

The Gender Gap in Reservation Wages in South Africa

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Abstract:

The gender wage gap is well documented internationally (Blau, 2012) and in South Africa (Casale and Posel, 2011). Various explanations have been proffered: ranging from gender discrimination, to lower returns to observable and/or unobservable characteristics, to women sorting into occupations with lower wages than men. Another possible reason why women's wages are less than men's is that women may have lower reservation wages than men: women may choose (relatively) low reservation wages because they anticipate discrimination and/or have different tastes or preferences than men (Caliendo et al. 2017). In this paper, we ask if the mean reservation wages of South African women and men differ, and then decompose differences in stated reservation wages.

We explore the gender gap in reservation wages in South Africa using data from the fourth wave (conducted in 2014/5) of the National Income Dynamics Study (NIDS). Preliminary descriptive analyses reveal that South African women have significantly lower mean reservation wages than South African men, which holds even after controlling (separately) for duration of unemployment, level of education, place of residence and race. Next, following Natrass and Walker (2005) we estimate wage regressions for employed South Africans, and conduct out-of-sample forecasting to obtain predicted wages for unemployed South Africans, using characteristics that are observed for the employed and unemployed. Our preliminary descriptive analyses of the ratio of reservation wages to predicted wages reveal that the mean value of this ratio tends to be higher for South African women than men (also after – separately – controlling for duration of unemployment, level of education, place of residence and race). Finally, we will use Oaxaca-Blinder decompositions to ascribe gender differences in reservation wages to observed and unobserved characteristics of South African men and women.

JEL codes: J16, J31, J64.

Introduction

One of the best-documented facts in labour economics is that men earn more than women. Chauvin and Ash (1994), Babcock et al. (2003), Weichselbaumer and Winter-Ebmer (2005), Ehrenberg and Smith (2009), and Jacobsen (2016) showed that there is a gender gap in real wages, where women tend to earn less than men on average. Some authors believe that one reason why women earn less than men is that they have lower reservation wages Brown, et al., (2011) and Caliendo, et al. (2017). Little is known about the gender gap in reservation wages in emerging countries, especially in Sub-Saharan Africa, and no South African study has investigated this gap, which this study will do.

Hall and Lieberman (2012) define the reservation wage as the lowest wage that an individual is willing to accept in order to exit unemployment. It does not necessarily mean that the reservation wage is the actual wage that the individual will accept, as the accepted wage could be higher than the reservation wage (which is then called the realised wage). A reservation wage for an individual is seldom constant and will change if the determinants of the reservation wage change (such as labour market expectations, unemployment benefits, occupation). Reservation wages are also occasionally not in line with the expected or predicted wage of individuals, which are the wages that they can expect to earn in the labour market, given their (observed) characteristics (such as education, experience, and labour market expectations based on gender, race, and age; Natrass & Walker, 2005).

Brown, et al. (2011) and Caliendo, et al. (2017) also believe that women have lower reservation wages because of their lower labour market expectations (in terms of having lower paying jobs, slower job progression than men, and outright discrimination). Another source of women having lower reservation wages than men is that women may perhaps be more risk-averse in bargaining (Meriküll & Motsmees, 2017). Observed differences act to condition women – they are resigned to the fact that they will receive lower wages or work in lower paying occupations, thereby leading them to accept job offers that men would reject. This implies that men will have higher reservation wages than women due to being more risk-tolerant in terms of negotiating and choosing a new reservation wage, which further shows the importance of the gender gap in reservation wages. Research into reservation wages is also important due to the possibility of unemployed individuals pricing themselves out of the labour market (Kingdon and Knight, 2004).

Blackaby, et al. (2007) further showed how reservation wages play a key role in job search theory and is affected by unemployment benefits and the arrival rate of job offers. Brown and Taylor (2011) used British panel data to show that an individual's reservation wage and its difference from their predicted wages are determinants of both future employment and future wages. Lancaster and Chesher (1983) were some of the first authors that showed that reservation wages have a key relationship with unemployment and the duration of unemployment. They also argued that an individual's reservation wage increases as their expected wages increase: Brown & Taylor (2013) showed this using British individual data after finding a positive relationship between reservation wages and expected wages.

The aim of this study is to determine which factors are related to the reservation wage gap between men and women, using cross-sectional South African household survey data. We first determine if a South African gender reservation wage gap exists. We will also obtain predicted wages for the unemployed (based on their observable characteristics), and then determine if

the ratio of reservation wages to predicted wages differs for men and women. Finally, we use the Oaxaca-Blinder decomposition to determine how much of the gender gap in reservation wages is explained by observed differences between men and women, and how much is explained by unobserved differences.

Literature Review

In this section, we survey the empirical literature about factors associated with reservation wages (found in international studies), (international) studies about the gender gap in reservation wages and studies about South African reservation wages.

Reservation wage determinants

Jones (1988, 1989), Christensen (2002), and Blackaby, et al. (2007) presented evidence that was in line with existing theory using their empirical findings, and the findings of Malk (2014), who assessed the possible determinants of the reservation wage, will be discussed later. The state that the labour market is in, the unemployed individual's effort in searching for a job, and their characteristics (i.e. gender, age, and skill) affect the probability of successfully receiving a job offer. This probability affects the duration of employment or the probability of entering/returning to employment in turn. However, the probability of the unemployed individual accepting the wage offer is dependent on their reservation wage, and (theoretically) an unemployed individual will only accept a job offer if the wage exceeds the individual's reservation wage (Malk, 2014).

The gender gap in reservation wages

Prasad (2003) used German microdata to show that while German men also have higher reservation wages than German women, the main drivers of this gap is the presence of children in the household (which increases the male's reservation wage), a determinant Brown, et al. (2011) also found to be significant, as well as the presence of other income-earning individuals in the household (which starkly decreases the male's reservation wage). Prasad also recognised that while male and female reservation wages are positively related to unemployment benefits, females' elasticity of reservation wages with respect to unemployment benefits are more than twice as large than that of males.

Brown, et al. (2011) used the Oaxaca-Blinder decomposition method to determine how much differences in the levels of various control variables affect the gender gap in reservation wages. The control variables included age, health, education, number of children, and number of employed individuals in the households, along with gender. They found that a gender gap in reservation wages exists in Britain, with the presence of (particularly pre-school aged) children having the biggest influence on this gap. When estimating for all individuals (with and without children), 22% of the gap is explained by observed factors, while estimating for individuals with and without children separately, 1% and 51% of the gap is explained by observed factors, respectively. Age is also a significant contributor to the gap: older women tend to have lower

reservation wages due to their previous experience of discrimination and lower observed wages, and it is also suggested that further "research exploring the labour market aspirations of women" is needed (Brown, et al., 2011: 90). This indicates that important personality traits may have to be included as possible determinants of reservations wages.

Caliendo et al. (2017) used the Oaxaca-Blinder method to decompose the gender gap in real wages in Germany. They noted that using a wage decomposition method and controlling for reservation wages, the gender gap in realised wages are small and insignificant in Germany. They also used different personality traits and participants' job search history in the decomposition of both real wages and reservation wages and suggested that these variables are contributors to the significant gender gap in reservation wages. The gap was as large as 12.5% when controlling for personality traits, education, labour market history, job search, and expectations. When also controlling for the wage that individuals had before entering unemployment, the gap is reduced to an amount that is still significant (5.2%). In their decomposition of reservation wages, they found that about 46% of the gender gap in reservation wages is explained by observed factors.

Malk (2014), using Estonian survey data, and ordinary least squares (OLS), as well as two-stage least squares (2SLS) estimators, also assessed what the determinants of the reservation wage are, and found that there is a clear gender gap in reservation wages. Men have higher realised (market) wages than women and have higher reservation wages than women. Other significant determinants that were also noted were age, the regional unemployment rate and duration of unemployment, all of which were found to have a negative relationship with reservation wages, while education, alternative household income (e.g. unemployment benefits), the probability of finding a job, the expected wage offer and voluntarily leaving previous jobs all have a positive relationship with reservation wages. Also, it was noted that the negative effect that duration of unemployment has on reservation wages were mainly driven by males.

To account for possible simultaneity between reservation wages and the duration of unemployment, Malk (2014) used three different instruments for the duration of unemployment. These instruments were: the number of different sources for subsistence, a dummy variable indicating receipt of unemployment benefits, and a dummy for financial support from other household members. These variables act as suitable instruments because of their indirect effect on reservation wages through the duration of unemployment. Individuals with various sources of alternative income will have lower job-search costs and are able to search for jobs for longer periods of time.

Meriküll and Motsmees (2017), who used data on unemployed workers in Estonia, showed that there is a significant difference between men and women in desired wages (which is the ideal wage that the individual would realistically accept to exit unemployment), realised wages, and reservation wages. While the gender gap in reservation wages was not significant for employed Estonian individuals, the gap for unemployed Estonian individuals was significant and was as large as 20%. They also suggested that because women have lower reservation wages, they are more risk averse, and gain more disutility from unemployment.

South African reservation wages

To our knowledge, little is known about the gender gap in reservation wages in South Africa. However, there are a number of South African studies that have considered if the unemployed are pricing themselves out of the labour market, by considering whether reservation wages are in line with the expected/predicted wages of the unemployed, based on observable characteristics.

Kingdon and Knight (2004) used out-of-sample predictions from estimated wage equations for employed workers to obtain predicted wages for unemployed South Africans (based on observed characteristics). They found that roughly half of the unemployed had reservation wages that exceeded their predicted wages, which may indicate that many unemployed South Africans are pricing themselves out of the labour market.

Nattrass & Walker (2005) studied reservation wages in the Khayelitsha/Mitchells Plain (KMP) Magisterial District in Cape Town. They used the Heckman selection (Maximum Likelihood) estimator, and found that the reservation wages of unemployed adults in the KMP area were in line with their expected wages, and therefore their unemployment could not be ascribed to their reservation wages being too high: most unemployed had reservation wages that did not exceed their predicted wages.

Levinsohn and Pugatch (2010), using a sample of young people from Cape Town, and Rankin and Roberts (2011), using a sample of young people from Limpopo and Gauteng, also find that that a large proportion of the unemployed have reservation wages that exceed their expected wages. This is especially the case if they are expected to start their careers in smaller firms, where observed wages are lower. Rankin and Roberts also added that other reasons for the high reservation wages of youths might be that they have imperfect information about the labour market before entering, their expectations are more in line with what they could earn in a larger firm, and the costs of accepting employment. Moreover, Rankin and Roberts also found that young men in Limpopo and Gauteng generally have higher reservation wages than young women in these two provinces.

Levinsohn and Pugatch (2010) emphasise the severity of unemployment among the youth (individuals aged 16 to 24). More than half of these individuals were unemployed in 2005, which was significantly higher than ten years earlier. Levinsohn and Pugatch (2010) found that the unemployed frequently received job offers. However, many of these offers were at wages that were lower than the reservation wages of those receiving these job offers. They also found evidence of duration dependence: as unemployment duration increases, the probability of receiving a job offer decreases, as employers expect that the skills of individuals will deteriorate/atrophy if they experience prolonged spells of unemployment. Longer periods of unemployment also have larger opportunity costs of not being employed, as unemployment benefits also decrease over time: as Unemployed Insurance Fund (UIF) payments run out, the search intensity of unemployed individuals increases. However, an increasing unemployment duration can also decrease the search intensity due to the (long-term) unemployed becoming more pessimistic about their job-finding prospects as unemployment duration gets more prolonged.

Data and method

In this section, we describe the data that we use in this study, as well as the methods that we use to determine if a gender gap in reservation wages exists in South Africa, and whether this gap can be ascribed to observed characteristics of the unemployed.

Data

This study uses data from the National Income Dynamic Study (NIDS). We specifically use data from the fourth wave of interviews, which were conducted from October 2014 to August 2015 in all nine provinces of South Africa: 37 396 individuals from more than 7 300 households were interviewed: 67.5% of which were members that participated in all of the three previous waves, and 71.7% of the individuals were adults. Data obtained from questions that ask information about an unemployed person's reservation wage, employment status, job characteristics (if employed), unemployment duration (if unemployed), and other determinants of wages and reservation wages will be used to analyse reservation wages in South Africa and to predict wages for the unemployed.

Method

The focus of this study is on the gender gap in the reservation wages of the unemployed. In NIDS (specifically, in the adult questionnaire), the unemployed were asked: "What is the absolute lowest take-home wage that you would accept for any permanent, full-time work (per month)?" The answer of unemployed people to this question will be taken to be their (stated) reservation wage.

However, Burger, et al. (2017) pointed out that asking survey participants outright what their reservation wage is can yield misleading results: some people may over-estimate their reservation wages, and studies that conclude that people are pricing themselves out of the market may be wrong.

The NIDS questionnaire does however follow this question up with the following question: "What do you think would be a fair take-home monthly wage for you, given your age, education, and skills?" While not necessarily addressing measurement issues in the reservation wage, this question may cause the unemployed to pause and reflect on the difference between what they consider to be a minimum acceptable wage offer, and what they consider to be a fair wage offer. Kingdon and Knight (2004) and Natrass and Walker (2005) expressed concerns that people may confuse minimum acceptable wage offers with fair wage offers if surveys only include one-shot reservation wage questions.

Descriptive statistics for the reservation wages, such as the mean, standard deviation, and quartiles will be estimated for the entire sample, as well as for males and females separately¹. To determine if a gender gap in reservation wages exists in South Africa, a two-sample t-test will be conducted, using the mean reservation wages of males and females. The same t-test will be performed on the ratio of the natural logarithm of individuals' reservation wages to the

¹ Additionally, differences in reservation wages over control variables will also be investigated, such as differences in reservation wages between genders by race, highest level of educational attainment, place of residence and duration of unemployment.

natural logarithm of their predicted wages² - henceforth ω - after also calculating summary statistics for ω for the whole sample, as well as for males and females separately. Before being able to calculate any descriptive statistics for ω , the predicted wage for unemployed individuals must be obtained.

Obtaining Predicted Wages.

A wage equation will be estimated using OLS. However, the OLS estimates for wages could suffer from incidental truncation, a form of sample selection bias where a portion of the sample's wage is unobservable. Wages for some individuals were not recorded due to them being unemployed, self-employed, or part of a family enterprise, and this incidental truncation could yield biased estimation results (i.e. sample selection bias). Heckman's two-step method is a popular method for correcting for incidental truncation. Brown and Taylor (2011) implemented this method in their study, but more importantly, Schultz and Mwabu (1998), Natrass and Walker (2005), and Burger (2008) used this approach to estimate wage equations for South Africa³.

Schultz and Mwabu's (1998) selection equation included explanatory variables that describe a household's assets and nonearned income. Natrass and Walker (2005) included a dummy variable for the individual living in a rural area and a dummy variable for that individual being the head of the household in their selection equation. Burger (2008) proposes to include the number of people in the household, the number of children in the household, and the number of employed individuals in the household into the selection equation. Finally, Brown and Taylor (2011) also included the number of children in the household, along with a dummy that indicates whether the individual's spouse is the primary caretaker of the children in the household.

Like Burger (2008), we considered using household variables (household size, the presence of other employed household members, and the household dependency ratio) as the excluded variables in the Heckman model's selection (employment) equation. Just like Burger, we find that all three of these excluded variables were individually statistically significant when added to the outcome (wage) equation. None of these variables therefore represent valid exclusion restrictions. Other authors have also noted the inappropriateness of the Heckman model due to the difficulty of obtaining valid exclusion restrictions in the South African context (Muller, 2009; Casale and Posel, 2010; Bhorat and Goga, 2013).

There, we used OLS to estimate the following wage equation to obtain the (out-of-sample) predicted wages of unemployed South Africans:

$$\log(w) = \beta_0 + \beta_1(\textit{female}) + \beta_2(\textit{education}) + \beta_3(\textit{rural}) + \beta_4(\textit{age}) + \beta_5(\textit{married}) \\ + \beta_6(\textit{depend}) + \beta_7(\textit{metro}) + \beta_{8j} \sum \textit{province}_j + \beta_{9k} \sum \textit{district}_k + \varepsilon$$

² This ratio was used by Natrass and Walker (2005) and Brown and Taylor (2011) in their respective studies.

² Schultz and Mwabu (1998), and Burger (2008) used a national representative sample, while Natrass and Walker (2005) used the Khayelitsha-Mitchells Plain (KMP) area in Cape Town as their sample.

³ Schultz and Mwabu (1998), and Burger (2008) used a national representative sample, while Natrass and Walker (2005) used the Khayelitsha-Mitchells Plain (KMP) area in Cape Town as their sample.

Where w is wages, $female = 1$ if the person is female, $education$ is the years of education received, $rural = 1$ if the person lives in a rural area, age is a person's age in years, $married = 1$ if the person is married or living with a partner, $depend$ is the household's dependency ratio (number of young children and elderly to household size), $metro = 1$ if the municipality in which the person resides is a metropolitan municipality, while $province$ and $district$ are controls for the province and district that an individual resides in.

The predicted wages that we obtained using out-of-sample forecasting were then used to construct ω .

Results

In this section, we first present kernel density estimates of the log of the reservation wage by gender. We also present Kernel density estimates of the log of the reservation wage by gender and duration of unemployment; by gender and race; by gender and place of residence; and by gender and level of education. Next, we present evidence of significant differences in mean reservation wages by gender, even after controlling for duration of unemployment, race, place of residence and level of education. Then we present our wage regression estimates and obtain the ratio of the reservation wage to predicted wage, which we then compare by gender, and by gender and duration of unemployment, gender and race, gender and place of residence, and gender and level of education.

Reservation wage differences

Figure 1 presents kernel densities of the log of the reservation wage for men and women.

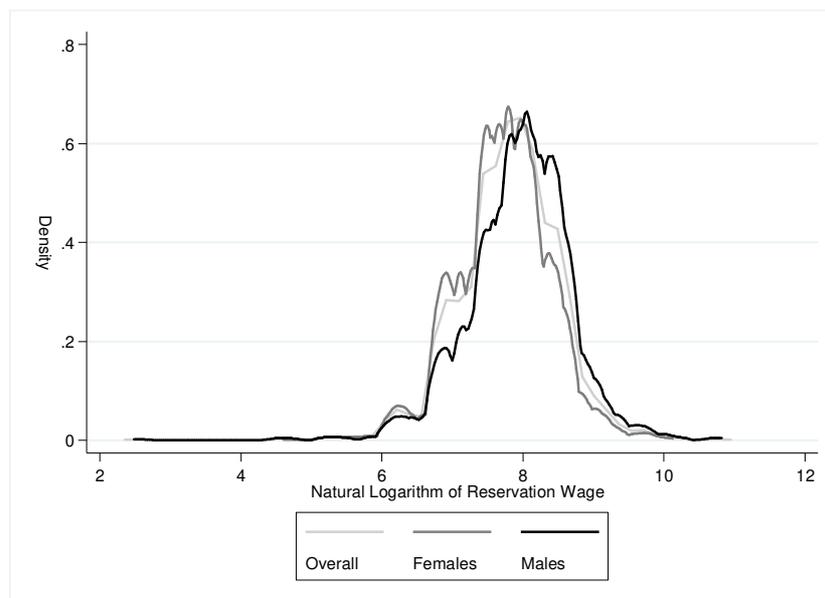


Figure 1: Kernel densities of log reservation wage by gender.

Figure 2 presents kernel densities of the log of the reservation wage by gender and unemployment duration.

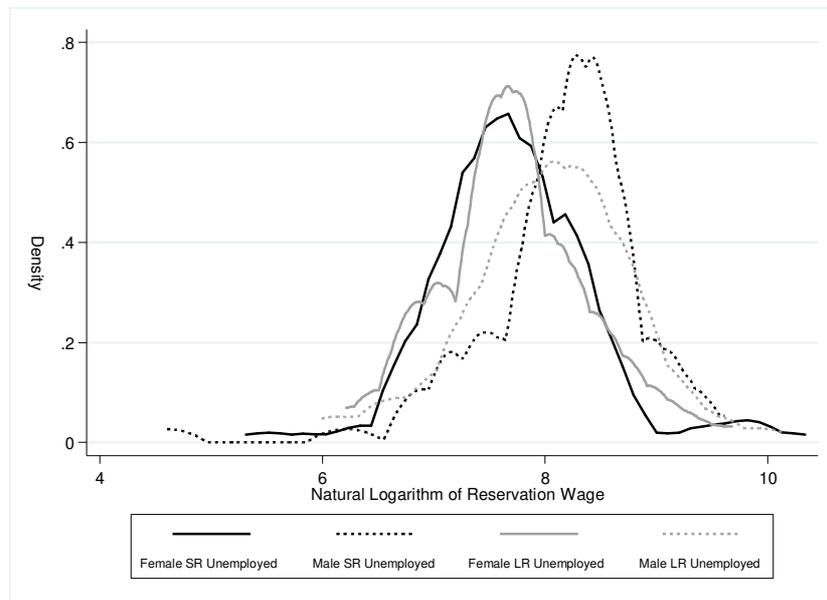


Figure 2: Kernel densities of log reservation wage by gender and unemployment duration

Figure 3 presents kernel densities of the log of the reservation wage by gender and race (for African and Coloured South Africans only, due to very small sample sizes for White and Indian/Asian South Africans).

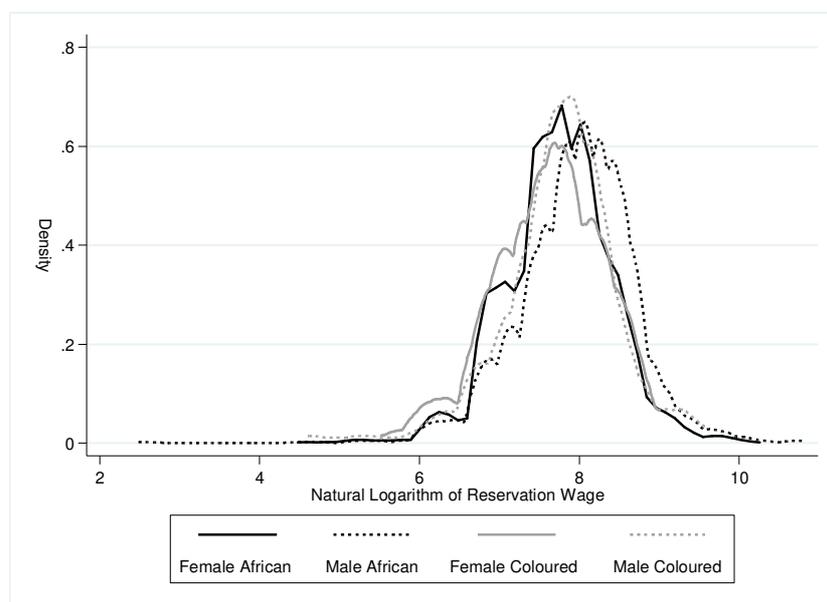


Figure 3: Kernel densities of log reservation wage by gender and race

Figure 4 presents kernel densities for the log of the reservation wage by gender and place of residence.

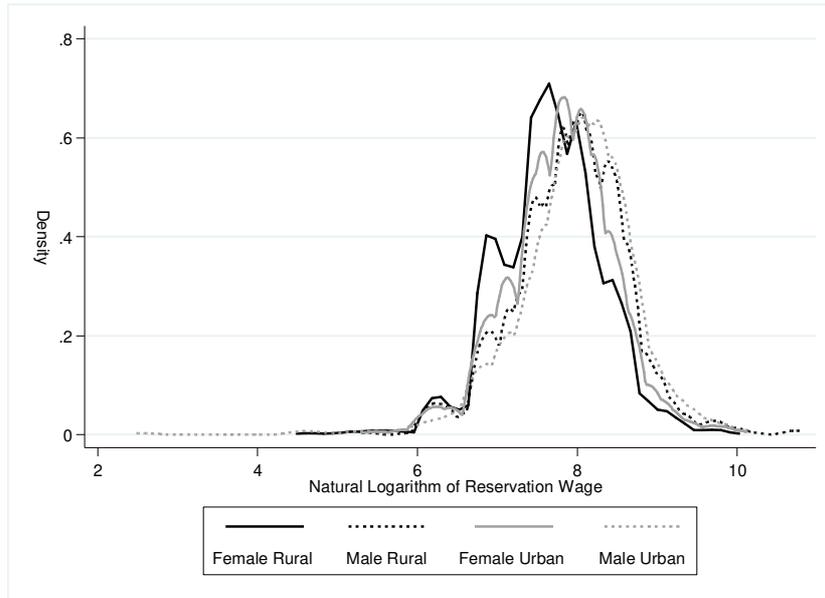


Figure 4: Kernel densities of log reservation wage by gender and place of residence

Figures 5 and 6 present kernel density estimates for the log reservation wages by level of education for females and males.

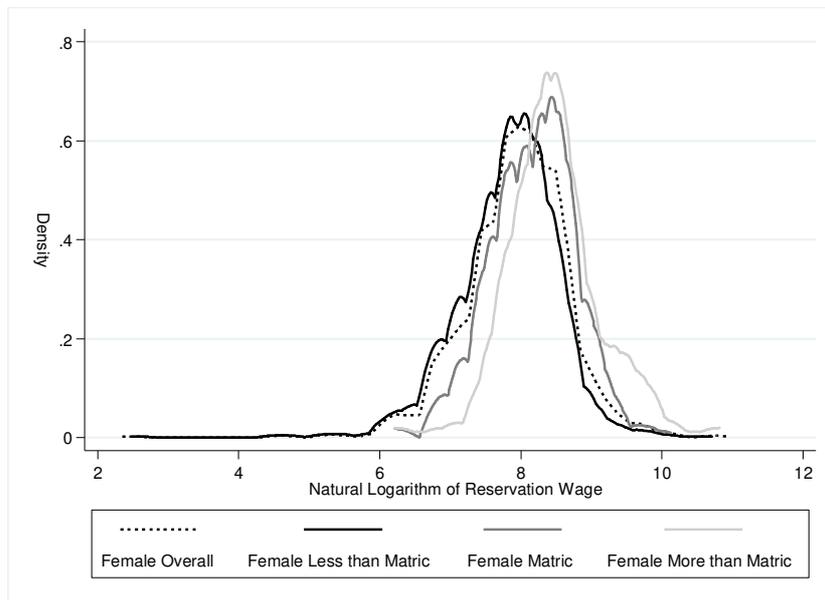


Figure 5: Kernel densities of log reservation wage by level of education: females

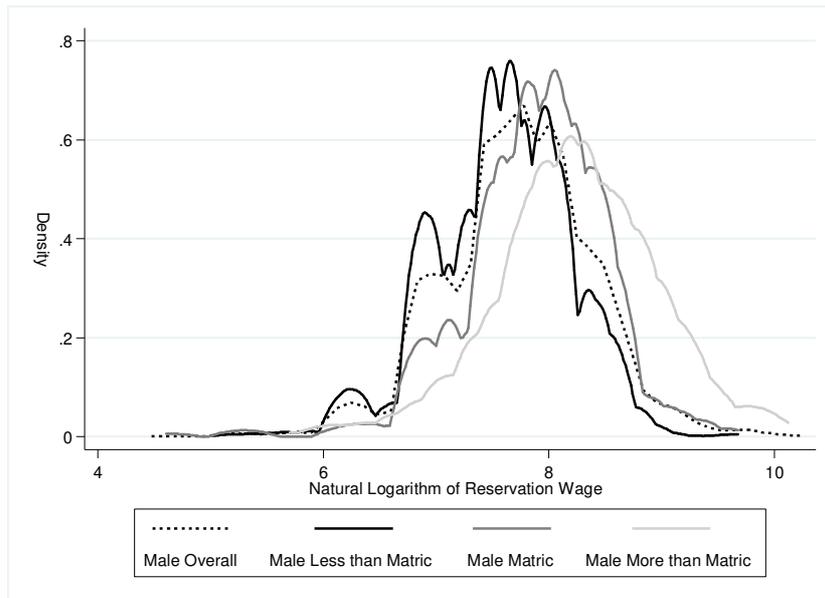


Figure 6: Kernel densities of log reservation wage by level of education: males.

Figures 7-9 present kernel density estimates of the log of the reservation wage by gender for those with less than matric, those with matric, and those with more than matric

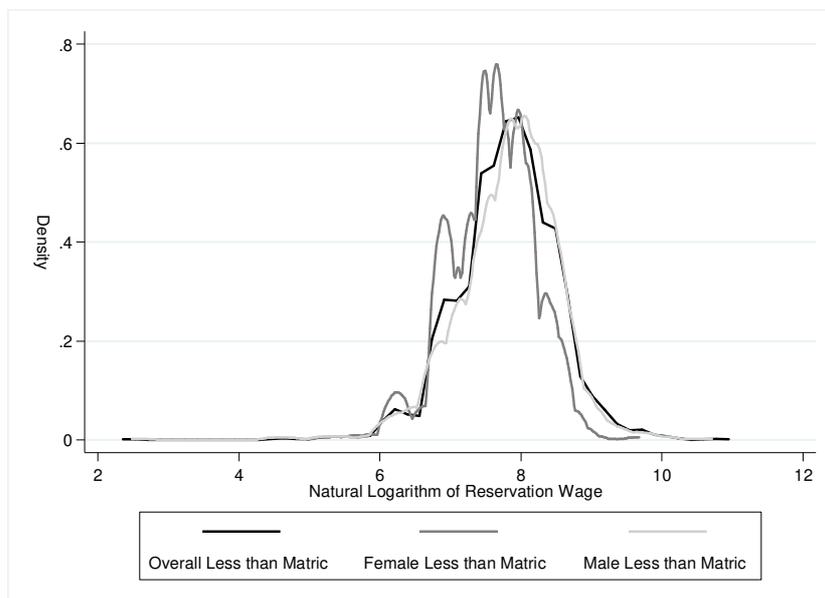


Figure 7: Kernel densities of log reservation wage by gender: less than matric

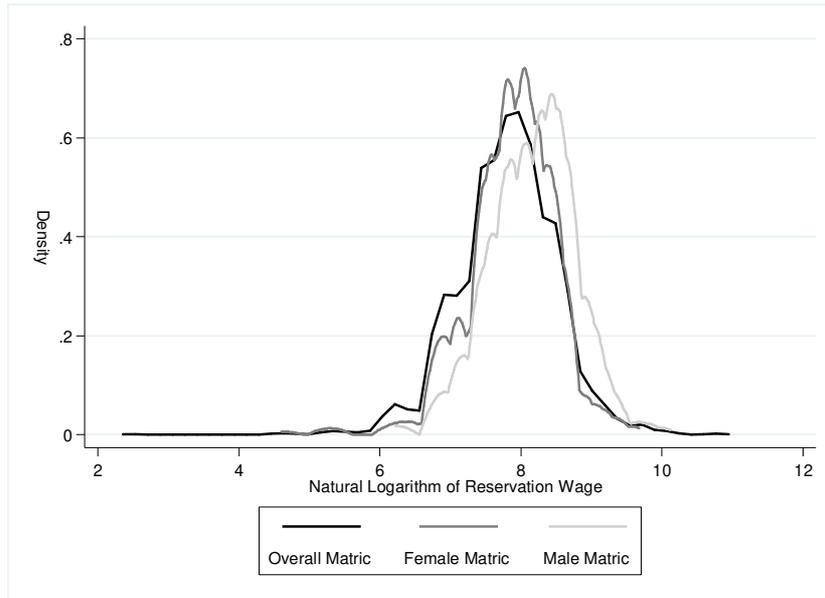


Figure 8: Kernel densities of log reservation wage by gender: matric

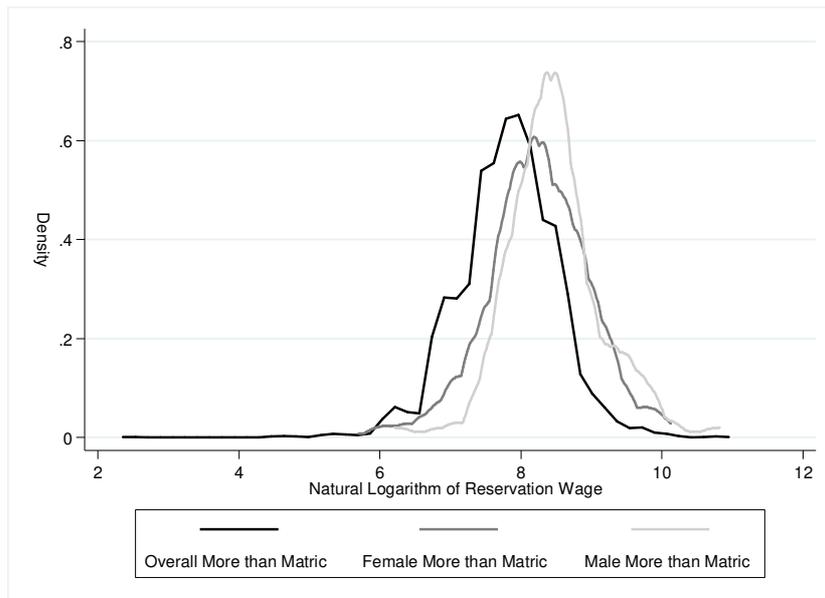


Figure 9: Kernel densities of log reservation wage by gender: more than matric

The mean reservation wage of unemployed SA women is R2808, which is 23% lower than the mean reservation wage of unemployed SA men. This difference is highly statistically significant.

Table 1 shows that unemployed South African women have significantly lower mean reservation wages than unemployed South African men, irrespective of duration of unemployment, race, place of residence and level of education.

Table 1: Mean reservation wages by gender and unemployment duration; gender and race; gender and place of residence; gender and level of education

	Mean (n)	Absolute value of difference (standard error)	t-statistic	p-value
Short-run Unemployed Males	4292.308 (78)	1290.522 (491.718)	2.625	0.010
Short-run Unemployed Females	3001.786 (84)			
Long-run Unemployed Males	4067.123 (73)	1181.653 (441.564)	2.676	0.008
Long-run Unemployed Females	2885.470 (117)			
African Males	3686.924 (1043)	851.865 (107.326)	7.937	0.000
African Females	2835.059 (1603)			
Coloured Males	2973.932 (117)	457.265 (221.543)	2.064	0.040
Coloured Females	2516.667 (210)			
Urban Males	3691.427 (576)	664.757 (135.311)	4.913	0.000
Urban Females	3026.670 (883)			
Rural Males	3563.065 (597)	960.053 (141.911)	6.765	0.000
Rural Females	2603.013 (946)			
Less than Matric Males	3160.254 (835)	820.691 (91.175)	9.001	0.000
Less than Matric Females	2339.563 (1236)			
Matric Males	4236.992 (246)	1087.126 (193.297)	5.624	0.000

Matric Females	3149.866 (373)			
More than Matric Males	6179.121 (91)	1322.757 (576.543)	2.294	0.022
More than Matric Females	4856.364 (220)			

Differences in the ratio of the reservation wage to the predicted wage

About 58% of the unemployed have reservation wages that exceed their predicted wages: 17% have reservation wages that are less than 3% greater than their predicted wages; 9% have reservation wages that are between 3% and 5% greater than their predicted wages; 18% have reservation wages that are between 5% and 10% greater than their predicted wages; and 13% have reservation wages that are more than 10% greater than their predicted wages.

The female wage penalty is so large in the wage regressions, that even though women have significantly lower mean reservation wages than men, they have higher mean ratios of their predicted wages to their reservation wages⁴.

Table 2 shows that the mean ratio of the reservation wage to the predicted wage (ω) is greater for unemployed South African women than for unemployed South African men, irrespective of duration of unemployment, race, place of residence, and level of education. But only four of these differences are statistically significant at the 5% level. These significant differences are those between African men and women, Coloured men and women, urban men and women, and men and women with less than matric.

Table 2: Mean ω by gender and unemployment duration; gender and race; gender and place of residence; gender and level of education

	Mean (n)	Absolute difference (standard error)	t-statistic	p-value
Short-run Unemployed Males	1.026 (78)	0.009 (0.015)	0.630	0.533
Short-run Unemployed Females	1.016 (84)			
Long-run Unemployed Males	1.006 (73)	0.004 (0.013)	0.277	0.782
Long-run Unemployed Females	1.002 (117)			

⁴ Male wages were found to more than 40% greater than female wages, on average, after controlling for other covariates.

African Males	1.011 (1043)	0.007 (0.004)	2.026	0.043
African Females	1.018 (1603)			
Coloured Males	0.976 (117)	0.030 (0.010)	3.005	0.003
Coloured Females	1.006 (210)			
Urban Males	0.993 (576)	0.018 (0.005)	3.817	0.000
Urban Females	1.010 (883)			
Rural Males	1.021 (597)	0.001 (0.005)	0.299	0.765
Rural Females	1.023 (946)			
Less than Matric Males	1.011 (835)	0.009 (0.004)	2.310	0.021
Less than Matric Females	1.020 (1236)			
Matric Males	1.000 (246)	0.007 (0.007)	1.087	0.277
Matric Females	1.007 (373)			
More than Matric Males	0.995 (91)	0.019 (0.011)	1.726	0.085
More than Matric Females	1.014 (220)			

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