, we found that on average formal sector workers have higher wages than informal sector wage workers. In addition, we also find that permanent workers on average have higher earnings as compared to contract workers. This indicates the existence of both between and within sector segmentation.

Further, the study provides some empirical evidence on the significance of the earnings differentials and determines the significance of firms' ability to pay in explaining within formal sector segmentation. The study has empirically tested the question on the extent of between and within sector labour market segmentation and its associated causes. Zimbabwe provides an interesting case study to carry such an analysis given its labour market rigidities. We argue that labour market segmentation in Zimbabwe may be driven by rent sharing where formal firms pay higher wages due to higher bargaining power by workers especially permanent workers. We further argue that such a way of setting wages has implications on the inefficient allocation of resources as it does not match worker's productivity with worker compensation. This exposes firms to labour market-driven inefficiencies that may have large spillover effects to the output and capital markets.

The study contributes to the literature by incorporating firm characteristics and rent sharing models to the analysis of labour markets segmentation. The empirical results have provided some key insights: First, a comparison between formal and informal sector shows a significant wage penalty associated with being an informal wage worker of between 18 and 53 percent. The results have also shown that firms' characteristics play a significant role in explaining sector wage differentials. Secondly, the wage gap decomposition results show that the wage gap is higher at the top and bottom tail of the wage distribution and that segmentation is higher

at the median of the wage distribution. Thirdly, the results show significant wage differentials within the formal sector labour market, thus highlighting that formal sector labour markets are not uniform. Specifically, the results show a wage penalty associated with being a contract worker that ranges between 16 and 28 percent. A further decomposition of within the formal sector wage gap shows that the extent of segmentation is high across the entire wage distribution as shown by a high proportion of the wage gap attributed to the unobservable characteristics.

In relation to the rent sharing as a source of wage differentials, the study finds a positive and significant association between firm profit-per-worker and employee wages for both permanent and contract workers. These results confirm that competitive labour models do not apply in the Zimbabwe labour markets. To the extent that the wage-profit elasticity is higher for contract workers and given our results on wage flexibility, we interpret our results as evidence of risk-sharing where firm's performance directly link to employee wages, especially for contract workers. A further decomposition of rent sharing model shows that profits-per-worker significantly contributes to the wage gap between permanent and contract workers. Thus, a firm's ability to pay (profit-per-worker) is a significant source of within sector labour market segmentation.

Given the potential contribution of this study, we wrap up with a word of caution when interpreting the results. The major issues concerning our results are the selection bias associated with estimating sectoral earnings differentials and the potential endogeneity problem associated when estimating the relationship between wages and profits-per-worker. On the first issue of selection bias, while some studies in the literature have attempted to solve this using the Heckman two-stage correction methods, we fail to correct for such potential selection bias in this studydue to unavailability of plausible exclusions variables. Literature has argued that the use of weak exclusion variables may exacerbate the selection bias problem. Thus, our results may be affected by the selection bias and the direction of bias cannot be predicted. Regarding endogeneity of profits-per-worker, we first proxy profits-per-worker with the lagged values of sales-per-worker and then use the instrumental variable strategy to try to minimise endogeneity. However, it is also always a challenge to find plausible instruments. Thus, future studies could focus on securing a panel data on formal sector firms that can allow one to utilise a wide range of methods such as fixed effects that can deal with some endogeneity and selection bias issues.

References

Arai, M. 2003. Wages, profits, and capital intensity: Evidence from matched worker-firm data. *Journal of Labor Economics.* 21(3):593-618.

Bargain, O. & Kwenda, P. 2014. The informal sector wage gap: New evidence using quantile estimations on panel data. *Economic Development and Cultural Change.* 63(1):117-153.

Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J.W., Oduro, A., Oostendorp, R. et al. 2003. Risk sharing in labor markets. *The World Bank Economic Review.* 17(3):349-366.

Blanchflower, D.G., Oswald, A.J. & Sanfey, P. 1996. Wages, profits, and rent-sharing. *The Quarterly Journal of Economics.* 111(1):227-251.

Botelho, F. & Ponczek, V. 2011. Segmentation in the Brazilian labor market. *Economic Development and Cultural Change.* 59(2):437-463.

Burger, J.D. & Walters, S.J. 2008. Testing fair wage theory. *Journal of Labor Research.* 29(4):318-332.

Card, D. . 1999. The causal effect of education on earnings. In *Handbook of labor economics.* Elsevier. 1801-1863. Available: .

Card, D., Devicienti, F. & Maida, A. 2013. Rent-sharing, holdup, and wages: Evidence from matched panel data. *Review of Economic Studies.* 81(1):84-111.

Carneiro, F. & Henley, A. 2001. Modelling formal vs. informal employment and earnings: micro-econometric evidence for Brazil. *U of Wales at Aberystwyth Management & Business Working Paper.* (2001-15).

Casale, D. & Posel, D. 2011. Unions and the gender wage gap in South Africa. *Journal of African Economies.* 20(1):27-59.

Cazes, S. & de Laiglesia, J.R. 2015. Temporary contracts and wage inequality. In *Labour markets, institutions and inequality.* Edward Elgar Publishing. Available: .

Deakin, S. 2013. *Addressing labour market segmentation: The role of labour law.* Centre for Business Research, University of Cambridge Cambridge. Available: .

Doeringer, P. & Piore, M. 1971. Internal Labor Markets and Manpower Analysis, Lexington, Mass. *Health.*

El Badaoui, E., Strobl, E. & Walsh, F. 2008. Is there an informal employment wage penalty? Evidence from South Africa. *Economic Development and Cultural Change.* 56(3):683-710.

El Badaoui, E., Strobl, E. & Walsh, F. 2010. The formal sector wage premium and firm size. *Journal of Development Economics.* 91(1):37-47.

Fields, G.S. 1990. Labour market modelling and the urban informal sector: Theory and evidence. In D. Turnham, B. Salomé, and A. Schwarz (Eds.), The informal sector revisited (pp. 49-69). *Organisation for Economic Co-Operation and Development.*

Firpo, S., Fortin, N. & Lemieux, T. 2018. Decomposing wage distributions using recentered influence function regressions. *Econometrics.* 6(2):28.

Fortin, N., Lemieux, T. & Firpo, S. 2011. Decomposition methods in economics. In *Handbook of labor economics.* Elsevier. 1-102. Available: .

Gong, X. & Van Soest, A. 2002. Wage differentials and mobility in the urban labour market: a panel data analysis for Mexico. *Labour Economics.* 9(4):513-529.

Günther, I. & Launov, A. 2012. Informal employment in developing countries: Opportunity or last resort? *Journal of Development Economics.* 97(1):88-98.

Gürtzgen, N. 2009. Rent-sharing and collective bargaining coverage: Evidence from linked employer–employee data. *Scandinavian Journal of Economics.* 111(2):323-349.

Hildreth, A.K. & Oswald, A.J. 1997. Rent-sharing and wages: evidence from company and establishment panels. *Journal of Labor Economics.* 15(2):318-337.

Kalleberg, A.L. 2003. Flexible firms and labor market segmentation: Effects of workplace restructuring on jobs and workers. *Work and Occupations.* 30(2):154-175.

Keswell, M. & Poswell, L. 2004. Returns to education in South Africa: A retrospective sensitivity analysis of the available evidence. *South African Journal of Economics.* 72(4):834-860.

La Porta, R. & Shleifer, A. 2014. Informality and development. *Journal of Economic Perspectives.* 28(3):109-126.

Maloney, W.F. 1999. Does informality imply segmentation in urban labor markets? Evidence from sectoral transitions in Mexico. *The World Bank Economic Review.* 13(2):275-302.

Marcouiller, D., de Castilla, V.R. & Woodruff, C. 1997. Formal measures of the informal-sector wage gap in Mexico, El Salvador, and Peru. *Economic Development and Cultural Change.* 45(2):367-392.

Matano, A. & Naticchioni, P. 2017. The extent of rent sharing along the wage distribution. *British Journal of Industrial Relations.* 55(4):751-777.

Mazumdar, D. & Mazaheri, A. 1998. The structure of labor market and wages in African manufacturing. *University of Toronto, Mimeo.*

Mincer, J. 1974. Schooling, Experience, and Earnings. Human Behavior & Social Institutions. *Columbia University Press, New York.*

Nguyen, H.C., Nordman, C.J. & Roubaud, F. 2013. Who suffers the penalty?: A panel data analysis of earnings gaps in Vietnam. *Journal of Development Studies.* 49(12):1694-1710.

Nickell, S.J. & Andrews, M. 1983. Unions, real wages and employment in Britain 1951-79. *Oxford Economic Papers.* 35:183-206.

Nickell, S. & Wadhwani, S. 1990. Insider forces and wage determination. *The Economic Journal.* 100(401):496-509.

Nordman, C.J., Rakotomanana, F. & Roubaud, F. 2016. Informal versus formal: a panel data analysis of earnings gaps in Madagascar. *World Development.* 86:1-17.

Plasman, R., Rusinek, M. & Rycx, F. 2007. Wages and the bargaining regime under multi-level bargaining: Belgium, Denmark and Spain. *European Journal of Industrial Relations.* 13(2):161-180.

Pratap, S. & Quintin, E. 2006. Are labor markets segmented in developing countries? A semiparametric approach. *European Economic Review.* 50(7):1817-1841.

Rand, J. & Torm, N. 2012. The informal sector wage gap among Vietnamese micro-firms. *Journal of the Asia Pacific Economy.* 17(4):560-577.

Rani, U. & Belser, P. 2012. Low pay among wage earners and the self-employed in India. *International Labour Review.* 151(3):221-242.

Rusinek, M. & Rycx, F. 2013. Rent-Sharing under Different Bargaining Regimes: Evidence from Linked Employer–Employee Data. *British Journal of Industrial Relations.* 51(1):28-58.

Rycx, F. & Tojerow, I. 2004. Rent sharing and the gender wage gap in Belgium. *International Journal of Manpower.* 25(3/4):279-299.

Shapiro, C. & Stiglitz, J.E. 1984. Equilibrium unemployment as a worker discipline device. *The American Economic Review.* 74(3):433-444.

Söderbom, M. & Teal, F. 2001. *Firm size and human capital as determinants of productivity and earnings.* United Nations Industrial Development Organization Geneva. Available: .

Tannuri-Pianto, M. & Pianto, D. 2002. Informal employment in Brazil-a choice at the top and segmentation at the bottom: a quantile regression approach. *Anais do XXIV Encontro Brasileiro De Econometria.* 2:1-20.

Tansel, A. & Kan, E.O. 2012. The Formal/Informal Employment Earnings Gap: Evidence from Turkey, IZA Discussion Papers 6556. *Institute for the Study of Labor (IZA).*

Tansel, A. & Kan, E.O. 2012. The formal/informal employment earnings gap: evidence from Turkey. *Available at SSRN 2049336.*

Teal, F. 1995. Real wages and the demand for labour in Ghana's manufacturing sector. *Centre for the Study of African Economies, University of Oxford.Working Paper Series 95-7.*

Teal, F. 1996. The size and sources of economic rents in a developing country manufacturing labour market. *The Economic Journal.* 106(437):963-976.

Velenchik, A.D. 1997. Government intervention, efficiency wages, and the employer size wage effect in Zimbabwe. *Journal of Development Economics.* 53(2):305-338.

Appendix

Table 6A. Between sector labour market segmentation: The Full RIF decomposition results

VARIABLES	(1) 10	(4) 50	(7) 90
Formal Workers	5.014***	5.738***	6.472***
	(0.027)	(0.013)	(0.029)
Informal Workers	4.385***	5.195***	5.855***
	(0.142)	(0.040)	(0.046)
Difference	0.629***	0.543***	0.617***
	(0.145)	(0.042)	(0.054)
Total explained	0.392***	0.211***	0.497***
	(0.085)	(0.041)	(0.087)
Total unexplained	0.238	0.333***	0.120
	(0.166)	(0.057)	(0.101)
Explained effects attributed to			
Individual Characteristics	0.0640	0.0976***	0.206***
	(0.042)	(0.020)	(0.0429)
Human Capital	0.040***	0.036***	0.115***
	(0.015)	(0.010)	(0.024)
Job Characteristics	0.037***	0.019***	0.008
	(0.011)	(0.006)	(0.010)
Firm Characteristics	0.251***	0.0582*	0.167**
	(0.074)	(0.035)	(0.074)
Unexplained effects attributed to			
Individual Characteristics	-2.392	-0.121	1.106*
	(1.607)	(0.514)	(0.668)
Human Capital	0.799	0.722***	1.703***
	(0.814)	(0.257)	(0.320)
Job Characteristics	-0.006	0.018	0.068
	(0.124)	(0.040)	(0.052)
Firm Characteristics	3.790***	0.007	0.001
	(0.683)	(0.213)	(0.257)
Constant	-1.952	-0.294	-2.757***
	(1.814)	(0.583)	(0.769)
Observations	2,217	2,217	2,217

Table 8A. Within formal sector labour market segmentation: The Full RIF decomposition results

VARIABLES	(1) 10th percentile	(2) 50th percentile	(3) 90th percentile
Permanent	5.108***	5.779***	6.511***
	(0.040)	(0.016)	(0.035)
Contract	4.813***	5.568***	6.170***
	(0.075)	(0.024)	(0.049)
difference	0.295***	0.211***	0.341***
	(0.085)	(0.028)	(0.060)
Total explained	0.097**	0.088***	0.224***
	(0.041)	(0.019)	(0.041)
Total unexplained	0.198**	0.123***	0.116*
	(0.091)	(0.031)	(0.066)
Explained effects attributed to			
Individual Characteristics	0.059*	0.032**	0.078***
	(0.033)	(0.013)	(0.028)
Human Capital	0.016	0.018**	0.041**
	(0.012)	(0.008)	(0.019)
Job Characteristics	0.030**	0.037***	0.085***
	(0.012)	(0.008)	(0.018)
Firm Characteristics	-0.007	0.001	0.021*
	(0.017)	(0.006)	(0.011)
Unexplained effects attributed to			
Individual Characteristics	1.962*	0.584*	0.278
	(1.036)	(0.346)	(0.722)
Human Capital	-0.322	0.278**	-0.384
	(0.403)	(0.132)	(0.271)
Job Characteristics	0.066	0.023	0.230***
	(0.095)	(0.036)	(0.075)
Firm Characteristics	0.127	0.021	0.104
	(0.361)	(0.119)	(0.246)
Constant	-1.636	-0.784*	-0.111
	(1.211)	(0.403)	(0.839)
Observations	1,902	1,902	1,902

Table 10A: First-stage Regression: The Relationship between the Profits and the Instruments

VARIABLES	(1) Overall	(2) Permanent	(3) Contract
Cost of Electricity	0.280***	0.233***	0.384***
	(0.019)	(0.022)	(0.041)
log_K_L	0.189***	0.216***	0.153***
	(0.019)	(0.022)	(0.038)
Constant	4.499***	4.574***	4.295***
	(0.364)	(0.470)	(0.659)

Observations	1,856	1,326	530
R-squared	0.462	0.478	0.502
Human capital	YES	YES	YES
Job Characteristics	YES	YES	YES
Firm Characteristics	YES	NO	YES