Short-term Impact of the 2018 National Minimum Wage Legislation on Household Income in South Africa

By

MWENYI, Micheal

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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Committee in charge:

Professor Shin, Ja-Eun, Supervisor

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Abstract

Does the introduction of a national minimum wage policy in South Africa address the income inequality gap by increasing the household income? This paper utilizes a 6-wave panel developed from the Labor Market Dynamics in South Africa dataset which is compiled annually from the Quarterly Labor Force Survey between 2018 and 2019, the year the policy came into effect in South Africa, to contribute to the existing knowledge gap in developing countries. I employed the Difference in Differences (DID) estimation model to examine the short-term impact of South Africa's national minimum wage policy on household income in both informal and formal sectors. With a 5 percent increase relative to the prevailing average sectoral wages implied by the national minimum wage legislation, my findings suggest that the introduction of the national minimum wage in South Africa had positive effects on household income. However, the increase in real average wage had negative effects on contract employment especially among male employees. There were generally no registered significant effects on hours of work. The outcomes imply that the enactment of a national minimum wage policy leads to a rise in household income, but with minimal detected negative effects towards employment, there must be clear discipline on annual increases of the minimum wage to avoid surging an already existing problem of unemployment in South Africa.

Keywords: National Minimum Wage; South Africa; Household Income; labour market impacts; wages; contract; employment; Hours of work

Introduction

The minimum wage is one of the key wage policies that has not only attracted intense debate among scholars but also among policymakers in developing countries on the best decision to take regarding its implementation. Despite the fact that numerous least-developed countries are contemplating adopting new minimum wage laws or changing their existing minimum wage regimes, almost all developed countries have already embraced the minimum wage policy. South Africa is among the developing countries that have been operating different sector minimum wage policies since 1999. With a population of around 55 million people, there were around 30 million people, or about 51% of the population, who lived under the poverty threshold of R 1,036 every month, while 50 percent of the workforce earned below a working poverty line of R 3,700 per month (Stats SA, 2016).

It is imperative to note that despite South Africa implementing sector minimum wages, it consistently ranked on top as one of the most unequal countries in the world with a Gini coefficient of 0.63 in 2015 and 0.67 in 2018. In fact, 58% of the country's income was attributed to the wealthiest 10% of the population, whereas a mere 0.5% of the income was attributed to the least affluent 10% (Stats SA, 2016). This has been urged on the failure of the government to implement the national minimum wage policy that would replace the existing sector minimum wages that had resulted in the exploitation of low-income earners in different employment sectors. South Africa introduced the national minimum wage at the beginning of 2019, 1st of January that replaced all the existing sector minimum wage policies and registered a 5 percent increase relative to the prevailing average sectoral wages implied by the national minimum wage legislation.

This research paper seeks to investigate the short-term impact of the 2018 national minimum wage legislation on household income to contribute to the existing knowledge gap in South Africa. Labor Market Dynamics in South Africa (LMDSA) is annually compiled data set by Data First of the University of Cape Town from Quarterly Labor Force Surveys conducted on a quarterly basis to collect labour-related information from employees aged between 15 to 64 years who are the subject of interest in my study. This paper only focuses on those employed. The dataset on Labor Market Dynamics in South Africa is compiled to include the income information not accounted for in the Quarterly Labor Force Surveys. Specifically focusing on the years 2018 and 2019, this dataset enables exploration into the research question. *What is the short-term impact of introducing the national minimum wage policy on household income within South Africa?* Since I could access data for before (2018) and after (2019) implementation of the policy, I utilized the Difference in Differences (DID) estimation strategy.

The findings of the Difference in Differences model estimation suggest that introducing the national minimum wage policy increased household income by 39 percent. These findings are consistent across all sectors and industries. This paper further executed regressions on different subgroups to determine the changes in reaction to the policy, but all remained consistent with the main results.

This paper contributes to the large volume of literature on minimum wage policy on income (e.g., Jones, 1997; Neumark et al., 2006; Anake, 2014; Vázquez et al., 2017; Redmond, 2019; Jardim et al., 2022), which confirms the fact that implementation of minimum wage yields both positive and negative effects on wage and employment and hours of work respectively. Although these studies examined the same nexus understudy, little attention was directed

toward the impact on household income particularly in developing countries (but see Mwangi et al., 2015 on Kenya; Abachi & Iorember, 2017 and Idiaye et al., 2018 on Nigeria).

There is a growing consensus on the key role minimum wage policy plays in increasing family incomes when implemented. Choi (2018) urged that for a country to improve the quality of low-paying jobs, minimum payment laws must be adopted, and this must be done by altering wages and working practices across the entire economy. Undoubtedly, the minimum wage is a crucial policy for socio-economic transformation since it allows the working poor access to decent employment and income that is sufficient to meet their necessities and increase their standards of living. According to Sabia (2015), implementing minimum wage boosts the development of the economy at the national level. It increases economic growth by fostering advantageous pay systems or by bringing actual salaries and legal wages into line (Rizov et al., 2016). An important aspect to highlight is that the utilization of appropriate and reliable resources for policy evaluation vividly demonstrates the genuine impact of the policy outcome on stakeholders (Bernhardt et al., 2016). This founded the interest to explore the short-term impact registered as result of implementing the 2018 national minimum wage law enacted in South Africa.

The rest of the paper has been structured as follows. The Background that provides detailed information about the national minimum wage policy in South Africa has been presented in the second section. The third section which is the literature review focused on exploring previous studies and provides different arguments by different scholars on the topic. The fourth section explains the rationale of the econometric strategy and methodology chosen, highlights how the data used in the study is collected, and the Difference in Differences approach is employed. The results of the analysis are discussed in the fifth section and lastly, the conclusion is shared in section six of this paper.

Background

South Africa introduced a national minimum wage on the 1ˢᵗ of January 2019, which offered a helpful analytical framework for assessing the minimum wage's effects so far attained since its implementation. Although the Basic Conditions of Employment Act (BCEA) and the Labour Relations Act (LRA) were both enacted in the 1990s as part of the significant legal reforms that accompanied South Africa's transition from apartheid to a democratic society with the purpose of establishing a more equitable and fair labour relations system which would ensure that the rights of workers were protected, and the labour practices are aligned with democratic principles, South Africa did not have a national minimum wage policy until 2019.

It is imperative to note that the national minimum wage policy was introduced to replace sector-specific minimum wages that had been implemented since the early 2000s after attaining independence. Sector-specific minimum wages in South Africa were established through Bargaining Councils as a result of the country's historical context of labour exploitation and inequalities, particularly during the apartheid era with the goal of ensuring fair compensation and working conditions for employees in sectors that might have been historically marginalized or exploited. Bargaining Councils are bodies that consist of representatives from trade unions and employers within specific sectors of the economy. These councils negotiate and set minimum wage rates, working conditions, and other employment-related matters for the respective sectors they cover. The establishment of sector minimum wages was intended to address the unique needs and dynamics of various industries.

Table 1:

Sector Minimum Wages

Worker Category	Year of Implementation	Lowest Sector Determination Wage (2017)	Sectoral Average Wage	National Minimum Wage
Agriculture	2002	R 2,607	R 2,414	R 3,200
Forestry	2003	R 2,607	R 2,231	R 3,500
Domestic Workers	2002	R 1,813	R 1,671	R 2,600
Private Security	2001	R 2,067	R 3,995	R 3,500
Wholesale and retail	2003	R 2,514	R 4,558	R 3,500
Taxi	2005	R 2,113	R 3,796	R 3,500
Hospitality	2007	R 2,761	R 3,935	R 3,500
Contract Cleaners	1999	R 2,844	R 2,938	R 3,500
Average / Total		R 2,522	R 3,192	R 3,350

Notes. *Data collected from labour reports on sectoral wage determinations right before implementation of the national minimum wage. Sectoral average wage is R 3,192 per month, with a median of R2,396 per month covering almost 5.1 million workers.*

The National Minimum Wage Act 2018 was the result of extensive consultations between the government, business, labour unions, and civil society conducted by an independent committee that shared key recommendations to implement during the adoption of the new wage policy. These consultations sought to find a balance between providing a decent wage for workers while not placing an undue burden on businesses, particularly small and medium-sized enterprises.

Following the extensive deliberation and discourse regarding the legal provisions, both the National Minimum Wage Council (NMWC) of South Africa and Parliament came to a consensus, leading to the enactment of the Minimum Wage Act in July 2017. The primary aim was to reduce wage disparities and enhance the well-being of the workforce. The law was clear that the National Minimum Wage Council would determine the initial minimum wage in 2017 and that it would go into effect on January 1st, 2019, after a two-year transition period that involved educating the public and employers about the new law.

The initial national minimum wage was set at 20 rands per hour (R 3500 per month) which was the equivalent of about $1.42 USD at that time. This rate was determined through various economic considerations, like poverty line, cost of living, and the potential impact on businesses with exceptions of farm and domestic workers whose wage was set at 90 percent and 75 percent of the national minimum wage respectively (Presidency, 2017). To ensure consistent application of the national minimum wage across all employees in South Africa, the National Minimum Wage Commission announced a commitment to a system based on universal coverage. Additionally, they outlined plans to gradually phase out the tiered approach for farm and domestic workers.

The introduction of the minimum wage sparked debates and discussions among various stakeholders. Some argued that the rate was too low to significantly improve the livelihoods of workers, while others were concerned about potential job losses and the impact on small businesses. South Africa's Employment and Labour Department is responsible for enforcing the National Minimum Wage Act. Employers are required to pay their employees at least the minimum wage rate. Failure to comply can result in penalties and legal action.

The national minimum wage was designed to be amended and set new policy wages yearly to take into account inflation and shifting economic conditions. According to Section 6 of the National Minimum Wage Act of 2018, the National Minimum Wage Commission (NMWC) is tasked with reviewing the national policy and document key recommendations to the Minister on any adjustments. According to the Act, the Commission's review report to the Minister must include a variety of viewpoints, including public opinion. This allows for adjustments to ensure that the minimum wage remains relevant and effective in addressing wage inequality.

Literature Review

For more than a century, legislation establishing a minimum wage policy is still a crucial component for the public policy formulation and implementation around the world. Any nation's strong wage policy must be rational, believable, and socially and economically justifiable before its implementation. Minimum wage policy is a critical tool to address income inequality and poverty reduction by setting a minimum amount of money that an employer legally pays to an employee for their work done (see Karakitsios & Matsaganis, 2018; see also Kapelyuk, 2015; Jones, 1997; Freeman, 1996). In fact, Freeman (1996) suggested that higher minimum wage is a good way to fight poverty and give low-paid workers a reasonable living salary.

In many countries, the government sets the minimum wage to protect workers and ensure they earn a decent wage. The impact of the minimum wage on household income is an important area of research because it can affect the well-being of families and the broader economy (see Dube, 2019; Abachi & Iorember, 2017; Sabia, 2015). While some research suggests that the minimum wage increase results in a rise in household income, others have suggested that it can lead to job losses and reduced hours of work, thereby having negative effects on household income (eg., Neumark & Wascher 2017; Alatas & Cameron, 2008).

There is a large volume of literature on minimum wage policy and household income, and how it greatly contributes to poverty reduction and unemployment. Findings of studies indicate that raising the minimum wage has a favourable effect on household income. According to Neumark and Wascher (2008), minimum wage is set to protect the low-earning and disadvantaged families within a country. Allegretto et al. (2018) found that minimum wage increases in California contributed to a rise in low-wage workers' earnings, which in turn increased household income. Similarly, Alsalam (2019) found that a minimum wage increase

of $15 per hour would result in an increase in wages for 17 million workers and would lift 1.3 million people out of poverty. However, this study is only significant to low-wage workers since the increase in wages had no impact on the household income of high-wage earners.

Despite the fact that the minimum wage effect on income has been extensively studied, there is limited literature on developing economies compared to developed economies (but see Mwangi et al., 2015 on Kenya; Abachi & Iorember, 2017 and Idiaye et al., 2018 on Nigeria). Existing research conducted highlights the key role minimum wage policy plays in increasing family incomes when implemented (Dube, 2019). Asharieen et al. (2022) emphasized the need to not only set but also increase the minimum wage to attain better income distribution. However, they noted that increasing the minimum wage yields higher results in developed than developing countries.

An empirical emphasis asserts the fact that household income is significantly impacted by the minimum wage. According to Belman and Wolfson (2014), increasing the policy by 10 percent led to a 1.3 percent increase in household income. They argued that the positive effect of the minimum wage on household income was because most minimum wage workers are from low-income households. In contrast, Neumark and Wascher (2007) found no significant relationship between minimum wage and household income because most minimum wage workers are not the primary earners in their households.

According to Choi (2018), minimum wage rises that are both gradual and rapid have more unanticipated negative effects. It is imperative to note that there are some low-income earners working for fewer hours than before or totally failing to get a job because of the minimum wage increase. The results of minimum wage policies vary depending on the particulars of the economic, social, and labor market conditions, but also heavily on how the policy is managed and put into practice (Bernhardt et al., 2016). Sugiyarto and Endriga (2008) investigated how

the minimum wage was being welcomed. According to a survey conducted in Indonesia, supporters of the policy praised that it should guarantee decent living conditions and help the poor receive benefits, while the negative impacts on the poor like unemployment are being highlighted by opponents.

Even though most studies highlight the positive impact of the policy on household income, there is evidence to suggest that an increase in remuneration has no effect on the income of the household and employment for middle and high-wage earners (see also Cengiz et al., 2019; Clemens & Wither, 2019; Neumark & Wascher, 2017; Allegretto, 2016; Dube et al., 2010). In fact, the minimum wage is associated with some negative effects that affect the welfare of households in both the short and long run. According to Neumark and Wascher (2017), minimum wage increases led to job losses and reduced working hours, particularly for low-skilled workers. This reduction in employment can lead to a reduction in household income for affected workers and their families. Similarly, Clemens and Wither (2019) found that raising the minimum wage can result in low-wage workers losing their jobs and income. According to the study, the number of jobs for affected workers decreased by 2-4% for every 10% increase in the minimum wage.

Increases in the minimum wage initiate huge labour expenses for businesses, which hinder economic growth by having a negative impact on employment (Sabia, 2015). As a result of a sharp increase in the pay floor, it is anticipated that companies that run on a profit margin will exit the market (Luca & Luca, 2019). A sharp increase in wages, according to Alvarez and Fuentes (2018), has a negative impact on enterprises' capacity. Employers should use alternate methods to address the situation whenever the minimum wage is raised, such as a price increase, reducing hours of work, or lowering labour costs (Choi, 2018). According to Hamermesh (2014), more labour costs like higher minimum wages and more perks for

employees can have a negative impact on a company's earnings, employment, and total hours of work. To promote profitability and sustainable competition of local businesses, it is important to consider various factors when determining the level of a national minimum wage.

The short-term impact of the 2018 national minimum wage legislation on household income is a complex issue, and the literature provides mixed evidence. In summary, the literature suggests that minimum wage law is an important strategy to reduce income inequality and poverty reduction by increasing household income, but policymakers must consider the potential trade-offs between higher wages and potential unemployment effects when designing and implementing minimum wage policy in developing countries. In the next section, let us review the justification for using the Difference in Differences (DID) methodology and data considered in this study.

Data and Methodology

Data

This paper explores the short-term impact of the 2018 national minimum wage legislation on household income using Labor Market Dynamics in South Africa (LMDSA) dataset compiled annually by the University of Cape Town from Quarterly Labour Force Surveys (QLFS). Quarterly Labour Force Survey is one of the most comprehensive surveys conducted quarterly by Statistics South Africa (Stats Sa). Since 2008, it has offered a variety of data directly pertaining to individuals' lives in various provinces, including records of employment, education, marital status, etc.

Each year, the QLFS waves are combined with other variables like income to compile an LMDSA dataset. The Statistics South Africa 2011 population census served as the foundation for the QLFS master frame for this LMDSA. Province, district, and geographic type (rural, traditional, urban) are used to stratify the sampling. Using probability proportional to size (PPS) sampling, 3,324 Primary Sampling Units (PSUs) are drawn annually, and PSUs are used to methodically choose Dwelling Units (DUs). The 3,324 PSUs are then divided into four groups and during each quarter, the DUs from the respective group are rotated out of the sample being replaced with DUs from the same PSU. It is important to remember that the sampling unit is the dwelling, and the unit of observation is the household.

The Quarterly Labour Force Survey is four times annually conducted household survey that is nationally representative. Household members between the ages of 15 and 64 interviewed are asked to complete the questionnaires answering questions related to labour and demographic factors. This collected data is then compiled to populate the Labour Market Dynamics in South Africa (LMDSA) dataset that includes data on earnings from the four (4) QLFS every year.

Even though the Labor Market Dynamics in South Africa data set is a cross-sectional dataset in nature, I took advantage of the panel component that allowed 75% of the household sample in the previous wave to be resampled in the following wave. This facilitated the systematic matching of individuals using unique identifiers across consecutive survey waves. As a result, this rotating panel enables the monitoring of individuals for four consecutive quarters before they are opted out of the sample.

A distinctive advantage of structuring data in a panel format is the presence of cross-sectional characteristics. This allows for leveraging its ability to handle specific unobservable effects that remain constant over time and vary between individuals. Moreover, it helps mitigate bias associated with omitted factors that could result from the correlation between the error term and the explanatory variables. Panel data, which combines intra-individual dynamics and inter-individual variances, provides various benefits over cross-sectional or time-series data, claims Hsiao (2007). Time-series data and panel data differ in that numerous persons are focused on at various time points in panel data (also known as longitudinal data), whereas a single individual is only focused on at various time points in time-series data. Therefore, to assess the impact so far achieved by the policy, I must observe individual members in my sample for at least one wave before and after the implementation of the policy.

Using a sample of 2018 and 2019 periods, Total weighted employment at the country level was approximately estimated to be 16.5 million people, of which 10.5 million were classified as employees (Stats Sa, 2019). 2018 is the period before the implementation of the national minimum wage which came into operation on 1st January 2019 and 2019 is a period after the launch of the policy. The analysis is restricted to employed individuals of working age between 15 to 64 years earning an income from employment in both formal and informal sectors. All

employers, and unemployed individuals not affected by the set minimum wage were excluded from my analysis.

This setup enables the formation of three panels, each comprising six waves of data. The data spans from the second quarter of 2018 (2018Q2) prior to the policy implementation, up to the third quarter of 2019 (2019Q3) post-implementation. Consequently, it allows for the observation of each individual in the sample at least once during both the pre- and post-implementation periods of the policy. The matching of individuals across waves especially before the implementation of the policy ensured that members were mutually exclusive of each other. This helped me to identify those in the sample who were brought on board in quarters three and four of 2018 to avoid double counting.

In Table 2, I provide a brief description of the panel constructed from the Labor Market Dynamics in South Africa data set. Since only those employed are considered in our analysis, a total of 12,583 were sampled in 2018 quarter 2 which in this study is treated as our first wave (wave 1). In wave 2, which is conducted in the following quarter, roughly 75% (7,567) of the sample is resurveyed while 25% of the sample is made up of people who were not surveyed in wave 1 (4,878). Only around 50% of the wave 1 sample (4,739) is present in wave 3. Wave 4 is the last one for the first panel in which I examine those who were still active right from Wave 1, which surveys 25% of the initial wave 1 sample (about 2,100 people). For the first panel 2018Q2 – 2019Q1, only 2,100 out of the 12,583 were used since this can be observed in both pre- policy period and the post-policy period. For the second (2018Q3 – 2019Q2) and third (2018Q4 – 2019Q3) panels, 2,771 out of 4,878 and 3211 out of 4,431 observations were used respectively.

To construct a maximum sample size, while consistently being able to observe every person in at least each pre-national minimum wage and post-national minimum wage period, we construct six waves as listed in the table below.

Table 2:

Summary of Panel Observations

Pre- National Minimum Wage (2018)				Post- National Minimum Wage (2019)		
Quarter 2	Quarter 3	Quarter 4		Quarter 1	Quarter 2	Quarter 3
1st Wave (Observations)	Active in 2nd wave	Active in 3rd wave		Active in 4th wave	Active in 5th wave	Active in 6th wave
12,538	7,567	4,739		2,100	0	0
	Joined in 2nd Wave	Active in 3rd wave		Active in 4th wave	Active in 5th wave	Active in 6th wave
	4,878	3,265		2,629	2,014	0
		Joined in 3rd Wave		Active in 4th wave	Active in 5th wave	Active in 6th wave
		4,431		2,948	2,492	1,950

At this level, I can now identify all employees whose monthly income is less than the set minimum wage in 2018Q2, 2018Q3, and 2018Q4 the periods before the national minimum wage policy was introduced. This allows for the investigation of what happens to them in the period after implementation of the policy since we can follow the same people over time.

I define both control and treatment groups in this specification using the set wage threshold as minimum that distinguishes covered from uncovered workers. For example, in the pre-policy period, the outcomes for individuals making less than the national minimum wage are contrasted with those making more than the national minimum wage. I considered Bhorat et

al. (2021)'s approach, that choose employees for the control group who earn above 110% of the set national minimum wage because these workers should not be affected by the new policy but will continue to be similar to those in the treatment group (all those earning below 110% of the set national minimum wage) in other respects. The 10% consideration is to cater for spillovers. The size of our panel sample allows us to account for a wide range of demographic and occupation-specific factors that could affect income prospects.

Table 3:

National Minimum Wage Rates

Workers	Hourly	hours	weeks	total	Monthly NMW	10% consideration
Others	20	40	4.33	3,464	3,500	3,850
Agriculture	18	40	4.33	3,118	3,200	3,520
Domestic	15	40	4.33	2,598	2,600	2,860

Notes. *Calculated at 40hrs from data adapted from Minimum Wage Panel Report (2016)*

My main outcome of interest is household income that is provided in the compiled LMDSA. The income is the monthly earned salary excluding transfers and remittances in the sample. Furthermore, I also used the consumer price index (CPI in 2016 = 100) from Statistics South Africa to account for the real wage for the period under consideration

Variables

In this study, the log of household income is the main outcome variable while the log of hourly wage, contract employment, hours of work, and employment are other dependent variables considered in estimating the impact influenced by the introduction of the new wage law. The independent variable is the minimum wage policy intervention (dummy variable: minwage = 1 if individual wage is below calculated wage in table 3 or minwage = 0 otherwise). The

covariates considered include industries such as manufacturing and service, types of employment, age, marital status, gender, education, formal or informal sector, and province.

Descriptive statistics

Table 4 shows the summary statistics for the entire period considered in this paper from 2018Q2 to 2019Q3. Total of 22,215 households were considered in this analysis. Columns (1) reports the number of observations, column 2, 3, and 4 reports mean, standard deviation, minimum value and maximum value of each variable respectively. Income was maintained in South African Rand currency computed at monthly level. Hourly wage was calculated by diving monthly wage by individual total hours of work. There are 8 dummy variables created from the 'highest level of education gained' variable, ranging from no formal education to a doctorate. Similar conversions are made for the gender and married status variables. Additionally, the household income is expressed in log form for simplified interpretation.

Table 4:

Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Gender	22,215	1.492	.5	1	2
Age	22,215	39.873	10.863	15	86
Race	22,215	1.348	.839	1	4
Quarter	22,215	3.701	1.4	1	6
Marriage	22,215	3.124	1.829	1	5
Education	22,215	14.96	13.757	0	98
Contract Employment	22,215	1.209	.407	1	2
Hours worked	22,215	42.408	11.907	1	112
Minimum Wage	22,215	.564	.496	0	1
Income	22,215	8.137	1.21	2.533	12.824
Post	22,215	.636	.481	0	1
Hourly Wage	22,215	4.464	1.148	.172	9.796

To identify both treatment and control, I generated a minimum wage variable to indicate whether an individual affected by the policy (treatment) or not (control). Since the policy sought to increase the income of those earning below the set minimum wage. Thus, treatment group are those earning below 3,520 for agriculture, 2,860 for domestic workers and R3,850 for others (all inclusive of 10% spillovers) and the control group are those earning above the specified amounts for each category respectively. The total number of observations in the control are 9,680 households and 12,535 household in the treatment respectively as shown in the table 5 below.

Table 5:

Summary of Treatment and Control Per Quarter

Period (Quarters)	Minimum Wage		
	Control	Treatment	Total
2018 Q2	873	1,227	2,100
2018 Q3	1,189	1,582	2,771
2018 Q4	1,429	1,782	3,211
2019 Q1	3,323	4,354	7,677
2019 Q2	1,973	2,533	4,506
2019 Q3	893	1,057	1,950
Total	9,680	12,535	22,215

Empirical Strategy

To measure the resulting increase in household income due to implementation of the national minimum wage policy, I used the fact that the minimum wage policy had been introduced on January 1st, 2019. With available data for both before and after period of minimum wage implementation, Difference in Differences (DID) estimation method is best. To effectively argue the two-stage difference in policies or shocks, several econometrics researchers have

used the Difference in Differences estimation in their papers. The impact of minimum wage on income can be estimated by using the following regression equation:

$$Y_{ijt} = \beta_0 + \beta_1 Post_t + \beta_2 Treat_i + \beta_3(Post_t * Treat_i) + \alpha_k X_{ik} + i.province + i.quarterly + \epsilon_{it}$$

The main outcome variable of interest Y_{ijt} is log of income and other dependent variables that include total hours of work, Contract employment, and Employment status of individual i surveyed in quarter j of year t. $Treat_i$ is a binary variable that equals 1 if the individual i in year 2018 was below the set minimum wage, and 0 otherwise. $Post_t$ is also a binary variable that equals 1 if the survey was conducted in year 2019 and 0 otherwise. $Post_t * Treat_t$ allows interaction between two variables. Y is therefore the coefficient of interest which shows the effect of the national minimum wage on the household income. X represents the vector of control variables that may influence household income, such as age, gender, race, marital status, education, employment status, and industry type. β1, β2, β3, αk are coefficients to be estimated and ϵi is error term capturing unobserved factors and random variations.

The coefficient β1 represents the average treatment effect of the policy change on household income for the control group. β2 and β3 represent the average treatment effect of the policy change on household income for the treatment group, compared to the control group. The interaction term $Post_t * Treat_t$ captures the differential impact of the policy change between the treatment and control groups. The Quarterly and Province fixed effects account for all the time-invariant unobservable characteristics of households fixed across quarters and provinces. This helps to mitigate potential bias resulting from unobserved heterogeneity.

The key founding assumption for the Difference-in-difference (DID) estimation strategy is the parallel trends assumption which states that the outcome variables of interest for both control

and treatment groups would not be different in the absence of the national minimum wage (treatment) policy (Angrist & Pischke, 2008). This implies that the rate of change of the dependent variables between the treatment and control groups should not significantly differ from zero, even if both groups do not necessarily need to be on the same level. This assumption is supported by a visual analysis of the quarterly trends in the dependent variables for both the treatment and the control groups.

Figure 1:

Parallel Trends Assumption
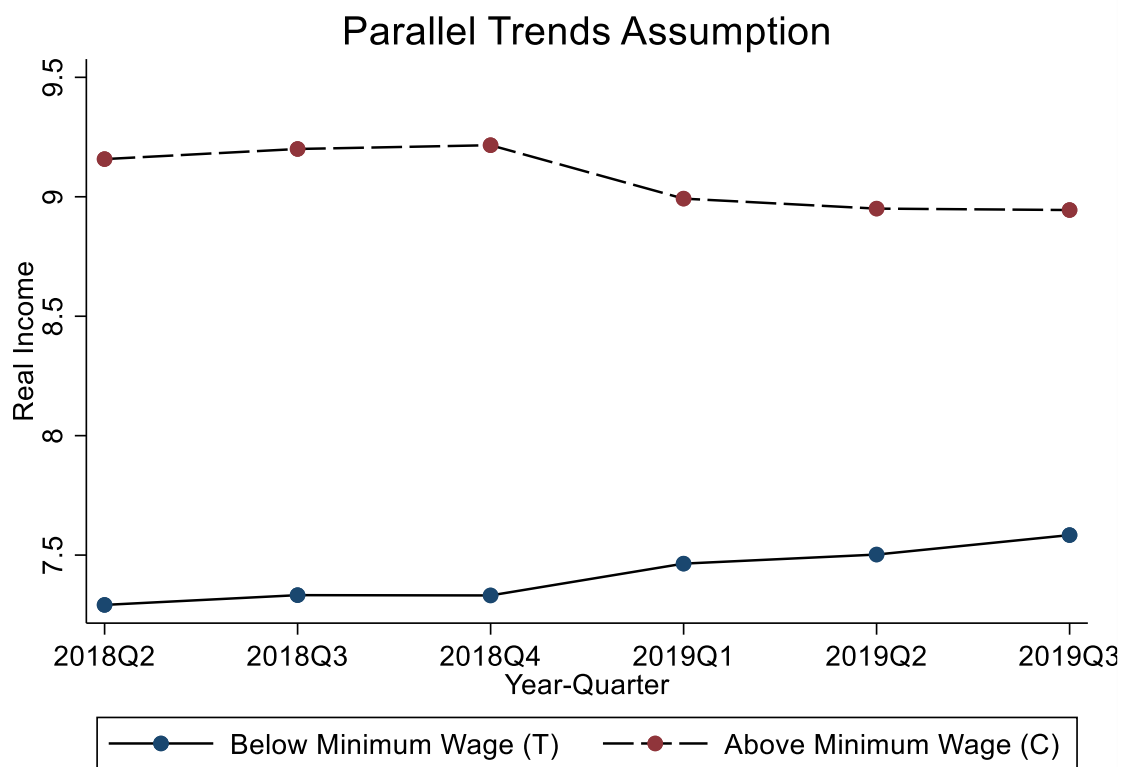
The mean of the dependent variable for each treatment and control group over the course of 6 quarters is shown in Figure 1. Prior to the introduction of the national minimum wage in 2019, one can conclude that trends shown in the above figure for both groups at different quarterly periods before the policy are more or less comparable. In other words, I don't discover any proof indicating that the desired outcome measure would have altered in a distinct manner if

the national minimum wage policy hadn't been put in place. Specifically, the wage per worker trends before introducing the minimum wage remain constant over various time spans. Given the resemblance in the trajectory, before the minimum wage was implemented, it is doubtful that our conclusion was caused by sector-specific shocks related to sector minimum wages.

Falsification Test

To further ascertain my position on the Difference in Difference estimation method, I ran a falsification test to support the parallel trends graphs visualized above. I used wave 2 (2018Q3) the third quarter before the implementation of the policy as a placebo treatment period. On the assumption that the treatment policy was implemented in the third quarter of 2018 contrary to the actual period of January 1st, 2019 when the policy was implemented, we ran the regression using our estimation equation. The Difference in Difference estimator is predicted to be insignificantly different from zero if the common trends assumption for this chosen strategy holds.

Table 6 displays the outcomes of the falsification test, which incorporated diverse individual control variables, quarterly fixed effects, and Province fixed effects, along with robust standard errors. As expected, the estimates from all the five dependent variables are not statistically significant as shown in Table 6 below.

Table 6:

Falsification Test Using 2002 as Treatment Year

	(1)	(2)	(3)	(4)	(5)
	Income	Hourly wage	Hrs work	Contract	Employment
Post#Minwage	-0.0208	0.8198	-0.0506	0.0177	0.0112
	(0.0366)	(0.4921)	(0.0383)	(0.0227)	(0.0240)
Post	0.0536	-0.2653	0.0692*	0.0282**	0.0319**
	(0.0337)	(0.3937)	(0.0305)	(0.0087)	(0.0109)
Minwage	-1.7841***	-2.3735**	-1.6418***	0.1386***	0.1724***
	(0.0956)	(0.8754)	(0.1015)	(0.0317)	(0.0294)
Individual Controls	YES	YES	YES	YES	YES
Quarterly Fixed Effect	YES	YES	YES	YES	YES
Province Fixed Effect	YES	YES	YES	YES	YES
N	8,082	8,082	8,082	8,082	8,082
R^2	0.587	0.082	0.558	0.210	0.180

Notes. *Standard errors clustered at Individual level as shown in parentheses.*
* *p < 0.05,* ** *p < 0.01,* *** *p < 0.001*

Results and Discussions

This section documents the short-term impact so far registered on household income as a result of introducing national minimum wage policy in South Africa at the beginning of 2019. The introduction of national minimum wage policy could have motivated the increase in household income since employers are barred from paying wage to employees below the set minimum pay across the nation. To analyse the impact of introducing the national minimum wage policy in South Africa, Difference in Differences (DID) method of analysis and Labor Market Dynamics in South Africa data for 2018 and 2019 was used while considering both quarterly and province fixed effects.

Using my estimation equation, I report regression estimates of the national minimum wage's effect on Household income in Table 7. Since the policy was officially implemented by the government on the first day of 2019, I can detect the differences in estimates between before and after. Whereas all columns from (1) to (5) report log of household income, column (1) to (4) includes 10% spillover effects and column (5) does not include 10% spillover effects. Column (1) reports the regression estimates of the model without controls like age, gender, race, marital status, household size, education, employment status, industry type, and fixed effects, column (2) reports an estimate of the model with the inclusion of fixed effects and without controls contrary to column (3) which reports estimate of the model with controls and without fixed effects to account for time-invariant unobservable individual characteristics. Columns (4) and (5) report my main results of the study with and without 10% spillover respectively while considering both province and quarterly fixed effects and control variables.

The regression results indicate that the introduction of the national minimum wage policy in 2019 increased household income for those who were previously earning below the introduced minimum wage regardless of spillover effects considerations. Household income increased on

average by 39% and is statistically significant at a 1 percent level. The overall model indicates a positive response to the introduction of the national minimum wage in South Africa. A 1 percent increase in minimum wage increases individual income by approximately 39 percent. This can be attributed to the fact that the National Minimum Wage law was passed in 2017 but implemented on the first day of 2019 providing a grace period of 2 years to all game players to smoothly transition to the new law by January 2019 (NEDLAC, 2016).

The Labor Force Survey (LSF), as recommended by the ILO, was used by the government to establish the proper minimum wage rate. Therefore, I believe that the establishment of the first national minimum wage policy had a significant impact on household income.

Table 7:

Impact of NMW on Household Income

	(1)	(2)	(3)	(4)	(5)
	Income	**Income**	**Income**	**Income**	**Income**
Post#Minwage	0.3954***	0.3964***	0.3912***	0.3922***	0.4057***
	(0.0253)	(0.0469)	(0.0454)	(0.0455)	(0.0485)
Post	-0.2240***	-0.1544***	-0.2212***	-0.1515***	-0.1363***
	(0.0190)	(0.0258)	(0.0230)	(0.0254)	(0.0211)
Minwage	-1.8751***	-1.8581***	-1.7851***	-1.7720***	-1.7456***
	(0.0202)	(0.0823)	(0.0827)	(0.0816)	(0.0885)
Fixed Effects	No	Yes	No	Yes	Yes
Controls	No	No	Yes	Yes	Yes
N	22,215	22,215	22,215	22,215	22,215
R^2	0.449	0.453	0.469	0.472	0.472

Notes. *Quarterly Labor Force (LMDSA) Survey from 2018 to 2019 is employed. CPI is considered (the year 2016 = 100). All monetary variables are in log form. The binary variable Minwage is equal to 1 if the wage is below 110% set NMW and 0 otherwise. Binary Variable Post is equal to 1 if the year of the survey is 2019 and 0 otherwise. Post#Minwage is the interaction term of two binary variables. Province, and survey Quarterly fixed effects, 10% spillover effects considered. Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table 8 summarizes the results of the other considered outcome variables of hours of work, log of hourly wage, contract, and employment. All results were also estimated using the same

estimation equation as earlier highlighted in the empirical strategy. Our regression results indicate that compared to household income and hourly wage, hours of work registered a positive impact. However, contract employment and employment status (formal or informal) registered a negative impact.

The first column (1) of table 8 provides estimates for the impact of national minimum wage on household income in south Africa. If the main argued options of reducing income inequality among South African population is by increasing their income, I would anticipate seeing a positive and statistically significant estimate of the model since implementation of the new wage law became a requirement for all the employers in the country. A positive 0.392 estimate coefficient that is statistically significant at 1 percent level shows that the monthly income of employees earning below the set minimum wage before increased by 39% as a result of introducing a national minimum wage policy in South Africa. This is a clear signal to emphasize the fact that introduction of national minimum wage policy yielded positive results in such a short time if we can on average realize some increase in remuneration of employees. When minimum wage is introduced, many employers are expected to implement in accordance with the new policy of national minimum wage to increase pay of employees that are most least paid to earn not less than the set minimum wage. This marks the real beginning of closing on the income inequality gap among South Africans.

The regression estimates in column (2) of Table 8 show the effect achieved since the introduction of the national minimum wage in South Africa on hourly wage. Hourly wage is computed by taking a division of the monthly income by total hours worked in a single month. My interest in detecting changes in hourly income for employees before and after implementation of the policy is to establish whether the results look any different from the monthly income or not and what lessons can we document towards reducing income inequality

in the country. The positive coefficient of 0.372 implies that the introduction of the policy has registered positive effects of an increase in hourly income by approximately 37%. This is also significant at a 1 percent level of significance. To be specific, this justifies the previous estimate of the positive impact on household income. This affirms the fact that the increase in the hourly wage is significant to contribute towards the reduction of income inequality among South Africans.

Column (3) documents the effect of the wage policy on hours of work. After discussing its reaction to the hourly wage above, I dive into assessing any effects on hours of work for employees. Logically all employers would scale down the number of employees or reduce the total number of hours worked to reduce the labour cost of operation hence the expected negative impact. The commencement of a minimum wage policy encourages many new entrants to the job market to embrace technology that relies more on capital investment. Consequently, these businesses tend to hire a smaller number of employees, as noted by Baek et al. (2021). In comparison to columns (1) and (2), the coefficient for hours of work in column (3) was 0.289, indicating that the introduction of the minimum wage in South Africa was associated with an increase in hours of work. However, it's important to note that this increase was not statistically significant. This position can be attributed to the fact that all employers were sensitized early enough in the granted grace period of 2 years before actual implementation of the policy (NEDLAC, 2016). This means that the employers prepared themselves to continue working with staff without unnecessary layoffs because of the implementation of a new national wage law.

Table 8:

Impact of National Minimum Wage on outcome variables

	(1) Income	(2) Hourly wage	(3) Hrs work	(4) Contract	(5) Employment
Post#Minwage	0.3922***	0.3724***	0.2890	-0.0241***	-0.0260***
	(0.0455)	(0.0499)	(0.2818)	(0.0063)	(0.0070)
Post	-0.1515***	-0.1608***	0.3750	0.0074	0.0149
	(0.0254)	(0.0201)	(0.4288)	(0.0180)	(0.0170)
Minwage	-1.7720***	-1.6504***	-1.8105**	0.1518***	0.1808***
	(0.0816)	(0.0875)	(0.5856)	(0.0270)	(0.0269)
Fixed Effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N	22,215	22,215	22,215	22,215	22,215
R^2	0.472	0.445	0.083	0.207	0.170

Notes. *Quarterly Labor Force (LMDSA) Survey from 2018 to 2019 is employed. CPI is considered (the year 2016 = 100). All monetary variables are in log form. The binary variable Minwage is equal to 1 if the wage is below 110% set NMW and 0 otherwise. Binary Variable Post is equal to 1 if the year of the survey is 2019 and 0 otherwise. Post#Minwage is the interaction term of two binary variables. Province, and survey Quarterly fixed effects, 10% spillover effects considered. Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01.*

Negative impacts were registered for both contract employment and formal employment as shown in columns (4) and (5) respectively. These estimates are both statistically significant at a 1 percent level. The regression estimates of the equation indicate that introducing the wage law in South Africa led to a decrease in both contract employment and formal or informal employment by 2.4 percent and 2.6 percent respectively. As earlier predicted, the decrease in employment is a clear indication that some employers reacted towards the introduction of minimum wage policy despite being given 2 years of transition before actual implementation. Therefore, the results from Table 8 indicate that the introduction of the national minimum wage had the expected effects of an increase in income and hourly wage and a decrease in employment. This result contradicts the findings of Bhorat et al., 2021 that found no significant effects on employment and hourly wage using cross-sectional data.

Heterogenous Effects

To fully appreciate the short-term impact achieved, I utilized 4 subgroups of sector, gender, race, and industry type to identify the heterogenous effects of implementing minimum wage on the considered outcome variables in South Africa. The results indicate that effects on household income are positive and statically significant across all four subgroups contrary to the remaining outcomes of Hourly wage, formal employment, contract employment, and hours of work.

We can distinguish between the formal and informal sectors with regard to how the national minimum wage policy in South Africa affects various job sectors. The legal sector of the economy of the nation is the formal sector, which includes enterprises that pay taxes and are subject to regulations. This category comprises well-known private enterprises, spanning from supermarkets and eateries to gas stations, financial institutions, insurance companies, and more, if these entities adhere to legal obligations and maintain legal employment practices. In contrast, the informal sector denotes the unregulated and untaxed portion of the economy. Enterprises within the informal sector are operated by individuals not engaged in formal sector employment, encompassing activities that might be illicit or unmonitored. The implementation of the national minimum wage policy led to a greater increase in household income within the informal sector compared to the formal sector.

Formal or Informal Employment

Table 9:

Minimum Wage Effects in Formal and Informal Sectors

	(1)	(2)	(3)	(4)
	Income	Hrs work	Hrly Wage	Contract Emp't
PANEL A: FORMAL SECTOR				
Post#Minwage	0.3768***	-0.0134	0.3675***	0.0012
	(0.0583)	(0.1713)	(0.0588)	(0.0023)
N	16884	16884	16884	16884
R^2	0.463	0.073	0.450	0.008
PANEL B: IMFORMAL SECTOR				
Post#Minwage	0.6944***	1.2351	0.6479***	0.0290**
	(0.0516)	(0.8559)	(0.0509)	(0.0114)
N	5,331	5,331	5,331	5,331
R^2	0.354	0.143	0.280	0.208

Notes. *Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

The results in Table 9 above show that household income for those employed in the informal sector increased by 69 percent as a result of introducing the national minimum wage in South Africa compared to the formal sector which increased by approximately 38 percent. Both results in panels A and B are positive and statistically significant at a 1 percent level of significance. This is in line with the main results that suggested an overall increase in household income. The higher increase in household income for the informal sector is based on the fact that many small businesses were paying their employees below the set minimum wage. However, such a positive response from a sector that is not fully regulated by the government gives a clear signal that awareness creation of the new policy was thoroughly done. Column (2) and Column (4) present estimates of the policy's impact on working hours and contract employment respectively. The findings indicate that, in the formal sector, the policy did not yield any statistically significant influence on either of these outcomes. Conversely, within the informal sector, the policy exhibited a noteworthy positive impact on contract employment, registering an increase of around 3 percent. This effect is statistically significant at the 5 percent

level of significance. This implies that minimum wage on the other hand promoted formalized employment where employer and employee work on clear terms and conditions to avoid litigations. Even though the magnitude is minor, it is an indication of the progress, especially in the year period of implementation considered in this study.

The policy's favorable outcomes, particularly within the informal sector, reinforce the policy's effectiveness, as it supports numerous South Africans who rely on this sector to access affordable necessities such as food, clothing, goods, and services. Additionally, many individuals in the country who are unable to secure formal employment depend on the informal sector as a source of income.

Gender Differences

Table 10:

Minimum wage Effects based on Gender.

	(1) Income	(2) Hrs work	(3) Hrly Wage	(4) Contract Emp't
PANEL A: MALE				
Post#Minwage	0.4392***	0.0006	0.4197***	-0.0455***
	(0.0382)	(0.4171)	(0.0478)	(0.0107)
N	11293	11293	11293	11293
R^2	0.437	0.030	0.425	0.112
PANEL B: FEMALE				
Post#Minwage	0.3499***	0.6015*	0.3295***	0.0001
	(0.0574)	(0.2717)	(0.0555)	(0.0141)
N	10922	10922	10922	10922
R^2	0.502	0.064	0.468	0.338

Notes. *Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 10 reports the regression results of the effects of the policy based on the gender differences between individuals. Panel A shows the regression results when an individual is a male, and Panel B shows the results when an individual is a female. When the national

minimum wage policy is introduced, among the male, both income and hourly wage increased by approximately 44 percent and 42 percent respectively. However, there is a decline in contract employment by 4.5 percent and all are statistically significant at 1 percent level. Compared to table 9, hours of work in column (2) yielded insignificant effects for both male and female. Among female in panel B, both income and hourly wage increased by 35 percent and 33 percent both being statistically significant at 1 percent. Contrary to male individuals, contract employment for the female group significantly yielded no impact as a result of implementing the national minimum wage policy. The gender differences confirm the fact that male individuals are most likely to benefit more from the policy compared to females. This is backed by the fact that male individuals are more exposed to employment opportunities than females.

To determine the difference between the effects of the policy on the outcome variables based on the race of the individuals considered in this study, I ran independent regressions for each race category. Understanding race in South Africa requires delving into the complex historical, social, and political context of the country. Race has played a significant role in shaping South African society, particularly due to the deeply entrenched system of apartheid that existed for decades (Erasmus, 2012). South Africa's population is diverse, with various racial and ethnic groups categorized into African/Black who include various ethnic groups, such as Zulu, Xhosa, Sotho, and others. White included those of European descent and held privileged positions under apartheid, enjoying superior rights and resources. Coloured included people of mixed race, often a mix of indigenous African, European, and Asian ancestry, and lastly, the Indian who included people of Indian descent, primarily brought to South Africa as indentured laborers during the 19th century (Erasmus, 2012)

Racial Differences

Table 11:

Minimum wage Effects based on Race

	(1) Income	(2) Hrs work	(3) Hrly Wage	(4) Contract Emp't
PANEL A: AFRICAN/BLACK				
Post#Minwage	0.4236***	0.3222	0.4031***	-0.0260**
	(0.0482)	(0.2740)	(0.0491)	(0.0083)
N	18203	18203	18203	18203
R^2	0.447	0.085	0.416	0.219
PANEL B: WHITE				
Post#Minwage	0.3598***	-1.2449**	0.3878***	-0.0422**
	(0.1054)	(0.4413)	(0.1002)	(0.0176)
N	1590	1590	1590	1590
R^2	0.524	0.072	0.510	0.040
PANEL C: COLORED				
Post#Minwage	0.3015***	1.0024	0.2581***	0.0068
	(0.0618)	(0.8300)	(0.0603)	(0.0221)
N	1892	1892	1892	1892
R^2	0.428	0.135	0.407	0.120
PANEL D: INDIAN				
Post#Minwage	0.2052***	-1.1330	0.2311***	-0.0363
	(0.0439)	(0.9843)	(0.0424)	(0.0339)
N	530	530	530	530
R^2	0.566	0.117	0.555	0.171

Notes. *Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 11 presents the findings from the regression analysis, illustrating the policy's impact categorized by racial factors. Panel A shows the regression results for Africans or blacks, Panel B for whites, Panel C for Coloured, and lastly Panel D for Indian race. As discussed, in Table 8 for the main results, this regression analysis supports the assertion that the introduction of the national policy resulted in a statistically justified rise in both household income and hourly wage across all racial groups in South Africa. The results show that the policy led to an increase in income (column 1) for Africans by 42 percent which is the highest compared to a 36 percent increase for whites, a 30 percent increase for coloured and 21 percent for Indian race. The

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increase across is statistically significant at a 1 percent level. The same pattern of increase is reflected under the hourly wage (column 3) variable as expected. This generally implies the fact that Africans were the least paid below the set national minimum wage in South Africa. These results signal the need for reducing income inequality in the country.

To my surprise, compared to other races of Africans, Coloured, and Indians where there was no significant effect on hours of work (Column 2), the results show that whites significantly lost hours of work by 124 percent which literally translates to loss of jobs among this group. This drop in hours of work is associated with a decrease in household income as evidenced in Figure 1 (parallel trend) where there was a serious drop in the income of the control group right in the first quarter of 2019 after the introduction of the wage policy in South Africa. This is attributed to the fact that employers might have made a decision to lay off most of the employees earning highly to reduce labor costs leading to an increase in unemployment by 0.5 percent (Stats Sa, 2019).

Column 4 shows the regression results for minimum wage on contract employment. There was a registered decrease in contract employment for Africans and whites by approximately 3 percent and 4 percent respectively. This is contrary to both Coloured and Indian groups that never registered any significant effect as a result of introducing the national minimum wage policy in South Africa. This entirely subjects the analysis to conduct several robust checks to further study the intuition behind the serious drop in the income of the control group, especially the Whites.

Industry Type Differences

Table 12:

Minimum wage Effects based on Industry Type.

	(1)	(2)	(3)	(4)
	Income	Hrs work	Hrly Wage	Contract Emp't
Agriculture; hunting; forestry and fish				
Post#Minwage	0.5083***	0.8897	0.4622***	-0.0130
	(0.0765)	(1.4010)	(0.0969)	(0.0326)
N	1503	1503	1503	1503
R^2	0.305	0.078	0.294	0.125
Mining and quarrying				
Post#Minwage	0.5776***	-1.5032	0.5953***	-0.0010
	(0.1039)	(1.5106)	(0.0880)	(0.0128)
N	657	657	657	657
R^2	0.519	0.079	0.513	0.056
Manufacturing				
Post#Minwage	0.3800***	0.3100	0.3612***	-0.0169
	(0.0641)	(0.5194)	(0.0631)	(0.0225)
N	2329	2329	2329	2329
R^2	0.421	0.065	0.423	0.095
Electricity; gas and water supply				
Post#Minwage	0.5052**	1.9266	0.4653**	-0.0334
	(0.1819)	(1.9520)	(0.1724)	(0.0590)
N	267	267	267	267
R^2	0.518	0.112	0.523	0.138
Construction				
Post#Minwage	0.4733***	1.0524	0.4311***	-0.0954**
	(0.0763)	(0.7960)	(0.0719)	(0.0385)
N	1437	1437	1437	1437
R^2	0.482	0.367	0.386	0.142
Wholesale and retail trade				
Post#Minwage	0.4047***	0.0590	0.3936***	0.0043
	(0.1071)	(0.5044)	(0.1000)	(0.0185)
N	3462	3462	3462	3462
R^2	0.385	0.039	0.377	0.059
Transport; storage and communication				
Post#Minwage	0.5427***	-0.6556	0.5329***	-0.0462
	(0.0700)	(0.8625)	(0.0819)	(0.0281)
N	1170	1170	1170	1170
R^2	0.460	0.196	0.484	0.282
Financial intermediations; insurance; real state				

Post#Minwage	0.3738***	-0.0021	0.3531***	-0.0314***
	(0.0347)	(0.6808)	(0.0352)	(0.0087)
N	3309	3309	3309	3309
R^2	0.454	0.122	0.467	0.048
Community; social and personal services				
Post#Minwage	0.3532***	0.1329	0.3497***	-0.0088
	(0.0554)	(0.5018)	(0.0514)	(0.0058)
N	5582	5582	5582	5582
R^2	0.578	0.078	0.538	0.134
Private households				
Post#Minwage	0.5647***	1.3846	0.5019***	0.0051
	(0.0862)	(0.9362)	(0.1060)	(0.0584)
N	2493	2493	2493	2493
R^2	0.275	0.098	0.242	0.092

Notes. *Quarterly Labor Force (LMDSA) Survey from 2018 to 2019 is employed. CPI is considered (the year 2016 = 100). All monetary variables are in log form. Binary variable Minwage is equal to 1 if the wage is below 110% set NMW and 0 otherwise. Binary Variable Post is equal to 1 if the year of survey is 2019 and 0 otherwise. Post#Minwage is the interaction term of two binary variables. Province, and survey Quarterly fixed effects, 10% spillover effects considered. Standard errors in parentheses, $^{*} p < 0.1$, $^{**} p < 0.05$, $^{***} p < 0.01$.*

Table 12 shows the regression results of the effects of the policy on the considered outcome variables in this study. South Africa is among the most industrialized countries in the continent of Africa, this is justified by the fact that it is among the top 3 biggest economies in Africa. Delving into understanding the effects of the policy in specific industries helps us to appreciate which industries were much affected perhaps for the government to have started considering all possible subsidies to ensure that over 26 percent of the unemployed population is reduced.

The results show that there was a tremendous increase in household income (column 1) and hourly wage (column 3) among all employees employed across all the stipulated industries. Agriculture, mining, electricity, transportation, and private households all registered an increase above 50 percent which is statistically significant at a 99 percent level of confidence. There was no significant impact registered for hours of work across all the industries. This can be attributed to the sensitization of employers and the provision of a 2-year period for transition.

For contract employment (column 4), it is only financial intermediations; insurance; real estate, and construction industries that registered a decrease in employment by 9 and 3 percent respectively otherwise all the remaining industries had no significant impact as a result of introducing national minimum wage policy for South Africa.

Conclusion

In this paper, I investigate the impact of the 2018 national minimum wage legislation on household income in South Africa. Since 1999, South Africa has been implementing sector minimum wages that applied to different sectors or industries until the 1st of January 2019 when the new policy was implemented to improve the working conditions of employees and reduce income inequality in the country. According to previous studies, the introduction of the national minimum wage yields a positive impact on household income and hourly wage (Neumark et al., 2006; Anake, 2014; Vázquez et al., 2017; Redmond, 2019). Employers must work in line with the approved policy to ensure their respective employees are paid not less than what was set. The Labor Market Dynamics in South Africa dataset which is compiled from Quarterly Labour Force Survey was used in this study. The data was collected quarterly, and the study focused on data selected for the years 2018 and 2019. The research utilized the Difference in Differences (DID) empirical method to quantify the effect of introducing a national minimum wage on household income in South Africa.

The analysis of the study produced compelling results regarding the introduction of the national minimum wage on household income in South Africa. The findings suggest that the implementation of the national policy had a notable and positive impact, leading to an increase in household income. This is consistent with the findings of Dube (2019) who produced robust evidence of higher minimum wage increasing family income in the United States of America. This is a well-aligned reference to my study since South Africa's national minimum wage is an upgrade of sector minimum wages that had been implemented before the introduction of the policy in January 2019. Hence, the introduction of sector-specific minimum wages in the past implies that a span of six months is ample time to detect noteworthy labor market reactions to a fresh national minimum wage legislation. However, the decision to allocate a two-year

transitional and awareness-building period subsequent to enacting the law resulted in extensive nationwide information campaigns. These campaigns aimed to educate the public and employers about the recently established national minimum wage law. This move is argued by Gindling et al., 2015 to cause a significant effect on compliance as witnessed in other developing experiences.

Considering the categorization of sectors, the minimum wage policy leads to higher household income and hourly wages, while also leading to decreased working hours within the informal sector in contrast to the service sectors. The results indicate that the implementation of the minimum wage leads to a statistically significant reduction in employment for part-time workers, particularly noticeable in the informal sector. However, part-time employment in the formal sector is stagnant compared to the informal sector. Concerning female and male employees, income for both males and females increased. However, contract employment for males was significantly decreased. The empirical findings demonstrate a statistically significant rise in the number of female workers. Hence, the observed relatively negative consequences of the minimum wage on men align with the analysis conducted by Del Carpio and Pabon (2017), which affirms that minimum wage policies tend to disproportionately affect the most vulnerable segments of the workforce. This pattern is discernible in economies, both advanced and developing. In summary, the empirical outcomes outlined in this study indicate that the implementation of minimum wage policy impacts enterprises within the informal sector more adversely than those in the formal sector. This finding suggests that the introduction of minimum wage legislation results in a slight reduction in the labour force, primarily due to the substitution of labour with capital-intensive elements like machinery and technology, as highlighted by Baek et al. (2021).

The analysis consistently indicates that the effect of the national minimum wage policy on hours of work is generally insignificant, a trend observed across almost all the tables. This lack of a substantial impact on hours of work may suggest that employers had made adequate preparations and adjustments in anticipation of the policy implemented by the government two years prior. The results agree with Bhorat et al. (2021) who found no significant effects of the policy on employment in South Africa.

The national minimum wage policy of South Africa generally strives to improve the standards of low-paying occupations and to reduce inequality. Nonetheless, if there is a significant constant increase in the minimum wage in the span of 2 years, the effect on employment predicts a significant decline in the future, which distorts the wage structure. As a result, taking the necessary steps to address the effects of wage as a result of unexpected unfavourable effects of the minimum wage implementation is highly recommended, and attempts are made to increase the employment's positive aspects (Choi, 2018).

Alvarez and Fuentes (2018) emphasized that the precondition for implementing the national minimum wage policy is building strong systems in the country to oversee the policy implementation and enforce compliance. Protecting employees in both informal and formal sectors can be of great importance to contribute towards the increase in their individual income. Moreover, the involvement of key stakeholders especially the key employers is very important in terms of compliance. Thus, a stakeholder analysis is very crucial for mapping the key stakeholders and labour unions to engage for smooth implementation.

What is not clear though is the fact whether minimum wage helps to address the problem of income inequality in the long run. As per the results in Figure 1 (parallel trends) shows a decrease in the gap between the control and the treatment but the gap is maintained for the

remaining quarter period considered. This study did not consider an increase in the set national minimum wage since 2019 to evaluate the changes that have evolved since the policy was announced. Further work should concentrate on this parameter and ensure to use a bigger sample and/or explore using cross-sectional data for at least 6 year period both before and after implementation of the policy.

Lastly, since this study empirically acknowledge the fact that introducing a national minimum wage policy tremendously increases the income of employees, every country should, of course, implement a minimum wage policy to address the problems faced by workers and firms at the lower end of the market. This creates a solution to the market balance that is reasonably competitive, and it should be applied as a means of improving the working conditions of employees in the labor market and reducing income inequality.

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