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The impact of COVID-19 on the Gender Wage Gap in South Africa

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Abstract

The COVID-19 pandemic resulted in large distributional changes in the South African labour market. Prior to the pandemic, South African women were compensated less relative to South African men. This paper applies the Oaxaca-Blinder decomposition to investigate the impact of the COVID-19 pandemic on the gender wage gap between February 2020, April 2020, June 2020 and March 2021. Results indicate that the COVID-19 pandemic widened the existing monthly gender wage gap, while barely altering the hourly wage gap over the given period. The study finds that the main contributor to the gender wage gap is discrimination in the South African labour market. Key variables that contributed to the discrimination component across all periods are population group and having children aged below 7 years. Gender differences in the composition of the employment sector, having young children and hours of work also significantly contributed to the gender wage gap. These results suggest a need for gender-sensitive policies to improve the labour market position of disadvantaged individuals.

1. Introduction

The gender wage gap is a well-known phenomenon that affects many nations regardless of the level of development. Several studies indicate that women receive relatively lower labour market wages than men. These wage inequalities are negatively associated with socio-economic development (Nordman, Rakotomanana and Robilliard, 2010). Hence, distinguishing and addressing the root causes are crucial goals for modern societies, especially those that have low human and economic development. This is relevant for South Africa as the country's labour market is characterised by large gender inequalities which have been amplified by the COVID-19 global pandemic (Ntuli, 2007; Bhorat and Goga, 2013; Casale and Posel, 2011, 2020; Hill and Köhler, 2021).

In March 2020, a state of national disaster was declared in South Africa followed by a national lockdown in response to the COVID-19 pandemic. This led to social and economic consequences for all South Africans. In April 2020, South Africa entered the second month of stringent lockdown level 5, and within a year (March 2021) the country moved to the least stringent adjusted lockdown level 1. During lockdown level 5, economic activity was stopped in many sectors of the economy, barring those offering essential services (Rogan and Skinner, 2020). Studies on labour market effects of COVID-19 showed that women were unduly impacted as they experienced more job and income losses than men (Casale and Posel, 2020). With subsequent lockdown levels, additional sectors of the economy were permitted to operate (Rogan and Skinner, 2020). Hence, it is expected that labour market inequalities such as the gender wage gap (GWG hereafter) attenuated over time.

Some studies of the relative labour market position of South African women during COVID-19 have mainly been descriptive in nature. For instance, Casale and Shepherd (2021) carried out a descriptive analysis of job loss by gender. The findings showed higher job-loss among women than men across racial groups, this could have impacted the GWG through a worker selection effect. In another study, they used wave 1 – wave 5 of NIDS-CRAM to investigate changes in monthly earnings between February 2020 (pre-COVID) and March 2021 (during-COVID) by gender. Results showed that the GWG in March 2021 was analogous to the GWG prior to the pandemic. Although informative, the study does not proceed to a decomposition analysis of the GWG to show factors underpinning the recovery.

Hill and Köhler (2021) analysed changes in the raw GWG across percentiles of the wage distribution. The analysis focused on February 2020 (pre-COVID), April 2020 (lockdown level 5) and June 2020 (level 3). Results showed existence of the GWG across the entire distribution. The GWG widened substantially below the middle of the wage distribution during these early periods of the pandemic. Hill and Köhler (2021) also argued that the pandemic did not result in a wider hourly GWG, but the monthly GWG was significantly impacted. This suggests that a disproportionate change in working hours between men and women could have driven the GWG. We however, note that the analysis of the GWG across the wage distribution, using NIDS-CRAM survey data, is compromised by small sample sizes for women in some percentiles of the distribution. Overall, existing South African studies on this topic have informed our knowledge of the GWG in current times. However, to the best of this author's knowledge, none of the existing studies provides an analysis of the relationship between a shift in working hours amongst women and the GWG. This also applies to a decomposition analysis that analyses the evolution and sources of the GWG before and during early and later periods of the pandemic.

The aforesaid raises the following questions that are addressed in this study:

1. Does the COVID-19 pandemic widen the GWG at the mean of the distribution compared to the pre-pandemic level?
2. Does the magnitude of the GWG differ across COVID-19 lockdown levels?
3. What drives the change in the GWG – discrimination/ unobservable factors or gender differences in observable characteristics?
4. Is there a relationship between a change in working hours during COVID-19 lockdown and the GWG?

To answer these questions, this study employs NIDS-CRAM survey data covering February 2020 (pre-COVID), and COVID periods of April 2020, June 2020 and March 2021. The mean-based Oaxaca-Blinder (O–B) (1973) decomposition is utilised to compute the magnitude of the gap and its driving factors for each of the datasets. This approach facilitates a temporal analysis of the GWG during the period of interest. The sources of the gap are separated into two key components, the unexplained component (due to discrimination and other unobservable characteristics) and the explained component (due to gender differences in endowments of human capital). The results serve to indicate whether women were being fairly/unfairly treated in the job market during the study period, with implications for corrective strategies.

Furthermore, the study carries out a descriptive analysis of whether a shift in working hours has affected the GWG. This is important as the gap may be driven by a fall in working hours amongst women, which in itself has negative welfare implications and may alter the characteristics of the South African labour market. In general, the COVID-19 pandemic was unexpected, and the government's response was swift. However, there were many learning curves. Therefore, there is a possibility that in the future, this study can be used as evidence on how a pandemic impacts the GWG and inform policy response.

The rest of the study is structured as follows; section 2 contains a brief background on South Africa and factors that influence the GWG. Section 3 contains a literature review in two parts, theoretical literature and country specific studies. Section 4 discusses the study's methodology, and discusses and analyses the data used for the study. The results are presented and discussed in Section 5. Finally, section 6 concludes the paper.

2. Background

Contextualising the GWG

South Africa has a history of inequality stemming from the Apartheid era and thus trickling down to contemporary gender wage inequality. The apartheid era was a period of racial segregation and legalised gender discrimination in South Africa (Bhorat and Goga, 2013). The apartheid laws that were enacted between 1948 and 1988 determined where people of colour could work, travel, eat and learn. These laws had a large impact on social inequality in South Africa. The Bantu Education Act formulated in 1953 implemented an inferior education system for black people, and black people were actively excluded from job industries apart from unskilled labour. Indian and coloured individuals also received an inferior form of education relative to white individuals, however, it was superior to the education that black individuals received (Thobejane, 2013).

The apartheid era reinforced the labour and welfare system developed during the period 1920 – 1930, this assigned women's role as home-makers and men's role as wage earners (Seekings and Nattrass, 2008 cited in Mosomi, 2019). Some African men survived on peasant agriculture and some migrated to urban areas seeking jobs. However, African women and girls were often prevented from migrating to towns due to limited lodging in urban areas and as a consequence

remained in rural areas (Posel 2004 cited in Mosomi, 2019). This resulted in a higher concentration of female-headed households in rural areas and higher poverty among African women (Gradín, 2021). The apartheid and patriarchal system confined most African women to low-wage jobs such as agricultural workers and domestic workers. The formal labour force was male saturated. During this era, women of all races were not granted equal opportunities in the labour market and thus feeding into the wage differential.

In 1994, South Africa became a democratic country, the implications were that a new era of equal opportunities for all South Africans would be ushered in. The post-apartheid era was characterised by enhanced gendered access to resources and sectors of the labour market (Posel and Rogan, 2009), and noticeable growth in the employment rate among women (Casale and Posel, 2002). However, between 1997 and 2006 households headed by women were more likely to face income poverty than households that were headed by men (Posel and Rogan, 2009). Income data from 1993 and 2008 indicated that the post-apartheid inequalities increased due to an increase in the labour share (Leibbrandt, Finn, and Woolard, 2012). Despite women having increased access to the labour market, income inequality remained an area of concern. Hinks (2002) presented a study on post-apartheid South Africa and found the presence of a GWG. Posel and Rogan (2009) state that the average earnings of women were approximately 69% of men's in 1997 and 75% of men's average earnings in 2006. This inherited problem of GWG still persists as suggested by more recent studies on the topic such as Bhorat and Goga (2013) and Hill and Köhler (2021).

Another consequence of the apartheid era that explains the GWG in South Africa is gender-based occupational segregation. This explains the occurrence of women and men working in different occupations despite having similar characteristics (Gradín, 2021). When taking into consideration the fields of education and the jobs that women and men occupy in the labour market, there appears to be significant differences (Nikolka, 2013). Human capital theory outlines differences in levels of education as one of the main reasons for wage differentials. However, when women and men have similar levels of education, studies show that a greater proportion of women self-select into lower paying jobs in the labour market (Nikolka, 2013). Gradín (2021) illustrates that immediately after the apartheid era gender segregation was relatively high across occupations, although it declined substantially between the periods 1996 and 2006. On a related note, South African women disproportionately work in the low-paying informal rather than in the formal sector of the labour market (Rogan and Skinner, 2020).

Women are also less likely to be members of labour unions when compared to men, yet union members earn more than non-members (Casale and Posel, 2011).

The gender inequalities that stem from the apartheid era necessitated corrective policies in order to promote inclusive socioeconomic development in South Africa. As an example, the post-apartheid South African Constitution (Chapter 2: Bill of Human Rights, section 9) and the Employment Equity Act (55 of 1998) promote equality, among others. In order to promote the participation of black, Indian and Coloured individuals in economic activities, including the labour market, the South African government implemented the Broad Based Black Economic Empowerment (BBB-EE) policy. To complement these national initiatives, South Africa is a signatory to The Southern African Development Community's (SADC) gender protocol. This aims to outlaw any sort of gender discrimination, including that in wages. This is also the case of the International Bill of Human Rights. To echo the sentiments of Ntuli (2007), with the presence of these pro-equality policies, it is rational to envisage a society rid of gender wage inequalities as the place of women in the labour market is improved.

COVID-19 Lockdown effects

Gender inequalities in the South African labour market have been amplified by the COVID-19 global pandemic (Casale and Posel, 2020; Hill and Köhler, 2021). In March 2020, a state of national disaster was declared in South Africa followed by a five-tiered national lockdown in response to the COVID-19 pandemic. To curb the negative effects of the pandemic, the national government implemented lockdown regulations nationwide. Listed below are the regulations attached to the different lockdown levels 5, 3 and 1 and their economic consequences.

Lockdown Level 5: From 26 March 2020 till 30 April 2020, South Africa went into lockdown Alert level 5 — the most stringent level of lockdown. The regulations attached to this lockdown were school closures, business closure excluding essential work (individuals were permitted to work from home), travel restrictions for humans and goods (local and international) and closure of retail stores except stores that sell essential goods. This resulted in notable job losses and a decrease in hours of work and wages for vulnerable workers (Rogan and Skinner, 2020). People that were unable to work from home were left with reduced incomes or no incomes at all. A substantial number of individuals reported 0 hours worked during strict levels of lockdown despite still being employed (Casale and Shepherd, 2021). Low-educated individuals and low-

skilled workers were among the most vulnerable, while higher educated workers were less impacted (Gambau et al., 2022). Most of the latter were able to work from home while the former were left unemployed or on furlough, thus, changing the characteristics of the labour market.

Due to female dominated jobs being largely negatively impacted by the pandemic relative to male dominated jobs, women were more likely to be at risk of job losses as most of their industries were subjected to business closures and government mandated lockdown (Casale and Posel, 2021). Between February 2020 and April 2020, two thirds of job losses were experienced by women (Casale and Posel, 2021). Additionally, school closures also meant a higher burden of unpaid domestic duties at home for women (Casale and Shepherd, 2020). This could have compromised their labour market productivity, work attendance, and hence increased the GWG from its pre-pandemic level.

Lockdown Level 3: From 1 June 2020 till 17 August 2020, South Africa went into alert level 3. Lockdown regulations were eased. Businesses, schools and retail shops were re-opened. With the easing of lockdown regulations, individuals were permitted to return to work while those who could work from home were still encouraged to do so. For private households this meant that domestic workers who are primarily women could be employed again (Casale and Shepherd, 2020). This also applied to women in other forms of informal work. Mean hours of work also recovered considerably compared to lockdown level 5 (Casale and Shepherd, 2021). To some extent, this hints at a marginal decrease in the GWG compared to its level during the hard lockdown.

Lockdown Level 1: From 1 March 2021 till 30 May 2021, South Africa went into adjusted alert level 1. Lockdown regulations were further eased, this level had the least stringent regulations of all lockdown levels. Movement of individuals was only restricted between 23h00 and 04h00 and more sectors of the economy were permitted to operate. However, Casale and Shepherd (2021) found that in March 2021, women's employment and working hours were lower than their pre-pandemic levels, while men's employment levels reverted to the initial level. This illustrates the disproportionate effects of the COVID-19 pandemic and its preventative measures, and its potential negative impact on the GWG. However, the magnitude and sources of the GWG could have evolved during the different lockdown levels which recommends a temporal analysis of the gap during the COVID-19 pandemic. This helps to assess whether the

lockdown regulations worsened gender wage inequality in South Africa compared to the pre-pandemic situation.

3. Literature review

a. Empirical literature review

Pre-pandemic Wage inequality: Evidence from abroad

The GWG is a widely studied topic and has received attention from countries in Asia, Australasia, Europe, North America, South America, South Africa, and other African countries. In a recent study, Blau and Kahn (2020) find evidence of a GWG in the United States of America (USA), and discuss the progression of the gap from the late 1970s till early 2000s. Blau and Kahn (2020) argue that convergence of female wages to male wages has been slowing down over recent years and may be indicating that it will continue to converge at a slower rate in the future. Suggesting that the GWG will never be fully eradicated in the near term. Despite declines in discrimination against women in the labour market, evidence suggests that it will remain an issue in the labour market (Blau and Kahn, 2020). In an earlier study Knight and Sabot (1982) used the 1971 establishment-based survey to study wage inequality in the Tanzanian manufacturing sector and found presence of a GWG. These studies indicate that GWG is a reoccurring topic of interest in literature.

In a developing country context, studies by Nielsen (2000), Siphambe and Thokweng-Bakwena (2001), Chi and Li (2008), and Nordman and Wolff (2009) showed evidence of a GWG in Zambia, Botswanan, China and Mauritius respectively. The results found by Nielsen (2000) suggest that there are increasing returns to education in the Zambian labour market. Two-thirds of the GWG was attributed to discrimination and one-third was due to the qualification differences between men and women. Using 1995/1996 labour force survey data, Siphambe and Thokweng-Bakwena (2001) found that a larger portion of the GWG in the public sector was due to differences in characteristics (human capital) between men and women. Contrastingly, in the private sector, discrimination accounted for 66% of the GWG and the remainder was due to differences in characteristics. Overall, Siphambe and Thokweng-Bakwena (2001) found evidence of a higher GWG in the private sector than the public sector. When comparing the GWG in the different labour market sectors in Madagascar, Nordman et al. (2010) found that the gap was highest in the informal sector and lowest in the public sector.

While Nielsen and Rosholm (2002) found a GWG in the Zambian private sector but none in the public sector. These studies suggest that the private sector is more prone to gender wage inequality than the public sector.

More recent international literature on the GWG includes Fortin (2019) who utilises Canadian Labour Force Survey data and finds that women comprise a higher proportion of workers at the bottom end of the wage distribution, conversely, men are a larger portion of top earners. This suggests that there is both a sticky floor[1] and a glass ceiling in the Canadian labour market. In a study consisting of 26 European countries, Christofides et al. (2013) finds a median GWG of 15%. For most European countries, the unexplained wage gap is higher at the bottom and top of the wage distribution.

In a natural experiment conducted in Chile, Didier (2021) examines whether the gender wage differential can be suppressed by the expansion of higher education. The results indicate that the expansion of higher education was successful in increasing female labour force participation and reducing the wage differential. However, the wage gap at the top of the wage distribution increased apart from the white-collar sector (Didier, 2021). Thus, indicating that access to higher education is a crucial but not sufficient tool for reducing the GWG. Similarly, Blau and Kahn (2020) found that educational attainment played a role in reducing the GWG in the USA as women in the sub-sample had higher educational attainment than men.

Pre-pandemic Wage inequality: evidence from South Africa

This empirical literature review serves to highlight that wage inequality was an issue in South Africa prior to the pandemic. With many South African studies focusing on human capital differences and discrimination. Ahead of his time, Hinks (2002) conducted the first gender wage differential study in South Africa. The Oaxaca–Blinder (1973) decomposition was applied to investigate sources of the GWG, with results confirming the existence of a wage gap across white, Indian and coloured racial groups. The wage gap was in favour of black women. Prior to COVID-19, distributive methods have been employed to examine the GWG, apart from estimation methods that are mean-based. Ntuli (2007) applied quantile regression counterfactual decomposition to conclude that women with the exact same characteristics as

[1] Higher gender wage gap at the bottom than the top of the wage distribution and vice versa for the glass ceiling.

men earn lower wages – thus suggesting evidence of gender discrimination. The results reinforced the presence of a sticky floor (as was found in Bhorat and Goga (2013)) in the South African labour market. Additionally, Ntuli (2007) found that gender wage discrimination had been rising between 1995 and 2004. Bhorat and Goga (2013) applied unconditional quantile regressions based on the Recentered Influence Function (RIF) in conjunction with the Oaxaca-Blinder (1973) decomposition and discovered that the determining factors of the GWG differ across the length of the wage distribution.

Given the extensive role of labour unions in the South African job market, Casale and Posel (2011) examined the GWG between African men and women in unionised and non-unionised jobs. Unexpectedly, they found that the GWG was larger in the union sector than the non-unionised sector. Lastly, unions were found to have a larger compressional effect among individuals that are more educated compared to less educated individuals, with the effect being relatively bigger for African women than African men. This study substantiates that pre COVID-19, gender wage inequalities driven by both gender differences in observable characteristics and discrimination characterised the South African labour market.

Wage inequality and COVID-19: Evidence from abroad

In a study to determine the effects of COVID-19 in Australia in 2020, Birch and Preston (2021) found that sectors dominated by women such as accommodation and food services were adversely affected by the pandemic, further emphasising the disproportionate gendered impacts of COVID-19. Additionally, Birch and Preston (2021) found that higher job losses were experienced by younger individuals ranging from 20 to 29 years old and older individuals. This indicates a change in the characteristics of the labour market in Australia. Czymara et al. (2021) discuss their results from an online survey conducted during the first four weeks of lockdown in Germany. Their findings indicated that women were more negatively impacted by COVID-19 than their male counterparts. Women in Germany experienced a greater reduction in paid hours as well as a higher childcare burden than their male counterparts. As a consequence, the GWG could have been widened in Germany. Adams-Prassl et al. (2020) found that in the USA, United Kingdom and Germany, the bottom of the wage distribution experienced a larger percentage drop in earnings due to the pandemic. Interestingly, the results obtained by Adams-Prassl et al. (2020) suggest that there were no significant differences in earnings lost by gender. This highlights that developed countries were also impacted by COVID-19.

Gender wage inequality and COVID-19: Evidence from South Africa

Recent studies have investigated the GWG in South Africa during the era of COVID-19. Casale and Posel (2020) unpack the initial ramifications of the pandemic on the job market and uncompensated care work at home in South Africa. Results indicated that on average women experienced higher job losses and a greater decline in hours worked per week than their male counterparts. As expected, women, those with lower earnings and individuals with lower levels of education experienced the greatest job losses. Using wave 1, 2 and 3 of NIDS-CRAM data for the periods February 2020 to October 2020, Casale and Shepherd (2021) discuss the gender-specific effects of COVID-19. Women's real earnings were not significantly impacted as their average wage was R5 721 in February 2020 (pre-COVID) and R5 524 in October 2020 (lockdown level 1. While men experienced an increase in real earnings from R9 147 in February to R9 748 in October. Indicative of an increase in the real monthly GWG from 37% to 43% between February and October 2020. This is possibly related to a decline in the average hours worked among employed women in comparison to before the pandemic and the evolving nature of jobs held by men and women employed in the job market. (Casale and Shepherd, 2021).

Casale and Shepherd (2021) also examined which racial group were more vulnerable to job losses. They found that African and non-African women were the most vulnerable, with African women experiencing a decline in employment of 11% and non-African women experiencing a 7% decline. In an extension of their 2021 study, Casale and Shepherd (2021) used wave 1-wave 5 of NIDS-CRAM data and found that between February 2020 (pre-COVID) and March 2021, monthly earnings for women declined by 5%. In contrast, men's monthly earnings were down by about 3%. Mean monthly earnings were significantly close to the pre-COVID level, and the GWG was similar to the pre-COVID level. Although this study does not proceed to a decomposition analysis of the GWG, it suggests that the easing of lockdown restrictions brought some recovery in the labour market.

Hill and Köhler (2021) utilized Recentered Influence Function (RIF) regressions to investigate whether the raw GWG in South Africa widened during the COVID-19 pandemic. The study uses NIDS-CRAM data which includes earnings information from February 2020 (pre-COVID), April 2020 (Level 5) and June 2020 (Level 3). The findings indicated the presence of a gender pay gap across the wage distribution. However, the gap widened substantially among the poorest 40% of earners. This was attributed to the negative effect of the childcare

burden on hours of work which was skewed against women. The analysis of the GWG across the wage distribution, using NIDS-CRAM survey data, is nonetheless compromised by small sample sizes for women in some percentiles of the distribution. Regardless, these studies illustrate that women were unduly effected in the early stages of the pandemic. While these studies are educational, they do not provide an in depth analysis of how a decrease in working hours amongst women impacts the GWG.

b. Theoretical literature review

Theoretical literature links the GWG to two main factors; gender differences in human capital endowments (skills, education, job training, etc.), differences in employment sector and wage discrimination. The rationale is briefly discussed in theories below.

Differences in Human capital

Human capital theory outlines that the differences in wages can be explained by differences in the level of education, experience and the age of individuals (Nikolka, 2013). The theory positively associates education with efficiency and productivity as education enhances the cognitive stock of human beings (Olaniyan and Okemakinde, 2008). During 1890-2001, the GWG in the United States of America narrowed due to a rise in human capital investments by women (Polachek, 2004). Thus, an increase in human capital investments by women relative to their male counterparts can reduce the GWG. In light of the human capital model, an individual's lifetime earnings depend on their expected lifetime labour force participation which drives their incentive to acquire marketable training (Polachek, 2004).

Globally, numerous studies have shown that women are more vulnerable to the negative effects of the pandemic, this is partly due to lower human capital and skill levels when compared to men. In a Bolivian study, Escalante and Maisonnave (2022) find that unskilled workers, especially women, bore the brunt of job losses in the formal labour market as a result of the pandemic, resulting in widening of existing gender inequalities. During February and April 2020 the GWG also widened in the South African informal economy as a result of COVID-19 regulations imposed (Rogan and Skinner, 2021). These studies suggest that the composition of the labour market might change as a consequence of the pandemic, resulting in restricted access to the labour market for the unskilled and women in particular.

Becker's household time allocation theory

Becker (1965) discusses the allocation of time within a household and how households maximise utility subject to time and budget constraints. Becker (1965) states that within a multi-person household, household members that are more efficient at working spend more time working and household members that are more efficient at consumption, spend more time at consumption – time at consumption can be spent on sleeping, leisure, eating, taking care of kids, seeing a play, etc. According to literature, on average men earn higher wages than their female counterparts and therefore, are deemed more productive at labour market work, assuming individuals are paid according to their productivity levels. During the early stages of the pandemic, women in a multi-person household were more 'efficient' than men at taking care of the kids and had a higher child care burden. Thus, women had to substitute their time at work for time at consumption, resulting in reduced weekly hours worked. While men who were earning more than their female counterparts continued working the same hours.

Discrimination

It is problematic when men and women are not equally compensated for equal work or productivity given that equality is the bedrock of South Africa and many other nations. In this context, wage discrimination can be explained as workers not being equally compensated for equal levels of productivity or work. Taste-based discrimination, statistical discrimination, labour market segmentation and occupational crowding are the mechanisms that explain discrimination in the labour market.

Statistical discrimination as defined by Bielby and Baron (1986) is an employer's belief that for a given occupation the average marginal productivity of a female differs from that of a male. Mincer and Polachek (1974) state that the wage differential occurs partly due to women having shorter and often discontinuous attachment to the labour force than men. Women are often discriminated against due to their intermittent participation in the labour market; the uncertainty of whether women may require maternity leave may make women less desirable to employ for certain employers. Hence, they end up being paid lower wages relative to men.

Becker (2010) states that an individual has a taste for discrimination if he/she acts as if they are willing to forgo income in order to avoid transacting with a particular group of people. *Taste-based discrimination* is determined by two factors: prejudice and ignorance. Employee taste-based discrimination can be explained as an employer having to pay a male employee a

higher wage rate for working with a female employee instead of a male employee. Given that the genders could be 'perfect' substitutes, it would be too costly for a profit-maximizing employer to hire a mixed workforce. Thus, taste-base discrimination can filter women out of the workforce and bolster gender wage inequality.

Solberg and Laughlin (1995) define *occupational crowding* as a situation that arises when a group of people are crowded into low-wage employment and/or actively excluded from high-wage employment. Occupational crowding can be defined as occupational segregation that results in "male" and "female" jobs, this leads to gender wage disparities (Solberg and Laughlin, 1995). Women are usually crowded into low paying jobs. This leads to excess supply of women looking for employment in low-wage jobs. This excess supply results in female employees losing their bargaining power and causes wages to fall further. Women are then left with low wage offers and thus, resulting in wage disparities between men and women.

As for *labour market segmentation,* Bauder (2001) defines it as the compartmentalisation and isolation of racial minorities, females and the working class. Dual market segmentation occurs when the labour market is split into two segments; primary and secondary labour market sector. This could be perceived as formal and informal sectors. Wilkinson (2013) states that compared to the secondary sector, the primary sector offers higher returns for a given level of productivity, and higher returns to increases in the level of productivity. Dual market segmentation can also be explained as separating the labour market into "good" and "bad" jobs. A higher proportion of women are employed in "bad jobs" in the secondary sector which in part explains why women earn lower wages than their male counterparts. Taken together, the above assortment of theories explain the GWG in this study.

4. Methodology

This study estimates Mincerian earnings functions and carries out a mean-based Oaxaca-Blinder (1973) decomposition to assess the GWG and its sources over time.

Mincerian earnings function

For each of the waves of NIDS-CRAM (1, 2 and 5), the raw wage gap is estimated at the mean using the following extended Mincerian earnings functions:

$$\ln w_k = a + bX_k + cF_k + U_k \qquad (1)$$

Where: $k\{February\ 2020, April\ 2020, June\ 2020, April, 2021\}$

$\ln w_k$ = log of hourly wage/log of monthly wage

X_k= vector of control variables representing individual specific characteristics, such as years of education, age, race, occupation[2], industry, kids, and, residential location (rural, urban).

b = the corresponding vector of coefficients.

F_k= gender dummy; 1 if female, 0 otherwise, if c is negative and statistically significant, it shows that women earn less than men (wage gap).

U_k= error term.

Results for F_k will be analysed to establish the change in the raw GWG at the mean across the periods. However, this is estimated on the assumption that men and women have similar coefficients for all variables which is relaxed in the Oaxaca-Blinder decomposition.

In order to analyse the effect of a change in working hours on the GWG, we estimate and compare the monthly and hourly GWGs. If the hourly GWG does not change from one period to the next, while the contemporaneous monthly GWG changes, this could be attributable to a change in hours of work, ceteris paribus. This would require an analysis of mean hours worked per week and mean monthly wages for men and women for each period k using descriptive statistics and kernel density functions.

Selection bias

Hill and Köhler (2021) state endogeneity of estimates is an issue related to the estimation of the GWG because of the selection of individuals into labour force participation. Selection bias in the estimation of the GWG is a result of women having a significantly lower likelihood of participating in the labour market than men (Mwabu and Schultz, 2000 as mentioned in Hill and Köhler, 2021). Additionally, Bhorat and Goga (2013) state that selection bias is a concern, due to high unemployment in South Africa, labour force participation is not equivalent to employment. This situation could have been worsened by the global pandemic, assuming that individuals with inferior labour market characteristics could have suffered more from pandemic induced unemployment than others. Therefore, the earners in the estimation samples may not

[2] We note that occupation and sector are not available for February 2020. Therefore we will run regressions for April 2020 - March 2021 with and without these variables so that we can compare to February 2020. Also the dataset does not provide information on crucial determinants of wages such as trade union membership. Provincial location is excluded from the analysis since NIDS-CRAM data is not representative at this level. When estimating the monthly wage gap we control for weekly hours worked.

be a representative sample of the labour force. “A number of studies have attempted to correct for this bias by estimating a two-stage Heckman selection model and controlling for the inverse Mills ratio in their subsequent regression estimates” (Hill and Köhler, p.10). Nonetheless, the available data lacks appropriate instruments to control for the problem, hence our study is not in a position to control for the bias. Regardless, we assess the potential effect of selection bias on the gender pay gap by comparing observable characteristics of our estimation samples before and during COVID-19 lockdown levels.

The Oaxaca-Blinder (1973) Decomposition

The Oaxaca-Blinder (O-B) (1973) decomposition has been extensively used to study sources of wage differentials between two mutually exclusive groups; in this case, men and women. It divides the GWG into two parts, an explained component (‘Endowment effect) that accounts for gender differences in productive characteristics such as education, work experience or training. As well as an unexplained component (‘Coefficient effect) which is used to measure the effect of labour market discrimination and other unobservable characteristics on the GWG. More recent studies utilize an extension of the O-B (1973) decomposition from the mean of the distribution to percentiles of the entire wage distribution. However, given the sample size for the data at use, a decomposition across the wage distribution is not recommended and may result in statistically insignificant results as criticised in Hill and Köhler (2021). Therefore, a mean-based analysis is employed in this study.

For each period(k), the O-B decomposition at the mean is estimated on the following specification of the extended Mincerian Earnings functions:

$$\ln w_j = a + bX_j + U_j \qquad (2)$$

Where: $j\{male, female\}$

$\ln w_j$ = log of hourly (monthly) wage for sex j

X_j = vector of control variables representing individual specific characteristics of sex j, such as years of education, age, race, occupation[3], residential location (rural, urban).

b = the corresponding vector of coefficients

[3] We note that occupation and sector are not available for February 2020. Therefore we will run regressions for June 2020 - March 2021 with and without these variables so that we can compare to February 2020. Further, we include hourly wages in the monthly wage regressions.

U_j= error term.

Blinder (1973) indicates that the wage gap can be decomposed as follows:

$$R = \beta_0^H + \sum_i \beta_i^H \bar{X}_i^H - (\beta_0^L + \sum_i \beta_i^L \bar{X}_i^L) = E + C + U \quad (3)$$

Where:

R = Raw wage differential

H denotes high wage group (male) and L indicates low wage group (female)

E = gender wage differential due to differences in endowments

$= \sum_i \beta_i^H (\bar{X}_i^H - \bar{X}_i^L)$

C = gender wage differential due to differing coefficients

$= \sum_i \bar{X}_i^L (\beta_i^H - \beta_i^L)$

U = Unexplained portion of the wage differential

$= \beta_0^H - \beta_0^L$

D = wage differential due to discrimination = C + U

Oaxaca (1973) explains that if discrimination in the labour market did not exist, men and women would have identical pay structures and D=0. Yet the relative wages of men often exceed the relative wages of women with the same criteria.

If the discrimination component is positive, wage discrimination is present in the labour market. For robustness, the analysis is conducted using coefficients (wage structure) for males, females and a pooled specification as the reference category; in case there is bias in using coefficients (wage structure) for a specific gender as reference (Oaxaca and Ransom, 1994).

Following Jann (2008), when using female (L) as the reference category, the O-B decomposition model can be written as follows:

$$R = \sum_i \beta_i^L \ (\bar{X}_i^H - \bar{X}_i^L) + \sum_i \bar{X}_i^L (\beta_i^H - \beta_i^L) + (\bar{X}_i^H - \bar{X}_i^L)(\beta_i^H - \beta_i^L) = E + C + I \quad (4)$$

Where:

R = gender wage differential

H = Male

β = estimated coefficients

E = gender wage differential due to differences in endowments; i.e. $\sum_i \beta_i^L \ (\bar{X}_i^H - \bar{X}_i^L)$

It shows a change in women's wages if they had men's distribution of predictor variables

C = accounts for the unexplained component or discrimination; i.e. $\sum_i \bar{X}_i^L (\beta_i^H - \beta_i^L)$

It gives the change in women's actual wages if they were paid according to men's pay structure.

I = Interaction component. (I) represents the simultaneous effect of (E) and (C); i.e. $(\bar{X}_i^H - \bar{X}_i^L)(\beta_i^H - \beta_i^L)$.

Analogously, the decomposition using male coefficients as reference can be specified as

$$R = \sum_i \beta_i^H \ (\bar{X}_i^H - \bar{X}_i^L) + \sum_i \bar{X}_i^H (\beta_i^H - \beta_i^L) + (\bar{X}_i^H - \bar{X}_i^L)(\beta_i^H - \beta_i^L) = E + C + I \quad (5)$$

The interpretation of $R = E + C +$ mirrors that in equation (4)

Oaxaca and Ransom (1994) state the two-fold decomposition using pooled coefficients as the reference can be specified as:

$$R = [E(X_H) - E(X_L)]' \ [W\beta_H + (I - W)\beta_L] + [(I - W)'E(X_H) + W'E(X_L)]' \ (\beta_H - \beta_L) = E + I \quad (6)$$

Where:

W = a matrix of relative weights given to the coefficients of Group H

I = the identity matrix

For instance, choosing W = 0.5I is equivalent to β^* i.e. $[W\beta_H + (I - W)\beta_L] = 0.5\beta_H + 0.5\beta_L$

The total wage gap is further decomposed to establish the contribution of each explanatory variable to the explained and unexplained components of the GWG. Following Oaxaca and Ramson (1999), the contribution of the jth predictor variable to the explained component of the GWG is given as: $\Delta\bar{X}^{(j)\prime}\hat{\beta}_m^{(j)}$ while for the unexplained effect this is given as: $\bar{X}_f^{(j)\prime}\Delta\hat{\beta}^{(j)}$

Where: *m and f* demote male and female, respectively.

Where: *m and f* demote male and female, respectively.

$$\Delta\hat{\beta}^{(j)} = \bar{\beta}_m^{(j)} - \bar{\beta}_f^{(j)},\ \Delta\bar{X}^{(j)\prime} = \bar{X}_m^{(j)\prime} - \bar{X}_f^{(j)\prime}$$

The Oaxaca-Blinder decomposition is not invariant to the choice of reference/base categories (Oaxaca and Ransom, 1999; Yun, 2005). That is, when one of the variables is omitted to avoid collinearity, the detailed decomposition results for the unexplained effect will depend on the choice of the base category. This averaging approach is suggested to address this problem, "using the average of coefficient effects with varying reference groups as the contribution of individual variables to the coefficient component of the wage differentials" (Yun, p.768, 2005). This is followed in this study.

Data description and data analysis

Data description

This study uses data from NIDS-CRAM Wave 1, Wave 2 and Wave 5. NIDS-CRAM is the National Income Dynamics Study – Coronavirus Rapid Mobile Survey. The survey rounds were conducted by the Southern Africa Labour and Development Research Unit (SALDRU) based at UCT's School of Economics (Ingle, Brophy and Daniels, 2021). NIDS-CRAM Wave 1 was collected between 7 May and 27 June 2020 and consists of data for February (pre-COVID) and April 2020 (Lockdown level 5). Wave 2 interviews were conducted between 13 July and 13 August 2020, and the sample consists of earnings data for June 2020 (level 3 lockdown). Wave 5 contains data for lockdown level 1, it was collected between 6 April and 11 May 2021, and contains March 2021 earnings data. The purpose of NIDS-CRAM data is to investigate the socio-economic effects of the national lockdown related to the State of Disaster declared by the national government in March 2020 (Ingle et al., 2021). Moreover, it can be used to examine the social and economic consequences of the global COVID-19 pandemic.

The NIDS-CRAM surveys contain data on individuals' demographics (age, race, gender and marital status), labour and income (education, employment, income, occupation, threats to business/income from the lockdown), household composition, social engagements, health and COVID-19 experiences. Individuals interviewed in the survey are above 17 years. For the purposes of this study, the sample has been restricted to individuals between the ages of 18 and 64. The sample for wave 1 consists of 7,073 observations, while those for wave 2 and wave 5 consist of 5,676 and 5,862 observations, respectively. After making adjustments based on

missing wage information, removing outliers (negative values), and removing individuals that **fell outside the age range of 18-64**. The remaining sample used for the analysis is shown in Table 1 below. Relevant sampling [4]weights are applied to the analysis in order for the results to be generalised.

Table 1: Sample of analysis: February 2020, April 2020, June 2020 and March 2021

Month	**Total sample**	**Male**	**Female**
February 2020	3001	1356	1645
April 2020	2121	1044	1077
June 2020	1837	888	949
March 2021	2382	1116	1266

These datasets allow for a comparison of the GWG across 4 points — February 2020 (pre-COVID), April 2020, June 2020 and March 2021 (a year within COVID) — and across the levels of lockdown (the most stringent, relaxed regulations and the least stringent). However, we acknowledge that the way earnings was captured in the questionnaire in February 2020 was different from April 2020 and each subsequent wave. Hence, our baseline measure is different and could potentially introduce problems when looking at changes over time.

Data analysis

The main purpose of this section is to illustrate how the characteristics of the South African workers in our sample have evolved due to the various stages of lockdown. Table 2 presents the descriptive statics for the individuals in the sample by gender across all periods. The variables are described in Appendix A. Gambau et al. (2022) state that the policies implemented to mitigate the negative health impact of the pandemic likely resulted in distributional changes in the USA. Much like the USA, strict regulations such as social distancing and stay at home orders were put in place in South Africa, thus temporarily changing the composition of men and women in the labour market.

[4] This study utilises the weights provided with the NIDS-CRAM data. "The weights in NIDS-CRAM are the NIDS Wave 5 post-stratified weights, adjusted for the probability of being selected into NIDS-CRAM and then adjusted for non-response. The weights are then trimmed to the 1st and 99th percentile. This weighting adjustment process is the same as that followed in NIDS Wave 5" (Ingle et al., 2020, p.2). Utilising sample weights decreases biases due to imperfections in the sample associated with non-uniform, and non-response. Limitations of using sampling weights include the sample not necessarily representing the population of South Africa in 2020 and 2021 but rather the population in South Africa in 2017. Therefore, using the sample weights may not provide proper estimates of the South African population in 2020 and 2021 and may affect the generalisation of results.

Table 2: Descriptive statistics by gender: February 2020, April 2020, June 2020 and March 2021

	February 2020		April 2020		June 2020		March 2021	
	Mean Female	Mean Male	Mean Female	Mean Male	Mean Female	Mean Male	Mean Female	Mean Male
Formal	0.78	0.73	0.69	**0.66**	0.68	0.66	0.63	0.68
Self employed	0.07	0.09	0.08	0.09	**0.13**	0.13	**0.15**	0.11
African	0.74	0.78	0.72	0.75	0.71	0.73	**0.78**	0.77
Coloured	0.12	0.10	0.11	0.12	0.12	0.11	0.09	0.11
Indian	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03
White	0.11	0.10	0.14	0.11	0.14	0.12	0.11	0.09
age18-34	0.41	0.42	0.37	0.43	0.38	0.41	0.36	0.44
age35-49	0.43	0.43	0.48	0.42	0.42	0.41	0.46	0.39
age50-64	0.16	0.16	0.15	0.15	0.20	0.18	0.18	0.18
Kids age 6 or below	0.48	0.36	0.47	0.37	0.46	0.34	0.47	0.38
Married	-	-	-	-	0.50	0.61	0.43	0.57
Unmarried	-	-	-	-	0.49	0.39	0.57	0.43
No matric	0.39	0.42	0.36	0.40	0.37	0.41	0.42	0.42
Matric	0.23	0.28	0.20	0.27	0.23	0.27	0.21	0.24
Tertiary education	0.39	0.30	**0.44**	0.33	0.40	0.32	**0.37**	0.34
Urban	0.86	0.84	0.87	0.85	**0.82**	0.82	0.79	**0.79**
Rural	0.14	0.16	0.13	0.15	0.18	0.17	0.20	**0.19**
Occupation								
Manager & Professionals					0.24	0.21	0.21	0.18
Technicians and Associate professionals					0.08	0.07	0.06	0.07
Clerical support workers					**0.13**	**0.14**	**0.07**	**0.05**
Service and sales workers					0.25	0.12	0.28	0.12
Skilled agricultural, Forestry and Fishery workers					0.01	0.02	0.01	0.01
Craft and related trades workers					0.04	0.15	0.05	0.15
Plant and machine operators, and Assemblers					0.02	0.12	0.02	0.16
Elementary occupations					**0.24**	**0.21**	**0.31**	**0.26**
Industry								
Agriculture and Hunting					0.03	0.05	0.03	0.04
Mining					0.01	0.06	0.01	0.06
Manufacturing					**0.06**	0.13	**0.11**	0.13
Utilities; Electricity, gas, water					0.00	0.04	0.01	0.02
Construction					0.02	0.15	0.02	0.16
Wholesale and Retail trade; repair					0.20	0.12	0.21	0.14
Transport, storage and comm					0.01	0.08	0.01	0.09
Financial intermediation					**0.18**	0.17	**0.10**	0.12
Community, social and personal services					0.34	**0.16**	0.36	**0.22**

Private households					0.14	0.05	0.14	0.02
N	1 645	1 356	1 077	1044	949	888	1 266	1 116

*Notes: (1) No data for marriage status and occupation in wave 1 data. (2) Own computations. (3) Statistics are weighted means/proportions by gender and period. (4) Full table including 95% confidence intervals can be found in the Appendix D.1. (5) Figures in bold indicate variables that are statistically different by gender in that period.

Consistent with recent studies, we find that the proportion of men and women in formal relative to informal employment declined during the most stringent level of lockdown (Alert level 5 and then level 4) i.e. in April, relative to February 2020 (pre-COVID). Formal employment for women was the lowest in March 2021 and the lowest for men was in June 2020. Additionally, before the pandemic (February 2020) women had a higher proportion in formal employment than men and, by March 2021, the converse was true. These findings show how South African women in the formal labour market were unduly impacted by COVID-19. In February 2020, a higher proportion of men than women were self-employed, but this was reversed by March 2021. Women had a higher proportion occupying "female jobs" like service and sales and elementary occupations, while this was for men in occupations such as agriculture, craft, and trades and, plant and machinery. This hints at women self-selecting into female jobs leading to occupation segregation. Across all periods, the proportion of women that have tertiary education is higher than that of men, although on average, men have a higher proportion that completed matric than women. During the more stringent levels of lockdown (Alert level 5), only individuals employed in essential occupations were permitted to work at their usual place of work (Köhler et al., 2023). As a result, during more stringent levels of lockdown, individuals employed in elementary (not deemed essential) occupations were prohibited from working. As regulations were eased, more individuals were permitted to work as a result, there was an increase in women and men working in elementary occupations between June 2020 and March 2021.

Table 2 indicates a higher proportion of married men than married women. Also, a higher proportion of women have kids below the age of 6, suggesting that women have a higher childcare burden than men. For both genders, there was a drop in the proportion of individuals who reside in urban than rural areas between February 2020 and March 2021.

Selection bias

To assess the potential effect of selection bias on the GWG, the observable characteristics of the sample are compared by gender across all periods; February 2020, April 2020, June 2020,

March 2021. Statistics for females are in Table 3 while those for males are in Table 4. The sample is confined to employed individuals in each respective period as the study focuses on differences in wages between women and men, which is dependent on employment. The full table with 95% confidence intervals can be found in appendix D.1. If the mean/proportion of a variable has overlapping confidence intervals across periods, we interpret it as statistically similar in the given periods, otherwise it will be statistically different. This discussion mainly focusses on variables whose distribution shifted over time.

Table 3 shows that in February 2020 78% of women were in formal employment and this significantly decreased by 15% points in March 2021. Since formal employment sector is a significant predictor of wages, this could have contributed to a temporal increase in the GWG. The proportion of African women is only statistically different between June 2020 and March 2021. There was no significant difference in age and education distribution across all periods. The proportion of women living in urban areas significantly declined from 87% to 82% between April 2020 and June 2020. Yankow (2006) finds that individuals employed in urban areas have a wage advantage over those in rural areas. Therefore, this change could have reduced female wages and possibly widened the GWG between April and June 2020. For the occupational distribution, there were no significant shifts between June 2020 and March 2021 except for two cases. The share of women in elementary occupations increased by 7% points while women in clerical jobs decreased by 6% points. All else equal, this could have increased the GWG from June 2020 to March 2021.

Statistics for industries show a significant increase (5% points) in the proportion of women employed in the manufacturing sector between June 2020 and March 2021. Meanwhile, there was a 8% points decline in women employed in financial intermediation. To the extent that the financial sector pays women more than the manufacturing sector, this could have led to a wider gender pay gap.

Table 3: Descriptive statistics by female: February 2020, April 2020, June 2020 and March 2021

Independent variables	February 2020	April 2020	June 2020	March 2021
Self employed	0.07	0.08	0.13	0.15
	[0.06: 0.09]	[0.07; 0.10]	[0.11; 0.15]	[0.13; 0.17]
Formal	**0.78**	0.69	0.68	0.63
	[0.76; 0.80]	[0.66; 0.72]	[0.65; 0.71]	**[0.60; 0.66]**

African	0.74	0.72	0.71	0.78
	[0.72; 0.76]	[0.70; 0.75]	**[0.68; 0.74]**	**[0.76; 0.80]**
Coloured	0.12	0.11	0.12	0.09
	[0.10; 0.13]	[0.09; 0.13]	[0.10; 0.14]	[0.07; 0.10]
Indian	0.03	0.03	0.03	0.02
	[0.02; 0.04]	[0.02; 0.04]	[0.02; 0.04]	[0.01; 0.03]
White	0.11	0.14	0.14	0.11
	[0.10; 0.13]	[0.12; 0.16]	[0.12; 0.16]	[0.09; 0.13]
age18-34	0.41	0.37	0.38	0.36
	[0.39; 0.43]	[0.35; 0.40]	[0.35; 0.41]	[0.33; 0.39]
age35-49	0.43	0.48	0.42	0.46
	[0.40; 0.45]	[0.45; 0.51]	[0.39; 0.46]	[0.43; 0.48]
age50-64	0.16	0.15	0.20	0.18
	[0.15; 0.18]	[0.13; 0.17]	[0.17; 0.22]	[0.16; 0.21]
Kids age 6 or below	0.48	0.47	0.46	0.47
	[0.46; 0.51]	[0.43; 0.50]	[0.43; 0.49]	[0.45; 0.50]
Married	-	-	0.50	0.43
			[0.46; 0.53]	[0.41; 0.46]
Unmarried	-	-	0.49	0.57
			[0.46; 0.53]	**[0.54; 0.59]**
No matric	0.39	0.36	0.37	0.42
	[0.36; 0.41]	[0.33; 0.39]	[0.34; 0.40]	[0.39; 0.45]
Matric	0.23	0.20	0.23	0.21
	[0.21; 0.25]	[0.18; 0.23]	[0.20; 0.26]	[0.19; 0.23]
Tertiary education	0.39	0.44	0.40	0.37
	[0.36; 0.41]	[0.41; 0.47]	[0.37; 0.43]	[0.34; 0.40]
Urban	0.86	0.87	0.82	0.79
	[0.85; 0.88]	**[0.85; 0.89]**	**[0.79; 0.84]**	[0.77; 0.82]
Rural	0.14	0.13	0.18	0.20
	[0.12; 0.15]	[0.11; 0.15]	[0.15; 0.20]	[0.17; 0.22]
Manager & Professionals			0.24	0.21
			[0.22; 0.27]	[0.18; 0.23]
Technicians and Associate professionals			0.08	0.06
			[0.06; 0.09]	[0.05; 0.08]
Clerical support Workers			0.13	0.07
			[0.11; 0.15]	**[0.05; 0.08]**
Service and sales Workers			0.25	0.28
			[0.22; 0.28]	[0.26; 0.31]
Skilled agricultural, Forestry and Fishery workers			0.01	0.01
			[0.00; 0.01]	[0.00; 0.01]
Craft and related trades workers			0.04	0.05
			[0.03; 0.05]	[0.04; 0.06]
Plant and machine operators, and assemblers			0.02	0.02
			[0.01; 0.02]	[0.01; 0.02]
Elementary occupations			0.24	0.31
			[0.21; 0.27]	**[0.29; 0.34]**

Agriculture and Hunting			0.03	0.03
			[0.02; 0.04]	[0.02; 0.04]
Mining			0.01	0.01
			[0.01; 0.02]	[0.00; 0.01]
Manufacturing			0.06	0.11
			[0.04; 0.07]	**[0.09; 0.12]**
Utilities; Electricity, gas, water			0.00	0.01
			[0.00; 0.01]	[0.00; 0.01]
Construction			0.02	0.02
			[0.01; 0.03]	[0.01; 0.02]
Wholesale and Retail trade; repair			0.20	0.21
			[0.17; 0.22]	[0.19; 0.24]
Transport, storage and comm			0.01	0.01
			[0.01; 0.02]	[0.00; 0.02]
Financial Intermediation			0.18	0.10
			[0.16; 0.20]	**[0.08; 0.12]**
Community, social and personal services			0.34	0.36
			[0.31; 0.37]	[0.33; 0.39]
Private households			0.14	0.14
			[0.11; 0.16	[0.12; 0.16]
N	1 645	1 077	949	1 266

*Notes: (1) No data for marriage status and occupation in wave 1 data. (2) Own computations (3) Variables are weighted. (4) 95% confidence intervals are presented in brackets. Figures in bold indicate variables that are statistically different between the two periods.

Table 4 indicates that the proportion of men that were self-employed in June 2020 was 0.13 and significantly declined in March 2021 to 0.11. The proportion of men that were formally employed between February 2020 (0.73) and April 2020 (0.66) statistically declined by 11% and remained statically similar thereafter. There was no significant change in male education and age. The proportion of men in clerical support occupation was 0.14 in June 2020 and declined to 0.05 in March 2021. However, in June 2020 and March 2021, the proportion of men in elementary occupations was 0.21 and 0.26, respectively. There was a significant increase in the proportion of men employed in the community, social and personal services industry between June 2020 and March 2021.

Table 4: Descriptive statistics by male: February 2020, April 2020, June 2020, and March 2021

	February 2020	April 2020	June 2020	March 2021
Self employed	0.09	0.09	**0.13**	0.11
	[0.07; 0.10]	[0.08; 0.11]	**[0.11; 0.15]**	[0.09; 0.13]
Formal	0.73	0.66	0.66	0.68
	[0.71; 0.76]	**[0.63; 0.69]**	[0.62; 0.69]	[0.66; 0.71]
African	0.78	0.75	0.73	0.77
	[0.76; 0.80]	[0.73; 0.78]	[0.70; 0.76]	[0.75; 0.80]
Coloured	0.10	0.12	0.11	0.11
	[0.09; 0.12]	[0.10; 0.14]	[0.09; 0.14]	[0.09; 0.13]
Indian	0.02	0.02	0.03	0.03
	[0.01; 0.02]	[0.01; 0.02]	[0.02; 0.05]	[0.02; 0.03]
White	0.10	0.11	0.12	0.09
	[0.09; 0.12]	[0.09; 0.13]	[0.10; 0.14]	[0.07; 0.10]
age18-34	0.42	0.43	0.41	0.44
	[0.39; 0.44]	[0.40; 0.46]	[0.38; 0.44]	[0.41; 0.47]
age35-49	0.43	0.42	0.41	0.39
	[0.40; 0.45]	[0.39; 0.45]	[0.38; 0.44]	[0.36; 0.41]
age50-64	0.16	0.15	0.18	0.18
	[0.14; 0.18]	[0.13; 0.18]	[0.16; 0.21]	[0.15; 0.20]
Kids age 6 or below	0.36	0.37	0.34	0.38
	[0.33; 0.38]	[0.34; 0.40]	[0.30; 0.37]	[0.35; 0.41]
Married	-	-	0.61	0.57
			[0.57; 0.64]	[0.54; 0.60]
Unmarried	-	-	0.39	0.43
			[0.36; 0.43]	[0.40; 0.46]
No matric	0.42	0.40	0.41	0.42
	[0.39; 0.45]	[0.37; 0.43]	[0.38; 0.44]	[0.39; 0.45]
Matric	0.28	0.27	0.27	0.24
	[0.25; 0.30]	[0.24; 0.30]	[0.24; 0.30]	[0.22; 0.27]
Tertiary education	0.30	0.33	0.32	0.34
	[0.28; 0.33]	[0.30; 0.36]	[0.29; 0.35]	[0.31; 0.37]
Urban	0.84	0.85	0.82	0.79
	[0.82; 0.86]	[0.83; 0.87]	[0.79; 0.85]	[0.77; 0.82]
Rural	0.16	0.15	0.17	0.19
	[0.14; 0.18]	[0.13; 0.17]	[0.15; 0.20]	[0.17; 0.21]
Manager & Professionals			0.21	0.18
			[0.18; 0.23]	[0.16; 0.20]
Technicians and Associate professionals			0.07	0.07
			[0.05; 0.09]	[0.06; 0.09]
Clerical support Workers			0.14	0.05
			[0.12; 0.17]	**[0.04; 0.06]**
Service and sales Workers			0.12	0.12
			[0.10; 0.14]	[0.11; 0.14]
Skilled agricultural, Forestry and Fishery workers			0.02	0.01
			[0.01; 0.03]	[0.00; 0.02]
			0.15	0.15

Craft and related trades workers			[0.13; 0.17]	[0.12; 0.17]
Plant and machine operators, and assemblers			0.12	0.16
			[0.10; 0.14]	[0.14; 0.18]
Elementary occupations			0.21	0.26
			[0.14; 0.19]	**[0.23; 0.28]**
Agriculture and Hunting			0.05	0.04
			[0.04; 0.07]	[0.03; 0.05]
Mining			0.06	0.06
			[0.04; 0.07]	[0.05; 0.07]
Manufacturing			0.13	0.13
			[0.10; 0.15]	[0.11; 0.15]
Utilities; Electricity, gas, water			0.04	0.02
			[0.02; 0.05]	[0.01; 0.02]
Construction			0.15	0.16
			[0.13; 0.18]	[0.13; 0.18]
Wholesale and Retail trade; repair			0.12	0.14
			[0.10; 0.14]	[0.12; 0.16]
Transport, storage and comm			0.08	0.09
			[0.06; 0.10]	[0.07; 0.10]
Financial Intermediation			0.17	0.12
			[0.14; 0.19]	[0.10; 0.14]
Community, social and personal services			0.16	0.22
			[0.14; 0.19]	**[0.20; 0.24]**
Private households			0.05	0.02
			[0.03; 0.06]	[0.01; 0.03]
N	1 356	1044	888	1 116

*Notes: (1) No data for marriage status and occupation in wave 1 data. (2) Own computations (3) Variables are weighted. (4) 95% confidence intervals are presented in brackets. Figures in bold indicate variables that are statistically different in the two periods.

Statistics for men in Table 4 show that the distribution of their characteristics was relatively stable across the period when compared to women's. However, the proportion of men in self-employment increased by 4% points from February/April 2020 to June 2020. Men in formal employment decreased by 7% points from the percentage in February (73%) to that in April 2020 to March 2021 (66%). While this change could have reduced men's wages, the effect is relatively larger for women as they had a larger contemporaneous decrease in formal employment than men. Suggesting that the change in women's employment could have had a

relatively larger effect on the direction of the GWG. Comparing only June 2020 and March 2021, male employment in elementary occupations increased by 5% points and by 6% points in community, social and personal services. On the contrary, male clerical support workers decreased by 9% points. However, the net effect of these changes on men's wages is not very clear.

Overall, this discussion shows that there have been a few changes in the sample composition over time which may threaten a comparison of the results across periods. Although not much, most of the heterogeneity is in the composition of females than males. The net changes in female composition from February 2020 to April 2021 point in the direction of a female wage decrease which could have increased the GWG, ceteris paribus. It is highly likely that there is a significant portion of the temporal change in GWG that is attributable to a relatively larger decline in the share of women in formal employment over time when compared to men. If this is plausible, it implies that the results of this study lack external validity.
Between June 2020 and March 2021 women and men both experienced declines and increases in some occupations and industries they are employed in. Therefore, from Table 3 and Table 4 it is unclear whether this will have an impact on the wage differential for that period.

Statistics for mean wages and hours worked

Table 5 presents summary statistics for mean real monthly (hourly) wages and mean hours worked per week. Like Hill and Kohler (2021), we use real hourly wages as one of the independent variables in the real monthly wage regressions. Mean real [5]monthly wages, mean real [6]hourly wages and [7]hours worked are statistically different for men and women for the months of study, excluding real hourly wage in April. For example, in February 2020 the mean real hourly wage for men was R57.64 compared to R39.53 for women. In the same period,

[5] Individuals in the NIDS-CRAM survey were asked to report their monthly earnings in February 2020 and June 2020. If they were unwilling to specify a rand amount, they were asked to identify which income bracket their earnings fall in. To compute monthly earnings, earnings lower than 0 and higher than R100 000 were dropped from the sample. Monthly wages in April 2020, June 2020 and March 2021 were deflated using deflators to base of February 2020.

[6] When generating hourly wages, monthly wages for the period, was divided 4.2 and then divided by hours worked per week in February 2020. Hourly wage in April, June 2020 and March 2021 were computed by dividing monthly earnings by monthly hours worked.

[7] In order to obtain weekly hours worked, days per week was multiplied by hours per day. When computing mean hours worked per week, implausibly large numbers were dropped, those who did not respond to the question were entered in as 0 weekly hours worked and individuals who reported negative hours were dropped from the sample.

weekly hours worked for men were 40.38 and 37.90 for women. On average, men worked longer hours per week and earned higher hourly and monthly wages than their female counterparts between February 2020 and March 2021.

Table 5 indicates that the real hourly wage significantly increased from February to June 2020, with a peak in April, and then declined in March 2021 regardless of gender. Our result for February to June 2020 supports that in Hill and Kohler (2021). The increase from February to April was by 87.72% ((73.81-39.53)/39.53) for women and 45.23% ((83.71-57.64)/57.64) for men. Although real hourly wages in June were lower than those in April, they were higher than those reported in February; by 43.41% ((56.69-39.53)/39.53) and 33.92% ((77.19-57.64)/57.64) for women and men respectively. The increase in mean real hourly wages in April and June may be a consequence of lower earning individuals dropping out of the labour market due to stringent lockdown regulations. Compared to February 2020, real hourly wages were 13.50% lower in March 2021 for men and 14.47% lower for women. Similarly, real monthly wages were higher for both men and women in April than in February 2020, however, they declined in subsequent periods. Real monthly wages in June 2020 were 16.12% and 12.17% lower for women and men respectively, in comparison to April 2020. Indicating that after the initial rise in average wages in April 2020, the labour market started reacting to lockdown restrictions resulting in lower monthly wages in subsequent periods. Both men and women were better off pre-pandemic in comparison to March 2021.

Before controlling for human capital, demographic and job characteristics, the unconditional hourly GWG in February 2020 and March 2021 was 31.42% ((57.64-39.53)/57.64) and 32.19% ((49.86-33.81)/ 49.86) respectively. This shows the percentage by which females' wages were less than males' wages. The monthly GWG was 31.28% ((8 652.27-5 945.64)/8 652.27) in February 2020 and 38.53% ((6 972.76-4 285.92)/6 972.76) in March 2021. These changes in the wage gap indicate that women were made worse off due to the COVID-19 pandemic. Across the wage measures, the unconditional monthly GWG in March 2021 is larger than the concurrent hourly wage gap. This prompts a further look into the factors that drive monthly wages, namely hours worked per week.

As expected, Table 5 shows that hours worked per week were the lowest in April 2020 during level 5 lockdown (the most stringent level of lockdown) for both men and women.

Table 5: Mean real wages, hourly wages and weekly hours worked for men and women: February 2020, April 2020, June 2020, and March 2021

	February 2020 (pre-Covid)			April 2020 (Level 5)			June 2020 (Level 3)			March 2021 (Adjusted level 1)		
	Female	Male	(Pr(|T| > |t|)	Female	Male	(Pr(|T| > |t|)	Female	Male	(Pr(|T| > |t|)	Female	Male	(Pr(|T| > |t|)
Mean real hourly wage	39.53 (50.55)	57.64 (89.50)	(0.00)	**73.81 (265.00)**	**83.71 (197.74)**	(0.22)*	56.69 (135.03)	77.19 (310.86)	(0.05)	33.81 (40.83)	49.86 (71.53)	(0.00)
Mean real monthly wage	5 945.64 (8113.34)	8 652.27 (12096.05)[8]	(0.00)	6196.32 (7680.68)	8860.00 (10561.22)	(0.00)	5 197.27 (7247.17)	7 781.81 (9592.31)	(0.00)	4 285.92)	6 972.76 (8207.86)	(0.00)
Mean hours worked per week	37.90 (15.39)	40.38 (16.48)	(0.00)	27.19 (22.64)	34.95 (23.38)	(0.00)	36.00 (18.65)	40.72 (17.54)	(0.00)	35.25 (16.22)	41.42 (17.67)	(0.00)

Source NIDS-Cram Wave 1, 2 and 5

* Notes: (1) the sample has been restricted to individuals between the age of 18 and 64. (2) The sample has been weighted to represent the population. (3) the standard errors are in brackets. (3) gender differences in wages, hours worked differences are reported at the 95% significance level.

[8] Some of the standard errors reported in the table are quite large even after removing outliers. In February, April, June, and March 2021 monthly wages that were smaller than 0 and greater than 100 000 were dropped from the sample.

Between February 2020 and April 2020 weekly hours worked declined by -28.26% (27.19-37.90)/37.90) for women and -13.45% ((34.95-40.38)/40.38)) for men. Casale and Posel (2021) also reported a decline in weekly hours worked between February 2020 and April 2020. While hours worked per week declined in April 2020, interestingly, between February 2020 and April 2020, real monthly wages and real hourly wages increased for both genders. By March 2021, mean hours worked per week had increased slightly by 2.53% above the pre-COVID level for men, but decreased by 6.99% for women. Thus, the gender gap in hours worked per week had increased by March 2021.

Kernel Density Functions for log real monthly wage and hours worked per week

Figures 1 and 2 illustrate the distribution of real monthly wages and hours worked per week by gender for February 2020, April 2020, June 2020, and March 2021. This provides further insight on how the wage distribution evolves throughout the various levels of lockdown.

Figure 1: Distribution of log real monthly wage

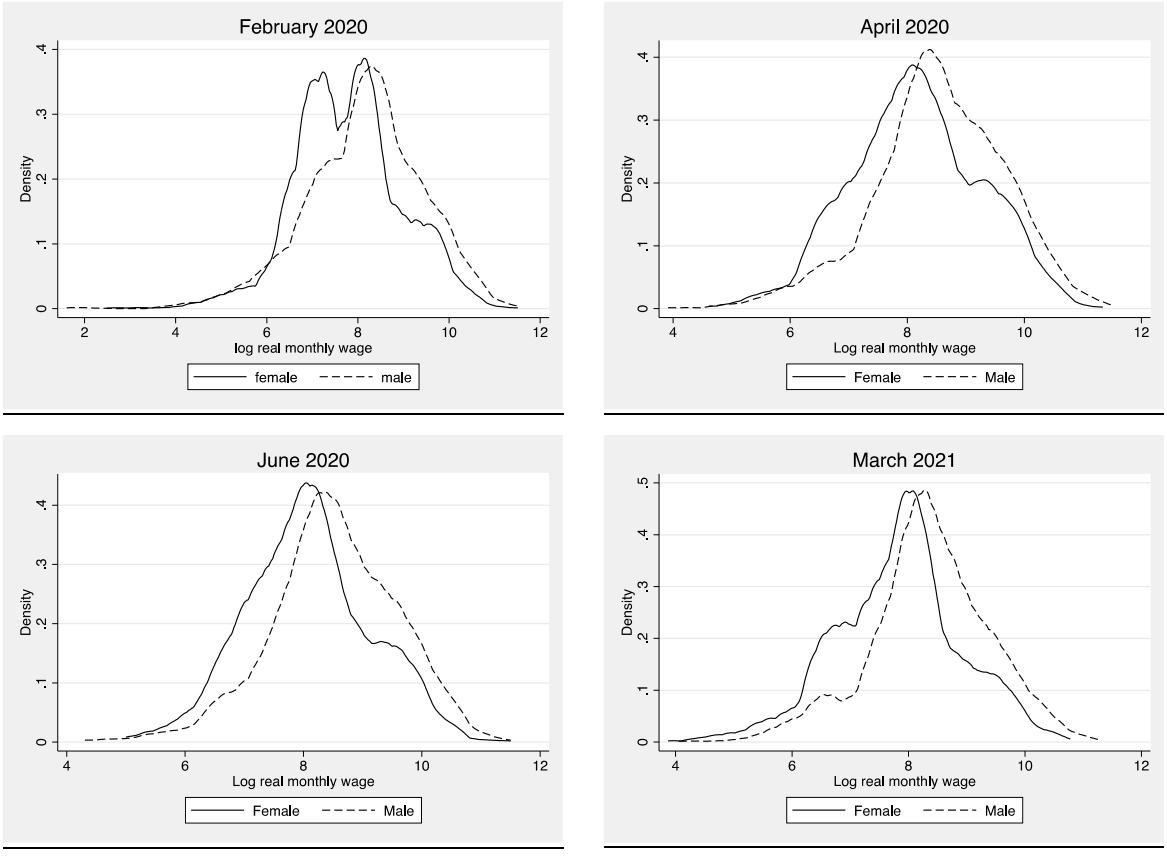
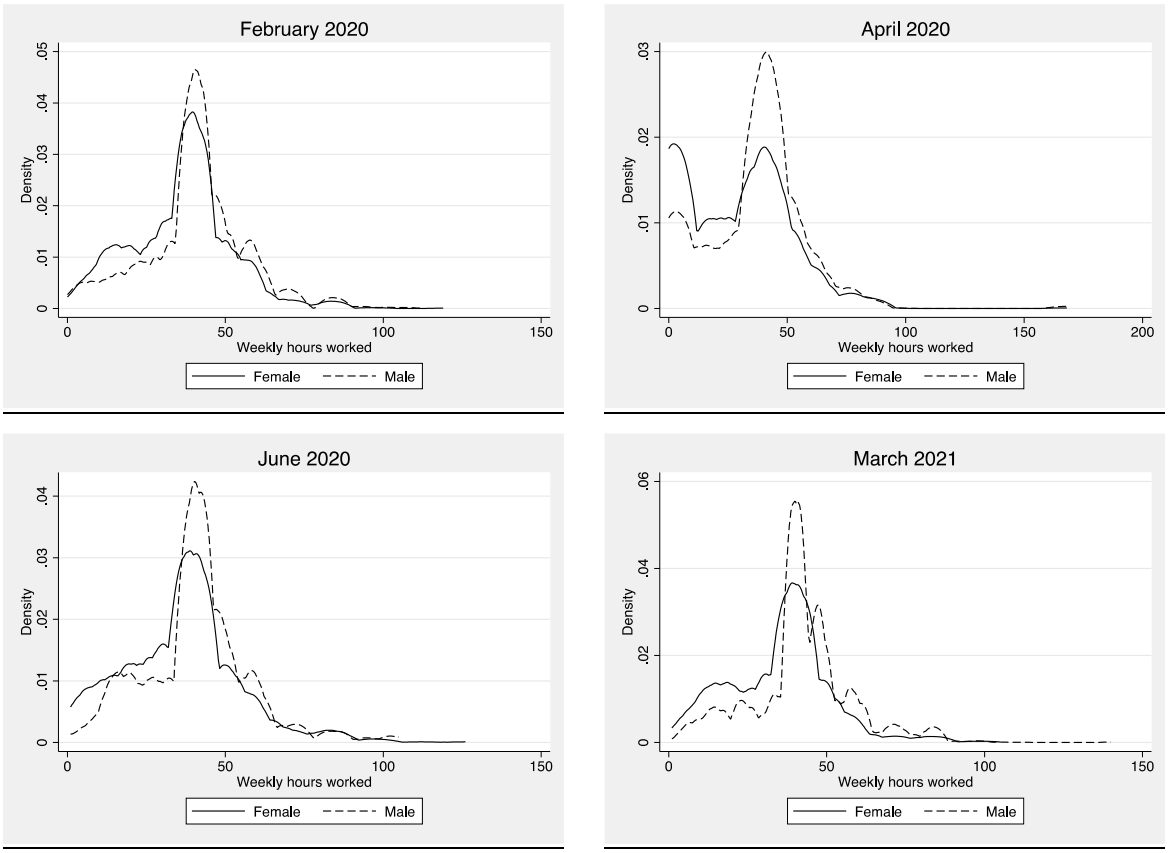


Figure 1 shows substantive changes in the monthly wage distribution for both genders. In February 2020, the kernel density function of log real monthly wages for men is skewed to the right, indicating that a greater portion of men fall within the top wage distribution than women. By March 2021, the distribution is more centred, indicative of a decline in top earning men. This is in line with Table 2 that shows a fall in males' mean monthly wages from R8 652.269 (February 2020) to R6 972.760 (March 2021). On the other hand, changes in the shape of the kernel density function for women indicate an increase in middle and top earning women and a fall in low earning women between February 2020 and April 2020, which explains the increase in monthly wages in April. Between June 2020 and March 2021, the proportion of women that fall within the top of the wage distribution declines, thus, suggesting that the fall in female monthly wages was driven by a decline in top female earners.

Figure 2 illustrates the distribution of men and women's hours worked per week over time. In February 2020, a higher proportion of men worked longer hours than women. In line with our findings in Table 5, Figure 2 illustrates that in April 2020, the distribution for both men and women is skewed more to the left, indicating a drop in weekly hours worked. A higher proportion of women and men reported zero hours worked in April 2020 relative to February 2020; the proportion of women in this category is higher than that of men. Casale and Posel (2020) also reported a similar finding. Figure 1 indicates a low density of monthly wage earners at the bottom end of the wage distribution in April 2020. Thus, individuals who reported zero weekly hours worked could be more concentrated to the bottom of the wage distribution. In June 2020 the kennel distribution shifts slightly to the right indicating a rise in weekly hours worked.

In June 2020 the proportion of men and women that reported zero weekly hours worked declined. In March 2021, the distribution of weekly hours worked for men shifts slightly to the right and is peaked more in the middle in comparison to June 2020 showing a further rise in weekly hours worked. The distribution for weekly hours worked for women in March 2021 is similar to the distribution in June 2020. However, there is a decline in the density of women who reported longer weekly hours worked. Thus, resulting in a slight decline in weekly hours worked for women in March 2021. These changes in the distribution of weekly hours worked for men and women partly explain why the monthly GWG increases over time – a loss in hours of work for women coupled with an increase in men's hours of work, ceteris paribus.

Figure 2: Distribution of hours worked per week



5. Results

Mincerian regression

In order to assess the temporal changes in the mean conditional and unconditional raw GWG, the mincerian OLS regression is estimated separately for February 2020, April 2020, June 2020 and March 2021. Variables controlled for in the regressions are age, population group, having kids below the age of 6, education, work type and location. Weekly hours worked is included when monthly wages are estimated. The base categories are male, age 18-34, white, tertiary education and rural. We note that our dataset does not have information on other predictors of wages such as labour union membership. Monthly and hourly wages are regressed against gender (female) in order to obtain the conditional raw GWG. We note that these estimates are based on the assumption that men and women have similar coefficients to their characteristics which will be relaxed in the O-B decomposition. The complete regression estimates can be found in appendix B.1.

Table 6: OLS Regression estimates of the GWG

Dependent variable	**Log hourly wage**							
Period	**February 2020**		**April 2020**		**June 2020**		**March 2021**	
Controls	Y	N	Y	N	Y	N	Y	N
Female	-0.32***	-0.22**	-0.41***	-0.26*	-0.39***	-0.30**	-0.32***	-0.29***
	(0.06)	(0.07)	(0.09)	(0.11)	(0.08)	(0.10)	(0.05)	(0.07)
Confidence interval	[-0.44; -0.20]	[-0.36; -0.08]	[-0.59; -0.22]	[-0.48; -0.05]	[-0.55; -0.24]	[-0.49; -0.12]	[-0.43; -0.22]	[-0.44; -0.15]
Constant	4.35***	3.34***	4.66***	3.83***	4.49***	3.71***	4.54***	3.51***
	(0.16)	(0.06)	(0.20)	(0.07)	(0.21)	(0.07)	(0.15)	(0.05)
N	2510	2576	1238	1282	1352	1440	2073	2170
R-square	0.34	0.01	0.31	0.01	0.35	0.02	0.40	0.02
F-statistic	41.54	9.17	22.00	5.85	26.21	10.02	45.42	15.96
Prob > F	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Dependent Variable	**Log monthly wage**							
Period	**February 2020**		**April 2020**		**June 2020**		**March 2021**	
Controls	Y	N	Y	N	Y	N	Y	N
Female	-0.33***	-0.27***	-0.44***	-0.29***	-0.52***	-0.46***	-0.42***	-0.54***
	(0.06)	(0.07)	(0.08)	(0.08)	(0.07)	(0.09)	(0.05)	(0.08)
Confidence interval	[-0.45; -0.21]	[-0.42; -0.12]	[-0.60; -0.28]	[-0.45; -0.12]	[-0.65; -0.38]	[-0.64; -0.28]	[-0.53; -0.32]	[-0.70; -0.39]
Constant	8.39***	8.30***	9.10***	8.66***	8.95***	8.68***	8.76***	8.53***
	(0.18)	(0.06)	(0.20)	(0.06)	(0.21)	(0.07)	(0.15)	(0.05)
N	2525	2834	1525	1965	1352	1567	2073	2281
R-square	0.44	0.01	0.36	0.015	0.49	0.04	0.54	0.06
F-statistic	63.37	12.96	29.60	11.78	52.79	25.10	79.73	49.16
Prob > F	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes (1) Standard errors in parentheses. (2) * p<0.05, ** p<0.01, *** p<0.001. (3) Full table can be found in appendix (Table A).Y=yes, N=no control variables. CI are calculated at 95% level of significance.

At face value, results in Table 6 indicate that after controlling for individual characteristics, the hourly GWG is the highest in April 2020 – when lockdown regulations were at the strictest. After increasing from 32% to 41% between February and April 2020, the gap decreases in June and further decreases to 32% in March 2021, which is the pre-COVID level. However, this changes when considering the confidence intervals at the 95% level of significance, they all overlap, which indicates that GWG was of the same order across all these months. Results at face value also show that the monthly GWG increased from February to June 2020, and then

decreased in March 2021, but does not revert to its pre-COVID level. However, an analysis of the confidence intervals suggests that the GWG was statistically similar across the time periods. These results suggest that both the hourly and monthly GWGs are present but did not register statistically significant changes when comparing the period before COVID and during early and late periods of the pandemic. This result is not unique to this study alone, Hill and Köhler (2021) reached a similar conclusion when comparing early periods of the pandemic and the pre-COVID period. However, we note that this result should be treated with caution. When using a small sample size, one might be at risk of a type II error – incorrectly accepting that there is no difference between the monthly and hourly wage gap between the periods studied in this paper.

Taking a look at other factors that affect earnings, results in Table B.1 (full Table 6 – appendix B), show that individuals with matric and no matric education have lower wages than those with tertiary education over the study period. The differential is statistically significant and greater (smaller) between individuals with no matric (matric) and tertiary education. Thus, returns to education increase with the levels of education as predicted by human capital theory. The results also show a racial wage differential where being white is associated with significantly higher wages than other racial groups.

When looking at the role that age plays, the log monthly and hourly wages of individuals aged 50-64 years is significantly higher (at the 5% level) than that for the 18-34 years age group, except for April 2020. However, wages for individuals aged 35-49 years are consistently higher than those of the base category, at the 5% level of significance. This supports theory that older individuals – assumed to have higher levels of experience – earn higher wages than younger individuals. In addition, the results report a decrease in returns to experience between February 2020 and April 2020, while the result varied in subsequent months, it also emerges that the returns were lower in March 2021 compared to February 2020. Formal employment is associated with higher wages than informal employment, except for April 2020. The results also suggest a self-employment wage penalty. Residing in an urban area had a similar effect on wages as living in a rural area at the 5% level of significance (except for hourly wage in April 2020), and having children aged below 7 years did not significantly determine wages. Results for *weekly hours worked* show that the monthly wage increases by 1-2 log points in response to a hour increase in weekly hours worked during the period of analysis. This result is statistically significant at conventional levels.

Given evidence of the unconditional GWG which is present in each period but does not vary over time, below we discuss results of the O-B decomposition analysis to analyse sources of the gap.

Decomposing the GWG

Table 7 presents overall results of the O-B decomposition of the log hourly and log monthly GWGs at the mean for February 2020, April 2020, June 2020 and March 2021. These are based on female coefficients as the reference group. In Table 7 'Difference' gives the total wage gap computed as a differential between mean wages for men and women. 'Coefficients' effect shows a change in women's wages if they had male coefficients while the 'Endowments' effect shows an increase/decrease in women's wages if they had male characteristics. 'Interaction' denotes the simultaneous effect of these two components. The 'Endowments' and 'Coefficients' components are further decomposed to show the contribution of each of the explanatory variables to the GWG. To address the parameter invariance issue, the categorical variables (age, race and education) have been normalised following Yun (2005).

Overall decomposition results

Findings for log hourly wage show that in February 2020 (pre-COVID) the GWG was 0.235 log points, this increased to 0.277 log points (in April 2020), 0.314 log points (in June 2020) and dampened to 0.284 log points (in March 2021), although still larger than the pre-COVID level by 23.5% ((0.284-0.235)/0.235). The monthly wage GWG showed a sustained and statistically significant increase over the period with the magnitude surpassing that of the hourly wage gap in June 2020 (0.462 log points) and March 2021 (0.525 log points). Indicative of a disproportional impact of the Covid-19 pandemic on women.

Table 7: Oaxaca-Blinder Decomposition (female coefficients as the reference group)

	Hourly GWG				**Monthly GWG**			
	February 2020	April 2020	June 2020	March 2021	February 2020	April 2020	June 2020	March 2021
Log wage Male	3.362*** (0.000)	3.836*** (0.001)	3.715*** (0.000)	3.525*** (0.000)	8.326*** (0.000)	8.683*** (0.00)	8.681*** (0.000)	8.540*** (0.000)
Log wage Female	3.128*** (0.000)	3.559*** (0.001)	3.401*** (0.001)	3.241*** (0.000)	8.036*** (0.000)	8.379*** (0.001)	8.218*** (0.000)	8.014*** (0.000)
Difference	0.235*** (0.001)	0.277*** (0.001)	0.314*** (0.001)	0.284*** (0.001)	0.290*** (0.001)	0.304*** (0.001)	0.463*** (0.001)	0.525*** (0.001)
[Confidence interval]	[0.234; 0.236]	[0.275; 0.278]	[0.313; 0.315]	[0.283; 0.285]	[0.289; 0.291]	[0.302; 0.305]	[0.462; 0.465]	[0.524; 0.526]
Interaction	-0.015*** (0.000)	-0.010*** (0.000)	-0.029*** (0.000)	-0.025*** (0.000)	-0.014*** (0.000)	0.041*** (0.000)	-0.000 (0.000)	-0.036*** (0.000)
Endowments/ Explained component								
Total proportion	-0.076*** (0.000)	-0.107*** (0.001)	-0.065*** (0.000)	-0.024*** (0.000)	-0.094*** (0.000)	-0.123*** (0.000)	-0.061*** (0.000)	0.021*** (0.000)
Race	-0.022*** (0.000)	-0.028*** (0.000)	-0.009*** (0.000)	-0.016*** (0.000)	-0.017*** (0.000)	-0.018*** (0.000)	-0.006*** (0.000)	-0.016*** (0.000)
Age	-0.001*** (0.000)	0.002*** (0.000)	-0.001*** (0.000)	-0.018*** (0.000)	-0.002*** (0.000)	-0.011*** (0.000)	-0.002*** (0.000)	**-0.020*** ** (0.000)
Kids	**0.018*** ** (0.000)	**0.009*** ** (0.000)	**0.002*** ** (0.000)	**0.010*** ** (0.000)	0.014*** (0.000)	0.006*** (0.000)	-0.010*** (0.000)	0.009*** (0.000)
Education	**-0.060*** ** (0.000)	**-0.063*** ** (0.000)	**-0.047*** ** (0.000)	**-0.022*** ** (0.000)	**-0.066*** ** (0.000)	**-0.061*** ** (0.000)	**-0.043*** ** (0.000)	-0.013*** (0.000)
Employment	-0.011*** (0.000)	-0.023*** (0.000)	-0.010*** (0.000)	**0.022*** ** (0.000)	-0.022*** (0.000)	**-0.037*** ** (0.000)	0.001*** (0.000)	**0.061*** ** (0.000)
Location	0.000*** (0.000)	-0.003*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.001*** (0.000)	-0.003*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)
Coefficients/ discrimination component								
Total proportion	0.326*** (0.001)	0.394*** (0.001)	0.408*** (0.001)	0.333*** (0.000)	0.398*** (0.001)	0.413*** (0.001)	0.525*** (0.001)	0.540*** (0.000)
Race	**0.200*** ** (0.000)	**0.358*** ** (0.001)	**0.169*** ** (0.001)	**0.139*** ** (0.001)	**0.151*** ** (0.001)	**0.300*** ** (0.001)	**0.201*** ** (0.001)	**0.168*** ** (0.001)
Age	-0.055*** (0.000)	-0.023*** (0.000)	-0.041*** (0.000)	-0.032*** (0.000)	-0.058*** (0.000)	-0.021*** (0.000)	-0.074*** (0.000)	-0.036*** (0.000)
Kids	**0.065*** ** (0.000)	**0.102*** ** (0.001)	0.003*** (0.001)	0.086*** (0.000)	0.075*** (0.001)	0.031*** (0.001)	-0.007*** (0.000)	0.079*** (0.000)
Education	-0.009*** (0.000)	0.049*** (0.000)	0.025*** (0.000)	0.011*** (0.000)	-0.021*** (0.000)	0.011*** (0.000)	-0.007*** (0.000)	0.025*** (0.000)
Employment	**0.099*** ** (0.001)	**-0.420*** ** (0.001)	**-0.274*** ** (0.001)	-0.030*** (0.001)	0.019*** (0.001)	-0.127*** (0.001)	-0.197*** (0.001)	**-0.199*** ** (0.001)
Location	0.078*** (0.001)	**0.218*** ** (0.002)	0.081*** (0.001)	-0.035*** (0.001)	0.028*** (0.001)	-0.065*** (0.002)	0.109*** (0.001)	0.046*** (0.001)
Constant	-0.051*** (0.002)	0.109*** (0.003)	0.445*** (0.002)	0.193*** (0.002)	0.204*** (0.002)	0.283*** (0.002)	0.501*** (0.002)	0.457*** (0.002)
N	2510	1238	1352	2073	2728	1873	1454	2171

Race: African, Coloured Indian and White
Age: age18-34, age35-49 and age50-64
Kids: kids age 6 or below
Education: no matric, matric and post matric(tertiary)
Employment: self-employment and formal employment
Location: Urban

* Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

*Notes: (1) Standard error are in parenthesis (2) * p<0.05, ** p<0.01, *** p<0.001. (3) Other variations of the Oaxaca-Blinder decomposition can be found in the appendix (Appendix C.1 – C.2). (4) No data for marriage status in wave 1 data – the variable married has been omitted from the decomposition in order to ensure that the result are directly comparable. (5) Figures in bold indicate the variables that have a higher relative contribution to the unexplained or explained gap for that period.

Table 7 presents a consistently positive 'Coefficients/unexplained' effect regardless of the wage measure. This suggests that women's wages could have been higher than their current level if they had male coefficients. For instance, regressions for hourly wages reveal that in February 2020 women's wages could have been 0.326 log points higher than what is observed if they maintained their characteristics but were paid according to men's returns structure.

Concerning changes in the 'Coefficients' effect over time, we observe that the trend for both hourly and monthly wages is parallel to that for the total wage gap. The results also suggest that differences in unobservable characteristics/discrimination are the main driver of the wage gap across all lockdown levels. The 'Endowments' effect is mostly negative, which indicates that women's wages could have been lower than their current level if they had men's characteristics. Consistent with findings in other South African studies (Mosomi, 2019), women have higher human capital attainment than men; if the human capital component were not considered, women would be worse off.

To check robustness of our results to the choice of reference category, we proceed to discuss findings based on male coefficients and pooled coefficients as reference (following Oaxaca and Ransom (1994)). These are in Tables C.1 and C.2 in the appendix. In Table C.1 we decompose the GWG while using the male coefficient as the reference, the assumption made is that women are unfairly compensated, and men are fairly compensated. This computation can be perceived as a reverse scenario of the case where female coefficients act as the reference category. Here male wages were subtracted from female wages. Therefore, the hourly and monthly wage gaps in Table 7 and Table C.1 (appendix) are of similar trend, magnitude and statistically significant for all periods, but with opposite signs. When male is used as the reference category, the wage difference is negative, suggesting that men are better compensated than women. Using results for the log monthly wage as an illustration, in February 2020 and March 2021, women's returns to characteristics were on average 0.38 log points and 0.50 log points less than those for men. The 'Endowments' effect is positive, which is a wage advantage that women have over men due to better endowments than men. Similarly, the Coefficients' effect outweighs the 'Endowments' effect in explaining the gap. In Table C.2 (appendix), we decompose the gender

wage differential while utilising the Oaxaca and Ransom (1994) decomposition. This is a two-fold decomposition which uses pooled coefficients estimated from a combined sample of men and women as the reference coefficients, and the male reference group. The size of the GWG in this model is of the same order as that uncovered from the O-B decomposition. This also applies to the direction of the 'Coefficients' effect and the 'Endowments' effect. However, the values of the 'Coefficients' effect and 'Endowments' effect are quantitatively different. Across all periods and wages, the unexplained component is greater than the wage differential and, the explained component plays a small contribution in decreasing the wage gap. This emphasises the impact of discrimination on the GWG.

Variable contributions

Here we discuss the contribution of the explanatory variables to the Coefficients' and the 'Endowments' components of the GWG. Given the robustness of the overall decomposition results to the choice of the reference category, we base this discussion on decomposition results based on female reference category, see Table 7 above.

'Endowments' effect results for the hourly wage in February 2020 show that gender differences in the distribution of education made the largest contribution (78.9% (-0.060/-0.076) to the explained gap. The absolute value of its contribution slightly increased in April 2020 and declined thereafter. However, education's relative contribution to the endowment effect was higher in March 2021 at 91.7% (-0.022/-0.024). The result for education can be interpreted as that the gender difference in the education distribution (women's is better than men's) dampened the hourly wage GWG by 2.2 - 6.3% points over the given period, and similarly reduced the monthly wage GWG by 0.13 - 6.6% points. The second most important contributor to the endowment effect in February 2020 was population group composition, accounting for (-0.022 log points/ 28.9% of the explained gap. This suggests that if men and women had the same population group composition the GWG could have been lower by 2.2% points. The effect of population group on the hourly wage gap increased from February to April 2020 and decreased thereafter, a similar trend is also uncovered for the monthly wage gap.

The contribution of employment sector to the 'Endowments' effect is not robust, although in cases where it reduces the GWG the contribution seems to follow that of population group. However, in March 2021 gender differences in employment sector composition work to

increase the GWG regardless of definition of wages. Table 2 shows that during this period women had a lower share in formal employment and a higher share of self-employment than men, which is associated with relatively lower wages for women than men. The findings also show that having children aged below 7 years contributed to an increase in the hourly/monthly GWG over time by 0.2 - 1.8% points. This works through women's disproportionate contribution to childcare which compromises labour market productivity when compared to men. The gender difference in men and women's geographic location (rural/urban) had the least contribution to the explained hourly/monthly GWG.

Results for the unexplained component show that gender differences in coefficients to population group play an important role in the 'Coefficient' effect. This increases the hourly wage GWG by 13.9 -35.8% points, and the monthly wage GWG by 15.1 – 30% points. This indicates the role of race-based gender wage discrimination in explaining the GWG. Coefficients for the constant term also play a significant role in the unexplained effect. This could be indicating 'pure' gender wage discrimination or the effect of gender differences in unobservable characteristics and omitted variables. Results also indicate that the coefficient effect for having children aged below 7 years had a notable effect of increasing the monthly and hourly GWG. Over the study period, the increase ranged between 0.3 and 10.2% points for the hourly wage GWG and, 3.1 and 7.9% points for the monthly wage GWG. This suggests a wage penalty for women associated with childcare when compared to their male counterparts. Although location has little to no influence on the endowment component, it has a larger impact on the unexplained component. It contributes positively to the hourly wage gap across all periods apart from March 2021 (for the hourly wage gap) and April 2020 (for the monthly wage gap) when its effect is negative. In most cases, gender differences in coefficients to sector of employment tended to reduce the GWG. Exception is February 2020, where it accounted for 30.4% of the hourly and 4.8% of the monthly unexplained gap. The dampening effect suggests that if men and women had the same distribution of workers in the formal sector, women would receive a formal sector employment premium when compared to men. In summary, this discussion shows that the driving factors of the explained and unexplained parts of the GWG were largely similar over time.

Effect of Weekly hours worked on the monthly GWG

One of the objectives of this study is to analyse the effect of hours of work on the monthly GWG. Outcomes for the monthly GWG decomposition which incorporates weekly hours worked are shown in Table 8. This shows that the total GWG, 'Coefficient' and 'Endowment' effects are qualitatively similar to those uncovered in Table 7.

Table 8: Oaxaca-Blinder decomposition results including Weekly hours worked

Monthly GWG				
	February 2020	April 2020	June 2020	March 2021
Log wage Male	8.363***	8.749***	8.682***	8.546***
	0.000	0.000	0.000	0.000
Log wage Female	8.081***	8.403***	8.245***	8.057***
	0.000	0.001	0.001	0.000
Wage differential	0.283*** (0.281; 0.284)	0.346*** (0.344; 0.347)	0.437*** (0.436; 0.439)	0.489*** (0.488; 0.490)
	0.001	0.001	0.001	0.001
Interaction	-0.022***	0.040***	0.002***	-0.066***
	0.000	0.000	0.000	0.000
Endowments				
Total proportion	-0.029***	-0.114***	-0.082***	0.101***
	0.000	0.000	0.001	0.000
Race	-0.022***	-0.029***	-0.010***	-0.016***
	0.000	0.000	0.000	0.000
Age	-0.000***	-0.002***	-0.004***	-0.017***
	0.000	0.000	0.000	0.000
Kids 6 or below	0.019***	0.008***	-0.009***	0.010***
	0.000	0.000	0.000	0.000
Education	-0.067***	-0.061***	-0.058***	-0.022***
	0.000	0.000	0.000	0.000
Employment	-0.014***	-0.047***	-0.014***	0.039***
	0.000	0.000	0.000	0.000
Location	0.001***	0.002***	0.001***	0.000***
	0.000	0.000	0.000	0.000
Weekly hours worked	0.056***	0.019***	0.013***	0.107***
	0.000	0.000	0.000	0.000
Coefficients				

Total Proportion	0.333***	0.420***	0.517***	0.454***
	0.001	0.001	0.001	0.000
Race	0.178***	0.370***	0.147***	0.185***
	0.001	0.001	0.001	0.001
Age	-0.051***	-0.012***	-0.075***	-0.027***
	0.000	0.000	0.000	0.000
Kids	0.084***	0.047***	-0.009***	0.060***
	0.001	0.001	0.001	0.000
Education	-0.011***	0.018***	0.004***	0.015***
	0.000	0.000	0.000	0.000
Employment	0.101***	-0.237***	-0.255***	-0.100***
	0.001	0.001	0.001	0.001
Location	0.107***	0.097***	0.077***	-0.006***
	0.001	0.002	0.001	0.001
Weekly hours worked	**0.007*** **	**0.115*** **	**0.087*** **	**-0.249*** **
	0.001	0.001	0.001	0.001
Constant	-0.081***	0.021***	0.542***	0.575***
	0.002	0.003	0.002	0.002

Race: African, Coloured Indian and White
Age: age18-34, age35-49 and age50-64
Kids: kids age 6 or below
Education: no matric, matric and post matric(tertiary)
Employment: self-employment and formal employment
Location: Urban

* Confidence interval in parenthesis
* p<0.05, ** p<0.01, *** p<0.001

*Notes: The variable married has been omitted due to marital status not being reported in Wave 1 data (February 2020 and April 2020)

Weekly hours worked has a positive statistically significant contribution to the 'Endowment effect'. Given that the overall 'Endowment effect' is negative, the gender differential in weekly hours worked counteracts this dampening effect on the GWG across all periods; except March 2021. The effect on the explained gap is comparable to and larger than that of having children aged below 7 years. This supports the idea that women's monthly wages are lower than men's partly due to spending relatively less time at paid work, although they spend more time on child-care. We also note that, in absolute value, weekly hours worked was the second largest contributor (following education) to the 'Endowment effect' in February 2020. Its contribution decreased in April and June 2020 but increased in March 2021 to become the single largest contributor to the 'Endowment effect' – contributed 105.94% (0.107/0.101) of the explained gap. Notably, the 'Endowment effect' (explained gap) became positive in March 2021 after

being negative in previous periods. This suggests that men in March 2021 had a better endowment of characteristics than women, which was driven primarily by weekly hours. Weekly hours worked also contributed to the unexplained gap although the effect is not robust. However, it was the second (third) largest contributor to the gap in April 2020 (June 2020), following population group (population group and the constant term). Again, this indicates the importance of equal pay structures for time that men and women spend at work.

Effect of Industry and Occupation on the GWG

Blau and Kahn (2016) find that industry and occupation are significant factors in wage determination. Thus, in Table 9 we decompose the hourly and monthly GWG for June 2020 and March 2021 while controlling for industry, occupation, and marital status among other covariates in Table 7. Industry and occupation data is only available for June and March 2021. The base categories used are white, age 18-34, tertiary (post matric), elementary work and private households.

Table 9: Oaxaca-Blinder decomposition results controlling for industry and occupation

	Log hourly wage		Log monthly wage	
	June 2020	March 2021	June 2020	March 2021
Panel A: Threefold decomposition - female reference category				
Coefficients	0.34*** (0.00)	0.25*** (0.00)	0.42*** (0.00)	0.40*** (0.00)
Endowments	0.06*** (0.00)	0.17*** (0.00)	0.13*** (0.00)	0.19*** (0.00)
Interaction	-0.07*** (0.00)	-0.16*** (0.00)	-0.07*** (0.00)	-0.10*** (0.00)
Difference (wage gap)	0.33*** (0.00)	0.26 (0.00)	0.48*** (0.00)	0.48*** (0.00)
Panel B: Twofold decomposition - female reference category				
Unexplained	0.33*** (0.00)	0.23*** (0.00)	0.40*** (0.00)	0.36*** (0.00)
Explained	0.00 (0.00)	0.03*** (0.00)	0.07*** (0.00)	0.12*** (0.00)
Difference (wage gap)	0.33*** (0.00)	0.26*** (0.00)	0.48*** (0.00)	0.48*** (0.00)

*Notes: (1) Standard error are in parenthesis. (2) Female is used as the reference coefficient. (3) * p<0.05, ** p<0.01, *** p<0.001. (3) full Oaxaca-Blinder decomposition results can be found in the appendix (Appendix C.3 – C.4).

Table 9 shows that when controlling for industry and occupation, the GWG at the mean is statistically significantly different from zero in June 2020 and March 2021. The discrimination/unexplained component remains the main contributing factor to the GWG. However, controlling for occupation and industry alters the magnitude of the GWG. Similar to results in Table 7, we find that the monthly wage GWG is larger than the hourly wage GWG.

Also, in June 2020 (March 2021) both the monthly and hourly wage gap are larger (smaller) when accounting for industry and occupation than when not. However, the changes in the monthly wage GWG between June 2020 and March 2021 are not statistically significant. Results further show that occupation and industry subsumed is the largest contributor to the endowments component (see appendix – Table C.3 and Table C.4). It is however, difficult to generalise this result as it is only analysed for a portion of the study period.

6. Conclusion, policy recommendations and limitations

The COVID-19 pandemic allows for a natural experiment to be conducted based on the negative effects of the pandemic on the GWG. The GWG is a crucial socio-economic issue that has a significant negative influence on economic development and poverty. Several studies indicate the presence of gender wage inequality in the South African labour market. Narrowing the GWG may be used as a tool to eradicate social inequalities in the country. Hence, it is crucial to understand the underlying cause of wage inequalities is South Africa. This study investigates temporal changes in the GWG using NIDS-CRAM survey data covering February 2020 (pre-COVID) and during COVID periods of April 2020, June 2020 and March 2021, descriptive statistics, Mincerian OLS wage regressions and a mean-based Oaxaca-Blinder decomposition. The analysis measures wages on an hourly and monthly basis in order to analyse the effect of the changes in hours of work on the GWG.

The findings in this study indicate the existence of a GWG in all periods of study. The magnitude of the hourly wage and monthly wage GWGs differs across the various lockdown levels. Although the GWG in each period is statistically different from zero, the changes in the unconditional and conditional GWGs are not statistically different across the various periods. Hill and Kohler (2021) found similar results when comparing the conditional wage gap present in February 2020 and June 2020. Conversely, the Oaxaca-Blinder decomposition results

indicate that the monthly and hourly wage gaps were statistically different in all periods. We also consistently find that the 'Coefficient effect'/unexplained component ('discrimination' and other unobservables) rather than the 'Endowment' effect is the main driver of the GWG across all the periods. Ntuli (2007) and Bhorat and Goga (2013) also found evidence of gender discrimination in the South African labour market. Given the large strides made in gender equality globally and nationally, one would not expect the discrimination component to

contribute to wage differential to the extent that it does as suggested in this study. Furthermore, we find that the COVID-19 pandemic has widened the unexplained effect on the GWG. When examining the impact of weekly hours worked on the monthly wage GWG, our results indicate that although weekly hours worked is a statistically significant factor in wage determination, factors such as race explain a greater proportion of the GWG. Since the discrimination component explains a greater portion of the GWG; policy makers should devote their efforts to addressing gender wage discrimination in the South African labour market. Race in particular accounts for the largest proportion of the unexplained effect.

Women in the sample are more educated than men, and if it were not for their educational attainment, the GWG would be larger. The findings confirm that education and the employment sector play a crucial part in reducing the explained GWG. The association between educational attainment and the wage differential call for concern because women are more educated but are paid less than their male counterpart, contrary to human capital theory. One explanation for the wage differential is women self-selecting into low-wage jobs. A recent study by O'Brien et al. (2022) suggests that gender coding may be the reason why women self-select into certain occupations. O'Brien et al. (2022) state that the percentage of male vs female applicants that choose to apply for a job is influenced by the feminine or masculine-code language utilised in job advertising. Therefore, utilising gender-neutral language in job advertising may help reduce occupational segregation in the South African labour market.

Overall, both men and women were negatively impacted by the global COVID-19 pandemic. However, women were disproportionally affected. Both men and women experienced a decline in average monthly and hourly wages between February 2020 and March 2021. Similar to Casale and Posel (2020), we found that women have a higher child burden than their male counterparts. A greater proportion of women have children and a lot of women are the head of households in South Africa, but women continue to earn lower wages. Additionally, women experienced a decline in hours worked per week between February 2020 and March 2021, this

is likely related to their increased child burden. Conversely, between February 2020 and March 2021, hours worked per week for men increased. This study indicates that women in South Africa bore the brunt of the negative effects of the early stages of the national lockdown.

Based on the results of this study, we recommend measures that reduce the effect of race on the GWG in South Africa, as well as pure gender wage discrimination in the South African

labour market. While this is already enshrined in the country's labour laws, there is a need for further understanding on the implementation side. Moreover, in the instance of similar lockdown shocks to the economy, we suggest that the government should put in place targeted measures to mitigate the negative effect of the childcare burden on women's wages and income. This can be in the form of social grants which widen or deepen the influence of the current child support grant. Short-term employment relief funds for women and other workers who unduly lose hours of work during stringent levels of lockdown are required to address wage inequality in the South Africa. Measures to increase women's participation in the formal sector of the labour market are also necessary in order to close the GWG.

We also note that this study has some limitations, hence the results are suggestive of the outcomes. First, it utilised the mean-based Oaxaca-Blinder decomposition analysis instead of a distributive approach which enables a more detailed analysis of sources of the GWG due to small sample size of the study. This has also led to pooling men and women of all racial groups in the analysis. Second, the study could not control for sample selection bias due to the lack of appropriate information to account for the bias. Third, wages were measured slightly different in February than in subsequent periods, age has been used as a proxy for experience while union membership could not be controlled for due to data limitations. Fourth, industry and occupation information were not included in the February and April 2020 data gathering process. Therefore, these variables were only controlled for in a separate regression for March 2021 and June 2020. We suggest that future studies can be improved by overcoming such shortfalls.

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Appendix A

Appendix A. 1: Variable descriptions

Dependent and independent variables	Variable names	Description of variable
Dependent variable	Wage/earnings	Log real hourly earnings and log of real monthly earnings derived from information on hours of work and wages.
Independent variables /Explanatory /control variables	Education	Dummies for no matric, matric, and post matric education
	Race	Black, White, Indian, Coloured
	Age	3 different dummy variables defined for individuals aged 18-64 years: 18-34 years 35-49 years 50-64 years
	Weekly hours worked	Number of hours worked in a seven-day week.
	Occupation	• Managers • Professionals, Technicians, and associate professionals • Clerical support workers • Service and sales workers • Skilled agricultural, forestry and fish • Craft and related trades workers • Plant and machine operators, and assembly • Elementary occupations
	Marital status	Married or unmarried
	Location	Rural/ urban dummy variable
	Gender	Gender of an individual: Female dummy variable Male dummy variable
	Kids 6 or below	Dummy variable for individuals with kids that are the age of 6 or below and dummy variable for individuals with kids that are older than 6 or individuals with no kids
	Employment	2 dummy variables

		- Self-employment - Formal employment
	Industry	- Agriculture and Hunting - Mining - Manufacturing - Utilities: Electricity, gas and water - Construction - Wholesale and Retail trade; repair - Transport, storage and comm - Financial intermediation - Community, social and personal services - Private households

*Notes: industry and occupation data available for waves 2 and 5 only.

Appendix B – OLS Regressions

Table B. 1 (full Table 6): Complete Mincerian OLS regression estimates of the GWG: February, April, June 2020 and March 2021

Dependent variable	Log hourly wage				Log monthly wage			
Period	February 2020	April 2020	June 2020	March 2021	February 2020	April 2020	June 2020	March 2021
Female	-0.32***	-0.41***	-0.39***	-0.32***	-0.33***	-0.44***	-0.52***	-0.42***
	(0.06)	(0.09)	(0.08)	(0.05)	(0.06)	(0.08)	(0.07)	(0.05)
African	-0.88***	-0.79***	-0.77***	-1.14***	-0.90***	-0.62***	-0.67***	-1.12***
	(0.11)	(0.14)	(0.15)	(0.12)	(0.11)	(0.12)	(0.14)	(0.12)
Coloured	-0.72***	-0.69***	-0.74***	-1.02***	-0.75***	-0.63***	-0.73***	-0.99***
	(0.15)	(0.19)	(0.16)	(0.16)	(0.15)	(0.17)	(0.15)	(0.16)
Indian	-0.97***	-0.69	-0.65	-0.80***	-0.99***	-0.45	-0.80**	-0.80***
	(0.25)	(0.44)	(0.34)	(0.19)	(0.27)	(0.41)	(0.30)	(0.22)
age35_49	0.35***	0.22*	0.39***	0.28***	0.38***	0.32***	0.37***	0.26***
	(0.06)	(0.10)	(0.08)	(0.06)	(0.06)	(0.08)	(0.07)	(0.06)
age50_64	0.42***	0.28	0.52***	0.25**	0.43***	0.28	0.42***	0.22*
	(0.11)	(0.15)	(0.13)	(0.09)	(0.11)	(0.15)	(0.12)	(0.09)
kids6	-0.06	-0.02	-0.00	-0.01	-0.05	-0.06	0.05	-0.04
	(0.06)	(0.10)	(0.08)	(0.06)	(0.06)	(0.08)	(0.07)	(0.05)
No matric	-1.03***	-0.87***	-0.84***	-0.64***	-1.13***	-0.84***	-0.90***	-0.64***
	(0.08)	(0.13)	(0.10)	(0.07)	(0.08)	(0.10)	(0.09)	(0.07)
Matric	-0.72***	-0.78***	-0.55***	-0.51***	-0.76***	-0.71***	-0.49***	-0.49***
	(0.08)	(0.13)	(0.11)	(0.08)	(0.08)	(0.11)	(0.10)	(0.08)

Self employed	-0.43*	-0.63***	-0.72***	-0.51***	-0.48**	-0.82***	-0.95***	-0.64***
	(0.17)	(0.18)	(0.16)	(0.10)	(0.17)	(0.19)	(0.13)	(0.10)
Formal employment	0.21*	0.22	0.30***	0.33***	0.25**	0.41***	0.50***	0.58***
	(0.08)	(0.12)	(0.09)	(0.08)	(0.08)	(0.11)	(0.08)	(0.08)
Urban	0.10	0.22*	0.05	0.09	0.13	0.14	0.11	0.11
	(0.09)	(0.10)	(0.11)	(0.06)	(0.09)	(0.08)	(0.09)	(0.06)
Weekly hours worked					0.02***	0.01**	0.01***	0.02***
					(0.00)	(0.00)	(0.00)	(0.00)
Constant	4.35***	4.66***	4.49***	4.54***	8.39***	9.10***	8.95***	8.76***
	(0.16)	(0.20)	(0.21)	(0.15)	(0.18)	(0.20)	(0.21)	(0.15)
Observations	2510	1238	1352	2073	2525	1525	1352	2073
R-square	0.34	0.31	0.35	0.40	0.44	0.37	0.49	0.54
F statistic	41.54	22.00	26.21	45.42	63.37	29.60	52.79	79.73

Notes: (1) base categories: Age 18-35, White and Tertiary education. (2) Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table B. 2: Complete Mincerian OLS regression estimates (by female) of the GWG: February, April, June 2020 and March 2021

Dependent variable	log hourly wage				Log monthly wage			
Period	February 2020	April 2020	June 2020	March 2021	February 2020	April 2020	June 2020	March 2021
African	-0.73***	-0.76***	-0.62**	-1.16***	-0.76***	-0.59***	-0.54**	-1.19***
	(0.15)	(0.18)	(0.19)	(0.16)	(0.15)	(0.14)	(0.18)	(0.17)
Coloured	-0.45	-0.69*	-0.56**	-0.91***	-0.47*	-0.55*	-0.46*	-0.91***
	(0.23)	(0.28)	(0.21)	(0.17)	(0.23)	(0.25)	(0.19)	(0.18)
Indian	-0.43	-0.18	0.00	-0.55**	-0.49	0.24	-0.32	-0.53*
	(0.26)	(0.28)	(0.62)	(0.21)	(0.30)	(0.29)	(0.41)	(0.21)
age35_49	0.26**	0.14	0.32*	0.24**	0.28**	0.31**	0.31**	0.23**
	(0.09)	(0.15)	(0.13)	(0.07)	(0.09)	(0.12)	(0.10)	(0.07)
age50_64	0.21	0.20	0.37*	0.13	0.23	0.29	0.15	0.13
	(0.13)	(0.19)	(0.15)	(0.11)	(0.14)	(0.18)	(0.12)	(0.10)
kids6	-0.14	-0.18	-0.01	-0.12	-0.15	-0.11	0.06	-0.11
	(0.08)	(0.15)	(0.12)	(0.07)	(0.08)	(0.11)	(0.08)	(0.07)
No matric	-0.87***	-0.69***	-0.75***	-0.59***	-0.96***	-0.74***	-0.91***	-0.63***
	(0.10)	(0.19)	(0.15)	(0.09)	(0.10)	(0.13)	(0.11)	(0.08)
Matric	-0.71***	-0.52*	-0.40*	-0.42***	-0.76***	-0.61***	-0.51***	-0.41***
	(0.10)	(0.22)	(0.168)	(0.10)	(0.11)	(0.17)	(0.13)	(0.10)
Self employed	-0.63**	-0.27	-0.52*	-0.40**	-0.67**	-0.82***	-0.88***	-0.56***

	(0.24)	(0.25)	(0.24)	(0.13)	(0.24)	(0.24)	(0.18)	(0.14)
Formal employment	0.13	0.57**	0.48***	0.32***	0.17	0.62***	0.68***	0.62***
	(0.12)	(0.21)	(0.11)	(0.09)	(0.11)	(0.15)	(0.09)	(0.09)
Urban	0.04	0.07	-0.01	0.11	0.05	0.09	0.06	0.11
	(0.12)	(0.17)	(0.15)	(0.08)	(0.13)	(0.10)	(0.10)	(0.08)
Weekly hours worked					0.02***	0.00	0.01**	0.02***
					(0.00)	(0.00)	(0.00)	(0.00)
Constant	4.05***	4.06***	3.84***	4.24***	8.11***	8.53***	8.32***	8.25***
	(0.20)	(0.29)	(0.27)	(0.18)	(0.22)	(0.22)	(0.24)	(0.19)
Observations	1370	569	714	1107	1380	757	714	1107
R-square	0.31	0.30	0.30	0.40	0.43	0.38	0.52	0.58
F statistic	24.28	16.86	13.82	30.51	41.58	19.61	29.95	54.30

Notes: (1) base categories: Age 18-35, White and Tertiary education. (2) Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Table B. 3: Complete Mincerian OLS regression estimates (by male) of the GWG: February, April, June 2020 and March 2021

Dependent variable	Log hourly wage				Log monthly wage			
Period	February 2020	April 2020	June 2020	March 2021	February 2020	April 2020	June 2020	March 2021
African	-1.01***	-0.81***	-0.88***	-1.09***	-1.03***	-0.64***	-0.74**	-1.05***
	(0.15)	(0.20)	(0.21)	(0.18)	(0.16)	(0.17)	(0.22)	(0.17)
Coloured	-1.01***	-0.76**	-0.86***	-1.06***	-1.03***	-0.69**	-0.90***	-1.04***
	(0.19)	(0.25)	(0.23)	(0.24)	(0.19)	(0.21)	(0.23)	(0.24)
Indian	-1.62***	-1.94**	-1.13***	-0.88**	-1.57***	-1.51**	-1.16**	-0.94**
	(0.39)	(0.60)	(0.32)	(0.28)	(0.40)	(0.55)	(0.36)	(0.30)
age35_49	0.42***	0.28*	0.43***	0.28***	0.44***	0.34**	0.40***	0.28***
	(0.09)	(0.12)	(0.11)	(0.08)	(0.09)	(0.11)	(0.10)	(0.08)
age50_64	0.61***	0.40*	0.66***	0.35*	0.61***	0.37	0.63***	0.32*
	(0.15)	(0.20)	(0.18)	(0.14)	(0.16)	(0.20)	(0.18)	(0.13)
kids6	-0.01	0.06	-0.01	0.06	0.03	-0.01	0.04	0.02
	(0.09)	(0.12)	(0.11)	(0.09)	(0.09)	(0.10)	(0.10)	(0.08)
No matric	-1.17***	-1.00***	-0.95***	-0.67***	-1.27***	-0.92***	-0.93***	-0.61***
	(0.11)	(0.15)	(0.14)	(0.11)	(0.12)	(0.12)	(0.14)	(0.11)
Matric	-0.75***	-0.97***	-0.73***	-0.56***	-0.79***	-0.80***	-0.55***	-0.52***
	(0.11)	(0.14)	(0.14)	(0.12)	(0.11)	(0.12)	(0.13)	(0.11)
Self employed	-0.34	-0.76***	-0.85***	-0.62***	-0.39	-0.83***	-0.96***	-0.73***

	(0.21)	(0.21)	(0.21)	(0.14)	(0.21)	(0.23)	(0.18)	(0.14)
Formal employment	0.23*	0.03	0.14	0.32**	0.27*	0.28*	0.32**	0.51***
	(0.11)	(0.13)	(0.12)	(0.12)	(0.11)	(0.13)	(0.12)	(0.12)
Urban	0.12	0.32*	0.08	0.07	0.17	0.20	0.15	0.11
	(0.12)	(0.13)	(0.14)	(0.08)	(0.12)	(0.12)	(0.14)	(0.08)
Weekly hours worked					0.02***	0.01***	0.01*	0.01***
					(0.00)	(0.00)	(0.00)	(0.00)
Constant	4.43***	4.78***	4.75***	4.52***	8.44***	9.12***	9.06***	8.88***
	(0.21)	(0.27)	(0.28)	(0.22)	(0.25)	(0.28)	(0.31)	(0.21)
Observations	1140	669	638	966	1145	768	638	966
R-square	0.38	0.35	0.40	0.38	0.45	0.36	0.46	0.47
F statistic	31.60	14.16	22.68	22.33	38.74	15.95	28.22	33.75

Notes: (1) base categories: Age 18-35, White and Tertiary education. (2) Standard errors in parentheses. (3)* p<0.05, ** p<0.01, *** p<0.001

Table B. 4: Complete Mincerian OLS regression estimates (overall) of the GWG: June 2020 and March 2021- Controlling for industry, occupation and marital status

	Log hourly wage		Log monthly	
	June	March	June	March
Female	-0.33***	-0.23***	-0.40***	-0.30***
	(0.08)	(0.06)	(0.07)	(0.05)
African	-0.59***	-0.94***	-0.48**	-0.90***
	(0.16)	(0.13)	(0.16)	(0.13)
Coloured	-0.57***	-0.88***	-0.53***	-0.81***
	(0.16)	(0.16)	(0.15)	(0.16)
Indian	-0.53	-0.62***	-0.61*	-0.59***
	(0.33)	(0.15)	(0.28)	(0.18)
age35_49	0.32***	0.24***	0.29***	0.25***
	(0.09)	(0.06)	(0.08)	(0.06)
age50_64	0.38**	0.18*	0.29**	0.19*
	(0.13)	(0.09)	(0.11)	(0.08)
Married	0.12	0.11*	0.20**	0.08
	(0.08)	(0.06)	(0.07)	(0.06)
Kids 6 or below	0.03	-0.01	0.07	-0.02
	(0.07)	(0.05)	(0.06)	(0.05)
No matric	-0.64***	-0.48***	-0.72***	-0.47***
	(0.11)	(0.07)	(0.10)	(0.07)
Matric	-0.34**	-0.37***	-0.33***	-0.34***

	(0.11)	(0.08)	(0.10)	(0.08)
Self employed	-0.57***	-0.48***	-0.82***	-0.63***
	(0.17)	(0.11)	(0.14)	(0.11)
Formal employment	0.24**	0.22**	0.37***	0.44***
	(0.09)	(0.08)	(0.09)	(0.08)
Manager & Professionals	0.73***	0.52***	0.60***	0.60***
	(0.14)	(0.12)	(0.13)	(0.12)
Technicians and Associate Professionals	0.04	0.27*	0.00	0.27*
	(0.19)	(0.12)	(0.18)	(0.12)
Clerical support Workers	0.24	0.23	-0.00	0.28**
	(0.15)	(0.12)	(0.13)	(0.11)
Service and sales Workers	-0.05	0.03	-0.03	0.08
	(0.14)	(0.08)	(0.11)	(0.08)
Skilled agricultural, Forestry and Fishery workers	-0.03	0.29	-0.16	0.32
	(0.21)	(0.17)	(0.19)	(0.18)
Craft and related trades workers	0.40*	0.36**	0.19	0.28**
	(0.18)	(0.12)	(0.17)	(0.10)
Plant and machine operators, and assemblers	0.25	0.35***	0.20	0.41***
	(0.13)	(0.10)	(0.12)	(0.10)
Agriculture and Hunting	-0.36	-0.08	-0.00	0.10
	(0.20)	(0.14)	(0.14)	(0.14)
Mining	0.21	0.36*	0.58**	0.62***
	(0.23)	(0.15)	(0.18)	(0.15)
Manufacturing	-0.31	0.05	0.11	0.28*
	(0.24)	(0.12)	(0.16)	(0.12)
Utilities; Electricity, gas, Water	-0.14	0.04	0.17	0.27
	(0.32)	(0.20)	(0.28)	(0.22)
Construction	-0.13	-0.07	0.20	0.14

	(0.25)	(0.12)	(0.22)	(0.11)
Wholesale and Retail trade; repair	-0.19	-0.16	0.07	-0.01
	(0.24)	(0.11)	(0.14)	(0.11)
Transport, storage and comm	-0.11	-0.05	0.19	0.11
	(0.24)	(0.19)	(0.18)	(0.17)
Financial Intermediation	0.01	0.15	0.37*	0.35*
	(0.23)	(0.14)	(0.16)	(0.15)
Community, social and personal services	-0.03	0.13	0.17	0.24*
	(0.21)	(0.10)	(0.13)	(0.10)
Urban	0.06	0.13*	0.10	0.14**
	(0.10)	(0.06)	(0.08)	(0.05)
weekly hours worked			0.01***	0.01***
			(0.00)	(0.00)
Constant	4.01***	3.98***	8.25***	8.08***
	(0.28)	(0.16)	(0.24)	(0.16)
observations	1318	2009	1318	2009
R-square	0.43	0.45	0.56	0.59
F statistic	20.19	25.00	31.33	43.37

Notes: (1) base categories: Age 18-35, White and Tertiary education. (2) Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Appendix C – Oaxaca-Blinder decompositions

Table C. 1: Full Oaxaca-Blinder Decomposition results for February 2020, April 2020, June 2020, and March 2021 – Male Reference

	Log hourly wage				**Log monthly wage**			
	February 2020	April 2020	June 2020	March 2021	February 2020	April 2020	June 2020	March 2021
Overall								
Group 1 (female)	3.13***	3.56***	3.40***	3.24***	8.04***	8.38***	8.22***	8.01***
Group 2 (male)	3.36***	3.84***	3.71***	3.53***	8.33***	8.68***	8.68***	8.54***
Difference	-0.23***	-0.28***	-0.31***	-0.28***	-0.29***	-0.30***	-0.46***	-0.53***
	[-0.24,-0.23]	[-0.28,-0.27]	[-0.32,-0.31]	[-0.29,-0.28]	[-0.29,-0.29]	[-0.30,-0.30]	[-0.46,-0.46]	[-0.53,-0.52]

Endowments	0.09***	0.12***	0.09***	0.05***	0.11***	0.11***	0.06***	0.02***
Coefficients	-0.31***	-0.38***	-0.38***	-0.31***	-0.38***	-0.43***	-0.52***	-0.50***
Interaction	-0.02***	-0.01***	-0.03***	-0.03***	-0.01***	0.01***	0.00***	-0.04***

Notes: (1) * p<0.05, ** p<0.01, *** p<0.001. (2) All standard errors are less than 0.005 (3) 95% confidence interval for wage differential in brackets. (4) Male is used as the reference wage structure.

Table C. 2: Oaxaca and Ransom (1994) decomposition results for February 2020, April 2020, June 2020, and March 2021 – pooled coefficients

	Log hourly wage				**Log monthly wage**			
	February 2020	April 2020	June 2020	March 2021	February 2020	April 2020	June 2020	March 2021
Overall								
Group 1 (female)	3.13***	3.56***	3.40***	3.24***	8.04***	8.38***	8.22***	8.01***
Group 2 (Male)	3.36***	3.84***	3.71***	3.53***	8.33***	8.68***	8.68***	8.54***
Difference	-0.23***	-0.28***	-0.31***	-0.28***	-0.29***	-0.30***	-0.46***	-0.53***
	[-0.24,-0.23]	[-0.28,-0.27]	[-0.32,-0.31]	[-0.29,-0.28]	[-0.29,-0.29]	[-0.30,-0.30]	[-0.46,-0.46]	[-0.53,-0.52]
Explained	0.08***	0.12***	0.07***	0.03***	0.09***	0.11***	0.05***	-0.01***
Unexplained	-0.31***	-0.39***	-0.38***	-0.32***	-0.38***	-0.41***	-0.51***	-0.51***

Notes: (1) * p<0.05, ** p<0.01, *** p<0.001. (2) All standard errors are less than 0.005 (3) 95% confidence interval for wage differential in brackets (4) Male is used as the reference category.

Table C. 3: Oaxaca-Blinder Decomposition results (Table 9- Panel A) for June 2020, and March 2021

	Log Hourly wage		**Log Monthly wage**	
	June 2020	March 2021	June 2020	March 2021
Group 1 (male)	3.73***	3.52***	8.70***	8.52***
Group 2 (female)	3.39***	3.26***	8.22***	8.04***
Difference	0.33***	0.26***	0.48***	0.48***
	(0.33; 0.33)	(0.26; 0.26)	(0.47; 0.48)	(0.48; 0.48)
Endowments	0.06***	0.17***	0.13***	0.19***
Coefficients	0.34***	0.25***	0.42***	0.40***
Interaction	-0.07***	-0.16***	-0.07***	-0.10***
Endowments				
African	0.00***	0.00***	0.01***	0.00***
Coloured	-0.01***	-0.02***	-0.00***	-0.02***
Indian	0.00***	-0.00***	-0.00***	-0.00***
Age35-49	-0.00***	-0.02***	-0.01***	-0.02***
Age50-64	0.00***	0.00***	0.00***	-0.00***
Kids 6 or below	-0.01***	0.01***	-0.01***	0.01***

Married	0.02***	0.01***	0.02***	-0.00***
No matric	-0.02***	-0.00***	-0.02***	0.00***
Matric	-0.01***	-0.01***	-0.02***	-0.01***
Self employed	0.00***	0.00***	0.01***	0.01***
Formal employment	-0.01***	0.01***	-0.00***	0.03***
Urban	-0.00***	-0.00***	0.00***	-0.00***
Manager & Professionals	-0.04***	-0.02***	-0.02***	-0.01***
Technicians and Associate professionals	0.00***	0.00***	-0.00***	0.00***
Clerical support Workers	0.00***	-0.00***	0.00***	-0.00***
Service and sales Workers	-0.04***	-0.01***	-0.05***	-0.01***
Skilled agricultural, Forestry and Fishery workers	0.00***	-0.00***	-0.00***	-0.00***
Craft and related trades workers	0.04***	0.05***	0.05***	0.04***
Plant and machine operators, and assemblers	0.06***	0.04***	0.02***	0.03***
Agriculture and Hunting	-0.00***	0.00***	0.00***	0.00***
Mining	-0.01***	0.04***	0.03***	0.06***
Manufacturing	-0.02***	-0.00***	0.02***	0.00***
Utilities; Electricity, gas, water	0.02***	0.00***	0.03***	0.00***
Construction	-0.03***	0.01***	0.06***	0.00***
Wholesale and Retail trade; repair	0.07***	0.00***	0.01***	-0.00***
Transport, storage and comm	0.02***	0.08***	0.03***	0.10***
Financial Intermediation	0.01***	0.00***	-0.00***	0.01***
Community, social and personal services	0.02***	-0.01***	-0.02***	-0.03***
Coefficients				
African	0.01***	0.09***	0.07***	0.12***
Coloured	-0.02***	-0.00***	-0.02***	0.00***
Indian	-0.03***	-0.00***	-0.02***	-0.00***
age35-49	0.02***	-0.01***	-0.04***	-0.03***

age50-64	0.05***	0.04***	0.05***	0.04***
Kids 6 or below	-0.01***	0.08***	-0.02***	0.06***
Married	0.02***	0.01***	0.10***	0.06***
No matric	-0.09***	-0.06***	-0.04***	0.03***
Matric	-0.06***	-0.05***	0.01***	-0.04***
Self employed	-0.04***	-0.05***	0.02***	-0.03***
Formal employment	-0.17***	0.01***	-0.12***	-0.12***
Urban	0.05***	-0.04***	0.05***	0.03***
Manager & Professionals	-0.06***	-0.03***	-0.06***	0.02***
Technicians and Associate professionals	0.01***	0.00***	0.02***	0.01***
Clerical support Workers	-0.14***	0.00**	-0.12***	0.02***
Service and sales Workers	-0.21***	-0.01***	-0.16***	0.07***
Skilled agricultural, Forestry and Fishery workers	-0.00***	0.00***	-0.00***	0.00***
Craft and related trades workers	0.00***	-0.02***	-0.01***	-0.01***
Plant and machine operators, and assemblers	-0.01***	0.00***	-0.00***	0.01***
Agriculture and Hunting	-0.01***	-0.01***	-0.01***	-0.01***
Mining	0.00***	-0.00***	-0.00***	-0.00***
Manufacturing	-0.01***	0.01***	-0.01***	0.03***
Utilities; Electricity, gas, water	-0.00***	-0.01***	-0.00***	-0.00***
Construction	-0.00***	-0.00***	-0.01***	0.00***
Wholesale and Retail trade; repair	0.10***	-0.09***	0.06***	-0.01***
Transport, storage and comm	-0.01***	-0.01***	-0.00***	-0.01***
Financial Intermediation	0.11***	-0.01***	0.06***	-0.01***
Community, social and personal services	-0.00**	-0.02***	-0.03***	0.05***
Constant	0.87***	0.44***	0.67***	0.13***

Notes: (1) * p<0.05, ** p<0.01, *** p<0.001. (2) All standard errors are less than 0.005. (3) 95% confidence interval for wage differential in brackets. (4) Female is used as the reference category.

Table C. 4: Full Oaxaca-Blinder Decomposition results (Table 9- Panel B) for June 2020, and March 2021

	Log hourly wage		**Log monthly wage**	
	June 2020	March 2021	June 2020	March 2021
Difference	0.33***	0.26***	0.48***	0.48***
Explained	0.00***	0.03***	0.07***	0.12***
Unexplained	0.33***	0.23***	0.40***	0.36***
Explained				
African	0.00***	0.00***	0.01***	0.00***
Coloured	-0.01***	-0.02***	-0.01***	-0.02***
Indian	-0.01***	-0.01***	-0.01***	-0.00***
age35-49	-0.01***	-0.02***	-0.00***	-0.02***
age50-64	0.01***	0.00***	0.01***	-0.00***
Kids 6 or below	-0.00***	0.00***	-0.01***	0.00***
Married	0.02***	0.02***	0.03***	0.01***
No matric	-0.02***	-0.00***	-0.02***	0.00***
Matric	-0.02***	-0.02***	-0.01***	-0.02***
Self employed	0.00***	0.00***	0.01***	0.01***
Formal employment	-0.00***	0.01***	-0.00***	0.03***
Urban	-0.00***	-0.00***	0.00***	-0.00***
Manager & Professionals	-0.03***	-0.02***	-0.02***	-0.02***
Technicians and Associate professionals	0.00***	0.00***	0.00***	0.00***
Clerical support Workers	0.00***	-0.00***	-0.00***	-0.00***
Service and sales Workers	0.01***	-0.00***	-0.01***	-0.02***
Skilled agricultural, Forestry and Fishery workers	-0.00***	-0.00***	-0.00***	-0.00***
Craft and related trades workers	0.05***	0.03***	0.02***	0.02***
Plant and machine operators, and assemblers	0.03***	0.06***	0.03***	0.08***
Agriculture and Hunting	-0.00***	-0.00***	0.00***	0.00***
Mining	0.01***	0.02***	0.04***	0.04***
Manufacturing	-0.03***	0.00***	0.02***	0.01***
Utilities; Electricity, gas, water	-0.00***	0.00***	0.00***	0.00***
Construction	-0.02***	-0.01***	0.04***	0.03***
Wholesale and Retail trade; repair	0.02***	0.01***	-0.02***	-0.00***
Transport, storage	-0.01***	-0.00***	0.02***	0.01***

and comm				
Financial Intermediation	-0.00***	0.00***	-0.01***	0.01***
Community, social and personal services	0.00***	-0.02***	-0.03***	-0.04***
Unexplained				
African	0.01***	0.09***	0.07***	0.12***
Coloured	-0.02***	-0.00***	-0.02***	0.00
Indian	-0.04***	0.00***	-0.02***	-0.00***
age35-49	0.02***	-0.01***	-0.04***	-0.02***
age50-64	0.05***	0.04***	0.06***	0.04***
Kids 6 or below	-0.01***	0.08***	-0.02***	0.06***
Married	0.02***	0.01***	0.12***	0.07***
No matric	-0.10***	-0.06***	-0.04***	0.03***
Matric	-0.07***	-0.05***	0.01***	-0.05***
Self employed	-0.04***	-0.04***	0.01***	-0.03***
Formal employment	-0.17***	0.01***	-0.12***	-0.13***
Urban	0.05***	-0.04***	0.05***	0.03***
Manager & Professionals	-0.06***	-0.03***	-0.06***	0.02***
Technicians and Associate professionals	0.01***	0.00***	0.03***	0.01***
Clerical support Workers	-0.14***	0.00**	-0.13***	0.01***
Service and sales Workers	-0.14***	-0.01***	-0.11***	0.05***
Skilled agricultural, Forestry and Fishery workers	-0.01***	0.00***	-0.00***	0.00***
Craft and related trades workers	-0.00***	-0.02***	-0.03***	-0.02***
Plant and machine operators, and assemblers	-0.03***	-0.00***	-0.02***	0.01***
Agriculture and Hunting	-0.01***	-0.02***	-0.01***	-0.01***
Mining	-0.01***	-0.02***	-0.01***	-0.00***
Manufacturing	-0.02***	0.01***	-0.03***	0.03***
Utilities; Electricity, gas, water	-0.01***	-0.01***	-0.01***	-0.00***
Construction	-0.02***	-0.02***	-0.03***	0.01***
Wholesale and Retail trade; repair	0.08***	-0.07***	0.06***	-0.01***
Transport, storage and comm	-0.02***	-0.02***	-0.02***	-0.01***
Financial Intermediation	0.11***	-0.01***	0.06***	-0.02***
Community, social and personal	0.02***	0.00	-0.01***	0.04***

services				
Constant	0.87***	0.44***	0.67***	0.13***

Notes: (1) * p<0.05, ** p<0.01, *** p<0.001. (2) All standard errors are less than 0.005 (3) 95% confidence interval for wage differential in brackets. (4) Female is used as the reference category.

Appendix D: Descriptive statics

Table D. 1: Descriptive statistics by gender: February 2020, April 2020, June 2020 and March 2021

	February 2020		April 2020		June 2020		March 2021	
	Female	Male	Female	Male	Female	Male	Female	Male
Self employed	0.07	0.09	0.08	0.09	0.13	0.13	0.15	0.11
	[0.06: 0.09]	[0.07; 0.10]	[0.07; 0.10]	[0.08; 0.11]	[0.11; 0.15]	[0.11; 0.15]	[0.13; 0.17]	[0.09; 0.13]
Formal	0.78	0.73	0.69	0.66	0.68	0.66	0.63	0.68
	[0.76; 0.80]	[0.71; 0.76]	[0.66; 0.72]	[0.63; 0.69]	[0.65; 0.71]	[0.62; 0.69]	[0.60; 0.66]	[0.66; 0.71]
African	0.74	0.78	0.72	0.75	0.71	0.73	0.78	0.77
	[0.72; 0.76]	[0.76; 0.80]	[0.70; 0.75]	[0.73; 0.78]	[0.68; 0.74]	[0.70; 0.76]	[0.76; 0.80]	[0.75; 0.80]
Coloured	0.12	0.10	0.11	0.12	0.12	0.11	0.09	0.11
	[0.10; 0.13]	[0.09; 0.12]	[0.09; 0.13]	[0.10; 0.14]	[0.10; 0.14]	[0.09; 0.14]	[0.07; 0.10]	[0.09; 0.13]
Indian	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03
	[0.02; 0.04]	[0.01; 0.02]	[0.02; 0.04]	[0.01; 0.02]	[0.02; 0.04]	[0.02; 0.05]	[0.01; 0.03]	[0.02; 0.03]
White	0.11	0.10	0.14	0.11	0.14	0.12	0.11	0.09
	[0.10; 0.13]	[0.09; 0.12]	[0.12; 0.16]	[0.09; 0.13]	[0.12; 0.16]	[0.10; 0.14]	[0.09; 0.13]	[0.07; 0.10]
age18-34	0.41	0.42	0.37	0.43	0.38	0.41	0.36	0.44
	[0.39; 0.43]	[0.39; 0.44]	[0.35; 0.40]	[0.40; 0.46]	[0.35; 0.41]	[0.38; 0.44]	[0.33; 0.39]	[0.41; 0.47]
age35-49	0.43	0.43	0.48	0.42	0.42	0.41	0.46	0.39
	[0.40; 0.45]	[0.40; 0.45]	[0.45; 0.51]	[0.39; 0.45]	[0.39; 0.46]	[0.38; 0.44]	[0.43; 0.48]	[0.36; 0.41]
age50-64	0.16	0.16	0.15	0.15	0.20	0.18	0.18	0.18
	[0.15; 0.18]	[0.14; 0.18]	[0.13; 0.17]	[0.13; 0.18]	[0.17; 0.22]	[0.16; 0.21]	[0.16; 0.21]	[0.15; 0.20]
Kids age 6 or below	0.48	0.36	0.47	0.37	0.46	0.34	0.47	0.38
	[0.46; 0.51]	[0.33; 0.38]	[0.43; 0.50]	[0.34; 0.40]	[0.43; 0.49]	[0.30; 0.37]	[0.45; 0.50]	[0.35; 0.41]
Married	-	-	-	-	0.50	0.61	0.43	0.57
					[0.46; 0.53]	[0.57; 0.64]	[0.41; 0.46]	[0.54; 0.60]
Unmarried	-	-	-	-	0.49	0.39	0.57	0.43
					[0.46; 0.53]	[0.36; 0.43]	[0.54; 0.59]	[0.40; 0.46]
No matric	0.39	0.42	0.36	0.40	0.37	0.41	0.42	0.42
	[0.36; 0.41]	[0.39; 0.45]	[0.33; 0.39]	[0.37; 0.43]	[0.34; 0.40]	[0.38; 0.44]	[0.39; 0.45]	[0.39; 0.45]
Matric	0.23	0.28	0.20	0.27	0.23	0.27	0.21	0.24
	[0.21; 0.25]	[0.25; 0.30]	[0.18; 0.23]	[0.24; 0.30]	[0.20; 0.26]	[0.24; 0.30]	[0.19; 0.23]	[0.22; 0.27]
Tertiary education	0.39	0.30	0.44	0.33	0.40	0.32	0.37	0.34
	[0.36; 0.41]	[0.28; 0.33]	[0.41; 0.47]	[0.30; 0.36]	[0.37; 0.43]	[0.29; 0.35]	[0.34; 0.40]	[0.31; 0.37]
Urban	0.86	0.84	0.87	0.85	0.82	0.82	0.79	0.79
	[0.85; 0.88]	[0.82; 0.86]	0.85; 0.89	[0.83; 0.87]	[0.79; 0.84]	[0.79; 0.85]	[0.77; 0.82]	[0.77; 0.82]
Rural	0.14	0.16	0.13	0.15	0.18	0.17	0.20	0.19
	[0.12; 0.15]	[0.14; 0.18]	[0.11; 0.15]	[0.13; 0.17]	[0.15; 0.20]	[0.15; 0.20]	[0.17; 0.22]	[0.17; 0.21]
Occupation								
Manager & Professionals					0.24	0.21	0.21	0.18
					[0.22; 0.27]	[0.18; 0.23]	[0.18; 0.23]	[0.16; 0.20]
Technicians and					0.08	0.07	0.06	0.07

Associate professionals					[0.06; 0.09]	[0.05; 0.09]	[0.05; 0.08]	[0.06; 0.09]
Clerical support Workers					0.13	0.14	0.07	0.05
					[0.11; 0.15]	[0.12; 0.17]	[0.05; 0.08]	[0.04; 0.06]
Service and sales Workers					0.25	0.12	0.28	0.12
					[0.22; 0.28]	[0.10; 0.14]	[0.26; 0.31]	[0.11; 0.14]
Skilled agricultural, Forestry and Fishery workers					0.01	0.02	0.01	0.01
					[0.00; 0.01]	[0.01; 0.03]	[0.00; 0.01]	[0.00; 0.02]
Craft and related trades workers					0.04	0.15	0.05	0.15
					[0.03; 0.05]	[0.13; 0.17]	[0.04; 0.06]	[0.12; 0.17]
Plant and machine operators, and assemblers					0.02	0.12	0.02	0.16
					[0.01; 0.02]	[0.10; 0.14]	[0.01; 0.02]	[0.14; 0.18]
Elementary occupations					0.24	0.21	0.31	0.26
					[0.21; 0.27]	[0.14; 0.19]	[0.29; 0.34]	[0.23; 0.28]
Industry								
Agriculture and Hunting					0.03	0.05	0.03	0.04
					[0.02; 0.04]	[0.04; 0.07]	[0.02; 0.04]	[0.03; 0.05]
Mining					0.01	0.06	0.01	0.06
					[0.01; 0.02]	[0.04; 0.07]	[0.00; 0.01]	[0.05; 0.07]
Manufacturing					0.06	0.13	0.11	0.13
					[0.04; 0.07]	[0.10; 0.15]	[0.09; 0.12]	[0.11; 0.15]
Utilities; Electricity, gas, water					0.00	0.04	0.01	0.02
					[0.00; 0.01]	[0.02; 0.05]	[0.00; 0.01]	[0.01; 0.02]
Construction					0.02	0.15	0.02	0.16
					[0.01; 0.03]	[0.13; 0.18]	[0.01; 0.02]	[0.13; 0.18]
Wholesale and Retail trade; repair					0.20	0.12	0.21	0.14
					[0.17; 0.22]	[0.10; 0.14]	[0.19; 0.24]	[0.12; 0.16]
Transport, storage and comm					0.01	0.08	0.01	0.09
					[0.01; 0.02]	[0.06; 0.10]	[0.00; 0.02]	[0.07; 0.10]
Financial Intermediation					0.18	0.17	0.10	0.12
					[0.16; 0.20]	[0.14; 0.19]	[0.08; 0.12]	[0.10; 0.14]
Community, social and personal services					0.34	0.16	0.36	0.22
					[0.31; 0.37]	[0.14; 0.19]	[0.33; 0.39]	[0.20; 0.24]
Private households					0.14	0.05	0.14	0.02
					[0.11; 0.16	[0.03; 0.06]	[0.12; 0.16]	[0.01; 0.03]
N	1 645	1 356	1 077	1044	949	888	1 266	1 116

*Notes: (1) No data for marriage status and occupation in wave 1 data. (2) Own computations (3) Variables are weighted. (4) 95% confidence intervals are presented in brackets.

Table D.2 - Overall sample descriptive statistics

Period	February					April					June					March				
Variable	Mean	se(mean)	Confidence intervals		N	Mean	se(mean)	Confidence Intervals		N	mean	se(mean)	confidence intervals		N	Mean	se(mean)	Confidence Intervals		N
Mean hourly wage	49.324	1.472	46.438	52.210	2,576	92.072	5.911	80.487	103.657	1,282	70.125	4.362	61.576	78.674	1,512	52.070	1.651	48.835	55.306	2,170
Mean monthly wage	7401.054	197.805	7013.356	7788.752	2,834	9280.758	253.639	8783.625	9777.891	1,965	8252.395	269.455	7724.263	8780.527	1,675	7248.852	193.436	6869.718	7627.986	2,281
Weekly hours worked	39.254	0.308	38.649	39.858	2,705	33.331	0.559	32.236	34.426	1,670	39.602	0.456	38.708	40.495	1,643	39.350	0.348	38.668	40.032	2,262
Female	0.458	0.009	0.440	0.476	3,001	0.415	0.011	0.394	0.436	2,121	0.438	0.012	0.415	0.461	1,837	0.430	0.010	0.411	0.450	2,382
Male	0.542	0.009	0.524	0.560	3,001	0.585	0.011	0.564	0.606	2,121	0.562	0.012	0.539	0.585	1,837	0.570	0.010	0.550	0.589	2,382
Race- African	0.761	0.008	0.746	0.776	3,001	0.742	0.010	0.723	0.760	2,121	0.723	0.010	0.703	0.744	1,837	0.777	0.009	0.761	0.794	2,382
Race- Coloured	0.109	0.006	0.097	0.120	3,001	0.114	0.007	0.101	0.128	2,121	0.115	0.007	0.101	0.130	1,837	0.102	0.006	0.090	0.114	2,382
Race-Indian	0.022	0.003	0.017	0.027	3,001	0.021	0.003	0.015	0.027	2,121	0.033	0.004	0.025	0.041	1,837	0.024	0.003	0.018	0.030	2,382
Race-White	0.108	0.006	0.097	0.119	3,001	0.123	0.007	0.109	0.137	2,121	0.129	0.008	0.114	0.144	1,837	0.097	0.006	0.085	0.109	2,382
age18_34	0.413	0.009	0.395	0.430	3,000	0.405	0.011	0.384	0.426	2,120	0.395	0.011	0.372	0.417	1,837	0.405	0.010	0.385	0.425	2,382
age35_49	0.428	0.009	0.410	0.445	3,000	0.444	0.011	0.423	0.466	2,120	0.416	0.012	0.393	0.438	1,837	0.416	0.010	0.396	0.436	2,382
age50_64	0.160	0.007	0.147	0.173	3,000	0.150	0.008	0.135	0.166	2,120	0.190	0.009	0.172	0.207	1,837	0.179	0.008	0.164	0.195	2,382
Kids 6 or below	0.415	0.009	0.397	0.433	2,885	0.408	0.011	0.386	0.429	2,032	0.391	0.012	0.368	0.414	1,740	0.419	0.010	0.399	0.439	2,382
Education: No matric	0.405	0.009	0.387	0.422	3,001	0.384	0.011	0.363	0.405	2,109	0.394	0.011	0.372	0.417	1,837	0.419	0.010	0.399	0.439	2,382
Education: Matric	0.255	0.008	0.239	0.270	3,001	0.243	0.009	0.225	0.261	2,109	0.251	0.010	0.232	0.271	1,837	0.228	0.009	0.211	0.245	2,375
Education: Post matric (tertiary)	0.341	0.009	0.324	0.358	3,001	0.373	0.011	0.353	0.394	2,109	0.354	0.011	0.332	0.376	1,837	0.352	0.010	0.333	0.371	2,375
Self-employment	0.081	0.005	0.071	0.091	3,001	0.090	0.006	0.078	0.102	2,121	0.129	0.008	0.113	0.144	1,837	0.129	0.007	0.116	0.143	2,382
Formal employment	0.755	0.008	0.740	0.770	3,001	0.672	0.010	0.652	0.692	2,121	0.667	0.011	0.645	0.688	1,837	0.660	0.010	0.641	0.679	2,382
Urban	0.853	0.006	0.841	0.866	3,001	0.857	0.008	0.842	0.872	2,119	0.820	0.009	0.802	0.837	1,790	0.794	0.009	0.777	0.810	2,263
Rural	0.147	0.006	0.134	0.159	3,001	0.143	0.008	0.128	0.158	2,121	0.175	0.009	0.158	0.193	1,837	0.194	0.008	0.178	0.210	2,382
Married											0.560	0.012	0.535	0.584	1,837	0.510	0.010	0.490	0.530	2,382
Unmarried											0.437	0.012	0.414	0.460	1,837	0.490	0.010	0.470	0.510	2,382

Occupation																				
Manager & Professionals											0.224	0.010	0.204	0.243	1,787	0.191	0.008	0.175	0.207	2,327
Technicians and Associate professionals											0.074	0.006	0.061	0.086	1,787	0.069	0.005	0.059	0.080	2,327
Clerical support Workers											0.137	0.008	0.121	0.153	1,787	0.057	0.005	0.048	0.067	2,327
Service and sales Workers											0.177	0.009	0.160	0.195	1,787	0.192	0.008	0.176	0.208	2,327
Skilled agricultural, Forestry and Fishery workers											0.015	0.003	0.010	0.021	1,787	0.008	0.002	0.004	0.012	2,327
Craft and related trades workers											0.101	0.007	0.087	0.115	1,787	0.104	0.006	0.091	0.116	2,327
Plant and machine operators, and assemblers											0.075	0.006	0.063	0.087	1,787	0.098	0.006	0.086	0.111	2,327
Elementary Occupations											0.197	0.009	0.179	0.216	1,787	0.280	0.009	0.262	0.299	2,327
Industry																				
Agriculture and Hunting											0.043	0.005	0.033	0.052	1,820	0.038	0.004	0.030	0.046	2,360
Mining											0.039	0.005	0.030	0.048	1,820	0.038	0.004	0.030	0.046	2,360
Manufacturing											0.096	0.007	0.083	0.110	1,820	0.120	0.007	0.107	0.133	2,360
Utilities; Electricity, gas, Water											0.021	0.003	0.014	0.027	1,820	0.013	0.002	0.009	0.018	2,360
Construction											0.094	0.007	0.081	0.108	1,820	0.095	0.006	0.083	0.107	2,360
Wholesale and Retail trade; repair											0.154	0.008	0.137	0.170	1,820	0.174	0.008	0.158	0.189	2,360
Transport, storage and comm											0.051	0.005	0.041	0.061	1,820	0.053	0.005	0.044	0.062	2,360
Financial Intermediation											0.172	0.009	0.155	0.190	1,820	0.112	0.006	0.099	0.125	2,360
Community, social and personal services											0.240	0.010	0.220	0.259	1,820	0.280	0.009	0.262	0.298	2,360
Private households											0.086	0.007	0.073	0.099	1,820	0.074	0.005	0.064	0.085	2,360