

ESTIMATING THE IMPACT OF MINIMUM WAGES ON EMPLOYMENT, WAGES, AND NON-WAGE BENEFITS: THE CASE OF AGRICULTURE IN SOUTH AFRICA

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Assessments of the impact of minimum wages on labor market outcomes in Africa are relatively rare. In part this is because the available data do not permit adequate treatment of econometric issues that arise in such assessments. This paper, however, attempts to estimate the impact of introducing a minimum wage law in the agriculture sector in South Africa, based on 15 waves of the biannual Labor Force Survey conducted between September 2000 and September 2007. The chosen sample includes six waves before the legislation's effective date (March 2003) and nine afterwards. To assess whether the changes experienced by farm workers are unique, we identify a control group that has similar characteristics to the treatment group. Our econometric approach involves using two alternative specifications of a difference-in-differences model. We test whether employers reduced employment, and whether they responded at the intensive margin by reducing hours of work. The results suggest a significant employment reduction in agriculture from the minimum wage (and particularly a noticeable move away from employment of part-time workers), an increase in wages on average, and a rise in non-wage benefits compliance. Our analysis also indicates that, firstly, overall average of hours worked fell in the post-law period, suggesting that employers adjusted to some extent on the intensive margin. Secondly, it appears that hours of work increased more in areas where wages were lower in the pre-law period, driven largely by the fall in part-time employment.

Key words: Minimum wage, agriculture, South Africa, wage, employment, hours of work.

JEL codes: C21, J23, J30, J31, J38.

The successful growth of commercial agriculture in South Africa for most of the twentieth century relied on extensive state intervention and support for white farmers with virtually no intervention on behalf of black farm workers, who were vulnerable, poorly remunerated, and non-unionized. This began to change with the demise of apartheid (Sandrey et al. 2011). The agricultural industry—a long-time

beneficiary of policies that provided state support—was rapidly deregulated and forced to compete internationally (Thompson and Benjamin 2011). Simultaneously, a series of laws aimed at protecting vulnerable workers were gradually introduced. The Constitution, the Labor Relations Act (LRA, 1995), the Basic Conditions of Employment Act (BCEA, 1997) and the Extension of Security of Tenure Act (ESTA, 1997), all strengthened the laws governing worker rights, which had historically been provisioned in colonial and apartheid labor legislation such as the Master and Servants Act (1856) and the Industrial Conciliation Act (1924), or in specific cases by Wage Boards and Bargaining Councils (Ibid. and ILO 2011). This growing regulatory framework was extended in 1999 when nationally-binding minimum wages were introduced in South Africa for the first time (Government Notice No. 622). Minimum wage laws were initially promulgated for workers in the contracted cleaning sector,

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and reached agricultural workers in 2003. Since 1999 a detailed minimum wage schedule has been developed—currently covering eleven sectors of the economy—and labor market institutions have been created to enforce the new laws. This minimum wage policy has been pursued with the explicit aim of ensuring that workers in low-paid, vulnerable occupations are guaranteed a basic subsistence income and protected from exploitation. Notably though, enforcement of these laws in South Africa remains relatively weak. Introducing a large jump in mandated wage levels did, however, risk increasing job-shedding in the agricultural sector, which mechanized and shed jobs to the point that in 2007 agricultural employment had fallen to one-third of its peak in the mid 1960s.

Unlike many other countries, the minimum wage in South Africa is different for each sector. There is thus currently no single national minimum wage. Even within a particular sector the mandated wage can vary by occupation type, number of hours worked, or geographic location, and this is specified in a Sectoral Determination, which includes regulations on working hours, overtime pay, and written contracts, among other employment stipulations. The body responsible for guiding state legislation on the various sectoral determinations is the Employment Conditions Commission (ECC). The ECC is a representative body within the Department of Labour (DoL) established to advise the Minister of Labour on appropriate and feasible sectoral wage schedules. The Sectoral Determination for farm workers was first announced in December 2002 and became effective in March 2003. Employer and employee organizations immediately approached the Minister of Labour with concerns regarding the determination, and after a meeting with agricultural and employee representatives in April 2003, a task team was established to investigate the concerns raised. A report on the outcome of these deliberations was then submitted to the ECC a year later, but no major changes to the law were made as a result of this submission.¹

Minimum wages for farm workers were initially set at 650 Rands pm (per month) for workers in areas loosely classified as “rural” and at 800 Rands pm in areas classified as “urban,” with plans to adjust the minimum

upwards each year.² When the minimum wage was introduced in 2003, over 80% of farm workers were earning less than the urban minimum, and over 60% were earning less than the rural minimum. To support implementation of the new legislation, labor inspectors employed by the Inspection and Enforcement Services (IES) were tasked with inspection and enforcement activities across all sectors. Generally, labor inspections in South Africa take the form of visiting workplaces, reviewing information on worker contracts, hours of work, salaries, and overtime pay, as well as interviewing a sample of workers. Enforcement in the agricultural sector does not differ from other sectors, except for the fact that in many cases the remote location of farms can prevent regular inspections, as opposed to employers and firms in urban sectors that are more easily visited. This is one of several factors contributing to the low levels of compliance in the agricultural sector.

There are a number of mechanisms through which the agricultural minimum wage, set above existing wage levels, could impact farm worker livelihoods. Firstly, average wages for farm workers are expected to rise given that the majority of workers earned below the new minima in the pre-law period, although this effect would depend on the degree of compliance with the law. Secondly, both employment levels and average hours of work could shift up, down, or remain unchanged, although in most cases employment is expected to either decrease or remain unchanged. Thirdly, employers may offset higher wages against other non-monetary benefits such as food, housing, and transport, thus limiting the gains of workers—although in this case payment in kind was legally limited to 10% of a worker’s wage. Fourth, the total payments to labor are likely to increase, but this would depend on the elasticity of wages with respect to hours. Finally, the law could have an impact on poverty levels within farming communities, depending on how close households are to the poverty line, and considering the above-mentioned effects. It is therefore unclear a priori how a minimum-wage law would affect farm workers’ livelihoods. The question is an empirical one and the aim of this paper is to

¹ Department of Labor (2006).

² The U.S. dollar value at the time was approximately U.S. \$78 and U.S. \$96.

answer it by analyzing wages, employment, hours worked, and the provision of written contracts for workers. Neumark and Wascher (2007), who offer a comprehensive review of empirical research into minimum wages internationally, note that “studies [which] focus on the least-skilled groups provide relatively overwhelming evidence of stronger disemployment effects for these groups.” This reinforces the importance of this study on the South African agricultural sector.

Reliable economic research on the effects of minimum wages in South Africa is limited, and published work that compares it with the international literature is even more so.³ The most comprehensive research available has focused on the effects of introducing the minimum wage on household domestic workers. Papers by Hertz (2005) and Dinkelman and Ranchhod (2012) examine the impact of the sectoral determination for domestic workers by focusing on a number of observables, including wages, employment, contract coverage, and hours worked. These authors use contrasting methodologies and reach mixed conclusions.⁴ In both studies, immediate and significant increases in earnings are reported after the law’s introduction. The requirement for employers to establish a written contract with employees formed part of the new legislation, and again both Hertz (2005) and Dinkelman and Ranchhod (2012) found that the number of domestic workers with such contracts increased significantly in the post-law period. Regarding employment, Dinkelman and Ranchhod (2012) present a model showing that the probability of employment for a typical domestic worker remained unchanged after the law, while Hertz (2005) does find negative employment effects, though these are small. Together the results suggest that employment was not significantly reduced (if at all) after the law, even though wages rose. The two papers also disagree about the effect of the legislation on hours worked: Dinkelman and Ranchhod (2012) find no negative effect on hours worked, while Hertz (2005) finds

hours worked to have fallen. In this paper we employ methods of testing that incorporate the approaches used in both papers to examine the case of agricultural workers.

Two previous studies have tried to analyze the impact of minimum wages on particular sub-sectors of the South African agricultural industry. Conradie (2004) uses data from a survey of 190 grape farmers in the Western Cape to examine how labor practices have changed in response to increases in the minimum wage, in both the table grape and wine grape industry. The paper shows that on average, a wage increase of 10% is likely to decrease employment by between 3% and 6%, depending on the industry, but that farmers generally offset wage increases against non-wage benefits such as housing, electricity, clothing, transport, and food. Employment levels also appear to depend not only on the wage but also on the size of a farm’s output, the price of inputs such as fuel, as well as the extent to which mechanization can replace labor. Another study, by Murray and Van Walbeek (2007), tries to determine the effect of the Sectoral Determination among sugarcane farmers on South Africa’s Kwazulu-Natal coast. The authors use data gathered from interviews with 103 farmers. Typically farmers did not report mass retrenchments as a result of the minimum wage, and many claimed not to be able to distinguish the impact of the minimum wage on their labor force from the impact of other labor laws. However, the authors note that job-shedding was disguised by the fact that farmers chose not to replace workers who left their jobs, particularly those who were unskilled were not replaced. In addition, some farmers reduced working hours in order to lower their total wage bill and approximately 40% of growers had decreased in-kind benefits for their workers. Although the sugarcane industry remains relatively labor intensive, farmers increasingly opted for labor-reducing practices where possible, such as chemical weed-killing over manual weeding practices.

Both Hertz (2005) and Dinkelman and Ranchhod (2012) offer valuable insights on the agricultural sector, but neither attempts to provide an empirical estimate of minimum wage impacts at the national level. While significant sectoral differences within agriculture should not be ignored, an aggregate assessment based on data from workers, and not employers, remains important.

³ One reason for this may be the complex minimum wage schedule in South Africa, which makes econometric analysis using the available household survey data very difficult.

⁴ The most important methodological contrasts between the two papers are that Hertz (2005) employs a difference-in-differences approach similar to Card and Krueger (1994) and uses Magisterial Districts as the unit of analysis, while Dinkelman and Ranchhod (2012) use a difference-in-differences approach found in Lee (1999) with the province being the unit of analysis.

We contribute to this literature by using a national dataset to analyze an application of the minimum wage promulgation in agriculture, within the emerging market context of South Africa. The paper attempts to estimate the impact of the minimum wage on employment and wages within the agriculture sector. We then assess whether employers responded at the intensive margin by reducing hours of work after the new law. The law also required non-wage benefits to be introduced, and we track the response here in the form of one such provision, namely that of a written employment contract.

Methodological Approach and Data

The primary data for this study are drawn from 15 waves of the South African Labor Force Survey (LFS) conducted between September 2000 and September 2007. These were bi-annual, rotating panel surveys conducted in February/March and September each year. The chosen sample includes six waves prior to the legislation's effective date (March 2003) and nine afterwards. All 15 waves are pooled and treated as repeated cross sections over time.⁵ The LFS covers approximately 30,000 households in each wave and this includes between 2,000 and 3,300 farm workers per wave over the period.

The minimum wage law was promulgated in December 2002 and came into effect on the 1st of March 2003.⁶ September 2003 is treated as the first wave where the direct impacts of the law should become evident.⁷ Two separate wage levels were prescribed for full-time farm workers, according to geographic location: a higher minimum wage (R800) for those working within urbanized municipal areas classified as Area A, and a lower wage (R650) for predominantly rural areas classified as Area B.⁸ To evaluate which minimum wage applied to each individual it

was necessary to assign individuals to geographic areas.⁹ This was done by matching geographic information available in the LFS to areas A and B listed in the sectoral minimum wage schedules. The sample includes both rural and urban workers, and includes full-time and part-time workers—defined as individuals working at least 27 hours per week, or less than 27 hours a week, respectively.

Monthly wages reported in brackets in the LFS are transformed into point estimates by random allocation to a uniform distribution within the bracket to maintain variation.¹⁰ This accounts for between 5% and 10% of the sample in each wave, on average. All monthly wages are then combined and converted into hourly wages, and wages are deflated by the annual Consumer Price Index (CPIX). Individuals reporting zero or missing wages are excluded.

In an attempt to provide a counterfactual for what would have happened to farm worker wages, employment, hours, and contract coverage in the absence of the minimum wage law, we identify a control group that has similar characteristics to farm workers. This is part of our difference-in-differences identification strategy, which compares changes in farm worker outcomes to equivalent outcomes in the control group. The control group is made up of employees in unskilled or “elementary” occupations, based on the 4-digit South African Standard Classification of Occupations (SASCO) occupation codes and the International Standard Industrial Classification (ISIC) industry codes (both available in the LFS). The employees earn

⁵ B. Average income was between Rands 12,000 and Rands 24,000 per annum.

Areas with average income below R12,000 are included in Area B. Since 2009 the demarcation between Area A and Area B was removed, and Area A schedules now apply nationally. We use geographical information on Magisterial Districts and District Councils in the LFS to demarcate areas A and B.

⁹ We are, however, unable to differentiate between place of residence and place of work for individuals, though we would argue that this is not as problematic for the agricultural sector as it might be for some other sectors. Although there are no reliable national figures, we assume that the majority of full-time farm workers still live on the farm, and there is some evidence to suggest this is so: During the South African Human Rights Commission's 2007 hearings on farm workers and farm dwellers, Agriculture South Africa stated that, in addition to workers, approximately 4 million people lived on farms but were not employed there. This suggests that the number of farm workers living on farms is still significant if we assume the average household size for South Africa applies to these households. Moreover, the Department of Land Affairs held that the majority of full-time farm workers still live on farms (Human Rights Watch 2011).

¹⁰ A new seed is set in STATA for each bracket calculation.

⁵ We do not use the standard LFS individual-level weights, but rather those provided by Branson (2009). We continue to use the post-stratification unit (PSU) and district-level weights from the LFS, which adjust for the survey design.

⁶ The initial legislation for the farming sector was outlined in Sectoral Determination 8 and then later updated by Sectoral Determination 13 (Department of Labor 2002, 2006).

⁷ We do, however, expect to see some lagged effects in agriculture given the nature of the industry.

⁸ This demarcation was based on the average household income recorded for the municipal area concerned in the 1996 census, where:

A. Average income was greater than Rands 24,000 per annum.

less than 10,000 Rand per month, are aged between 15–65, and have completed no more than 12 years of schooling. In addition, union members are excluded, as are those in sectors affected by another minimum wage. For clarity, the excluded group is made up of occupations such as street vendors, packers, construction workers, manufacturing and transport laborers, and elementary machine operators, as the agricultural minimum wage law does not apply to them. Changes in the control group's wages, employment, contract coverage, and hours worked indicate movements in the economy that coincided with the period when the agricultural minimum wage was introduced, but were not the result of that policy change.

We also model the probability of being employed as a farm worker, and whether this has changed as a result of the law. For this we construct a separate control group of individuals who are most likely to transition both into and out of farm employment. This group is comprised of employed and unemployed people with similar age, race, earnings, and education profiles to farm workers.¹¹ This is a group of approximately 5–6 million individuals in each wave, which includes farm workers. Cross-sectional variation at the district council level is used in combination with the time-series variation in the pooled LFS to identify the effects of the law on employment probability. We also test the results for sensitivity by using different control groups such as selecting only employed workers, only those in elementary occupations, as well as using the control group specified in the previous paragraph together with our sample of farm workers. The results are robust to these changes in the sample, but we believe our sample to be the most realistic group that would transition in and out of farm labor.¹²

The most important data limitation in this study is that it is impossible to capture any non-monetary income received by farm workers such as housing, food, transport, utilities, or any other in-kind transfers from employers. Importantly, the legislation does

restrict such non-monetary payments to 10% of a worker's salary in the case of agriculture. Nevertheless, it is possible that increases in wages after the introduction of the law may have resulted in a reallocation of non-pecuniary benefits offered in the pre-law period. This is the biggest challenge for analyzing wage gains in the sector. A second concern is that a common employer response to the law may have been to convert permanent employees into contract or seasonal laborers. Anecdotal evidence, together with the work of Conradie (2004) and Murray and van Walbeek (2007), suggests that this has taken place in agriculture (Conradie, 2006). There may be a correlation in South Africa between stricter wage legislation (higher minimum wages, restrictions on dismissal and tenure, etc.) and increased casualization. However, the LFS data on non-permanent employment arrangements for farm workers (i.e., temporary, seasonal, or contract work) fluctuates considerably over time in a manner that suggests poor reporting and data collection. This may be particularly problematic in cases where agricultural employment is a secondary occupation. We include workers who are not permanent in our sample but do not make analytical use of the distinction between permanent and non-permanent work. We instead rely on the full-time versus part-time distinction, based on hours worked per week. Thirdly, no reliable data on temporary employment services in agriculture are available in the LFS. Finally, we are unable to measure exactly how new restrictions on employee dismissals or legislation that relates to living rights on farms such as the ESTA have influenced employment practices, although these may have encouraged job-shedding and casualization.

Approach and Method

To analyze the effects of the law, two specifications are used. We first employ a standard difference-in-differences model analogous to Card and Krueger (1994):

$$(1) \quad Y_{ikt} = \beta_0 + \beta_1 POST_t + \beta_2 Farmworker_k + \beta_3 POST_t * Farmworker_k + X_{ijt} + \epsilon_{ikt}$$

where, Y_{ikt} is the outcome of interest (wages, contracts, hours worked) for individual i , in group k , in period t , and $POST_t$ is the time

¹¹ This includes individuals of working age (15–65) with less than 12 years of education, who are not white, are not union members, earn less than Rands 10,000 pm, and are involved in elementary occupations (if they are employed) based on the ISIC 2-digit codes.

¹² Disemployment effects are more muted when using a group of all employed individuals, and are more pronounced when using a smaller sub-sample such as only those employed in elementary occupations.

dummy that captures “before-and-after” effects. Further, $Farmworker_k$ is the dummy for whether an individual is in the treatment or control group ($k=1, 2$), which equals 1 if the individual is a farmworker, and 0 if they are in the control group.¹³ The term $POST_t * Farmworker_k$ is the difference-in-differences term that measures the difference between the outcomes of the treatment group versus those of the control group. This tests whether the observed changes in wages, contracts, and work hours were shared by similar workers to whom the law did not apply. Specifically, the difference-in-differences coefficient measures the difference between what happened to farm workers in the post-law period versus what happened to the control group. This will correctly identify the effects of the minimum wage if there were no idiosyncratic shocks in addition to the law that only affected farm workers in the post period.¹⁴ Lastly, X_{ijt} controls for various worker characteristics such as age, education, and race, and we run the regression with and without controls.

Secondly, we specify a difference-in-differences model which tests to see whether wages increased more in areas where farmworker wages were lower in the pre-law period.¹⁵

$$(2) \quad Y_{ijt} = \alpha_0 + \alpha_1 POST_t + \alpha_2 WG_j + \alpha_3 POST_t * WG_j + X_{ijt} + v_{ijt}$$

where Y_{ijt} is the outcome of interest (employment, wages, contracts, hours worked) for individual i , living in district j , in period t . Further, $POST_t$ is the time dummy X_{ijt} and controls for various worker characteristics such as age, education, and race, as well as dummy variables for seasonality

and district-level variation. The wage gap (WG_j) is a constructed variable that identifies cross-sectional variation between district councils in the pre-law period. The wage gap is represented by:

$$(3) \quad WG_j = \log[\text{minimum}(W_j^*)] - \log[\text{median}(W_j')]$$

where w_j^* is the initial minimum wage in district j and w_j' is the median agricultural worker wage in district j , in the year before the law was introduced. Further, w_j' is calculated using real wages in 2002. Areas with a larger gap in the pre-law period would be expected to experience greater increases in wages in the post-law period if the law was binding.¹⁶

In equation (1), β_1 indicates the changes in the post-law period for both groups, β_2 gives the average difference between farm workers and the control group over the full period, and β_3 shows the change for farm workers in the post-law period relative to the control group. In equation (2), the parameter α_2 represents the average difference in outcomes for workers in low wage gap versus high wage gap areas across the entire period, α_3 is the difference-in-differences parameter and tells us how much more outcomes changed in the post-law period, in areas where the wage gap was largest. Lastly, α_1 is also of interest, as it tells us how the variable of interest changed, on average, after the law for a particular district, conditional on the wage gap being zero in that district. As in all such natural experiments, we must assume that in the absence of the law, agricultural wages would be on the same general trend across districts, as well as for both groups of workers.

Descriptive Statistics

Despite contributing less than 3% to Gross Domestic Product (GDP) between 2000 and 2007, agriculture remains a real economic anchor for the South African economy

¹³ Recall that the control is made up of demographically similar workers not covered by the minimum wage law. Characteristics of the control group are presented in the following section and shown in table 2.

¹⁴ To control for changes specific to the agricultural sector that may bias our results, we tested using agricultural GDP as well as Net Agricultural Income as independent variables in our regression. Neither variable had any significant impact on our results. We also confirmed through comprehensive reviews of agricultural sector performance that no large and sustained idiosyncratic shocks occurred, which explain the observed impact on employment in the post-law period (NAMC 2003–200829; BFAP 2012; DoL 2006, 2013).

¹⁵ This approach follows Lee (1999) and Dinkelman and Ranchhod (2012). Equation 1 cannot be used to test for employment changes, since the dependent variable would be whether an individual was a farm worker (1) or not (0), and farmworker=1 would exactly predict the outcome.

¹⁶ To identify the effect of the minimum wage law we must assume that in the absence of the law change, low wage-gap districts would be on the same trend in outcomes as high wage gap districts (as in Dinkelman & Ranchhod 2012). We must also assume that changes in labor demand were uniform. A review of the recent agricultural economics literature for South Africa provides no reason to believe that there were price or non-price changes that may have caused labor demand to differ by geography in the post-law period.

Table 1. Average Characteristics of Farm workers (2000–2007)

	2000	2001	2002	2003	2004	2005	2006	2007
N	3,363	3,021	3,084	2,047	2,498	2,490	2,484	2,361
Weighted	1,100,382	1,055,849	1,009,162	787,079	670,908	555,514	576,319	555,549
Area A	0.20	0.24	0.24	0.33	0.31	0.27	0.30	0.32
Age	35	36	36	36	36	36	35	36
Education	5.45	5.35	5.38	5.40	5.34	5.78	6.05	6.21
Male	0.57	0.66	0.63	0.72	0.70	0.71	0.69	0.69
African	0.79	0.75	0.78	0.69	0.73	0.75	0.74	0.75
Full-Time	0.69	0.75	0.77	0.94	0.93	0.90	0.87	0.91
Hours per Week	39	43	42	49	49	48	46	47
Full-time equivalent hours	1,194,774	1,101,992	1,134,201	744,331	742,379	615,397	619,609	598,223
Nominal Monthly Wage	498	586	513	738	770	917	1,068	1,221
Nominal Hourly Wage	4.03	4.52	4.65	5.14	5.23	5.69	6.16	6.27
Fraction < Min. (Area B)	0.80	0.76	0.75	0.58	0.61	0.58	0.61	0.60
Written Contract	0.31	0.29	0.30	0.47	0.51	0.49	0.49	0.52

Note: Figures are calculated from the South African Labor Force Surveys (LFS) for September 2000–September 2007. All statistics are weighted. Full-time workers are those working more than 27 hours per week. The dashed black line indicates the timing of the law (March 2003). Noncompliance before 2003 is based on the initial minima adjusted backwards using the formula contained in the Agricultural Sectoral Determination.

in many respects. For example, the sector accounts for almost 10% of formal employment (StatsSA 2008). A major purpose of the agricultural minimum wage law was to provide protection for workers in a sector that is poorly unionized and reports the lowest average wages in the country. In addition to setting a legal wage floor, the new law also outlined terms and conditions of employment for the farming sector that included maximum working hours and the establishment of a written employment contract for employees.

The introduction of minimum wages appears to have had some immediate and substantial effects for the farm workers covered by the law. Table 1 provides an overview of workers in the agricultural sector by presenting key features of the sample over time. The typical demographic of a farm worker in South Africa is clear. Most individuals in the sample are African, male, have few years of education (less than six), and are engaged in full-time employment. Table 2 provides an equivalent set of data for the chosen control group. The similarities of this group are evident. These workers are also typically African, male, have between seven and eight years of education, and work full-time.

In the first row of table 1 we identify the number of farm workers sampled in each wave, which remains relatively stable over the period. This is reassuring and should increase the reliability of the weighted estimates. Changes in employment are the first subject of interest. The figures in table 1 show that the weighted number of farm workers

falls by over 200,000 between the September 2002 and September 2003 survey waves, which is a decrease of over 20%.¹⁷ Table 2 provides comparable data on the change in the number of workers in the control group, where a gradual increase in employment can be observed. This sudden drop in agricultural employment after 2002 gives an initial indication that job losses may have been a result of the law. To explore the possibility that this decrease may have been driven by economic conditions in the agricultural sector, table 3 details average growth levels over the period. The growth in agricultural GDP was approximately 1% and thus while employment losses may have come from increased capitalization of farming activities, it seems implausible that the sector was forced to shed jobs due to contracting output. We also control for agricultural labor demand in our regression estimates and find no significant effects on the results.¹⁸

Figures 1 and 2 contain kernel density plots of hourly wages for September 2001–September 2007.¹⁹ Each line is a smoothed

¹⁷ We identify farm workers in each wave of the LFS using the SASCO occupation codes, as well as the three-digit ISIC industry codes. We also apply income restrictions that are detailed in the Sectoral Determination, and exclude workers earning above a specific threshold in a given year. It should also be noted that despite possible variation in methods of identifying farm workers in the LFS, a similarly sharp employment decrease is documented in Liebenberg (2012).

¹⁸ In our regression analysis we use agricultural GDP at the provincial level for each year.

¹⁹ For purposes of visual clarity, we only report years 2001, 2002, 2003, 2004, and 2007. All other years are available from the authors.

Table 2. Average Characteristics of the Control Group (2000–2007)

	2000	2001	2002	2003	2004	2005	2006	2007
N	4,121	3,773	3,603	3,379	3,781	4,455	4,456	4,228
Weighted	1,785,730	1,600,441	1,636,771	1,682,776	1,796,746	2,162,153	2,128,327	2,038,391
Urban	0.57	0.56	0.58	0.55	0.44	0.41	0.42	0.41
Age	38	41	40	40	38	44	46	41
Education	7.65	7.72	7.88	8.05	8.25	8.27	8.37	8.25
Male	0.62	0.59	0.62	0.56	0.62	0.58	0.58	0.61
African	0.83	0.85	0.84	0.85	0.84	0.86	0.85	0.86
Full-Time	0.87	0.88	0.90	0.89	0.90	0.89	0.90	0.89
Hours per Week	45	43	45	46	46	46	45	45
Nominal Monthly Wage	1,321	1,210	1,307	1,367	1,441	1,492	1,736	1,961
Nominal Hourly Wage	6.24	5.84	6.16	6.83	7.17	7.01	8.58	9.91
Fraction \geq Farm Min.*	0.34	0.37	0.33	0.30	0.33	0.36	0.32	0.28
Written Contract	0.46	0.44	0.55	0.60	0.63	0.57	0.60	0.64

Note: Figures are calculated from the South African Labor Force Surveys (LFS) for September 2000–September 2007. All statistics are weighted. Full-time workers are those working more than 27 hours per week. The dashed black line indicates the timing of the law (March 2003). Asterisk * denotes the minimum used is for farm workers in Area B.

Table 3. Gross Domestic Product and Value added by Industry (Constant 2005 Prices)

	2000		2007		2000–2007
	R Million	Share	R Million	Share	Growth Rate
Primary Sectors					
Agriculture, forestry, and fishing	34,787	3.0%	36,301	2.3%	1.2%
Mining and quarrying	99,069	8.6%	105,336	6.7%	0.6%
Secondary Sectors					
Manufacturing	222,579	19.2%	290,246	18.6%	4.4%
Electricity, gas, and water	28,597	2.5%	35,294	2.3%	3.1%
Construction	26,410	2.3%	48,971	3.1%	8.8%
Tertiary Sectors					
Wholesale, retail, motor trade, and accommodation	161,503	14.0%	217,607	13.9%	4.8%
Transport, storage, and communication	102,874	8.9%	156,289	10.0%	6.4%
Finance, real estate, and business services	216,747	18.7%	349,501	22.4%	6.6%
General government services	191,340	16.5%	223,618	14.3%	1.9%
Personal services	75,735	6.5%	98,247	6.3%	3.9%
Aggregate GDP	1,157,441		1,561,410		4.4%

Source: Own calculations (StatsSA 2011).

plot of the log of real wages. The figures use data from the September waves of the LFS and therefore include two waves before the law's introduction and five after. The vertical line represents the full-time minimum wage for area B when it was introduced in 2003. Figure 1 shows that in the pre-law period (2001 and 2002) there is no evidence that earnings are shifting in real terms; in fact, the 2001 distribution is slightly to the right of the distribution in 2002, suggesting a slight decline in real earnings. However, the distribution shifts noticeably to the right in September 2003, ten months after the law was announced. The distribution then gradually moves to the right for all of the post-law years, with the final wave being

most pronounced. Testing for distributional differences using the Kolmogorov-Smirnov test shows that each of the post-law distributions is significantly different at the 5% level from those before the law was introduced.

Figure 2 then plots the distribution of real hourly wages for the control group. The kernel density plots reveal that no significant changes in wages have occurred for the control group over the examined period. The Kolmogorov-Smirnov test confirms that none of the post-law distributions are significantly different from the distributions in the period prior to the law's introduction. As a descriptive comparison with the wage increases experienced by farm workers over

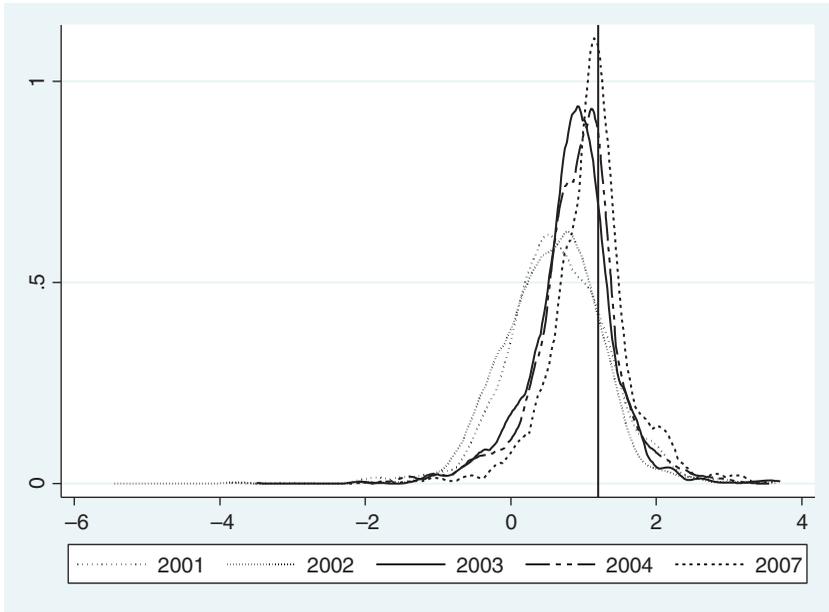


Figure 1. Distribution of farm worker log real hourly wages (2001–2007)

Note: Data are from the September Waves of the LFS 2001–2007. The vertical line is the level of the full-time (Area B) minimum wage in 2003. Each wave of data contains between 2,000 and 3,300 observations. Kolmogorov-Smirnov tests for equality of distributions are rejected at the 5% level for each pairwise comparison of waves in the before and after periods. Years 2005 and 2006 have been removed to de-clutter the graph; the full graph is available from the authors.

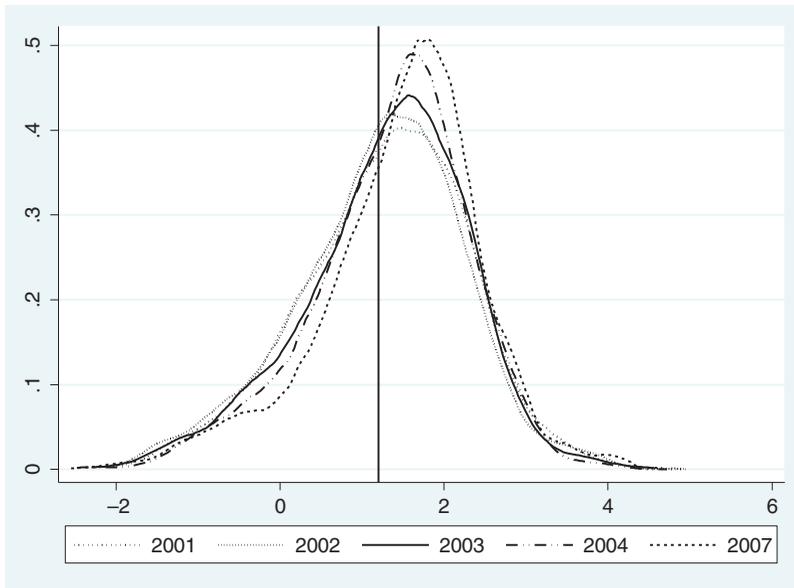


Figure 2. Distribution of control group log real hourly earnings (2001–2007)

Note: Data are from the September Waves of the LFS 2001–2007. The vertical line is the level of the full-time (Area A) minimum wage in 2003. Each wave of data contains between 3,801 and 4,507 observations. Kolmogorov-Smirnov tests for equality of distributions are not rejected at the 5% level for each pairwise comparison of waves in the before and after periods. Years 2005 and 2006 have been removed to de-clutter the graph; the full graph is available from the authors.

the period, these figures suggest that the law had an observable and substantial impact in the agricultural sector after its introduction.

The third variable of interest in this study is the existence of a formal employment contract for farm workers. Establishing such a contract was mandated by the new law and the effect of this change can be observed in the data. The final row of table 1 provides information on the percentage of workers in the sector who hold a written contract. It is evident that this proportion rises considerably after September 2002, with coverage increasing by 16% in the first 12-month period. Contract coverage then increases marginally to 56% by September 2007. A significant portion of this increase appears to be a result of the legislation when the control group is used as a comparison. Although it is unclear exactly how regulations govern the establishment of contracts for workers in the control group, the timing of the increase in table 1 is informative when compared with the gradual changes observable in table 2. The largest increase over a 12-month period in the control group is 6%.

The final variable of interest is the number of hours worked, which could be expected to change as a result of the law. In theory, employers may reduce demand at the intensive margin to comply with the 45 hours per week maximum set out in the minimum wage schedule, or simply to afford the higher wage. Hamermesh (1993) has argued that “employers are quicker to alter hours in response to shocks than they are to change levels of employment.” Further, if employers have to increase wages as a result of the law, they might require more productivity per hour from each worker and thus be able to reduce demand at the intensive margin. Alternatively, it is a common stylized fact that full-time workers earn more than similar part-time workers. This suggests that full-time workers produce more per hour. If this is true, firms may actually lengthen work weeks rather than reduce them in response to a minimum wage increase, as argued by Brown (1999). Furthermore, we may find that employers restructure the full-time versus part-time arrangement of their workforce. Theoretically then, the effect of a minimum wage law on hours worked is somewhat ambiguous. In South Africa, Hertz (2005) finds that the minimum wage reduced hours of work for domestic workers, while Dinkelman and Ranchhod (2012) find

no evidence that employers adjusted at the intensive margin after the minimum wage law was implemented.

Table 1 suggests that average hours of work in the agricultural sector may have been significantly influenced as a response to the law. The data reveal an increase in average hours worked after the law (from 42 to 49 hours), as well as a significant rise in the number of workers who are employed full-time. In trying to account for the possible distinction between full-time and part-time categories of work, we estimate the change over time in full-time equivalent (FTE) units of labor.²⁰ There is a sharp and significant reduction in the FTE hours of 34% between 2002 and 2003. For the control group, average hours worked and the percentage of full-time workers remains relatively stable across the period. To examine the changes in hours worked more critically, figure 3 plots a kernel density function of the average hours worked per week for farm workers. The vertical line is placed at 45 hours per week. The density plot confirms that a statistically significant increase in hours worked occurred in the post-law period, most plausibly as a result of the changing makeup of the agricultural workforce, where the percentage of full-time workers increases from 77% in 2002 to 94% in 2003. The observed employment changes suggest that employers adjusted at the extensive margin to afford the larger wage bill, with many part-time workers losing their jobs, thus pushing average hours of work upwards. In the post-law period, hours of work decrease slightly over time, but the regression results are able to examine the marginal effects of the law on hours worked in more detail.

Econometric Results

Table 4 presents the difference-in-differences results for the probability of being employed as a farm worker after introducing the minimum wage law, using equation (2). The binary dependent variable is whether an individual works as a farm worker (one) or not (zero). The second column includes

²⁰ The full-time equivalent is the sum of total hours worked for each individual divided by the maximum number of compensable hours in a full-time schedule as defined by law (45 hours).

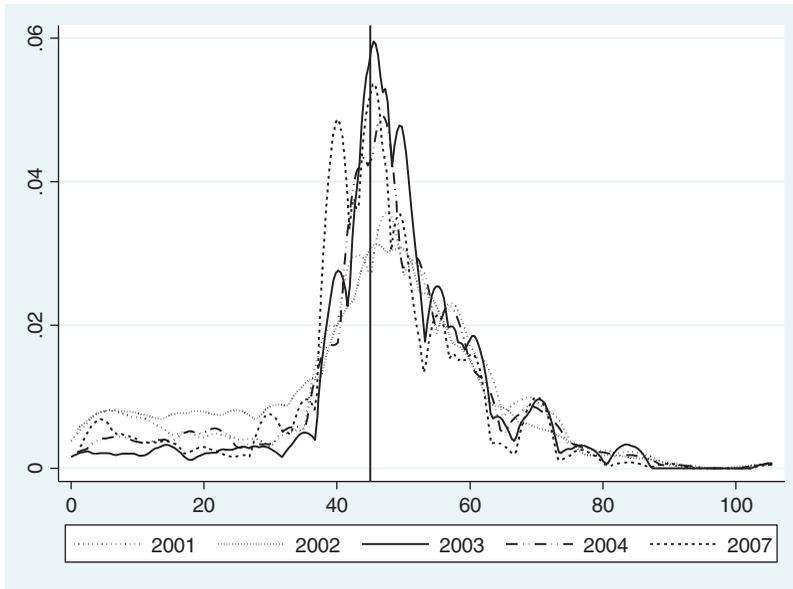


Figure 3. Usual number of hours worked per week

Note: Data are from the September Waves of the LFS 2001–2007. The vertical line is set at 45. Each wave of data contains between 2,000 and 3,300 observations. Kolmogorov-Smirnov tests for equality of distributions are rejected at the 5% level for each pairwise comparison of waves in the before and after periods. Years 2005 and 2006 have been removed to de-clutter the graph; the full graph is available from the authors.

Table 4. Probability of being a Farm Worker

VARIABLES	(1)	(2)
POST	−0.1204*** (0.0265)	−0.0877*** (0.0228)
Wage Gap	0.1013*** (0.0194)	0.1523*** (0.0107)
Wage Gap*POST	−0.0353 (0.0261)	−0.0563*** (0.0128)
Controls	NO	YES
Constant	0.4011*** (0.0221)	0.9606*** (0.0272)
Observations	160 817	160 817
R-Squared	0.049	0.126

Note: Robust standard error appear in parentheses. Asterisks denote *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. All regressions are weighted. The dependent variable is whether the individual is employed as a farm worker (1) or not (0). POST = 1 after March 2003 and 0 otherwise. The Wage Gap is the district-level difference between the log of the minimum wage upon introduction and the log of median farm worker wages in 2002. Controls are included for age, race, education, and provincial agricultural GDP. Dummy variables are included for seasonality and district-level variation. A linear probability model was used; logit and probit estimations report similar results.

controls for individual worker characteristics, as well as controls for seasonality and agricultural GDP.²¹ The sample in this case includes farm workers and a broader group

of demographically similar individuals who are either employed or looking for work, as noted previously.²² Using this sample allows for farm workers to lose or switch jobs in the post-law period. If employment has in fact fallen for farm workers due to the law, as the descriptive data indicates, then one should see a decrease in the probability of being employed as a farm worker in the post-law period. This probability is measured by the POST coefficient, which should be interpreted in conjunction with the interaction term WAGEGAP*POST, where the wage gap is constructed as per equation (3). The mean of the wage gap across districts is 0.78, while the standard deviation is 0.44, which illustrates how large a 1-unit change in the wage gap is—that is, more than two standard deviations. Hence, the POST coefficient in column 2 is −8.7%, suggesting that conditional on the wage gap being zero, and the interaction term thus having no effect, the probability of employment was estimated to have fallen by approximately 9%. The

²¹ A linear probability model was used to estimate the results, however, logit and probit specifications report similar results.

²² To reiterate, the sample includes individuals of working age (15–65) with less than 12 years of education, who are non-white, not union members, earn less than Rands 10,000 pm, and are involved in elementary occupations (if they are employed) based on the ISIC 2-digit codes.

coefficient on the difference-in-differences estimator is -5% , which suggests that the probability of farm employment after the law was lower in areas where the wage gap was larger. Put differently, a 1-unit increase in the wage gap is associated with a 5% decrease in the probability of employment as a farm worker, suggesting that districts with a bigger pre-law wage gap experienced larger decreases in employment probabilities. This result on the POST coefficient, together with the descriptive data that illustrates the trends in the number of farm workers over time, provides evidence of falling employment, and suggests that minimum wage has had observable disemployment effects in the agricultural sector overall. The positive coefficient on the wage gap variable indicates that the probability of agricultural employment is higher in areas where the wage gap was bigger. This is most likely picking up districts with more farm workers and therefore lower wages.

Regarding earnings, we consider the descriptive data to be compelling evidence of a large shift in wages due to the introduction of the new law; the density plots in particular make this clear. In an attempt to isolate the effect of the law, the difference-in-differences approach tests whether farm workers experienced significant changes in wages in the post-law period when compared to a similar group of workers not covered by the law. The results from table 5 suggest that this does appear to be the case. It is also shown that districts with a higher wage gap experienced greater wage increases after the law.

Specifically then, column 1 of table 5 compares the wage outcomes of farm workers against wages of the control group, using equation (1). Results show that real wages in the post-law period have risen by approximately 7% for all workers in the sample. The farm worker dummy variable indicates that, when compared to individuals in the control group, farm workers earn significantly lower wages. On average, farm worker wages are over 70% lower than the wages earned by similar workers in other occupations for the entire sample period. Of principal interest is the difference-in-differences estimator, which reveals how much wages have risen for farm workers in the post-law period relative to those in the control group. The output shows that the estimated effect of the law on farm worker wages was an increase of 22% relative to the control group. This outcome controls for the difference between the two

Table 5. Log Hourly Wages, Difference-in-differences

VARIABLES	(1)	(2)	(3)
POST	0.072*** (0.0162)	0.1229*** (0.0434)	0.153*** (0.0325)
Farmworker	-0.867*** (0.0193)		
Farmworker* POST	0.224*** (0.0228)		
Wage Gap		-0.471*** (0.0434)	-0.328*** (0.0395)
Wage Gap* POST		0.179*** (0.0596)	0.121*** (0.0443)
Controls	YES	NO	YES
Constant	0.9111*** (0.0323)	1.155*** (0.0292)	0.434*** (0.0410)
Observations	75,466	38,436	38,116
R-Squared	0.323	0.102	0.263

Note: Robust standard errors appear in parentheses. Asterisks denote *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. All regressions are weighted. Regression 1 is run on the sample of farm workers and a control group of similar workers. Regressions 2 and 3 include only farm workers. Regressions have the "Log of Real Hourly Wages" as dependent variables. POST = 1 after March 2003, and 0 otherwise. The Wage Gap is the district-level difference between the log of the minimum wage upon introduction and the log of median farmworker wages in 2002. Controls are included for age, race, and education. Dummy variables are included for seasonality and district-level variation.

groups, as well as possible biases emanating from trends over time.

The output in columns two and three of table 5 use the approach outlined in equation (2) to assess whether the wage increases for farm workers were larger in districts where the wage gap was greater. Column 3 includes controls for education, age, and race, as well as dummy variables for seasonality and agricultural GDP. The pre-law wage gap is defined so that districts with lower farm worker wages (relative to the minimum wage) result in a larger wage gap. When examining the output, one can see that, in districts with a zero wage gap, an increase in wages of between 12–15% is evident in the post-law period. Inspecting the wage gap coefficients shows that farm worker wages are lower in districts where the gap is larger, which is intuitive. The coefficient $POST_i * WG_j$ is large, significant, and positive in both specifications. This suggests that areas with a greater wage gap in the pre-law period saw greater increases in earnings after the law was introduced. Overall, these are interesting findings: not only have farm worker wages risen in the post-law period relative to counterparts in other occupations, they have risen significantly more in district councils

Table 6. Contract Coverage, Difference-in-differences

VARIABLES	(1)	(2)	(3)
POST	0.0895*** (0.00958)	0.108*** (0.0329)	0.134*** (0.0302)
Farmworker	-0.192*** (0.0128)		
Farmworker* POST	0.0755*** (0.0173)		
Wage Gap		-0.226*** (0.0270)	-0.140*** (0.0250)
Wage Gap* POST		0.129*** (0.0378)	0.0876** (0.0353)
Controls	YES	NO	YES
Constant	0.543*** (0.00721)	0.475*** (0.0252)	0.338*** (0.0301)
Observations	75,549	29,826	29,635
R-Squared	0.040	0.051	0.071

Note: Robust standard errors appear in parentheses. Asterisks denote *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. All regressions are weighted. Regression 1 is run on the sample of farm workers and a control group of similar workers. Regressions 2 and 3 include only farm workers. The dependent variable is whether the individual has a written employment contract (1) or not (0). POST=1 after March 2003 and 0 otherwise. The Wage Gap is the district-level difference between the log of the minimum wage upon introduction and the log of median farm worker wages in 2002. Controls are included for age, race, and education. Dummy variables are included for seasonality and district-level variation. A linear probability model was used; logit and probit estimations report similar results.

where the gap between the actual wage and the legislated wage was larger.

Regarding contract coverage, the difference-in-differences output clearly confirms the pattern observed in the descriptive statistics. Table 6 presents the same set of regressions as for wages, where column 1 is based on equation (1) and columns 2 and 3 are estimates of equation (2). The dependent variable is whether an individual has a written employment contract or not. Column 1 shows a 9% percentage point increase in the fraction of farm workers and control group workers who hold a written contract after the law, so contract coverage appears to have increased for both groups. It is also clear from the results that fewer farm workers have written contracts than their counterparts in the control group (around 19% less). The interaction term is of primary interest and indicates that employment contracts increased by 7.5% for farm workers in the post-law period. Columns 2 and 3, which focus exclusively on the sample of farm workers, also indicate relatively large and significant growth in contract coverage after the law. Additionally, these regressions show that districts with a larger wage gap in the pre-law

Table 7. Usual Hours of Work, Difference-in-differences

VARIABLES	(1)	(2)	(3)
POST	-0.350 (0.241)	-3.557*** (1.063)	-3.508*** (1.107)
Farmworker	-5.747*** (0.496)		
Farmworker* POST	5.549*** (0.355)		
Wage Gap		-12.36*** (0.5679)	-14.213*** (0.626)
Wage Gap* POST		7.225*** (1.424)	9.058*** (1.504)
Controls	YES	NO	YES
Constant	52.415*** (0.618)	54.26*** (0.564)	59.26*** (0.826)
Observations	78,451	39,126	38,803
R-Squared	0.024	0.126	0.150

Note: Robust standard errors appear in parentheses. Asterisks denote *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. All regressions are weighted. Regression 1 is run on the sample of farm workers and a control group of similar workers. Regressions 2 and 3 include only farm workers. The dependent variable is the number of hours worked per week. POST = 1 after March 2003 and 0 otherwise. The Wage Gap is the district-level difference between the log of the minimum wage upon introduction and the log of median farm worker wages in 2002. Controls are included for age, race, and education. Dummy variables are included for seasonality and district-level variation.

period have fewer individuals with contracts, but that coverage increased by more in these areas after the law. These econometric results demonstrate that formalizing employment for farm workers, from the contract coverage perspective, has been positively affected by the legislation.

Lastly, table 7 presents results from the regression analysis on changes in hours worked from 2000–2007. The same set of three regressions is run as above. The POST variable in column 1 shows that hours worked have fallen for all workers, while the Farmworker dummy estimates that on average across all years, farm workers work an average of 5 hours less per week than their control group counterparts. The interaction term suggests that hours worked for farm workers have increased, relative to the control group, by approximately 5 hours per week. Columns 2 and 3 report more clearly on the marginal effects on hours worked for farm workers. The results on the POST variable suggest that hours worked have fallen in the post-law period in districts where the wage gap is zero, but the interaction terms show that hours worked have risen considerably for districts with larger wage gaps in the pre-law period. Larger wage gaps are most likely associated with greater proportions of

part-time workers before 2003, which would explain why such a large increase in hours worked is evident. Overall the output from table 7 indicates that average hours of work have adjusted in two ways: firstly, the overall average of hours worked has fallen in the post-law period, suggesting that employers have adjusted marginally on the intensive margin, and secondly, it appears that hours of work have increased by more in areas associated with greater wage gaps, driven by the fall in part-time employment.

Assessing Employment Losses in the Agricultural Sector

Despite the results on employment presented above, it is possible that factors specific to agriculture in South Africa, but unrelated to the promulgation of the minimum wage, may have instead driven the statistical fact of a large employment loss in the post-law period. We thus present a consideration of these factors below, whilst also comparing the findings with those in the domestic workers' sector where employment losses were negligible.

To account for potential idiosyncratic shocks to the agricultural sector, we tested for the impact of both agricultural GDP by province and Net Farm Income as controls in our regressions to pick up sector-specific effects.²³ This, however, had no significant impact on our results. Table 3 provides a broad overview of agricultural sector GDP and value added relative to other industries in South Africa. In addition, extensive reviews of the South African agricultural economy for the period 2001–2007, including detailed submissions to the ECC that provide information on agricultural labor in specific sub-sectors over the period, yield no evidence of specific shocks that seem likely to have caused the observed drop in agricultural employment in the years after 2003 (Vink 2003; Sparrow et al. 2008; Tregurtha et al. 2009; NAMC 2003–2008; Department of Labor 2006 and 2013; BFAP 2012; DAFF 2010; Liebenberg and Pardey 2010; Liebenberg 2012). The only factor that appears noteworthy is the decline in net farm income after 2002/03. However, testing for this did not have any impact in our

²³ While agricultural GDP increased slightly, net farming income peaked in 2002/03, largely as a result of good export revenues from a weak Rand.

employment regressions.²⁴ We also examine trends for agricultural exports from 2001–2007. In particular, we focus on the sector's 3 largest employers (citrus, maize, and grapes), but again the results do not suggest any large and sustained shocks in exports or output from 2002–2003. Agricultural exports and the price of exports increased steadily over the period, whilst the price of agricultural inputs rose sharply in 2007, largely as a result of increases in the price of fuel and fertilizers. Food inflation as measured by the food Consumer Price Index (CPI) rose abruptly at the beginning of 2002 (spiking at the start of 2003 due to rising grain prices) and decreased to pre-2002 levels by the end of 2003, only to start rising again at the end of 2004 (NAMC 2007).²⁵ However, this does not provide a potential reason for a large decrease in farm employment, and the fluctuations in consumer prices do not always offer an accurate picture of prices at the farm gate, which in turn reflect more muted fluctuations. Furthermore, investigation into the promulgation of the minimum wage for farm workers preceded the onset of the temporary rise in food prices. The argument is reinforced by evidence indicating similar price movements in the past with no large changes in farm employment. We also find no evidence of a substantial decrease in the costs of labor-saving technology, which may have driven down employment after 2003.

Concerning the apparent employment losses in the face of relatively stable output, we suggest four main reasons for this outcome. Firstly, there is some evidence suggesting that the agricultural sector was employing excess labor in the pre-law period and thus the higher wage appears to have encouraged farmers to shed excess unskilled labor and replace them with fewer, more skilled workers.²⁶ Ewert and Hamman (1999) also argue that “over employment” was linked to a spirit of paternalism among white farmers toward black workers. This over employment is then coupled with the existence of a largely

²⁴ Moreover, similar peaks and troughs in net income during the 1990s have no observable impact on employment, which remained relatively stable until 2003 (BFAP 2012).

²⁵ The food-CPI rose from just over 5% in January 2001 to nearly 20% in July 2003, falling back to around 2% in July 2005 (NAMC 2007). An index of producer prices (where 2005=100) reveals an increase from 84 in 2001 to 115 in 2003, and then a decline to reach 100 in 2005 (DAFF 2010).

²⁶ Department of Labor (2001), Vink (2003). Skill may not necessarily correlated with years of education, although this does increase marginally for farm workers after 2003.

unskilled and low-productivity workforce in an industry where labor costs make up a relatively large proportion of input costs.²⁷ Secondly, while the Sectoral Determination was officially announced in December 2002 and implemented in March 2003, it is likely that many farmers were aware of and anticipated the new legislation, although not the level at which the wage would be set.²⁸ According to the national agricultural statistics, in 2002 gross capital formation in agriculture (specifically investment in “Tractors, machinery, and implements”) was 4,226 Rm. This was up from 2,306 Rm in 2001 and 2,010 Rm in 2000, an annual increase for the 2002–2003 period of 83%, and investment remained high in 2004 and 2005 (DAFF 2010). Greater investment in capital is complementary evidence of the employment losses after 2003. Thirdly, the introduction of the minimum wage came after the ESTA (1997) had increased workers’ tenure rights (leading to increased evictions from farms), and came amidst fears of land redistribution in South Africa (with fast-track reforms in Zimbabwe being in full swing). The ESTA, coupled with the minimum wage promulgation, may have thus underpinned strong political economic views amongst white farm-owners about possible increased state intervention in the agricultural industry. Thus job shedding arguably served as a defensive response to these two pieces of state legislation. Finally, the results also suggest that workforce consolidation took place, with the proportion of part-time farm workers falling significantly after the law’s introduction. This may have allowed farm production to become more efficient through the increased use of more skilled, permanent workers.

When comparing the results in this paper to work by Hertz (2005) and Dinkelman and Ranchhod (2012), we believe there are four main reasons why similar employment declines were not found for domestic workers. The first is to do with relative labor costs in each industry. A simple calculation reveals that the wage bill as a percentage of total income for the average farmer in 2003 was

over 40%.²⁹ However, in the case of domestic workers this percentage is much lower. Employers are predominantly relatively wealthy, private households, and a calculation based on average household income for households above the 60th percentile, as well as the salary of a domestic worker at the minimum wage, reveals that the wage bill as a percentage of employer household income in 2003 was less than 10% (approximately 6.5%).³⁰ This suggests that an increase in farm worker wages would have a much greater impact on farmers than it would on employers of domestic workers. Secondly, as argued above, there is evidence to suggest that farmers in the pre-law period may have been overemploying unproductive labor, and the law pressed them to employ fewer but more-skilled workers. This was not the case in the domestic worker sector. Thirdly, as argued above, political economy fears among many white farmers may have encouraged a move away from employing large amounts of black labor, where possible. Again, similar dynamics are not present in the domestic worker sector, where a far less politically charged labor relations environment has existed since 1994.³¹ Fourthly, we suggest that there is evidence of greater investment in labor-saving equipment in the agricultural sector. In the domestic worker sector, however, far less scope exists to replace labor with capital, and thus many employers of domestic workers appear to have simply absorbed the wage increase. It must also be emphasized that due to the specific characteristics of the South African agricultural sector, the results found here may not apply to other sectors, time periods, or countries. This caveat is bolstered by recent work examining the impact of minimum wage laws in other sectors in South Africa, where no dis-employment effects were apparent (Bhorat, Kanbur, and Mayet 2013).

Conclusion

Our results suggest that the sectoral minimum wage law in South African agriculture

²⁷ A recent investigation estimates that the share of labor remuneration in agricultural value added is approximately one-third (BFAP 2012). Calculations based on the agricultural statistics available in DAFF (2010) puts the share of labor remuneration in total agricultural revenue at over 40% in 2003, if it is assumed that all workers are paid the minimum wage.

²⁸ Investigations into the agricultural minimum wage were conducted by the ECC in the years leading up to 2002.

²⁹ This was calculated by taking the average labor cost per farm, at the minimum wage, and dividing by total remuneration per farm (DAFF 2010).

³⁰ For households above the 70th percentile, the figure falls to nearly 5% (LFS 2003).

³¹ King (2007).

has had significant effects, as farm worker wages rose by approximately 30% as a result of the law when compared with a control group of similar workers. Examining the difference-in-difference results, it was also clear that wages rose by more in districts where the wage gap was higher. In other words, districts where farm worker wages in 2002 were far below the new minimum wage experienced greater wage increases. This was evident despite the fact that over 50% of farm workers still received sub-minimum wages in 2007. Regarding non-pecuniary benefits, the law also substantially increased contract coverage for farm workers in South Africa. The number of workers with a written employment contract increased to reach 52% in 2007.

Examining the effect that the minimum wage had on employment, this paper shows that employment fell significantly in response to the law. This was evident in the descriptive statistics, particularly when employment changes are compared to those experienced by the control group. Additionally, the probability of employment as a farm worker was shown to have fallen by approximately 9% in the post-law period and greater disemployment effects were experienced in districts that had a larger wage gap. Such effects are largely supported by the new minimum wage literature, where, for example, Neumark and Wascher (2007) emphasize that disemployment effects are more likely when aggregate data is analyzed, and particularly so for unskilled workers. Notably, employment losses appear to have been concentrated among part-time workers, who comprised approximately 23% of the sample in 2002, but only 6% in 2003. Finally, regression results show that the marginal effect of the law on hours worked was to decrease average hours of work in the post-law period, while the interaction term reveals that districts with a higher wage gap experienced an increase in hours worked on average due to a reduced number of workers being employed on a part-time basis.

The paper also attempted to provide evidence on those factors that may have potentially impacted employment losses in the sector. We find no strong evidence to suggest that other economic drivers explain the sharp loss in agricultural employment in the period between 2002 and 2003. Furthermore, it is crucial to note that direct comparisons in the case of domestic workers, for various

reasons, are not valid. It may, however, be important for future work to assess how in the long run employers respond, both at the extensive and intensive margin, to this legislation and to more recent minimum wage increases. Finally, given the characteristics of the agricultural sector described above, the results presented here may not apply to other sectors or time periods in South Africa, or to other countries.

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