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The Effects of the South African Minimum Wage on Labour Market Outcomes for Low-Income Earners

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Abstract

We capitalise on the 2006 implementation of a minimum wage for the hospitality sector to make well-evidenced inferences about the impact of the upcoming National Minimum Wage (NMW) Legislation on low-wage workers. Our paper focuses on the two largest low-wage sectors currently without minimum wage regulation, which are manufacturing and construction. Two regression specifications and sensitivity analysis are used to provide insights into the implications for wages, hours worked, employment, formality and poverty rates. In light of our results and a comprehensive review of the literature, we conclude that the NMW will be largely beneficial for low-wage labourers. Our critical recommendation for policymakers is the need for complementary policies to ensure compliance and facilitate the transition of vulnerable groups (particularly black women) into the formal sector.

Contents

1 Introduction

The labour market in South Africa is characterised by low wages, high unemployment rates and a large informal sector. The persistence of such traits contribute to the country's high levels of inequality and poverty. In this study, we analyse the impact of South Africa's sectoral minimum wage in order to evaluate the effects of the national minimum wage to be implemented in 2018[1] and make policy recommendations that may enhance and maximise its potential benefits.

The unemployment rate in South Africa was 24.7% as of March 2018. In addition, our data suggests that 13% of South Africans' earnings were below the lower bound of poverty line in 2015, a statistic which has worsened since 2011. Furthermore, South Africa is the most unequal country in the world according to the World Bank, presenting a GINI between 0.66 and 0.70. The richest 10% accounts for 58% of the country's income, while the poorest 10% accounts for 0.5% of the income. Experts point to lack of access to employment as a key reason for widespread poverty, since only 36% of the poorest households have access to employment opportunities. Over half of South Africa's workforce earn below $280, suggesting that even those who have jobs earn low wages that provide insufficient resources to support a household. Thus, wage inequality is a prominent characteristic of the polarised South African labour market. Moreover, wages are the main source of income for households. This difficult and complex labour market picture is found in an economy experiencing very slow growth, presenting a 1.3% increase in 2017, while the National Treasury expects a 1.5% increase in 2018.

To respond to this complex situation, the government, organised businesses and the different agents constituting the National Economic Development and Labour Advisory Council (NEDLAC) engaged in exploring the introduction of a national minimum wage in South Africa as a tool to reduce pay differentials while maximising job creation efforts. An advisory panel was established in June 2016, which formalised an agreement on introducing a national minimum wage (NMW henceforth) of R20 per hour on May 1st 2018. This agreement between the different social partners provided the basis for the National Minimum Wage Bill, 2017.

Minimum wages establish wage floors, which the International Labour Organisation (ILO) suggest have the purpose of ensuring wages are able to cover the basic needs of workers and their families, taking into account relevant variables in the economic environment. A national minimum wage sets a single economy-wide wage floor. In South Africa, the NMW will replace the current sectorally-set minima. A unique national rate is easier to enforce, however it does not establish lower rates for sectors with high proportions of vulnerable workers. Moreover, a nationwide policy can be more effective to achieve broad policy objectives such as reducing inequality rather than only targeted sectoral considerations. Hence, the main objective of this policy is the reduction of inequality and poverty on a national scale.

Within the context of these goals, and given our results, we provide insight into the following question: Will a low-income earner benefit from the policy? Our study is unique as it assesses the effects of the sectoral minimum wage on a variety of labour market outcomes in a sector that has not been studied before. We compare the labour market outcomes of the hospitality sector,

[1]The National Minimum Wage was scheduled to come into force on 1st May 2018. It has since been delayed in response to opposition from labour unions and in parliament.

where the sectoral minimum wage was implemented in 2007, with those in the manufacturing and construction sectors. We employ two different specifications that exploit heterogeneity across sectors and provinces. Using the results, we evaluate the effectiveness of the forthcoming NMW policy and give policy recommendations.

2 Literature Review

The three main labour market outcomes that we use to assess the sectoral minimum wage are: wages, hours worked and formality[2]. The majority of the literature claims that all three of these outcomes react positively to the minimum wage policy.

Our work draws upon the seminal paper written by Card (1992) that exploited the variation in the proportion of workers paid below the minimum wage level across states in the United States. He found that an increase in the minimum wage level led to a greater increment in the average wage level in states where the distance of the average wage from the minimum wage level prior to the minimum wage was large. Soon after, Card & Krueger (1993) studied the effect of an increase in the minimum wage policy on the fast-food industry in New Jersey and Eastern Pennsylvania. They found that the minimum wage policy had no negative effects on employment but the prices of products increased in some areas to adjust to the increased production costs arising from the minimum wage.

Similar studies that were conducted in South Africa found that the magnitude of increase in the average wages was largest in the sectors that were the farthest away from the minimum wage level. Bhorat et al. (2013) analysed the effects of the sectoral minimum wage on labour market outcomes in five sectors different from our study in South Africa and also found that the likelihood of being employed in sectors with a minimum wage increased while the number of hours worked decreased. Consistent with these results are those found by Hertz (2004). He found that while minimum wages improved the average wages in the South African domestic worker sector, it had a negative effect on the hours worked and on the number of people earning below the minimum wage level.

Dinkleman & Ranchhod (2012) built upon this work and adopted a difference-in-difference methodology that revolves around exploiting the regional variation in wages across provinces. They found that despite there being no regulation and enforcement in the South African domestic worker sector, the minimum wage policy had significant positive effects on formality, wages and worker conditions. Interestingly, they found no significant effects on employment. Similarly, Cunningham (2007) present evidence of the "lighthouse effect" where in higher minimum wages result in higher wages for workers in both the formal and informal sectors. However, Alaniz et al. (2011) claim that higher minimum wages seem to have little or no impact on wages in the informal sector.

When looking into the literature producing insights into future minimum wage implementation, we find a largely optimistic view of the policy. Adelzadeh & Alvillar (2016) make use of a Dynamically Integrated Macro - Micro Simulation Model of South Africa to make predictions about the effects of the NMW policy. They predict that the policy will be able to achieve its objective of reducing poverty and income inequality. Consequently, the increase in average income levels will spur aggregate demand and labour productivity and hence, national output and economic growth. Lastly, they claim that the positive effect emanating from the increased output will overpower the negative effect emanating from unemployment in 85% of the sectors.

Isaacs (2016) conducted a similar study pertaining to the predicted effects of the NMW policy using the same model and found largely consistent results. However, in addition he also assessed

[2]We also assess the effect on employment. However due to data gaps and lack of significance, we focus on the other three outcome variables.

the impact of the sectoral minimum wage implemented in South Africa in the past. He finds that there were almost no negative employment effects as a result of the sectoral minimum wage. The main argument behind is that is because employers have several other channels through which they can adjust to the minimum wage, such as productivity increases, decrease in wages of high earners and an increase in prices. He states that the channels of adjustment vary with the level at which the minimum wage is set. Thus, he claims, that the policy can be implemented with negligible employment effects if set at the correct level.

We now move on to some of the literature that studies minimum wages policies in developing countries and the challenges that the policy may face in such a context. While in the past, the original objective of establishing a minimum wage was to prevent workers from earning wages that did not allow them to live in minimal comfort (Australia and New Zealand during the late 1800s), nowadays in developing countries, such as South Africa, it is being used as a tool to reduce poverty levels and inequality.

T.H. Gindling (2014) studies whether this is the case, and claims that the effects of the policy will depend on the characteristics of the labour market, which we will elucidate further in the theoretical framework below. He goes on to say that the lack of formality in developing countries serves as a major challenge to the policy. As a result, employment losses tend to be concentrated among women, young workers and less-educated workers; the characteristics associated with low wages. Cunningham (2006), Arango et al. (2004) and Neumark et al. (2006) find that in developing countries such as Mexico, Colombia and Brazil, the minimum wage policy was not effective in pushing the majority of households above the poverty line, and it is usually the workers just below the poverty line that benefit the most.

Lack of enforcement of and non-compliance with the minimum wage legislation act as major obstacles to reaping the benefits of it in developing countries. Rani et al. (2013) find that lower levels of minimum wages are associated with higher levels of compliance. From (Figure 4)[3], we see that they find a negative relation between the rate of compliance and the gap between the median and minimum wage, which is another way of measuring poverty. The graph points towards the importance of a simplified minimum wage through the empirical finding of a negative relation between the number of different minimum wages rates and the rate of compliance.

A large amount of research has been done that looks into the determinants of non-compliance in South Africa. Studies conducted by Bhorat et al. (2011) and Bhorat et al. (2013) find that 44% of workers were paid below the stipulated minimum and the depth of the shortfall was 35%. They highlight the role that institutional factors such as the penalty structure for non-compliance, individual characteristics such as race and gender, firm characteristics and the labour market play in determining the degree of non-compliance.

Finally, we look at the literature that draws the link between the labour market outcomes that we study in this analysis and the goals of the South African NMW policy: reducing poverty and inequality. There is ample amount of evidence that links hours worked and the resulting wages to worker welfare. Studies conducted by McKee-Ryan & Harvey (2011) and Friedland & Price (2003) find that underemployment at the intensive margin results in poorer health and long term economic outcomes. Meyer & Niyimbanira, F.(2016) characterises South African underemployment and shows that females primarily constitute this demographic. Thus, if we assume that higher average hours worked indicate a reduction in underemployment, then the implementation of the minimum wage could be used as an effective mechanism to reduce this inefficiency. In addition, Duflo (2012) and Bardhan et al. (1999) explain how increases in female contributions to household income improve within household spending decisions, can improve child health and spur further development. When

[3]See Appendices

looking into the effects of increasing formality, La Porta et al.(2014) provide evidence that formality reduces the income risk exposure for low income workers, allowing them to access credit markets and invest in their family's health and education. Moreover, Farrell (2004) finds that minimum wages can raise productivity through formality and incentives for training and investment, thus indicating welfare improvements for workers.

Our study contributes to the existing literature by studying a sector that has not been studied before, focusing on socio-demographic variables that characterise potential vulnerable groups as well as working towards policy evaluation and recommendations.

3 Theoretical Framework on Minimum Wage

Following the theory explained by Stigler (1946), the effects of minimum wage policies differ according to the role of employers in determining the wage rate. In the scenario where the wages are competitively determined, one can assume that each worker gets paid the value of their marginal product. The implementation of the minimum wage can have the following effects: first, the workers whose productivity is below the minimum wage level will be discharged or secondly, their productivity will be raised to the minimum wage level.

The size of the disemployment effect varies with several factors such as the wage elasticity of labour, the value of the services provided by the workers and their marginal rate of substitution (Figure 5). As a result of the disemployment of workers, the aggregate output will fall and the wages of those near the minimum wage level will increase. However, wages of the workers far below the minimum wage level will reduce drastically as the discharged workers will have to seek employment in alternate unregulated jobs where their wages will be much lower as compared to the original regulated sector. However, if one assumes that the demand for inefficient labour is inelastic and workers are not forced to move to unregulated sectors, then the share of wage earners increases, ultimately leading to an increase in propensity to consume and a consequent increase in aggregate output.

The second result, the increase in labour productivity may come about through two potential channels. The first channel being an increase in the contribution of the inefficient labourers due to the threat of unemployment. The second channel works through an introduction of new techniques employed by entrepreneurs. Employers may adopt production techniques that initially seemed unprofitable, but are now profitable due to the increased cost of labour. These new techniques may require workers with relatively sophisticated skill sets, spurring the productivity of the employed workers.

In the scenario that the wages are determined by the employers, they control how much they pay for a given quality of labour. A minimum wage imposed optimally can increase hours worked, wages and aggregate output; as the wage is brought closer to the value of the marginal product. Thus, Stigler suggests that it is imperative that the minimum wage is set with a substantial knowledge of the dynamics of the labour market. This knowledge is crucial as often, the optimal varies across industries, regions and over time.

When looking into the effects of the minimum wage on formality in the economy, we draw upon the theory from Fajnzylber (2001). He explains that there are conflicting effects of the minimum wage policy on formality. Firstly, the attractiveness of formal sectors increases after the implementation of the policy and hence could lead to more workers outside the formal labour market to seek employment in formal work spheres. On the other hand, the increased labour costs could cause employers

to choose to substitute away from formal workers and employ unregistered informal workers instead. Ultimately, the adjustment mechanism will depend upon how the minimum wage is set and implemented, once again reinforcing how crucial it is to implement the policy in a way that is tailored to the dynamics of the labour market.

4 Policy

4.1 Hospitality Sectoral Determination

In South Africa, the Labour Relations Act of 1995 (LRA) and the Basic Conditions of Employment Act of 1997 (BCEA) provide the legal framework for the regulation of minimum wages. These two acts together outline the wage-setting mechanisms in the country. Briefly, these comprise: collective bargaining (CB) through statutory institutions in the form of bargaining councils (BC), and sectoral determinations (SD) which are determined by the Ministry of Labour. These sectoral determinations currently set minimum wages on a sector-by-sector basis, through a combination of bargaining council agreements and company level agreements, negotiated between trade unions and employer organisations. Sectoral determinations target sectors where workers are considered to be more vulnerable or are not represented by the unions. There are 12 sectoral determinations, which are presented in (Table 5). Under these regulations, 38.6% of total employees were covered by a minimum wage in 2016. The main uncovered industries are construction and manufacturing, accounting for 60% of the uncovered workers.

Given that this study focuses on hospitality as a comparable sector for low-income workers, we define the Sectoral Determination for Hospitality in more detail. According to section 51 of the Basic Conditions of Employment Act, No. 75 of 1997, the agreed date from which the provisions of the Hospitality Sectoral Determination would become binding was 1^{st} of July 2007.

The determination does not apply to employers and employees who are: (a) involved in the trade of letting of flats, rooms or houses; (b) covered by another sectoral determination or (c) covered by a collective agreement of a bargaining council in terms of the Labor Relations Act; of 1995. An employer must pay an employee who works 45 hours per week the rates established. Two different rates are set differentiating employers with ten or less employees and those with more than ten employees, the latter group receiving a higher rate. These rates are reviewed annually, taking into account factors in the economic environment such as employment, inflation, wage levels and collective bargaining outcomes. The most recent rate is R16.36 for the first group and R18.25 for the second, applied on July 1st 2017.

Regarding the scope of application, the determination applies to employers and employees engaged in the hospitality sector activities in the Republic of South Africa. Hospitality sector is defined as any commercial business or part of a commercial business in which employers and employees are associated to carry out activities providing accommodation (hotels, guest houses, etc.) or food and beverages services (restaurants, pubs, coffee, etc.), either in or outdoors and for consumption on or off the premises.

4.2 National Minimum Wage

The National Minimum Wage policy to be introduced in South Africa is defined in the National Minimum Wage Bill published on November 2017. The Bill agrees on a NMW of R20 per hour to come into effect in 2018. This rate applies to every sector except for farm workers, domestic workers, and workers employed on an expanded public works program, who are entitled to the rates of R18, R15 and R11, respectively. This NMW forms the minimum floor for wages, which means that every worker is entitled to at least the minimum wage and that every employer is prohibited from paying wages below this floor.

5 Empirical Analysis

5.1 Empirical Strategy

The initial analysis of our data suggests that 62% of the workforce was not covered by a sectoral minimum wage in 2015. Our approach is therefore to analyse those sectors with a minimum wage to find out which past policy to evaluate in order to give us the maximum possible insight into the upcoming implementation. Manufacturing and construction are the largest uncovered, employing 12% and 9% of the labour force respectively.

For our estimations we will use the sector of hospitality, since it underwent the minimum wage implementation in 2007 and from our descriptive statistics (see below), we find it to be the best counterfactual to provide intuition on other low skill sectors.

We define the hospitality sector in our dataset following the professions subject to the hospitality minimum wage. T-tests indicate that monthly hospitality wage is not significantly different to that of manufacturing and construction in 2006, although hours worked and formality show some differences (Table 6).

We employ two specifications for our analysis. The first compares sectors in which the sectoral minimum wage was implemented with those where the policy was not implemented. Following Card Krueger (1993), we employ a difference-in-differences specification that exploits the heterogeneity in labour market outcomes across sectors. In the second specification, we estimate the differences in the effects of the policy across provinces. We also employ a difference-in-differences specification following Dinklemann Ranchhod (2012), that exploits the differences in the gap between the median wage and the minimum wage. We make use of this gap, within the hospitality sector.

Sector specification

For our first specification, the hospitality sector will be used as the treated group and we define the control group as the manufacturing and construction sectors. Therefore, the corresponding regression is:

(1) $Y_{ist} = \beta_0 + \beta_1 T_s + \beta_2 Post_t + \beta_3 T_s Post_t + \gamma X_i + F_p + \epsilon_i$

Where our main outcomes (Y_{ist}) will be wages, hours worked and formality. To construct the variable of wages we add monthly job salaries and earnings, then deflate these values using 2000 prices to obtain real wages. Then, we transform the variable to make it in terms of logarithms. It must be

noted that, wages contain information for two-time spans: the first one from 1993-2006 and the second from 2007-2015. For the variable of hours we considered the logarithm of hours worked in the last 7 days. To estimate formality, we use a proxy measure of whether the agent has a written contract or not.

In addition, the explanatory variables correspond to the following: $Post_t$ is the variable capturing the time after 2006, since the policy was implemented in 2007; T_s, is our specification for the "treatment", in this case if the policy is implemented in the sector or not, therefore T=1 in the case of hospitality and T=0 corresponds to manufacturing & construction. Finally, $T_s * Post_t$ corresponds to the interaction of the implementation of the policy and time, which is our coefficient is of interest. The vector X_i corresponds to control variables such as gender, population group, age and years of education. Finally, F_p corresponds to the province fixed effects that we include to control for level differences in wages across provinces.

While we attempt to control for all possible pre-minimum wage law differences across the sectors, we do acknowledge the potential limitations of such an identification strategy. The first being the different demographic characteristics of workers across the three sectors. This implies that the minimum wage policy may have heterogeneous effects for different workers.

Province specification

In this approach our main objective is to exploit variation within hospitality. Given differences in initial median wage across provinces, the intensity of exposure to the minimum wage is specific to each individual province.

(2) $Y_{ist} = \beta_0 + \beta_1 GAP_j + \beta_2 Post_t + \beta_3 GAP_j Post_t + \gamma X_i + \epsilon_i$

As described before, the outcome variables are wages, hours and formality. The main difference in this specification is that the treatment is now the wage gap by province. Specifically:

(3) $GAP_j = ln[minwage_{2006}] - ln[medianwage_{2006,j}]$

Where, $minwage_{2006}$ is the minimum wage for hospitality in 2006, $medianwage_{2006,j}$ corresponds to the median wage observed in each province j during 2006. However, since the policy mandates two different values depending on the size of the firms[4], we generate a weighted minimum wage that accounts for the size of the firms, in order to make the value more precise.

One of the main labour market outcomes investigated by the minimum wage literature is the employment rate. Due to data constraints, it was not possible for us to analyse employment at the individual level, hence we analysed the employment in a sector for each province. Our specification is similar to the sector specification, however, instead of conducting the analysis at an individual level, we analyse employment at the province level from 1996 to 2017 (378 observations). Another difference is the introduction of value-added by sector as a control from StatsSA. Other controls have been introduced as the mean of the observations that we have by province and by year.

[4]Small firms are defined as having less than ten workers and consequently subject to a smaller minimum wage requirement.

For the interpretation of our results, it is important to highlight the distinctions between our two specifications. The first exploits heterogeneity across sectors and compares the outcomes for individuals of the hospitality sector relative to the manufacturing and construction sectors. The second specification exploits the heterogeneity in the hospitality minimum and median wage gap across provinces. It compares the outcomes for the individuals working in provinces with a large gap (poor provinces) relative to individuals working in provinces with a small gap (rich provinces), given that the median wage is below the medium wage for all provinces.

5.2 Methodology

According to our dataset, we observe that correlation exists between individuals in the same province, therefore it is necessary to adjust the grouped nature of the error. Otherwise, the standard OLS regression without adjustment considers that each observation contributes equally and independently to the variation in outcome.

Following a common recommendation in the literature, we estimate the Eicker-White clustered standard errors at the level of the province (see Bertrand et al.(2004)). However, the standard asymptotic arguments for the consistency of clustered standard errors may not apply with the small number of groups in this context. Since we are not able to compute a Cluster-Robust Variance Matrix due to the lack of more provinces, we will employ a block bootstrap that treats the provinces as a block. We validate the independence between clusters by looking at potential threats such as migration across provinces. By looking a the South African migration dynamics studied by Lehohla (2015), we find that domestic migration is characterised by young males. Since the hospitality sector is composed mostly by women, we believe that domestic migration does not imply a threat to clustering errors in our regression.

5.3 Data

We use data from the Post-Apartheid Labour Market Series (PALMS) which combines South African datasets from 1993-2017, all produced by Statistics South Africa (StatsSA). Our labour market variables of concern are sourced from the South African Occupational Health Survey (OHS), Labour Force Survey (LFS) or Quarterly Labour Force Survey (QLFS). These are nationally-representative household surveys conducted annually, biannually and quarterly respectively, which we treat as a repeated cross-section. In order to define poverty lines, we first use the World Bank definitions of moderate and extreme poverty. These appeal to an international audience and are updated every few years. For a more precise measure of South African purchasing power, we use food poverty bounds, which are adjusted for inflation annually (using the Consumer Price Index (CPIX)) all the information is provided by StatsSA. However, the PALMS dataset has gaps in the wage information for the years 2008 and 2009 which does not permit us to assess the short term effect of the policy implementation. We recognise that this data gap is a potential source of measurement error in our analysis, but intuitively we believe our estimated metric will provide us with significant insight into the dynamics of the labour market.

5.4 Descriptive statistics

General

Focusing on 2006, the year before the hospitality policy was implemented, it becomes apparent that there was heterogeneity in wages across regions. Mean wages and median wages are 80% and 62% higher in the Northern Cape compared to the Western Cape (see Table 1 below). Western Cape is also the province with the highest Gini coefficient, whereas Limpopo exhibits the highest mean hours worked and lowest proxy employment. We estimate the employment share by using the number of observations that identify with a sector and report non-zero number of hours worked. Consistent with diagnostics from the World Bank, we find that the trend of declining inequality since the turn of the millennium has been reversing since 2010 (Figure 6). The table below displays the relevant descriptive statistics for hospitality in 2006.

Table 1: 2006 Hospitality descriptive statistics

	Monthly Wage					Hours Worked			Employment			Formality		
	Number	Mean	Standard Dev.	Median	Gini	Number	Mean	Standard Dev.	Number	Mean	Standard Dev.	Number	Mean	Standard Dev.
All	38,137	2,489	(11256)	850	0.71	54,366	44	(16.86)	146,634	63%	(0.70)	42,047	67%	(0.47)
1. Western Cape	5,827	1,825	(6617)	600	0.76	8,588	43	(13.04)	16,708	70%	(0.63)	7,650	71%	(0.45)
2. Eastern Cape	4,222	1,831	(5626)	650	0.72	6,673	39	(19.80)	18,593	61%	(0.70)	4,407	57%	(0.49)
3. Northern Cape	3,281	3,282	(23509)	970	0.73	3,998	45	(16.04)	9,782	67%	(0.69)	3,514	69%	(0.46)
4. Free State	2,966	3,134	(17377)	885	0.70	3,778	45	(16.26)	10,563	64%	(0.72)	3,100	71%	(0.45)
5. KwaZulu-Natal	8,060	2,201	(8101)	800	0.68	12,723	41	(17.71)	38,375	59%	(0.71)	8,594	62%	(0.48)
6. North West	3,075	2,886	(10470)	1,000	0.67	3,778	46	(17.41)	12,422	60%	(0.73)	3,058	66%	(0.48)
7. Gauteng	5,168	3,175	(9212)	1,300	0.68	7,343	45	(14.27)	15,321	80%	(0.69)	6,051	73%	(0.44)
8. Mpumalanga	3,209	2,503	(10759)	1,000	0.68	4,131	46	(17.28)	10,827	68%	(0.72)	3,240	65%	(0.48)
9. Limpopo	2,329	2,336	(4519)	1,000	0.67	3,354	48	(18.30)	14,043	47%	(0.69)	2,433	69%	(0.46)
Manufacturing	1,315	1,065	(1400)	600	0.58	1,438	49	(20.91)	1,622	N/A	N/A	1,598	69%	(0.46)
Construction	1,190	1,406	(3221)	792	0.58	1,414	44	(12.87)	1,416	N/A	N/A	1,361	57%	(0.50)
Hospitality	1,710	1,367	(2152)	900	0.66	1438	49	(20.91)	2,242	N/A	N/A	1,662	67%	(0.47)

Our analysis shows that the gender pay gap has been increasing across time (Figure 7). According to our data, as of 2015, South African women earn an average of 30% less than their male counterparts. Since 2007, the average wage of black South Africans has increased threefold, whereas that of whites has only doubled. Despite this narrowing of the wage gap, average white wages still stand at quadruple the average for blacks. Our data suggests that manufacturing & construction and hospitality have seen declines in union membership by 27% and 35% respectively between 2006 and 2015.

For our specifications

Even within the same sectors, wage rates differ largely between occupations (Figure 8). Consequently, hereafter in the paper we omit the high skilled occupations within each sector. This is beneficial as the results of our evaluation are more applicable to those who face similar labour market conditions. Excluding high wage observations from our analysis does not impact our underlying goal of analysing implications for low-skilled workers. This has the benefit of allowing us to compare workers who have a similar skill (and wage) level, who are likely to respond in a similar manner to minimum wage implementation.

The average wages in hospitality trend similarly to those in both manufacturing & construction before the minimum wage implementation (Figure 1 below). This parallel trend assumption is crucial for our difference-in-difference specification since it is the most critical to ensure its internal validity. It requires that in the absence of treatment, the difference between the 'treatment' and 'control'

group is constant over time. This is subject to sector-specific shocks that we cannot account for. However we run t-tests that indicate that 2006 monthly wage of our control group (manufacturing & construction) is not significantly different to that of hospitality in 2006, although hours worked and formality differ significantly (Table 6). Since we do not have data for the years immediately after the implementation of the hospitality minimum wage, therefore we will be evaluating the medium-term impact.

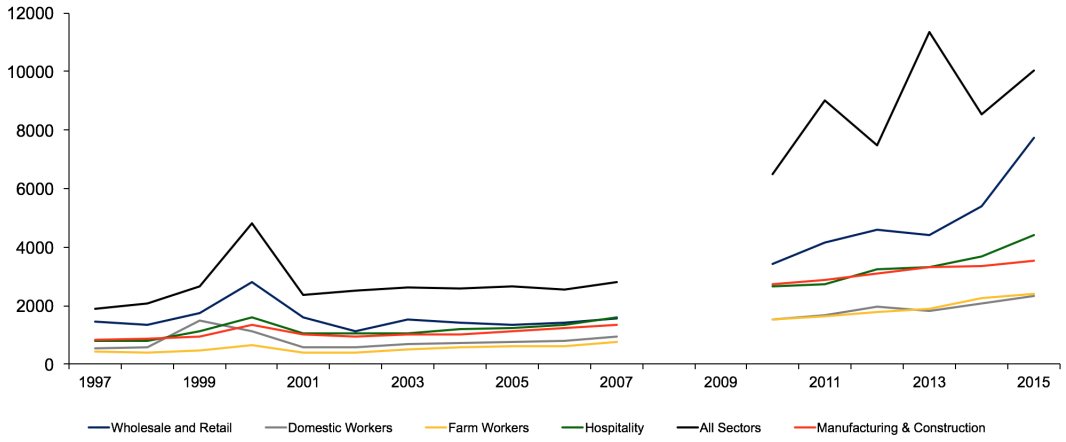

Figure 1: Average Monthly Wage Trends by Sector (ZAR)

However, (Figure 9) shows that the difference between the sector median wage (in 2006 for hospitality and 2015 for construction and manufacturing) and the proposed (or already implemented) minimum wage exhibits a lot of variation across provinces. We must account for these gaps before imposing any estimated elasticity onto future predictions. We observe that after 2007, proxy employment rose in hospitality and fell in comparable sectors, signalling that workers moved to the hospitality sector as a response to the minimum wage legislation (Figure 10).

We also compare distributions of previous minimum wage sectors with manufacturing and construction sectors in order to verify their comparability (Figure 11). We find that the taxi drivers, domestic workers, hospitality and wholesale and retail sectors displayed similar wage distributions in 2006 to manufacturing & construction.

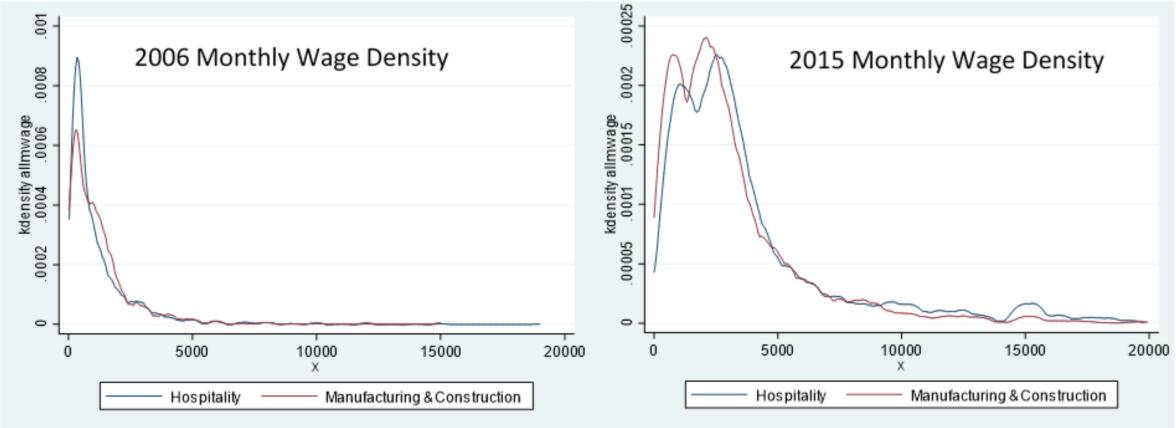

Figure 2

Figure 2 above compares wages of our sectors of interest in 2006 with those in 2015. It is clear that both have experienced nominal wage increases across the wage distribution. The hospitality distribution has shifted substantially more than that of manufacturing and construction. Interestingly, both distributions have developed 'twin peaks', giving an initial indication of some labour market distortion that is altering the smooth distribution. In (Figure 12) we investigate the origin of this phenomenon by looking at hospitality wage distributions across time and for different segments of the population. The trough appears between 2012 and 2013 and is prevalent across all ethnicities and genders. However, from the fourth distribution, it is clear that the distortion only happens for those in formal employment. Our research suggests the trough is caused by the minimum earnings threshold level for public pension eligibility (OECD 2012), that came into force in 2012.

Finally, (Figure 13) depicts the regional variation in the distance of the median wage from the minimum wage, the gap that we employ for the second specification of our analysis.

6 Results

As mentioned in the empirical strategy, we conduct two different types of regressions. The first, identified as the "sectoral regression", analyses the difference between workers in the hospitality sector and those in the construction and manufacturing sectors, since hospitality workers were the ones who benefited from the implementation of the policy. In the second specification, identified as "province regression", we analyse the heterogeneity of effect of the policy between provinces considering the distance of the median wage from the minimum wage.

6.1 Sectoral Regression

Results from the first regression are shown in Table 2. It must be noted that, according to the results, strong effects are obtained for female and black people rather than for overall population.

The first two columns of Table 2 analyse the wages of hospitality workers against wages of the control group, using equation (1), as specified above. Variable "Post" in the first column shows an increase in wages after the implementation of the minimum wage by approximately 73.15 percent[1], for all the workers in the sample. The dummy variable for hospitality indicates that, when compared at baseline to individuals in the control group, hospitality workers do not earn significantly higher wages. Our coefficient of interest is the difference-in-differences estimator (Post*Hosp) which reflects how much wages have risen for hospitality workers in the post-implementation period relative to those in the control group. The output shows that the estimated effect of the policy on hospitality worker wages was an increase of 8 percent. Column 2 shows the impact on wages of black workers (Post*Hosp*Black), female workers (Post*Hosp*Female) and black female workers (Post*Hosp*Female*Black) in the hospitality sector. We find that, the hospitality wages for solely female workers decreased by 28 percent but those for black female workers show a significant increase of 70 percent in wages relative to the control group. This indicates that it is the most vulnerable groups (in this case black female workers) who benefited the most from the implementation of the policy.

Columns 3 and 4 present the results for variation in hours worked across individuals. All the coefficients are statistically different from zero in column 3. The 'Hospitality' worker dummy (Hosp)

[1] To obtain these elasticities we transformed the coefficient according to the rule: $[exp(\beta - variance(\beta)/2) - 1] * 100$. according to Halvorsen and Palmquist (1980).

Table 2: Sectoral Regression

	Wages		Hours/person		Formality	
	(1)	(2)	(3)	(4)	(5)	(6)
Hospitality	0.096	0.428***	0.044**	0.039	-0.043***	-0.029
	(0.083)	(0.087)	(0.018)	(0.025)	(0.010)	(0.023)
Black		-0.125		0.047***		-0.060**
		(0.161)		(0.016)		(0.029)
Female		-0.558***		-0.038*		0.044**
		(0.052)		(0.021)		(0.021)
Black Woman		0.214***		-0.009		-0.026
		(0.068)		(0.039)		(0.025)
Black in Hospitality		-0.353***		0.018		0.057**
		(0.087)		(0.028)		(0.025)
Female in Hospitality		0.167*		-0.040*		-0.020
		(0.097)		(0.023)		(0.022)
Black woman in hospitality		-0.321***		0.007		-0.061**
		(0.105)		(0.050)		(0.028)
Post	0.549***	0.572***	-0.091***	-0.040***	0.140***	0.091***
	(0.085)	(0.086)	(0.028)	(0.008)	(0.025)	(0.025)
Post*Black		-0.065		-0.041**		0.024
		(0.071)		(0.017)		(0.040)
Post*Female		0.331***		0.035		0.068**
		(0.067)		(0.024)		(0.032)
Post*Female*Black		-0.423***		-0.124***		0.039
		(0.098)		(0.038)		(0.041)
Post*Hosp	**0.075***	0.082	**0.028***	0.009	**0.023****	**0.055***
	(0.044)	(0.059)	(0.015)	(0.031)	(0.011)	(0.033)
Post*Hosp*Black		-0.053		-0.012		-0.043
		(0.061)		(0.037)		(0.040)
Post*Hosp*Female		**-0.335*****		-0.030		**-0.079***
		(0.086)		(0.032)		(0.045)
Post*Hosp*Female*Black		**0.535*****		**0.130*****		0.045
		(0.076)		(0.026)		(0.048)
Age	Y	Y	Y	Y	Y	Y
Years of education	Y	Y	Y	Y	Y	Y
Gender	Y	N	Y	N	Y	N
Population group	Y	N	Y	N	Y	N
Observations	72,272	72,272	111,301	111,301	100,837	100,837
R-squared	0.220	0.215	0.030	0.034	0.072	0.077

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(1), (3) & (5) General regression
(2), (4) & (6) Regression with black and female interaction

variable indicates that hospitality workers work 4.5 percent more than their control group counterparts. This difference increases by 3 percent after the implementation of the policy. Therefore as a result of the minimum wage implementation, aggregate hours worked increased by 1.3 million, which is equivalent to an additional 29,600 full-time hospitality jobs.

Analysing column 4, we can observe that the policy increases the hours worked by black female workers by 14 percent, relative to the control group. The fact that the hours worked and wages move in the same direction in reaction to the implementation of the policy is consistent with the efficiency wage theory. The theory explains that employees react to an increase in wages by improving the quality and quantity of their labour supply, hence increasing labour productivity and the number of hours worked.

Columns 5 and 6 analyse the effect on formality. The dependent variable is whether an individual has a written employment contract or not. Both columns show an increase of around 10 percentage points in the fraction of hospitality workers and control group workers who hold a written contract after the policy is implemented (Post coefficient). Therefore, coverage appears to have increased for both groups. It is also clear from the results that around 4 percent fewer hospitality workers have written contracts than their counterparts in the control group, at the baseline. The interaction term (Post*Hosp) is again of leading interest and indicates that employment contracts increased by 2 percent for hospitality workers in the post-implementation period. Column 6, which presents the interactions with black and female, shows a significant increase in formality by 5 percent for all hospitality workers and a decrease of 8 percent in written contracts for black female workers. From the literature, we can infer that this increase in formality can imply a positive effect on the welfare of the workers and their families.

Finally, (Table 7) shows the results of the analysis conducted to assess the effect of the policy on employment across provinces. We observe no significant effects of the introduction of the policy (Post*Hosp). This is consistent with the 'new minimum wage literature' which claims that the textbook trade off between minimum wage and employment does not always hold, as employers may find other ways to adjust to the minimum wage, such as an increase in good prices or a cut in the wages of high-income earners (Isaacs 2016).

6.2 Province Regression

We now show the results for the province regression. This regression compares the effect of the minimum wage on hospitality workers that live in provinces with a median wage far from the minimum wage with the ones that are closer to the minimum wage. We mainly find that the sectoral minimum wage policy had a small negative effect on hours worked in the hospitality sector. There was also a small increase in formality for black females who lived in poor provinces, relative to those in richer provinces.

(Table 8) displays the results of the regression. It is worth noting that all provinces had a median wage below the minimum before the implementation of the policy (Figure 13). As before, columns 1 and 2 show the effect on wages, 3 and 4 on hours worked per person and 5 and 6, show the effect on formality. The second column for every output includes interactions with black and female.

Focusing on the first two columns of (Table 8), specifically on the coefficients of the $Post * GAP$ variables, since they give us information about the differential impact on wages after the implemen-

tation of the policy, across provinces. We find no significant effect on wages. Thus, we can infer that the implementation of the policy affected the wages of all hospitality workers with the same intensity regardless of whether they lived in a poor or rich province.

Column 3 shows a significant increase in hours at 10% significance level that becomes non significant when we interact with female and black (columns 4). Columns 5 and 6 show whether the minimum wage increased or decreased the proportion of written contracts. The only significant coefficient for formality is with respect to the black female interaction term. However, given the magnitude and direction of the other interaction terms, the overall effect on this demographic is not economically significant.

6.3 Subsamples

In this section we analyse the effects of the policy within female workers and black workers using the sectoral regression. We do this in order to assess the robustness of our results. In both cases the results go in line with the results explained before in Table 2.

When looking at Table 3 below, the regression for females shows no significant difference in wages, a significant increase of 6.5 percent in hours worked per person and a 2 percent significant decrease in formality for hospitality workers relative to the control group. Finally, only for black workers, we observe an increase of 13.1 percent in wages, an increase in 3 percent of the hours worked per worker and no significant effects in formality for the hospitality workers against the control group after the implementation of the minimum wage. These results go in line with the results from our preceding regressions, hence confirming their robustness to different specifications.

Table 3: Subsamples

		Female			Black	
VARIABLES	Wages	Hours/person	Formality	Wages	Hours/person	Formality
Hospitality	0.106	0.020	-0.049***	0.004	0.051**	-0.040***
	(0.121)	(0.022)	(0.007)	(0.054)	(0.024)	(0.011)
Post	0.575***	-0.133**	0.205***	0.494***	-0.111***	0.152***
	(0.133)	(0.055)	(0.025)	(0.064)	(0.030)	(0.032)
Post*Hosp	0.047	**0.063***	**-0.021***	**0.124*****	**0.033****	0.021
	(0.097)	(0.037)	(0.012)	(0.042)	(0.015)	(0.016)
Years of education	Y	Y	Y	Y	Y	Y
Population group	Y	Y	Y	N	N	N
Age	Y	Y	Y	Y	Y	Y
Gender	N	N	N	Y	Y	Y
Observations	36,274	54,775	49,365	55,762	84,768	77,155
R-squared	0.236	0.036	0.075	0.181	0.039	0.077

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7 Policy Evaluation

If the same minimum wage was implemented over the manufacturing and construction sectors in 2006

For our first basic interpretation we make the assumption that collective bargaining conditions

have remained relatively constant for the sectors studied. We then use the results from our first specification to understand the impact on wages and hours worked of the hospitality sector to give a broad indication of what might happen to the manufacturing and construction labourers.

We acknowledge that the sectors could both be influenced by different unobservable factors and thus could react to the minimum wage in a different manner. Inspecting the observable variables, such as gender, can provide some insight into how robust this assumption is.

In 2006, the significant results in our first methodology indicate that monthly wage and hours worked increased as a result of the minimum wage by 8% and 3% respectively. This is equivalent to 35,000 full time hospitality jobs and an additional $5.44 (2018 prices) per employee. If wages and hours would increase proportionally in construction and manufacturing now, we would expect wages to increase by a similar amount of $5.10, with the equivalent of 65,000 (6% growth of sector size) full time jobs being created.

As the upcoming wage is universal, it is not subject to the same general equilibrium effects as the hospitality implementation, such as sectoral output, inflation and labour supply conditions. The hospitality minimum wage would attract workers into the sector, dampening the overall wage effect. Therefore our wage estimates constitute the lower bound of our prediction.

Poverty Rates

In 2006, the World Bank defined moderate poverty and extreme poverty as those living under $2 (452 Rand) or $1 (274 Rand) per day, respectively. Under full compliance, the hospitality minimum wage would have lifted 122,000 people out of extreme poverty. If the upcoming minimum wage for manufacturing and construction would have 100% compliance, the figure would be 390,000.

Our analysis shows that an 82% compliance rate would have been required to lift 100,000 people out of extreme wage poverty in hospitality in 2006, however only a 26% compliance rate would be needed to reach the same goal for manufacturing and construction in 2018. This effect is largely due to the World Bank updating their definition of extreme poverty to $1.9 per day.

Table 4: Compliance sensitivity analysis

		Assumption of compliance (% of job contracts)									
		100%		80%		69.27%		40%		20%	
		#People	*%Sector*	*#People*	*%Sector*	*#People*	*%Sector*	*#People*	*%Sector*	*#People*	*%Sector*
Iterations between upper bound and lower bound of 2017 poverty line	**758**	312,630	30%	250,104	24%	216,559	20%	125,052	12%	62,526	6%
	850	338,905	32%	271,124	26%	234,760	22%	135,562	13%	67,781	6%
	950	362,063	34%	289,650	27%	250,801	24%	144,825	14%	72,413	7%
	1050	397,690	38%	318,152	30%	275,480	26%	159,076	15%	79,538	8%
	1138	414,168	39%	331,334	31%	286,894	27%	165,667	16%	82,834	8%

Poverty as defined by the South African Statistical Agency is categorised as between 370 and 575 Rand per month for 2017. Rani et al (2013), find that in 2011 the compliance rate was 77.2% for manufacturing and 58.7% for construction. Taking a weighted average of these two, Table 4 above shows how sensitive poverty reduction is to deviations around the Rani compliance level and between the StatsSA poverty lines. Given this information, we would give a conservative estimate of workers

raised over the lower bound of poverty as between 100,000-200,000. A 32% compliance rate is now required to achieve a 100,000 reduction in workers earning below this lower bound.

Within Sector Wage Differential

Isaacs (2016) suggests that a way in which firms may react to the implementation of a minimum wage is by reducing the wages of high-paid workers in the organisation in order to free up resources. This kind of reaction would be very positive for South Africa, since it would potentially contribute to reducing inequality through a reduction in income inequality. This mechanism is likely to be strong since the main source of income for the poor comes from labour rather than capital earnings.

In order to check this hypothetical reaction by the firms, we compute the intra-sectoral interquartile range for wages, from 2000 to 2015 for hospitality and for construction and manufacturing together. As Figure 3 shows, the two ranges are very similar in terms of level and trend before 2007. After sectoral minimum wage implementation for hospitality, the difference in the range levels is made highly visible.

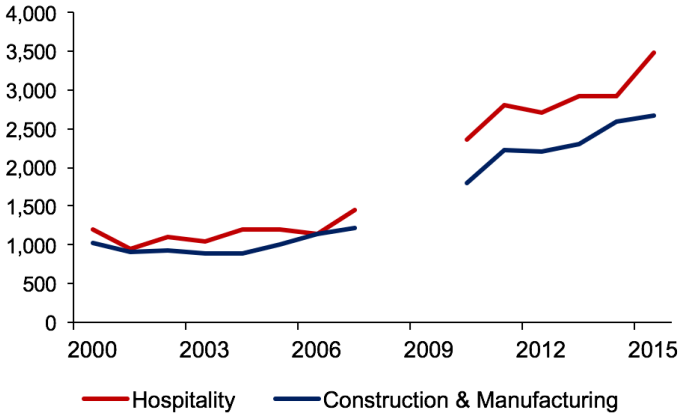

Figure 3: IQR Evolution Over Time

Although we cannot imply causality, it is relevant to note there is a clear upward trend in the difference between what high and low paid workers earn for both groups throughout the entire time period. In defining manufacturing and construction as our counterfactual, we observe a relative increase in wage inequality in the covered sector after the minimum wage implementation. This finding does not support Isaacs' (2016) adjustment theory.

8 Conclusion

To summarise, in order to contextualise our evidence-based policy recommendations, it is useful to articulate the main takeaways from our regression analysis.

Sectoral specification

We observe that average wages and hours worked in the hospitality sector increase overall when compared to the manufacturing and construction sectors. However, the majority of this increase is driven by black and females. This result is confirmed by running separate regressions for black and

female sub-samples only. These results indicate that the gender wage gap will shrink more for black workers than it will for the population as a whole.

From our first specification we observe an overall increase in formality resulting from the minimum wage, although the result is reversed for female workers. This result is complemented by our all-female regression and advocates the need for targeted policies to ensure vulnerable groups do not suffer as a response to the minimum wage. Finally, our results assessing employment indicate that the sectoral minimum wage policy had no significant impact in the hospitality sector relative to the manufacturing and construction sectors.

Province specification

It is important to note that our analysis for this specification is restricted to the hospitality sector. We do not find any significant effect on wages as a result of the minimum wage when exploiting the variation in the median wage across provinces. Therefore, other policies used as a safety net to combat the adverse effects of the minimum wage may be easy to implement for the Government in the absence of heterogeneous effects across regions.

The workers in the poorer provinces decreased hours worked with respect to richer provinces as a result of the minimum wage. This could imply that there is higher employment rigidity in richer provinces relative to poorer ones. It could also be the case that all provinces increased hours worked, albeit the poorer ones increased at a lower rate.

9 Policy Recommendation

The evidence pertaining to the effects of the implementation of a national minimum wage remains heterogeneous across countries as each one has a different institutional and economic context that affects compliance, discrimination, employment protection and thus economic outcomes.

As explained at the beginning of the report, the South African national minimum wage policy has two main goals: reducing poverty and reducing inequality. We analyse our results within the context of these goals and provide insight into the following question: Will a low-income earner benefit from the policy?

On the basis of our results indicating higher wages, more hours worked and greater formality, we would suggest that the answer to this question is yes. However, as different population groups are more sensitive to the policy than others, such an answer is conditional of the provision of complimentary policies to ensure compliance and equal treatment. According to the economic literature and the International Labour Organisation (ILO)'s guidelines, the effectiveness of such a policy at achieving its goals depends on the broadness of its coverage, the adequacy of its level, the monitoring mechanisms set in place, and the level of compliance.

Our results show an increase in wages in the hospitality sector, despite the low levels of compliance that authors such as Bhorat et al. (2011) found. Moreover, the sensitivity analysis we carry out in the policy evaluation section presents the great potential that marginal increases in compliance can have in lifting people out of poverty. On the other hand, the experience of developing countries suggests that monitoring compliance takes a large amount of resources and coordination. Given the

high levels of non-compliance that South Africa presents, it is relevant for the policy's success to assign the appropriate amount of resources to ensuring compliance.

Once these resources are available, compliance can be improved through a number of implementation measures. Some of these potential measures include information dissemination, capacity-building activities for employers, cyclical and proactive targeted labour inspections rather than reactive complaints-based strategies. Finally, it can also be highly efficient to set in place sanctions that are sufficiently high to act as a deterrent and to empower labour ministries to fast-track administrative proceedings.

In terms of coverage, South Africa seems to be taking a step towards effectiveness by broadening the minimum wage from selected sectors to a national scope. Moreover, this change in structure presents a trade-off. On the one hand, simple systems are easier to operate, communicate and enforce, which also facilitates compliance (Rani et al, 2013). On the other hand, they offer less scope to take into account the particular circumstances of different regions or sectors within a country. However, this complexity requires greater institutional capacity. In the case of South Africa, we believe that the simplicity of the new schedule compared to the old one presents a big advantage. The new system benefits from broader coverage, easier monitoring and facilitation of compliance, while the previous setup included over a 100 different rates specific to sectors, occupations, hours worked or firm size.

Regarding monitoring procedures, we consider that the National Minimum Wage Commission's plan to carry out annual adjustments over time is highly valuable, as it will take into account inflation, productivity and gross domestic product. Moreover, we suggest that these analyses and annual reports are exhaustive enough to detect meaningful differences across provinces and sectors.Additionally, particular focus should be placed on black females, because our analysis suggests this subgroup is especially vulnerable.

Taking inferences from our results, we suggest that complementary targeted policies be implemented. These are needed in order to ensure the protection of vulnerable groups, such as black women, who are more prone to be in informal working conditions as a result of the minimum wage. Moreover, our results pertaining to the homogeneous reaction of wages to the minimum wage across provinces, suggest that their implementation may have uniform intended outcomes.

Summing up, we use a variety of analytical techniques to conclude that the upcoming minimum wage will on average increase wages and hours worked, largely driven by increases for black female workers. Overall, minimum wage policies can be viewed as a valid instrument to counter the pervasive poverty experienced by low wage South African workers. However, such a policy must be complemented with measures such as the promotion of collective bargaining, the creation of employment and provision of safety nets in order to be effective.

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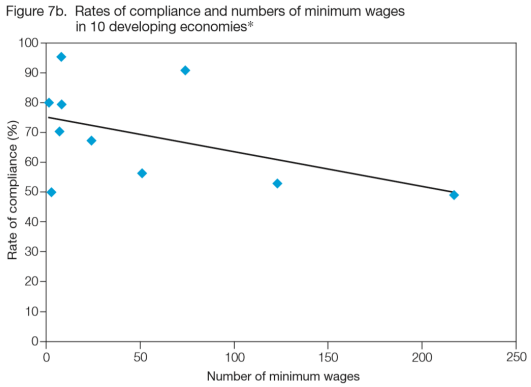
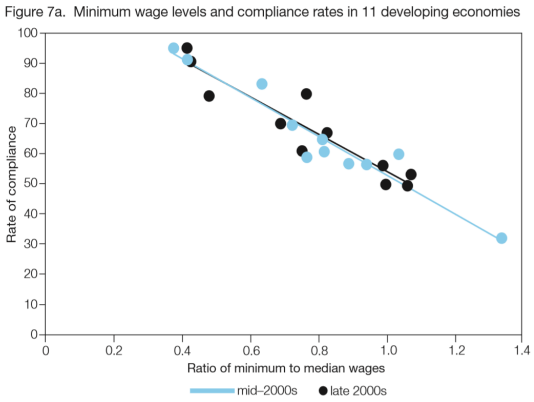
Appendices

Literature Review

Figure 4





Theoretical Framework on Minimum Wage

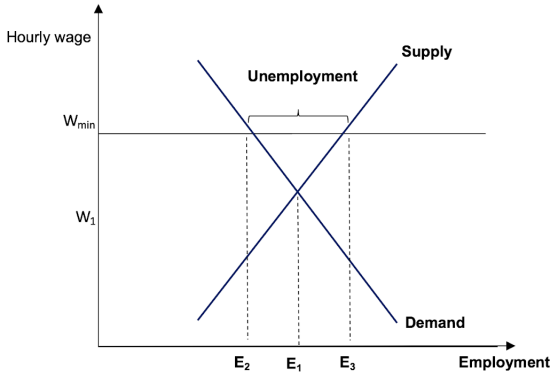


Figure 5: Imposing a minimum wage lowers employment and raises unemployment

Policy

Table 5: Wages in sectoral determinations 2016

Sectoral Determination	Lowest Sectoral Determination Wage	Highest Sectoral Determination Wage	Mean Wage	Median Wage	Number of Workers	% of total employees
Agriculture	R2607	R2607	R2414	R2175	668,048	5.1
Forestry	R2607	R2607	R2231	R1585	38,710	0.3
Domestic Workers	R1813	R2065	R1671	R1359	1,131,424	8.6
Private Security	R2067	R6155	R3995	R3137	523,870	4.0
Wholesale and Retail	R2514	R6506	R4558	R3171	1,382,320	10.5
Taxi	R2113	R3021	R3796	R2823	253,358	1.9
Hospitality	R2761	R3077	R3935	R2719	333,656	2.5
Contract Cleaners	R2844	R3122	R2938	R2196	743,723	5.7
Average/Total	R2522	R3624	R3192	R2396	5,075,109	38.6

General descriptive statistics

Table 6: t-test descriptive statistics

	Monthly Wage	Hours Worked	Formality
Manufacturing & Construction	1227.2	**44.804**	0.875
Hospitality	1095.4	**49.073*****	0.678***

Figure 6: Gini coefficient trend (all sectors)

Figure 7: Median wage gender GAP

Descriptives needed for our identifications

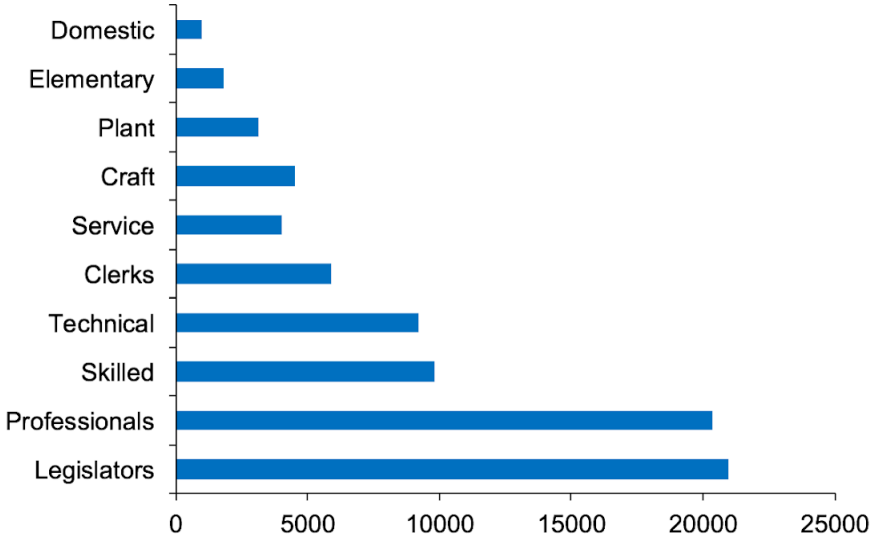


Figure 8: Mean monthly salary by occupation

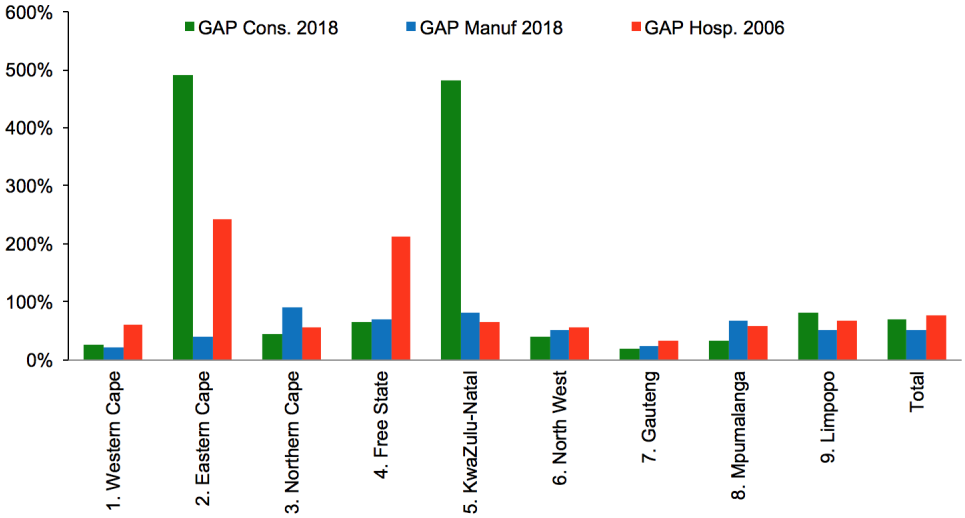


Figure 9: Wage gap by province

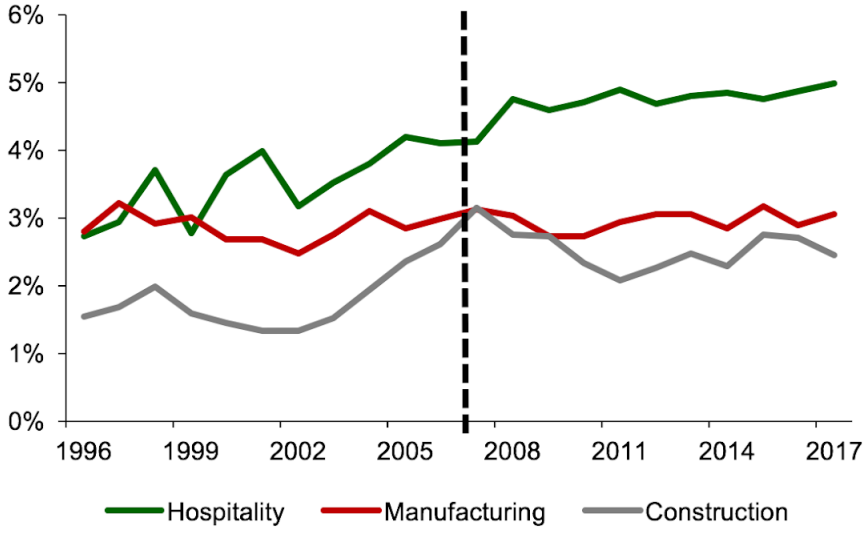


Figure 10: Proxy employment share of labour force

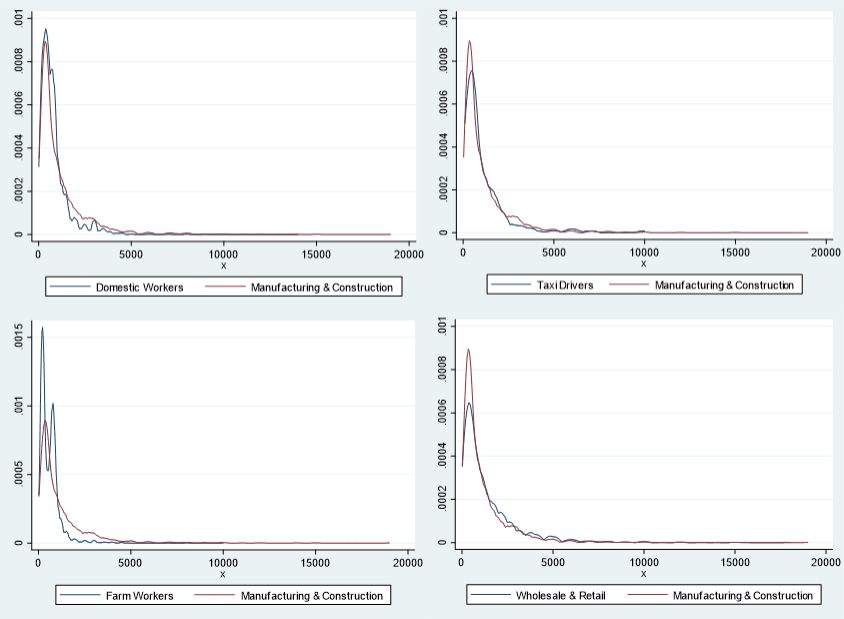


Figure 11: Wage distributions

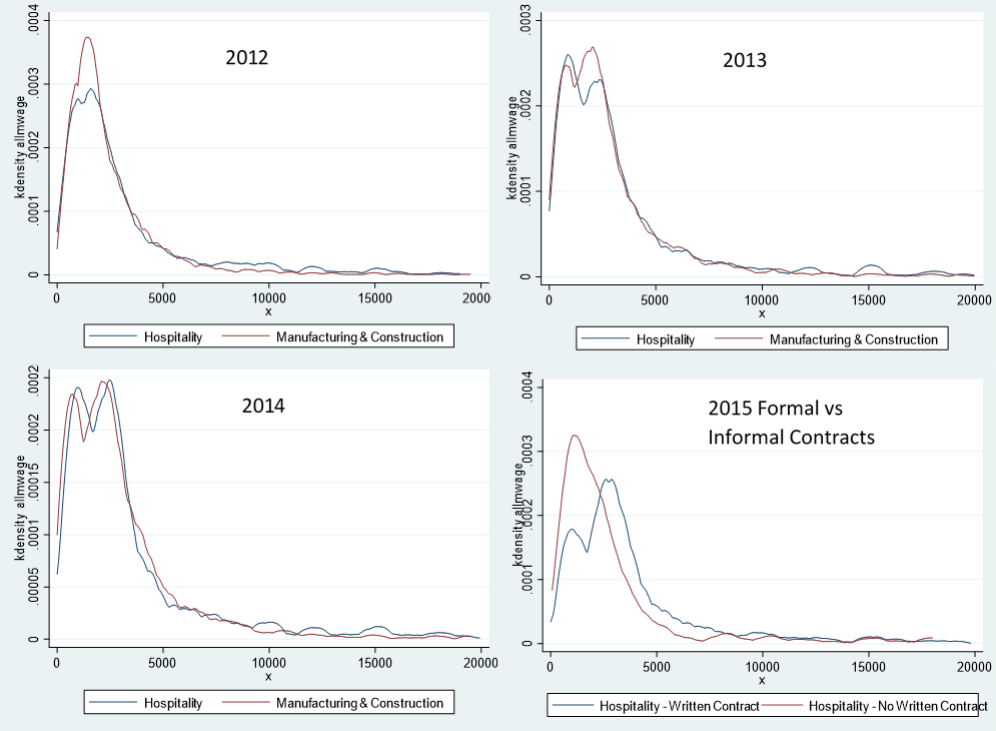


Figure 12: Investigation into the source of distortion post-2012

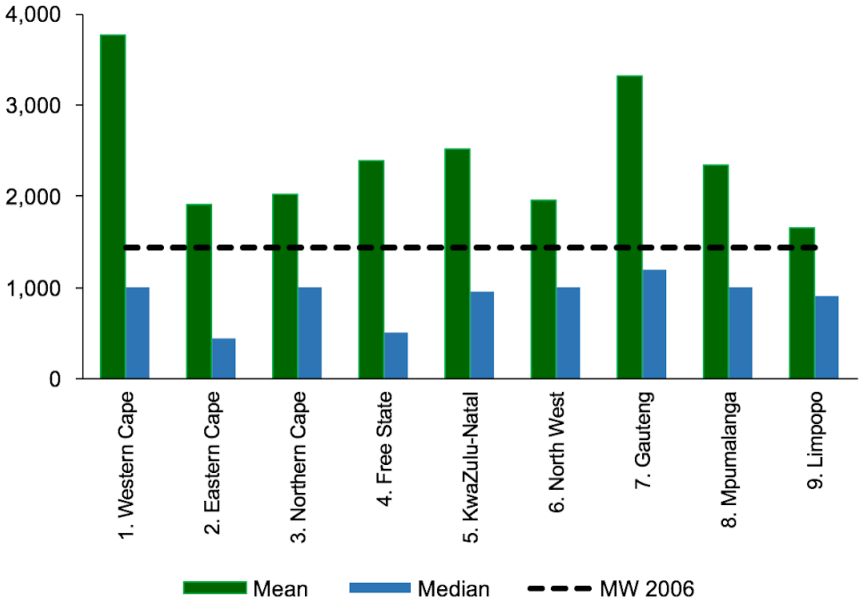


Figure 13: Regional wage disparities for hospitality

Results

Table 7: Employment

VARIABLES	Employment
Hospitality	-0.879***
	(0.202)
Post	0.323***
	(0.096)
Post*Hosp	0.034
	(0.115)
GDP	Y
Gender	Y
Age	Y
Population group	Y
Years of education	Y
Observations	378
R-squared	0.510

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Province regression

	Wages		Hours/person		Formality	
	(1)	(2)	(3)	(4)	(5)	(6)
GAP	-0.545***	-0.230	0.028	0.072	-0.151*	-0.157
	(0.135)	(0.971)	(0.042)	(0.453)	(0.089)	(0.302)
Black		-0.129		0.100		-0.052
		(0.405)		(0.336)		(0.136)
Female		-0.338		-0.051		0.025
		(0.367)		(0.132)		(0.113)
Black Woman		-0.162		-0.022		-0.044
		(0.235)		(0.292)		(0.122)
Black*GAP		-0.382		-0.033		0.064
		(0.752)		(0.729)		(0.292)
Female*GAP		-0.062		-0.042		0.006
		(0.747)		(0.284)		(0.234)
Black woman*GAP		0.105		0.019		-0.076
		(0.462)		(0.639)		(0.252)
Post	0.463	0.766*	-0.010	0.034	0.089	0.046
	(0.406)	(0.410)	(0.028)	(0.197)	(0.114)	(0.186)
Post*Black		-0.443		-0.074		0.070
		(0.690)		(0.298)		(0.317)
Post*Female		-0.094		-0.037		0.028
		(0.896)		(0.070)		(0.079)
Post*Female*Black		0.223		0.069		-0.038
		(1.003)		(0.172)		(0.037)
Post*GAP	0.208	-0.280	**-0.091***	-0.111	0.141	0.193
	(0.850)	(0.884)	(0.052)	(0.416)	(0.246)	(0.393)
Post*GAP*Black		0.582		0.040		-0.161
		(1.504)		(0.640)		(0.671)
Post*GAP*Female		0.199		0.070		-0.068
		(1.886)		(0.139)		(0.159)
Post*GAP*Female*Black		-0.267		-0.099		**0.207*** **
		(2.152)		(0.364)		(0.064)
Age	Y	Y	Y	Y	Y	Y
Years of education	Y	Y	Y	Y	Y	Y
Gender	Y	N	Y	N	Y	N
Population group	Y	N	Y	N	Y	N
Observations	30,879	30,879	47,897	47,897	41,137	41,137
R-squared	0.298	0.283	0.019	0.020	0.061	0.065

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(1), (3) & (5) General regression
(2), (4) & (6) Regression with black and female interaction