

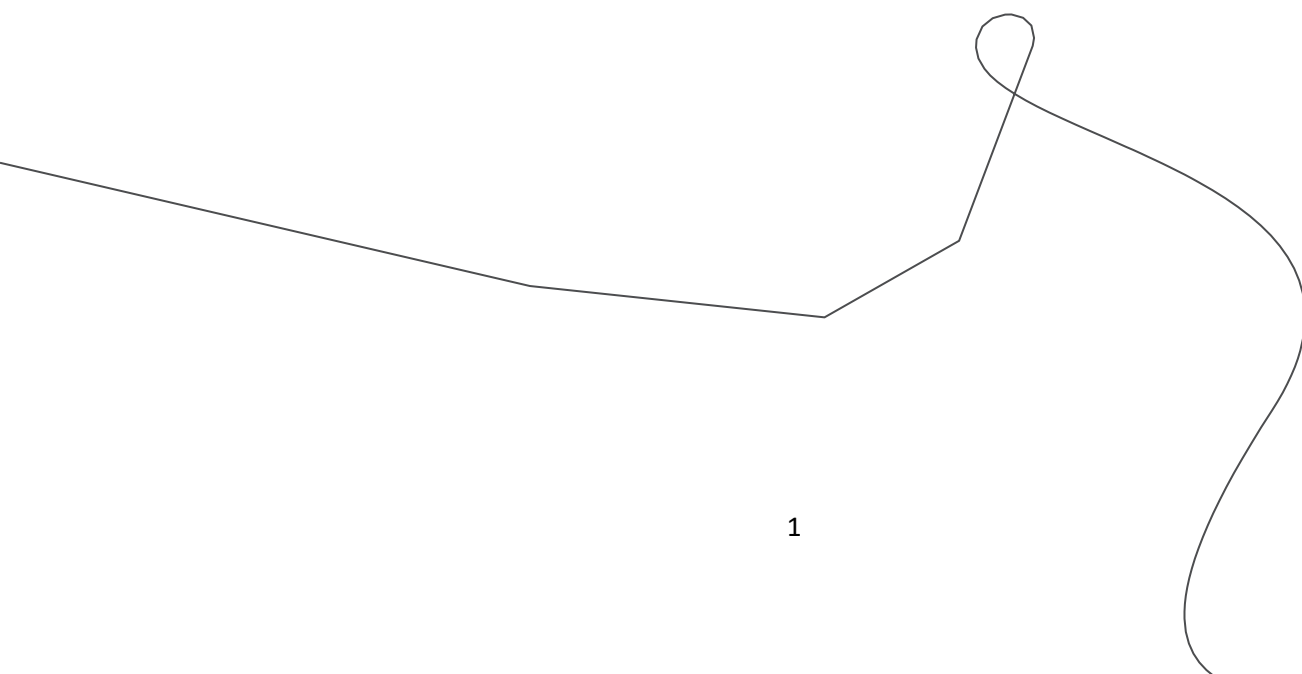


The Teacher Labour Market and Pay

How does it compare to other professions?

- Debra Shepherd (10 Nov 2022)

Teacher Demographic Dividend.



Executive Summary

The labour market for teachers is one that is worthy of attention because of the important role that teachers play in the success of educational systems and the acquisition of human capital. This makes attracting, motivating, and retaining good teachers of particular concern. The state of the labour market for teachers, and the relative position of teachers when compared to other qualified persons, play a crucial role in determining teacher supply and retention. **Teaching is a graduate profession, and as such competes with all other professional occupations open to graduates.**

This begs the question “Is teaching an attractive profession?”, and “How likely are the most productive and best educated labour to enter the teaching profession?” The available empirical evidence on the relative under- or over-payment of teachers in labour markets has been shown to depend crucially on the definition of the comparison group (Mizala & Nõpo, 2016). If it is found that relative teacher pay is below that of similarly educated and experienced individuals employed in other professions, then this would provide prima facie evidence of inadequate returns in the teaching profession (Podgursky, 2005). **Existing evidence in South Africa from 2000-2007 indicates teachers at the upper-end of the earnings distribution to be underpaid relative to their non-teaching counterparts**, whilst those at the lower-end were overpaid (Gustaffson & Patel, 2009; Burger & Van der Berg, 2010; Armstrong, 2015). A key contributing factor to this was the relatively flat returns to education and experience amongst the teacher workforce.

The aim of the analysis presented in this paper is to provide an overview of the teacher labour market in South Africa using household survey data, with a view to adding empirical evidence for the period 2012 - 2017 to complement that for 2000 - 2007. The first objective is to describe the teacher workforce in terms of age, gender, racial classification, and educational attainment, with a view to determining whether these have shifted over time. This is followed by an empirical analysis of how teacher pay compares with that of non-teaching professions in the South African labour market, as well as pay within the private and public sectors more generally, and among professionals specifically.

The main findings of the paper can be summarized as follows:

1. **Teachers earn higher hourly¹ median wages than non-teachers for almost all levels of education.** This is according to the Quarterly Labour Force Survey (QLFS) data from 2012-2017. The differences in median hourly wages are statistically significantly higher for teachers compared to non- teachers. Similar to Burger and Van der Berg (2010) and Armstrong (2015), comparisons of average hourly wages indicate teachers with Grade 12 or less to earn

¹ Hourly wages are chosen to be consistent with prior work on this topic. Wages are in 2015 prices.

significantly more than similarly educated non-teachers. Teachers with post-secondary education earn the same as their non-teaching counterparts, whilst amongst those with education beyond a bachelor's degree, non-teachers report significantly higher average wages.

2. **The teaching workforce is aging, highly feminized and unionized** when compared to other non-teaching private sector professions. The share of public sector teachers aged 50 years and older is rising, whilst the share of teachers aged 35 years and younger is declining. Teachers in the private sector show a substantially different profile in terms of population group and age.
3. **On average, teachers had higher (unconditional) hourly wages than at least 70% of all formal sector paid-employed people in South Africa in 2017, and lie higher in the wage distribution than the average person classified as a professional or associate professional (PAP).** Trends in average and median earnings disguises an important factor in teachers' pay: what induces an individual graduate to enter the teaching profession is not pay in teaching but relative pay when comparing earnings in teaching with potential 'foregone' earnings associated with an alternative career. Furthermore, teachers' average position has been converging on that of degreed PAPs — that is, those with a degree or a post-bachelor's qualification.
4. **Conditional on productive and socio demographic characteristics, teachers' expected position in the wage distribution is no different from that of similarly qualified professionals and associate professionals in both the public and private sectors.** Teachers with a degree or postgraduate qualification lie 20 percentage points higher in the wage distributions when compared to their less qualified teaching counterparts. Teachers are also expected to lie roughly 10 percentage points higher in the public sector wage distribution than an equivalently qualified nurse.

The teacher labour market and pay: How does it compare to other professions?

1. Introduction

The labour market for teachers is one that is worthy of attention, not only because of its size — in 2021, public sector teachers made up just over 3% of all employed persons — but also because of the important role that teachers play in the success of educational systems and the acquisition of human capital. This makes attracting, motivating, and retaining good teachers of particular concern, with salaries emerging as a main contender for achieving these ends (Hernani-Limarino, 2005). The state of the labour market for teachers and the relative position of teachers when compared to other qualified persons can therefore play a crucial role in determining teacher supply and retention.

The labour market for teachers is quite unusual when compared to most other labour markets. As pointed out by Chevalier and Dolton (2004), the “teacher market does not function in a vacuum” (p.3). This is because, unlike most labour markets, the government has substantial influence in the market for teachers. This is most acutely displayed by its monopoly power in the provision of teaching credentials and nearly monopsony power in teacher recruitment. For example, the Minimum Requirements for Teacher Education Qualifications (MRTEQ) (DHET 2011) — revised in 2015 — requires initial teacher education (ITE) to follow one of two routes: the completion of a four-year Bachelor of Education (BEd) degree; or the completion of an appropriate first degree followed by a one-year Advanced Diploma in Education (ADE) or Post-Graduate Certificate in Education (PGCE). This means that teaching is a graduate profession, and as such competes with all other professional occupations open to graduates. This begs the question “Is teaching an attractive profession?”, and “How likely are the most productive and best educated labour to enter the teaching profession?”

This paper aims to provide a twenty-year overview of the teacher labour market in South Africa using household survey data collected between 2000 and 2021. The first objective is to describe the teacher workforce in terms of age, gender, racial classification, and educational attainment, with a view to determining whether these have shifted over time. This is followed by an empirical analysis of how teacher pay compares with that of non-teaching professions in the South African labour market. The degree of substitutability between professions needs consideration, since the decision, or even ability, to switch between teaching and non-teaching professions can be related to productivity. The available empirical evidence on the relative under- or over-payment of teachers in labour markets has been shown to depend crucially on the definition of the comparison group (Mizala & Nõpo, 2016). If it is found that relative teacher pay is below that of similarly educated and experienced individuals employed in other professions, then this would provide prima facie evidence of inadequate returns in the teaching profession (Podgursky, 2005).

This is not to argue that earnings are the only feature determining the attractiveness of a particular occupation. Although the potential to earn a higher pay in other graduate professions increases the opportunity cost of being a teacher, there are other important explicit and implicit factors determining teacher recruitment, performance, and retention; for example, flexibility in hours worked, non-monetary benefits, interpersonal relationships, and the feeling of providing a valued service to society. The manner in which these non-pay factors affect the relative attractiveness of teaching as a profession can be quite complicated. It is also important to recognize factors that have undermined the attractiveness of teaching, such as an increased administrative load, the expectations of meeting continual policy changes within the sector, and a perceived lack of sufficient career advancement (SACE, 2009). Household survey data of the type employed in the empirical analysis of this paper do not capture these features of employment. For these reasons, the analysis presented

here focuses mainly on the earnings aspect of teaching in comparison to non-teaching professions.

Several existing studies have aimed to answer the question of the attractiveness of teaching from a labour market perspective. A 1993 Edupol report indicated teacher salaries to have more than doubled between 1988 and 1992, although these changes were non-uniformly distributed across age and race groups (Hosking 2000). Gustafsson and Patel (2009) point towards the equalisation of apartheid pay scales and 'management drift' as responsible for increasing teacher pay. They noted, however, that the ratio of teacher pay to GDP was in decline since the late 1990s, and that the position of teachers in the South African labour market relative to non-teaching professionals was worse than that of teachers in other middle-income countries. Two separate studies by Burger and Van der Berg (2010) and Armstrong (2015) employed regression analysis to investigate teachers' relative pay positions to non-teachers over the periods 1995-2005 and 2000-2010, respectively. Both found the returns to education and experience to be much higher amongst non-teaching professions, which they argue could serve as a disincentive to remain in teaching. Burger and Van der Berg, however, showed that whilst teachers at the top end of the earnings distributions were relatively underpaid, teachers at the bottom end were overpaid. This, they concluded, would mean an exit from teaching amongst those individuals with favourable endowments of productive characteristics, but a retention of teachers with lower endowments.

This paper makes use of the Post-Apartheid Labour Market Series (PALMS) data (Kerr et al., 2019) that harmonizes Statistics South Africa's Labour Force Survey (LS) and Quarterly Labour Force Survey (QLFS) data for 2000-2007 and 2008-2021; earnings data is only available for the LFSs and the 2010-2017 QLFSs. The South African Standard Classification of Occupations (SASCO) codes are used to identify individuals employed as primary and secondary school teachers, as well those employed in professions whose demographic characteristics are similar to those of teachers, and therefore serve as groups of workers to which teachers might be compared.

The remainder of this paper proceeds as follows. Section 2 provides a summary of teacher pay in South Africa beginning in the 1990s. This is followed by a description of the data and key dependent variables used by the empirical analysis of this paper. Section 4 provides a descriptive analysis of the teaching profession in relation to other sectors and occupations, whilst Section 5 empirically assesses teachers' relative earnings positions over time, and how this compares to the groups identified in Section 4. Conditional regression analyses are employed to isolate the influence of education and labour market experience on teachers' relative earnings positions.

2. A background to teacher pay in South Africa

For the first five years of democracy, education policy was oriented towards widespread systemic change that included a considerable shift in the allocation of

resources to the poorest in society (Van der Berg, 2006). The rapid expansion of the provision of public education to historically disadvantaged groups that had already begun towards the end of apartheid brought significant effects on the budget allocated to education, which by 1994 was 20%. Gustaffson and Patel (2008) show, for example, that between 1987 and 1997, and in response to increasing enrolment in schools, the number of teachers employed by the state increased by around 100 000. A slight decline in publicly employed teachers was observed post-1998 as a result of a rationalisation process that aimed to equalise pupil-teacher ratios within the public schooling sector. However, this had limited effects on particularly middle class public schools that had enjoyed favourable staffing under apartheid, as previously publicly employed teachers simply became private employed in the same public schools (Gustaffson and Patel, 2008: 9).

Another contributing factor to rising expenditures on education was the elimination of disparities in teacher pay along racial and gender lines, a process that had already begun in 1983. The pay norms, however, remained strongly linked to baseline qualifications and years of experience. In 1992, the average salary of white male teachers was double that of black African female teachers, indicating the former group to be significantly more experienced and qualified (Hosking, 2000). Only 5% of black African teachers were recorded to have a university degree towards the end of the 1980s, compared to 13% and 43% of coloured and Indian teachers, respectively (Christie, 1991). In 1994, 1 in 3 teachers, mostly black South African, were un- or under-qualified.

The transition to democracy in 1994 also came with an increased trade union pressure for the compression of teacher salaries.² SADTU, for example, called for the salaries of teachers at the bottom end of the salary scale to be increased by 12%, but no increase for those at the top end (Bot, 1996; Hosking, 2000). The idea behind such a proposal was to discourage teachers from acquiring irrelevant qualifications for salary recognition, a strategy identified in the late 1980s and early 1990s by several researchers (Salmon & Woods 1991; Hofmeyr & Hall 1996; Reeves, 1993). Trade union involvement in reform negotiations assisted with the creation of a more equitable salary structure; for example, the real minimum pay notch of black African teachers with complete secondary school and four years of initial teacher education increased by almost 25% in the mid-1990s (Gustafsson and Patel, 2009). Yet, a 12% gap between the wages of black and white teachers of the same level of education, post and province was still identified in 2000 (Van der Berg, 2006).

Although teachers' pay rose moderately over the decade 1996 to 2007, research has indicated that between 2000 and 2007, teachers were still at a pay disadvantage relative to others at their occupation level (i.e. professionals and associate professionals), even after conditioning on years of experience, education, gender and

² As argued by Seekings (2004), the fact that teachers represent at least 3% of all employed adults in the post-apartheid South African labour market gives them immense political force.

race. Gustaffson and Patel (2008) estimated the monthly earnings of professionals and associate professionals to be around 1.6 times as much as that of teachers in 2007, all else equal. Armstrong (2015) similarly showed the conditional gap in wages between non-teaching and teaching professionals to be about 30%, although this gap decreased to 19% in 2010. Using regression analysis, Burger and Van der Berg (2010) showed that the returns to additional years of education and experience for teachers between 2000 and 2007 was lower than that of especially private sector workers. This, they argue, could serve as a disincentive to teachers to remain in teaching or further invest in human capital. Lemieux decompositions also indicated that whilst teachers at the bottom end of the earnings distribution were overpaid, teachers at the upper end for underpaid relative to what they could have earned outside of teaching.

In 2007, nearly 1 million public sector workers — including teachers and nurses — joined a strike in support of an across-the-board salary increase of 12% and the provision of benefits (Von Holdt, 2012). This strike, in combination with the collective bargaining of the Public Sector Coordinating Bargaining Council (PSCBC) and the Education Labour Relations Council (ELRC)³, played a significant role in mobilising the 2008 Occupation Specific Dispensation (OSD) that brought major changes to teachers' salary structure. The intention of the OSD was to transform the flat age-gap slope for teachers — for which Burger and Van der Berg (2010) provided clear empirical support — into one that compared favourably with other professional occupations (Wills, 2020). The 2008 OSD also aimed to link pay improvements to performance, including pupil performance (Gustaffson & Patel, 2008).

However, proposals to link pay to performance were blocked by SADTU, with the result that many of the 2008 changes were reversed in 2009. This meant that the planned 'notch progression' pay structures were replaced by "large once-off increases in the pay of all educators" (Wills, 2020: 331). The terms agreed to in the ELRC Collective Agreement No.1 of 2008 included a "1.5% pay progression with additional accelerated progression for "Good" or "Outstanding" performance" (Spaull, Lilenstein & Carel, 2020: p.11). Collective Agreement No.4 of 2009 removed the performance-linked accelerated pay progression, altered the pay progression from 1.5% to 1%, and awarded a 1% salary increase for every 3 years. In 2019, the Quality Management System (QMS) Collective Agreement No. 2 of 2014 was enforced, which would increase all teachers' salaries by an additional 0.5% each year until retirement on top of the 1.5% increase due to 'acceptable performance'.

3. Data

The analysis of this paper makes use of the Post-Apartheid Labour Market Series (PALMS) data available from DataFirst that stacks 68 nationally representative surveys across the period 1993 to 2019. This allows for earnings and employment

³ The Education Labour Relations Council (ELRC) was set up in 1994 to inform and regulate labour relations within the education sector.

comparisons across surveys and years. The variable used in this paper is 'realearnings' that represents consistent monthly earnings adjusted for inflation (baseline = 2005). Since the analysis of this paper is interested in estimating the relative positions of South African teachers in the labour market in terms of pay, it is important to discuss known issues with the measurement of this variable in the QLFS.

Firstly, earnings data are imputed for some individuals. Kerr and Wittenberg (2017) note that between 2010 Q1 and 2012 Q2, earnings were imputed for those that gave bracket responses and for those that refused to provide an answer. From 2012 Q3 onwards, only the former is imputed. Unfortunately, no information is provided by Stats SA as to which earnings values are imputed. This makes descriptions of earnings over time difficult, as any changes could be due to imputation effects due to moving from unimputed earnings over 2000-2007 to completely imputed earnings between 2010 and 2012 Q2, and partially imputed earnings between 2012 Q3 and 2017 Q4 (Kerr & Wittenberg, 2019). This is revealed by the fact that earnings data is missing for 28.9% of the formally employed between 2000 and 2007, compared to 0.1% between 2010 Q1 and 2012 Q2, and 13.7% between 2012 Q3 and 2017 Q4. Kerr and Wittenberg (2017) note that "labour income data in the QLFS from 2010 to 2015 is substantially different from prior waves, due to differing imputation procedures used" (p.5). Unfortunately, imputed values are not flagged in the publicly released Stats SA data.

We also need to be concerned about the imputation method used and the potential bias this can introduce. Kerr and Wittenberg (2021) note that a 'hot deck' imputation method was employed by Stats SA to impute earnings, with very limited variables used to find 'donors' in the survey who closely match respondents with missing or bracket responses; these are gender, race, 7 education categories, and only 3 occupation categories that correspond to low-, semi- and high-skilled. This means that nonresponding teachers will be assigned the average earnings of nonteachers, introducing systemic bias into the average earnings of teachers and non-teachers.

Another known measurement issue with earnings in household surveys is under-reporting. Using administrative tax data, Wittenberg (2017) shows reported earnings to be lower than what is reflected on official pay slips, and that the level of under-reporting is notably higher at the top end of the earning distribution where benefits and tax are largest. Piketty and Saez (2013) note that self-reported income in standard surveys typically fails to properly measure incomes above the 90th percentile, which can have important effects for the measurement of and trends in inequality over time. The extent of under-reporting has, however, remained fairly stable over time. The analysis of this paper assumes that issues of under-reporting and imputation are no less or more likely to affect teachers' reported earnings than is the case for others in

paid formal employment. However, there is no workaround for the bias introduced by the imputation methodology, and so the analysis proceeds under caution.⁴

Answering the question of the relative pay of teachers in South Africa requires identifying teachers in the labour force data. According to the South African Standard Classification of Occupations (SASCO), teachers fall into one of two occupation levels: Professional (occupation code 2) and Associate Professional (occupation code 3). Table 1 details the 4-digit SASCO codes and associated descriptions that apply to *teaching* occupations within ordinary basic education; that is, teachers employed in primary and secondary schools. The sample of teachers used in this paper, therefore, excludes a range of teaching-related occupations, including post-secondary and pre-primary level teachers, those in special education, curriculum specialists, school inspectors, principals and heads of department. This paper follows the approach of Burger and Van der Berg (2010) in further excluding those individuals reporting to be outside the education services industry and those reporting to have acquired less than 10 years of educational attainment. Applying these restrictions yields a sample of teachers of 39 929.

To determine the relative positions of South African teachers with regards to pay, we need a comparison group who are as similar as possible to teachers. For consistency, comparisons are made after excluding informal sector workers, the self-employed, those that earn more than R200 000 (real terms) per month (see Burger and Yu, 2006), and outliers as flagged in the PALMS data.⁵ The analysis is also restricted to those aged 21 years and older, as well as those with at least a grade 10 (for reasons that will be expanded upon below). Teachers also tend to work fewer hours per week than other formal sector workers with similar levels of education. The PALMS data indicates a general downward trend in the weekly hours worked by those employed in the formal sector from an average of around 45 hours over the period 2000-2007 to 42 hours in the decade after. Teachers have reported working 9 fewer hours per week on average. This would imply that teachers do even better in terms of their wage rates than when comparing monthly earnings, as confirmed by Burger and Van der Berg (2010).

Table 1: South African Standard Classification of Occupations (SASCO) occupation codes

<u>Professional occupations:</u>	
Teacher, secondary education	2320
Teacher, primary education, professional	2331
Teacher, primary education, reading, professional	2331
Teacher, primary education, writing, professional	2331
Teacher, primary education, not elsewhere classified	2331
<u>Associate professional occupations:</u>	

⁴ At the time of writing this paper, the author did not have access to the nonimputed earnings data. Requests will be made to access this data so that the analysis can be performed excluding imputed data and running consistent imputations for all data.

⁵ Individuals who showed a studentized residual of 5 and larger based on an augmented earnings regression.

Teacher, primary education, associate professional	3310
Teacher, primary education, reading, associate professional	3310
Teacher, primary education, writing, associate professional	3310

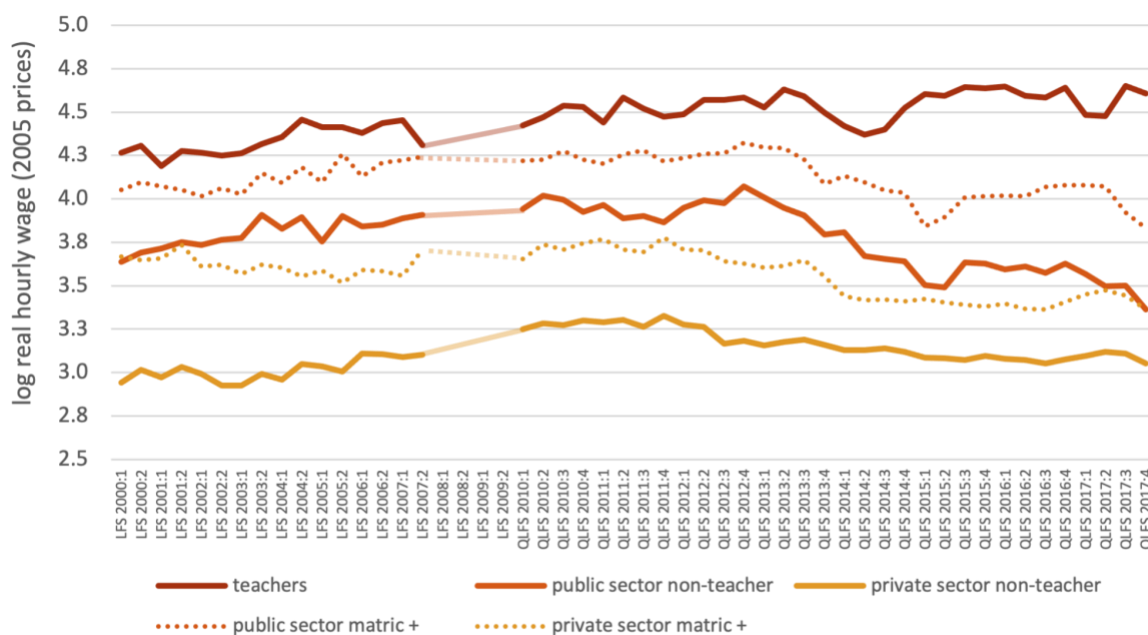
Source: Statistics South Africa (2012).

Figure 1 below compares the *median* (log) real wage — calculated as the real monthly earnings divided by 4.3 times the number of hours worked in the last 7 days — of teachers over the period 2000 to 2017 (excluding 2008 and 2009) to that of public sector and private sector workers.⁶ Over the entire period, the median teacher earned more per hour than other labour employed in either the public or private sectors. Hourly real wages were also observed to rise for all workers between 2000 and 2010. The relative median wage gap between teachers and other public sector employees remained stable between 2000 and 2012 but is observed to widen from 2013 onwards. This is driven primarily by a decline in the median hourly wage of public sector employees between 2013 and 2015. The median hourly wages of private sector non-teachers remained stable from 2012 onwards.

The gap in median wages closes substantially when comparisons are made with better educated public and private sector workers. This signals the high earnings premium for those with complete- and post-secondary qualifications. Roughly 90% of teachers in the PALMS data reported having completed matric with some post-secondary qualifications. This is compared to a third of other public sector employees and fewer than 20% of private sector employees. Therefore, teacher relative pay will seem large in comparison to workers who attained schooling equivalent to a matric or less. Figure 2 indicates the median and mean hourly wages earned by teachers and non-teachers over the period 2012 to 2017 by level of education. Using median values, teachers are observed to significantly out-earn their non-teaching counterparts at all levels of education except for higher degrees (i.e. masters, doctorate) where no significant difference in median hourly wages is observed. Using average values, no significant difference in pay between teachers and non-teachers is found amongst those with 1 to 3 years of post-secondary schooling. However, non-teachers significantly out earn teachers on *average* when comparing those with postgraduate qualifications.

⁶ The median wage is chosen over the mean wage given negative skewness in the distribution. Table A1 in the Appendix shows this to be particularly the case for non-teachers, as the average wage lies closer to the 75th than the 50th percentile.

Figure 1: Comparison of unconditional hourly median wages (2005 prices) of teachers to public and private sector workers, by survey wage



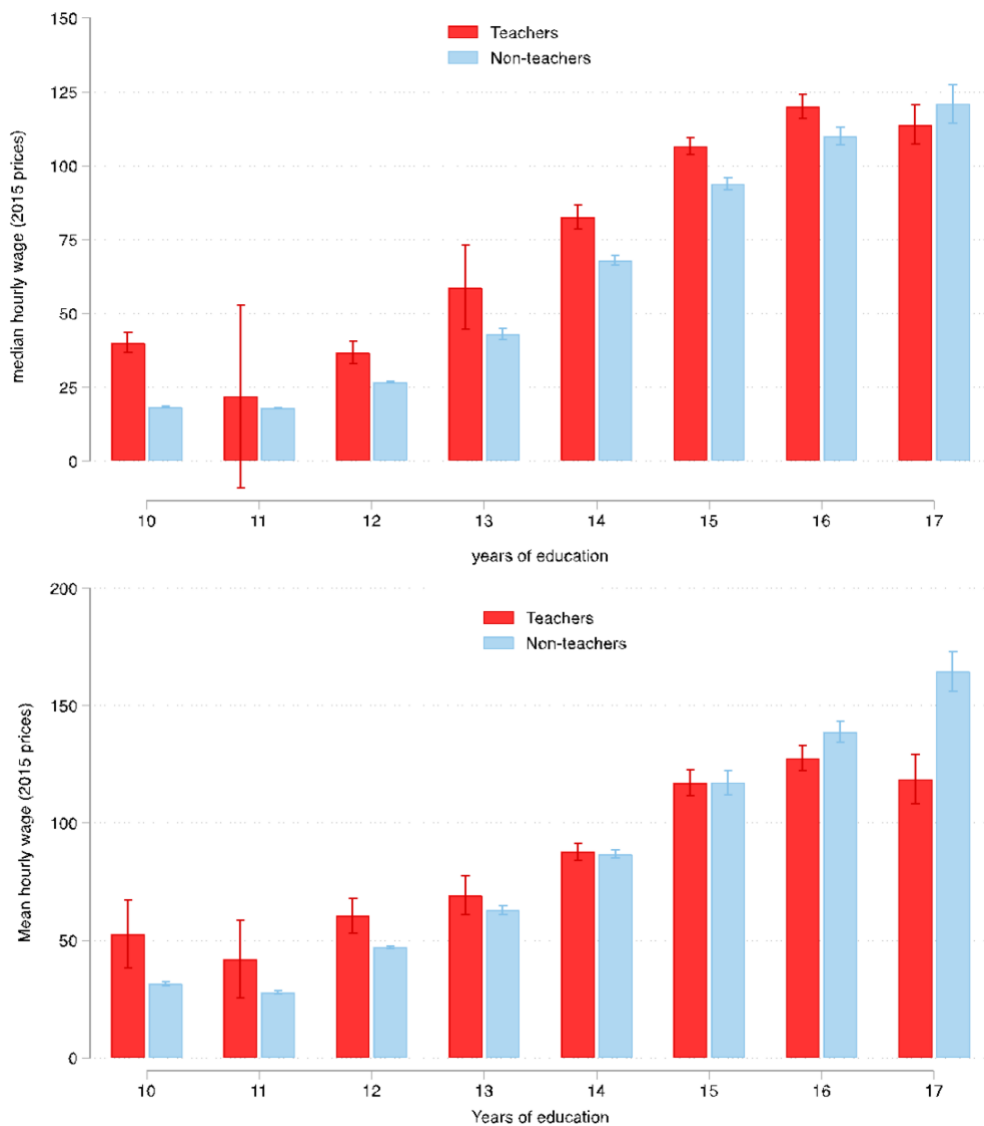
Source: own calculations using PALMS data.

Notes: Excludes informal sector workers, those earning more than R200 000 per month, the self-employed, and outliers as flagged by PALMs. Only individuals aged 21- to 64-years-old with at least grade 10 are included Data is weighted using PALMS bracket weights.

The comparisons shown in Figures 1 and 2 condition only on sector of employment and level of education. In other words, the analysis does not control for differences in other productive characteristics, both observable and unobservable. One important unobservable feature is inherent ability that tends to be both positively correlated with earnings and with educational attainment. We know from recent research conducted by Roberts and Porteus (2022) that students entering Bachelor of Education (BEd) degrees performed worse on a National Benchmarking Test (NBT) of English academic literacy when compared to students registered for commerce, law, and STEM⁷ programmes. Amongst a cohort of 85 000 students enrolled at 11 South African universities, fewer than 10% of those registered for education and nursing achieved proficiency in academic literacy.

⁷ Science, Technology, Engineering and Mathematics.

Figure 2: Median and average hourly wage of teachers and non-teachers (2012-2017)



Source: own calculations using PALMS data.

Notes: Excludes informal sector workers, those earning more than R200 000 per month, the self-employed, and outliers as flagged by PALMs. Only individuals aged 21- to 64-years-old with at least grade 10 are included. Data is weighted using PALMS bracket weights. 95% confidence intervals indicated.

Part of the problem could lie with the admission requirements into ITEs that remain low; for example, the National Senior Certificate (NSC) ‘admission points’ requirement for entering the BEd degree is between 24 and 34, compared to 40 or more points for Commerce, Law and Science programmes (Deacon 2016). The Initial Teacher Education Research Project (ITERP) survey conducted in 2013 provided the alarming finding that almost 40% of final year student-teachers had been admitted to ITE programmes without having achieved an NSC pass with bachelor’s degree endorsement (Deacon 2016). A further finding of the ITERP survey was that almost two-thirds of newly qualified FET (i.e. Grade 10 – Grade 12) Mathematics teachers felt underprepared in terms of their subject knowledge. With this in mind, the higher median, and even similar average earnings of teachers in Figure 2 are astonishing if we assume pay to be determined by productive capacities.

4. Descriptive Analysis

The previous section of this paper highlighted the importance of controlling for differences in hours as well as education when assessing the pay of teachers relative to non-teachers. Individuals in the labour market differ substantially from each other, and there are many factors — for example, gender, (potential) experience, union membership, geographic location — that might explain why individuals earn different wages, even with the same industry and occupation. This section reports on the differences between teachers and several comparison groups of workers on demographic and other characteristics. These groups are: (i) private sector non-teachers; (ii) public sector non-teachers; (iii) professionals and associate professionals; (iv) degreed professionals and associate professionals; and (v) nurses. Groups (iii) — (v) are chosen given the high level of education amongst teachers, the fact that teaching is classified amongst professional and associate professional occupations, and the closeness of teachers to nurses in terms of their demographic profile and employment within the public sector. The descriptive statistics are summarized in Table 2.

On average over the entire sample period, the majority (92%) of teachers were employed in the public sector. This proportion has fallen slightly over time from 95% in 2003/04 to 89% in 2015/16. Most non-teachers, on the other hand, work in the private sector (73%). As expected, nurses are also majority employed in the public sector (72%). Teaching as a profession remains heavily feminized, with some indication that this has increased over time (70% in 2000/01 to 76% in 2013/14). Whilst three-quarters of teachers are women, there is a roughly 50:50 gender split amongst non-teacher professionals and associate professionals, even amongst those with at least a three-year degree. Nursing is even more feminized, with only 1 in 10 nurses being men. Women also account for a higher share of teachers in private (82%) than in public (74%) sector schools.

Table 2: Descriptive statistics and individual characteristics of teachers and comparison groups of workers, 2000 - 2017

Characteristic	Teachers			Non-teachers		Non-teacher Professional and Associate Professional Occupations		Nurses
	All	Private sector	Public sector	Private sector	Public sector	All	Degreed	
% of all workers	4.4	0.4	4.0	72.7	22.8	20.9	6.8	2.5
Public sector	91.3	0.0	100.0	0.0	100.0	47.4	54.3	71.7
Female	74.3	81.7	73.6	41.7	49.8	54.3	54.0	89.9
Age (years):								
Mean	43.3	40.7	43.5	35.8	39.5	39.0	39.7	41.9
s.d.	9.4	11.1	9.2	9.7	9.7	10.3	10.1	10.0
Race:								

Black African	70.8	27.9	74.9	60.7	72.2	54.5	49.5	73.0
Coloured	8.5	6.9	8.6	11.6	10.1	9.8	6.6	11.1
Indian/Asian	3.4	9.2	2.9	5.3	2.9	5.9	6.8	3.2
White	17.3	56.0	13.6	22.4	14.7	29.7	37.1	12.8
Married/Cohabiting	64.0	74.4	63.1	49.9	49.1	60.6	64.9	55.6
Education:								
Grade 10/11	2.7	3.3	2.6	29.6	15.5	7.1	0.0	9.2
Matric	7.4	12.7	6.9	47.3	37.5	25.1	0.0	23.4
Matric + Diploma/Certificate	42.1	29.1	43.4	13.1	26.2	32.4	0.0	53.3
Degree/Higher Diploma	32.7	35.7	32.4	6.6	13.2	22.8	64.5	11.4
Postgraduate qualification + Weekly hours:	15.1	19.2	14.7	3.3	7.7	12.5	35.5	2.7
Mean	34.6	35.6	34.6	44.4	40.9	40.3	39.5	45.4
s.d.	10.9	10.9	10.9	11.2	11.4	11.2	10.9	14.1
Union membership	81.0	27.6	86.2	26.4	68.6	48.7	49.9	75.2
Metro ^a	34.4	67.2	30.9	60.1	42.6	57.7	59.8	46.6
Rural ^a	26.6	8.2	28.5	12.3	17.9	12.5	10.2	17.4
Number of obs.	35 175	2 050	33 119	438 194	158 133	162 600	53 245	18 524

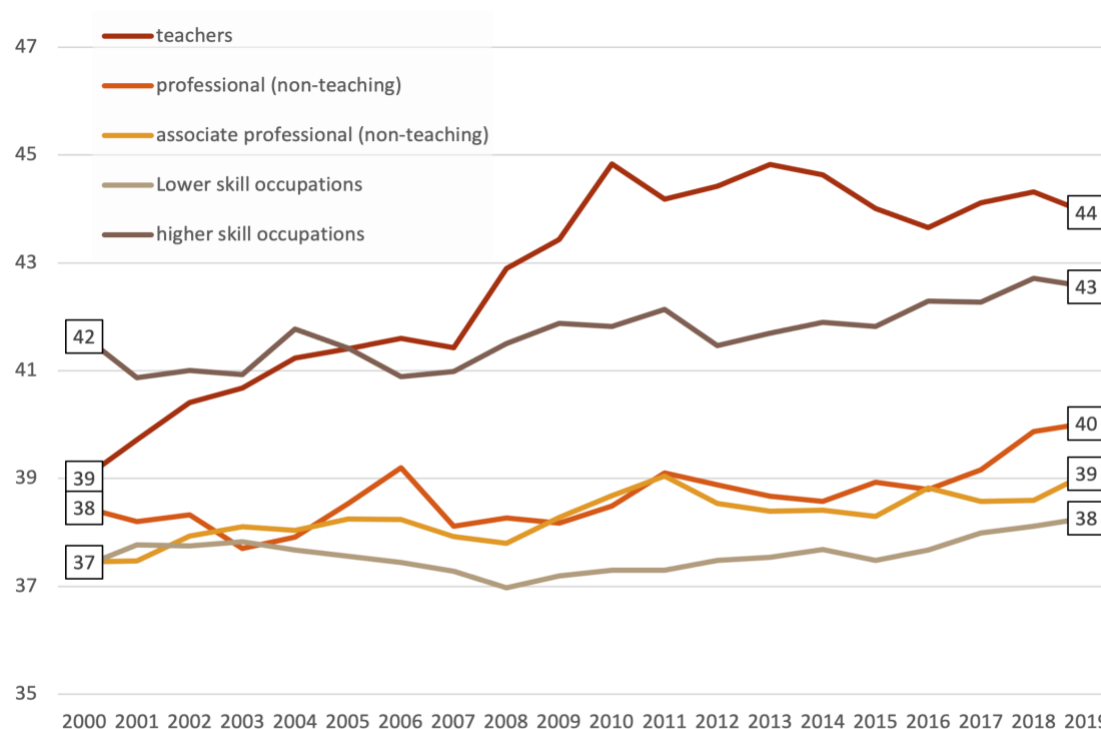
Source: own calculations using PALMS data.

Notes: numbers are in percent, unless otherwise indicated. Excludes informal sector workers and the self-employed. Only individuals aged 21- to 64-years-old with at least grade 10 are included. Data is weighted using PALMS cross entropy weights.

^a data for geographical area (i.e. metro and rural) is only available from 2008 onwards.

There are also significant differences in the age profile of teachers versus non-teachers. Teachers were on average 43-years-old over the entire sample period. This is compared to 39-40 years amongst other professionals and associate professionals, and 35.6 years amongst all private sector non-teachers (Figure 3). Nurses, possibly our most appropriate comparison group for teachers in terms of demographics, were similarly aged at 41.9 years on average. In 2000, teachers were, on average, similarly aged to those employed in other professional occupations (see Figure 3). However, whilst the average age of the latter group only increased by 1 year over the 19-year period, the average age of teachers increased by 5 years from 39 in 2000 to 44 in 2019. The most rapid shift in the age profile of teachers is observed for the period 2000 – 2010.

Figure 3: Trends in average age of teachers versus other non-teaching occupations, 2000 – 2019



Source: own calculations using PALMS data.

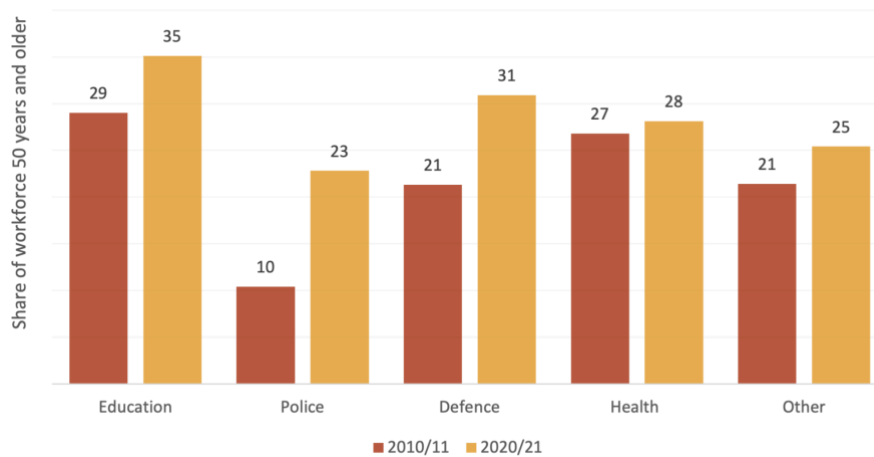
Notes: ages are in years rounded up to the nearest integer. Data is weighted using PALMS cross entropy weights.

National Treasury (2021) has noted the aging of teachers to be particularly high, even in the context of public sector industries. Figure 4 shows the share of workers aged 50 years and older in different sub-industries of the public sector. Those employed in education are consistently older than workers employed in, for example, the police and defence. The share of older workers in health remained stable over the decade under consideration, whereas there have been substantial increases in the share of older workers amongst the police and defence. An ageing workforce can contribute to higher average remunerations, since long-serving officials accumulate annual pay increases through, for example, promotions. It seems, then, that the education sector will not be alone in terms of increasing rates of retirement in the imminent future.

From Table 2 we can see that private school teachers are, on average, 3 years younger than public school teachers. Figure 5 compares the shift in age profiles of teachers in the private and public sectors over time. As expected, — given the average age gap — a significantly higher proportion of private sector teachers are 35 years old and younger when compared to the public sector. In both the 2000-2004 and 2013-2017 sample periods, just less than 40% of private school teachers fell into this age cohort. This is compared to only 27% of teachers in public schools in 2000-2004, which fell to 16% in 2013-2017. This trend suggests that the public sector finds it more challenging than the private sector to attract and retain younger teachers, and links

with an ageing teacher force amongst public schools. In 2000-2004, roughly 15% of teachers employed in both public and private schools were 50 years and older. By 2013-2017, the proportion of older teachers in private schools had increased to 24%, but within the public sector the proportion of teachers aged 50 and older had more than doubled to 35%.

Figure 4: Aging of the workforce in the public sector, 2010/11 vs 2020/21

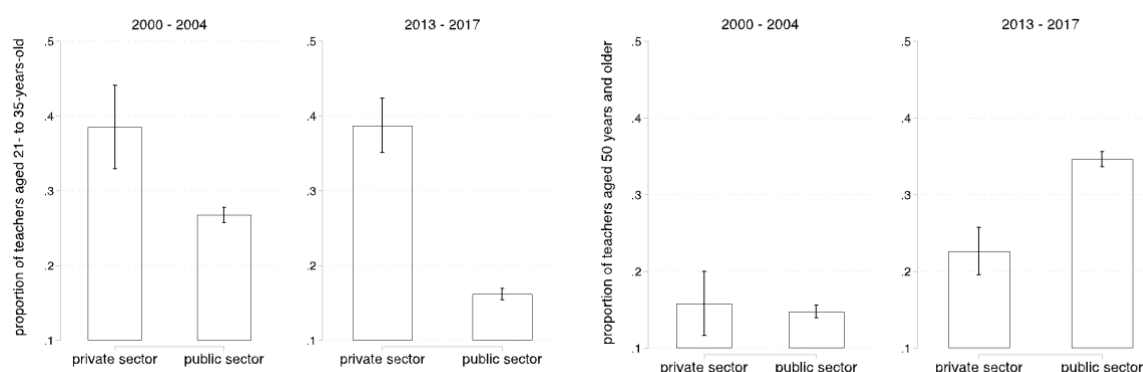


Source: own calculations using PALMS data.

Notes: Sample is restricted to workers employed in the public sector. Data is weighted.

We also see a difference in the racial make-up of the teacher workforce compared to other groups of workers. Whereas 55% of non-teacher professionals and associate professionals over the sample period are classified as black African, the proportion amongst teachers, nurses and other non-teacher public sector workers is just over 70%. The share of white teachers in the private sector is close to 60%, four times their share amongst public sector teachers, and close to double their share amongst non-teacher professionals and non-professionals. However, the share of white workers who are in non-teaching professional and associate-professional occupations has been declining over time from 37% in 2000-2003 to 25% in 2016-2019. This has come with a simultaneous increase in the share of black African workers in non-teaching professional and associate professional occupations from 48% in 2000-2003 to 60% in 2017-2019.

Figure 5: Age profiles of public and private sector teachers, 2000-2004 vs 2013-2017



Source: own calculations using PALMS data, 2000 – 2019.
 Notes: Data is weighted using PALMS cross entropy weights.

There are no substantial differences in the educational attainment of teachers across the private and public sectors. In general, teachers are substantially more educated than non-teachers: 48% of teachers have at least a three-year tertiary qualification, compared to 10% of those in private sector non-teaching occupations and 21% of those in public sector non-teaching occupations. Teachers also tend to be slightly more educated than their non-teaching professional and associate professional counterparts; only 35% of the latter reported having at least a three-year tertiary qualification, compared to 55% of teachers. And although teachers and nurses look very similar in terms of demographic profile, differences in the minimum qualification requirements mean that the bulk (53%) of nurses have only completed a diploma or certificate after finishing secondary school.

Authoritarian centralization and segregation that were characteristic of the apartheid regime meant that education policies affecting all race groups were determined and implemented by a whites-only parliament (Unterhalter, 1990). The consequence of this for women’s education, and particularly that of black African and coloured women, were a limited set of opportunities for post-secondary education. This led to employment in the largely “stereotypically female preserves” (p.69) of nursing and teaching. Although women remained a minority in tertiary education throughout the 1970s and 1980s, the numbers of black African women enrolled increased by 800% over the 1975-1985 period. A significant proportion of these women would have been enrolled at teaching and nursing colleges.

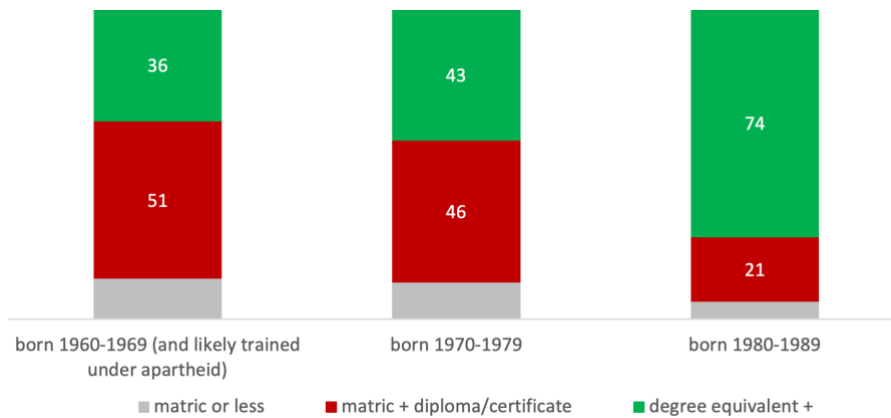
However, given that most black African children would have been enrolled in primary schooling at the time, with a limited proportion transitioning to secondary school, teachers would have required lower qualifications to teach in these schools. By the late 1980s, only 5% of black African teachers were recorded to have a university degree — compared to 13% and 43% of coloured and Indian teachers, respectively — and approximately a third of black African teachers possessed less than complete secondary education, with or without formal training (Christie, 1991). In accordance

with the formal curriculum and syllabi of the Department of Education and Training (DET), training institutions in the homeland authorities were provided a more limited curriculum that focused on the mastery of high school content and classroom management rather than conceptual and theoretical understanding (Walker 1991; Carnoy & Chisholm 2008).

Prior to Colleges of Education in South Africa changing their minimum entrance requirements to a complete grade 12 (matric) in the 1980s, there were many black, predominantly African and coloured, teachers in the field who had completed two or three years of professional training with less than a matric (Reeves & Robinson 2010). Most of these teachers held a Grade 9/10 in combination with a two-year Teachers' Certificate (TC) (Christie and Collins, 1984). Although provisions were made in the *Criteria for the Evaluation of South African Qualifications for Employment in Education* for teachers with M+3 to be trained to M+4 and teachers with M+2 to be trained to M+3, there were few if any provisions made for teachers with M+1 or less than matric (Reeves, 1993, Reeves, 1997). For example, within the Department for Education and Training (DET), teachers without a matric had no means to upgrade their qualifications unless they first completed matric. Completion of matric would put them at M+2, giving them access to a two-year full-time or four-year part-time Teachers' Diploma in Education (DE) to be fully qualified. Conversely, teachers in the House of Representatives (HOR) with less than a matric but a two-year TC were accepted as M+1, allowing them entrance to the second year of the DE. In-service DET and homeland teachers with a matric and no professional training had to first obtain three years of teaching experience followed by a one-year TC (M+1) to then qualify for a three-year full-time or six-year part-time DE.

What the above suggests is that older teachers — having been educated during apartheid — are expected to have attained lower levels of education, most likely of lower quality, than their younger counterparts. This is reflected in Figure 6. Amongst teachers born between 1960-1969, and therefore were 18 years old between 1978 and 1987, just over a third were in possession of a qualification equivalent to a three-year degree or higher when they were 35- to 39 years old. Another 51% were in possession of a post-secondary certificate or diploma. This is compared to teachers born between 1980-1989, and would have been educated under a democratic regime, of which 74% were in possession of a three-year tertiary qualification or higher at the age of 35- to 39 years old. This trend of increasing qualification levels amongst younger cohorts of teachers is further indicated in Figure 7: whereas two-thirds of teachers aged 22-32 years old have a three-year tertiary qualification or higher, this proportion is about 50% amongst teachers aged 33-53 years old, and lower still amongst teachers in their mid- to late-50s.

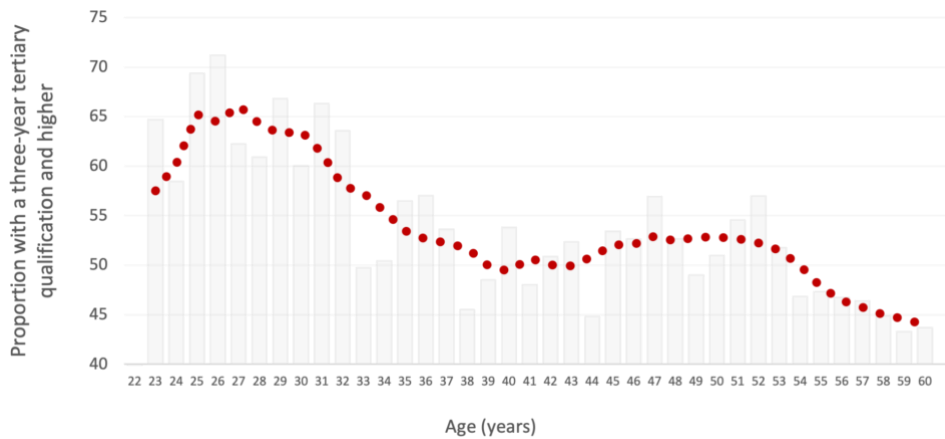
Figure 6: Levels of education attained amongst teachers aged 35-39 years old, by birth cohort



Source: own calculations using PALMS data, 2000 – 2019.

Notes: Sample is restricted to teachers aged 35-39 years old at the time of the survey. Data is weighted using PALMS cross entropy weights.

Figure 7: Proportion of teachers with a three-year tertiary qualification or higher, by age (2012 – 2019)



Source: own calculations using PALMS data, 2012 – 2019.

Notes: Data is weighted using PALMS cross entropy weights.

As mentioned earlier, teaching is a highly unionized profession. This is confirmed by the descriptive statistics in Table 2 that indicate 81% of teachers to be a union member. The share is dramatically lower amongst private sector teachers (27.6%), which is in line with the proportion of unionized workers amongst private sector non-teachers. Nursing indicates similarly high levels of unionization to teaching. Private sector teachers are also less (more) likely to be in rural (metro) areas when compared to their public sector counterparts. The representation of public sector teachers in metro and rural areas is more in line with that of non-teacher public sector workers and nurses than it is with non-teacher professional and associate professionals whose distribution across geographic location more closely mirrors that of non-teacher private sector workers.

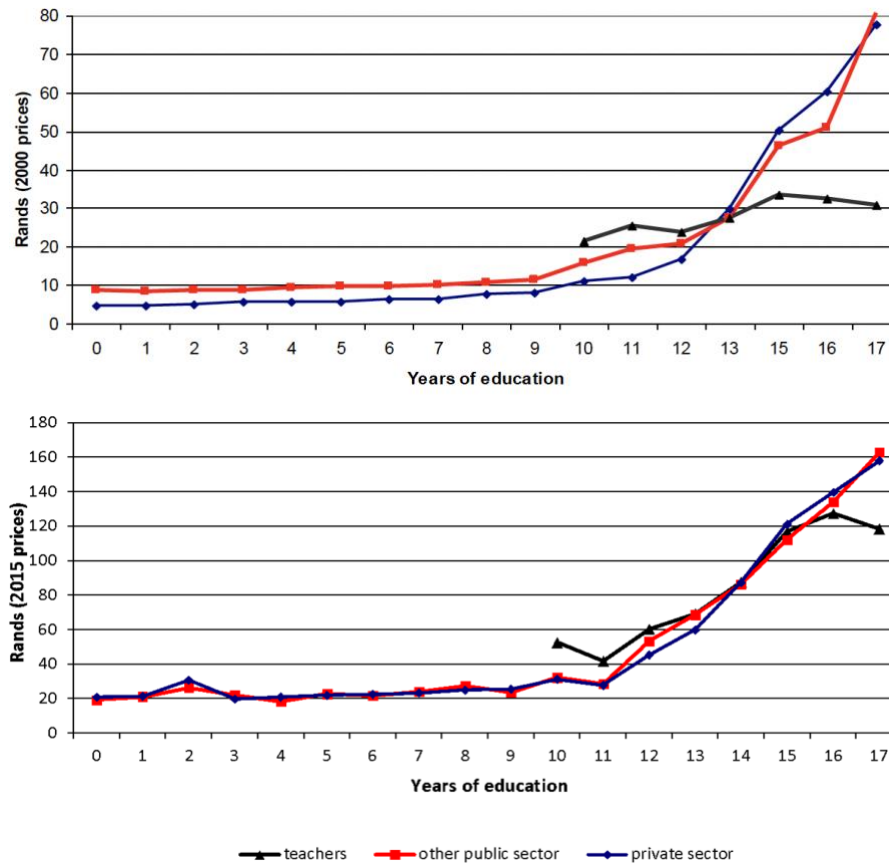
5. Wage analysis

5.1 Wage differentials

Figure 8 replicates the analysis of Burger and Van der Berg (2010) in which the average wage rate for teachers, other public and private sector workers with different levels of educational attainment were plotted using the 2000 – 2006 LFSs. In their analysis, they found a private sector premium beyond 13 years of education, which they ascribe to the low average wages earned by teachers. This is indicated by the black, almost horizontal line in the top frame of Figure 8. From this, they conclude that teachers with more education do only marginally better when compared to the returns to education outside of teaching. Repeating this analysis for the 2021 Q3 – 2017 Q4 QLFSs (bottom frame) indicates a shift in the returns to additional education amongst teachers such that the average wage of teachers follows a very similar pattern to other public and private sector workers with between 13 and 16 years of education. A premium in favour of non-teachers (both sectors) is observed only at the highest levels of education (as was already seen in Figure 2). This change in the returns to teachers' education is perhaps unsurprising given rising levels of qualifications amongst the teacher workforce.

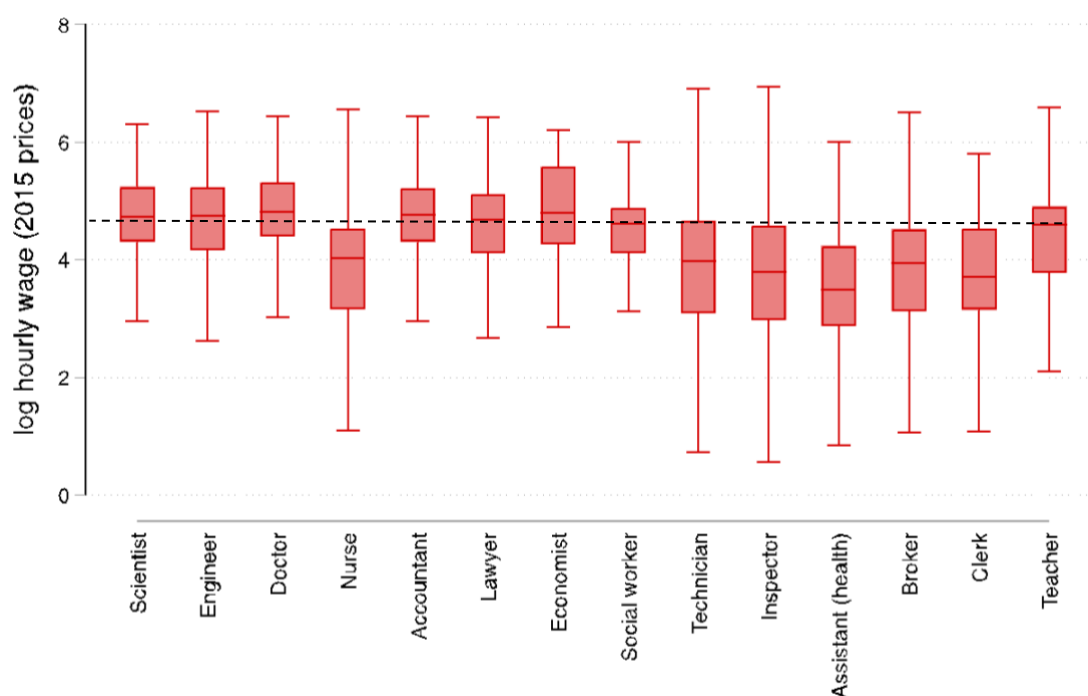
Following Gustafsson and Patel (2009) and Armstrong (2015) analysis of the earlier LFSs, Figure 9 indicates boxplots for real hourly wages (2015 Rands) for teachers and some non-teaching professionals and associate professionals (PAP) for the period 2012 Q3 - 2017 Q4. Note that outlier values have been excluded. Unlike the previous analyses, the range of teacher and nurse hourly wages are slightly larger in comparison to other broadly defined PAP occupations that are considered “prestigious”. This suggests — as was already seen in Figure 8 — higher wage returns in the teaching profession. The median hourly wage is below that of most other professional occupations, but above that of associate professional occupations. This is an interesting finding if we consider that secondary school teachers are classified as professionals — and are almost universally in position of a bachelor's degree or higher — whereas the majority of primary school teachers are classified as associate professionals. Because primary and secondary school teachers are paid almost the same, the former benefit relative to their non-teacher counterparts.

Figure 8: Comparison of teacher, other public sector and private sector hourly wages: 2000-2006 and 2012-2017



Source: Burger and van der Berg (2010), and author's own calculations using PALMS data, 2012 Q3 – 2017 Q4.
 Notes: Excludes informal sector workers, those earning more than R200 000 per month, the self-employed, and outliers as flagged by PALMs. Data is weighted using PALMS bracket weights.

Figure 9: Boxplots of log hourly wage by occupation, 2012 - 2017



Source: own calculations using PALMS data.

Notes: Excludes informal sector workers, those earning more than R200 000 per month, the self-employed, and outliers as flagged by PALMS. Data is weighted using PALMS bracket weights.

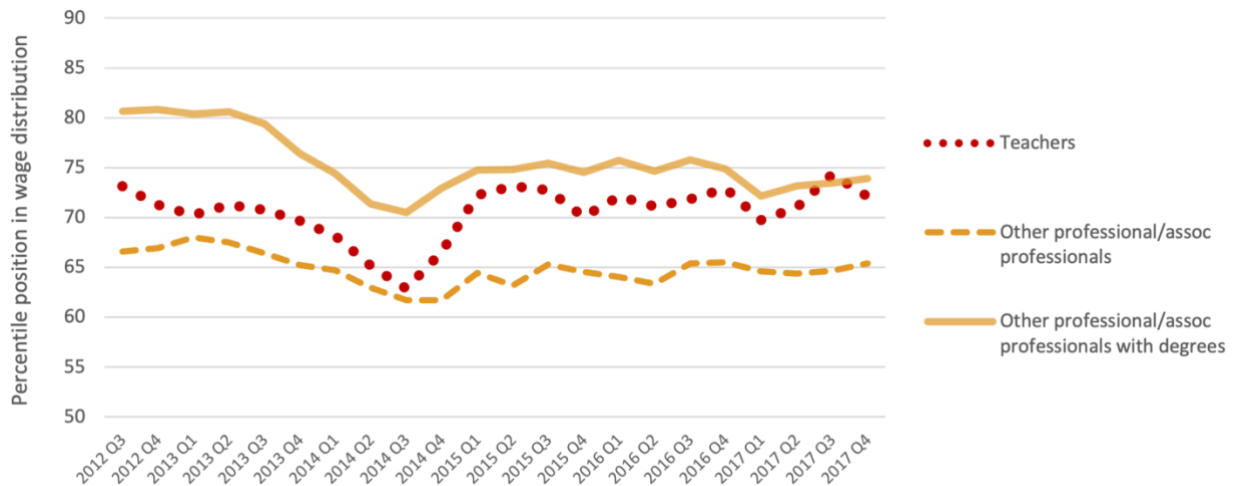
5.2 Relative positions in the wage distributions

The trends in average and median earnings already presented disguise an important factor in teachers' pay. What induces an individual graduate to enter the teaching profession is not absolute pay in teaching but *relative* pay when comparing earnings as a teacher with potential 'foregone' earnings associated with an alternative career. Understanding where teachers sit in the earnings distributions of different subsets of the labour market — as opposed to all employed labour — can help us to appreciate why, for example, studies like the 2019 Teaching and Learning International Survey (TALIS) reported at least 1 out of 5 teachers who wanted to leave their job within the next five years cited dissatisfaction with their salary as a contributing factor. According to relative deprivation theory (Davis, 1959), discontent and resentment can result from unfavourable social comparisons between one's own situation and that of similar others, even if an individual is otherwise 'objectively' affluent.

Figure 10 below shows that, on average, teachers had higher hourly wages than at least 70% of all formal sector paid-employed people in South Africa in 2017. Comparing the average teacher to other PAPs, the former lies higher in the wage distribution than the average worker from the latter group. This might not be a 'fair' comparison if we recall that teachers are, on average, more qualified than non-teaching PAPs. Degreed PAPs — that is, those with a degree or a post-bachelor's

qualification — lie much further up the wage distribution. Between 2012 and 2015, degreed PAPs' lay about 5 percentage points higher up in the wage distribution compared to teachers. However, teachers' average position, falling from the 75th to the 65th percentile between 2012 and 2015, has improved over time, and by 2017 teachers' average position had converged on that of degreed PAPs, with both lying at around the 73rd percentile by the end of 2017.

Figure 10: Teachers' and professionals' unconditional pay positions relative to all formal sector wage workers

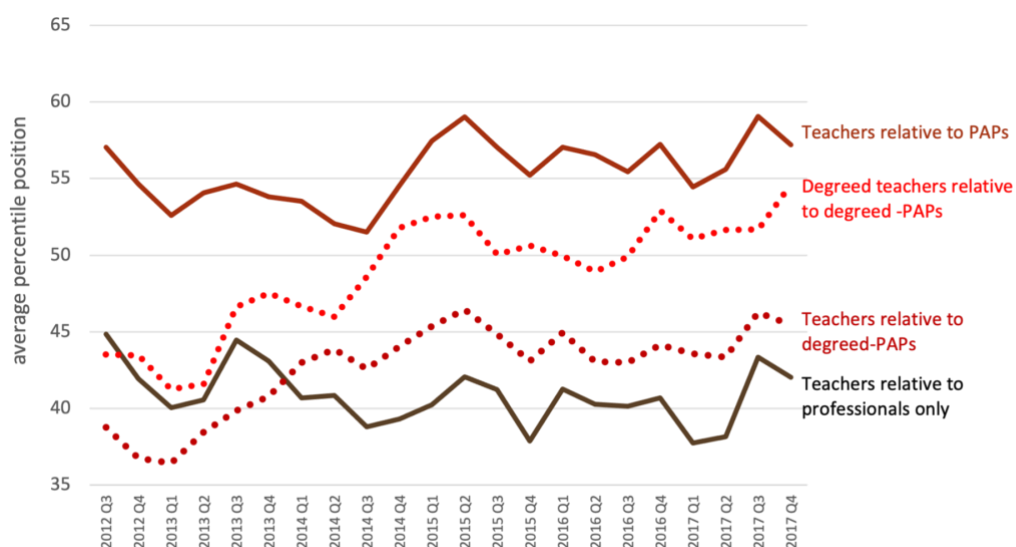


Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted.

Figure 11 indicates teachers' average positions within the wage distributions of several subgroups of PAPs. On average, teachers lie around the 55th percentile of the PAP wage distribution but drop down to the 45th percentile when comparing to degreed non-teaching PAPs. If we limit the comparison to professionals only — in other words, excluding associate professionals — teachers' average position drops down to the 40th percentile. The most improved relative position has occurred amongst *degreed* teachers when compared to the wage distribution of degreed non-teacher PAPs. In 2012, degreed teachers lay, on average, at the 45th percentile of the wage distribution of their non-teacher counterparts. By 2017, their position had improved substantially to the 55th percentile.

Figure 11: Teachers' pay position relative to other professionals



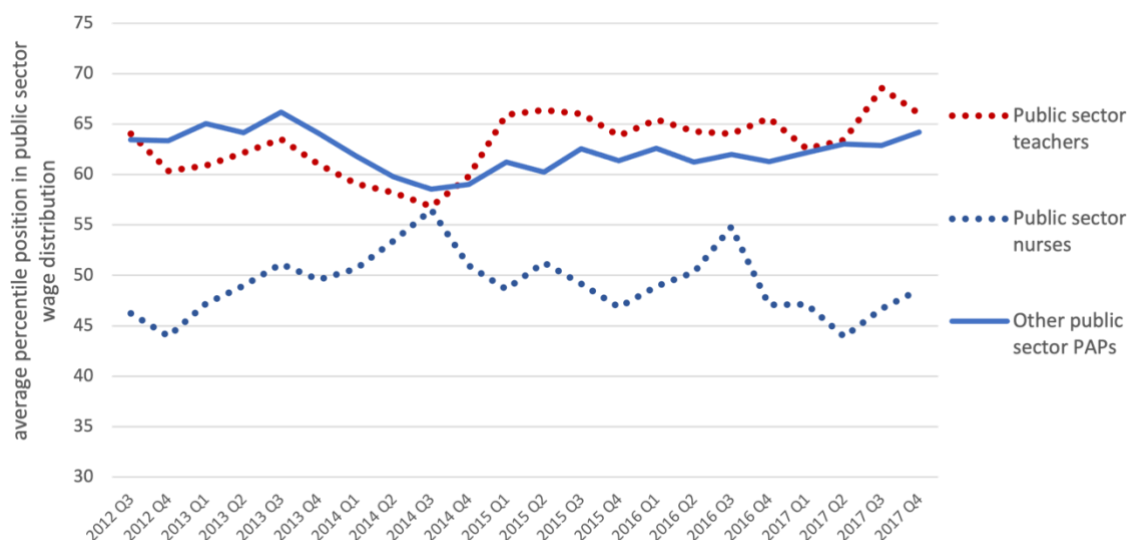
Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted.

Figure 12 compares the position of teachers in the public sector wage distribution. Teachers rank a bit further down the public sector wage distribution than in the formal sector wage distribution that includes both the private and public sectors. This makes sense given the higher average educational attainment of public sector workers versus private sector workers, and higher levels of unionization (refer back to Table 2). Teachers' average position in the public sector wage distribution has held itself relatively well, dipping from the 65th to the 55th percentile between 2012 and 2014, but rising back to the 65th percentile from 2015 onwards. Teachers are also observed to rank very similarly to other public sector PAPs. Nurses, however, rank substantially lower in the public sector wage distribution, with their average position fluctuating between the 45th and 55th percentiles over time.

Although this analysis goes some way towards making like-for-like comparisons, the descriptive statistics laid out in the previous section indicated teachers to be generally more educated and older than other workers, and more likely to be part of a trade union. These characteristics should, on average, put teachers in a favourable earnings position when compared to those in non-teacher occupations. However, the share of women and black Africans amongst the teaching force is greater than what is observed amongst other private sector non-teaching and non-nursing professional and associate professional occupations. Furthermore, and similarly for nurses, teachers are significantly less likely to reside in metro areas and more likely to reside in rural areas as they serve all communities.

Figure 12: Teachers', nurses' and other professionals' unconditional pay positions relative to all public sector wage workers



Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education, and those employed in the public sector. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMS. Data are weighted.

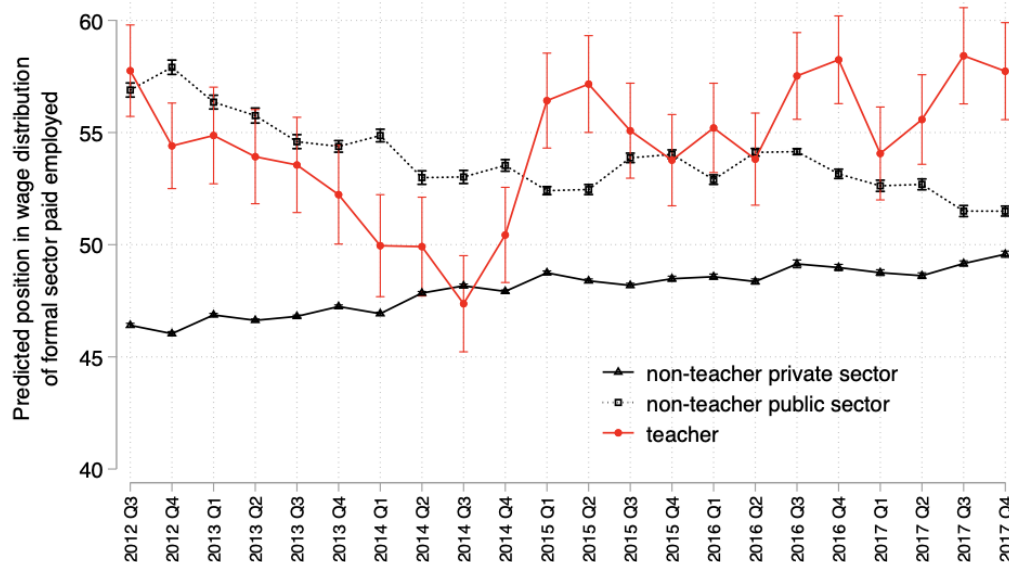
The analysis of Figures 10 through 12 are repeated using a tobit regression on an individual's percentile position within three wage distributions: (i) the full formal sector wage distribution; (ii) the wage distribution of formal sector professionals and associate professionals; and (iii) the wage distribution of public sector workers. A tobit regression is chosen as percentiles are left- and right-censored (bottom limit of 0 and upper limit of 100). The regression controls for differences in potential experience⁸ (mean centered at 10 years), population group, gender, geography (rural, metro and province), education, marital status, and time fixed effects (i.e. survey wave dummies). A teacher dummy is included and interacted with level of education and the time fixed effects. The results of these regressions are summarised in Table A2 of the Appendix.

Controlling for differences in potential experience, population group, gender, marital status, geography and education (as well as survey wave dummies), the average position of teachers in the wage distribution of the formal sector paid relative to non-teachers is roughly 5 percentage points higher on average over the period 2012 Q3-2017 Q4. Private sector workers are estimated to fall 6 percentage points lower in the wage distribution; therefore, all else equal, teachers rank significantly higher than non-teaching private sector workers than non-teaching public sector workers, as illustrated in Figure 13. Taking note of the reference categories in the regression, the comparison in Figure 13 is, in effect, being made between teachers and non-teachers that are married, black African, female, with 10 years of potential experience and a bachelor's

⁸ Potential experience is calculated as age – 6 – years of education. This represents the maximum number of years that an individual could have spent in the labour market, assuming they started school at age 6 and moved through the schooling system in minimum time.

degree (or equivalent), and residing in a metro area. The expected position of a teacher with these characteristics in the formal sector wage distribution declined significantly over the period 2012 Q3 to 2014 Q3 from around the 57th percentile to the 47th percentile. However, since 2015, their expected position has improved, putting them back at the 55th-57th percentile. Their public sector non-teaching counterpart has moved down the distribution from the 57th percentile to the 52nd percentile, whereas their private sector non-teaching counterpart has moved up the distribution from the 46th to the 50th percentile. It appears, then, that the public sector wage premium has eroded over time, all else equal. By the end of the sample period, teachers placed significantly higher than both public and private sector non-teaching workers, falling around 4-8 percentage points higher in the formal sector wage distribution.

Figure 13: Teachers' and private and public sector non-teachers' conditional pay positions in the wage distribution of the formal sector paid employed, 2012 Q3-2017 Q4



Source: own calculations using PALMS data.

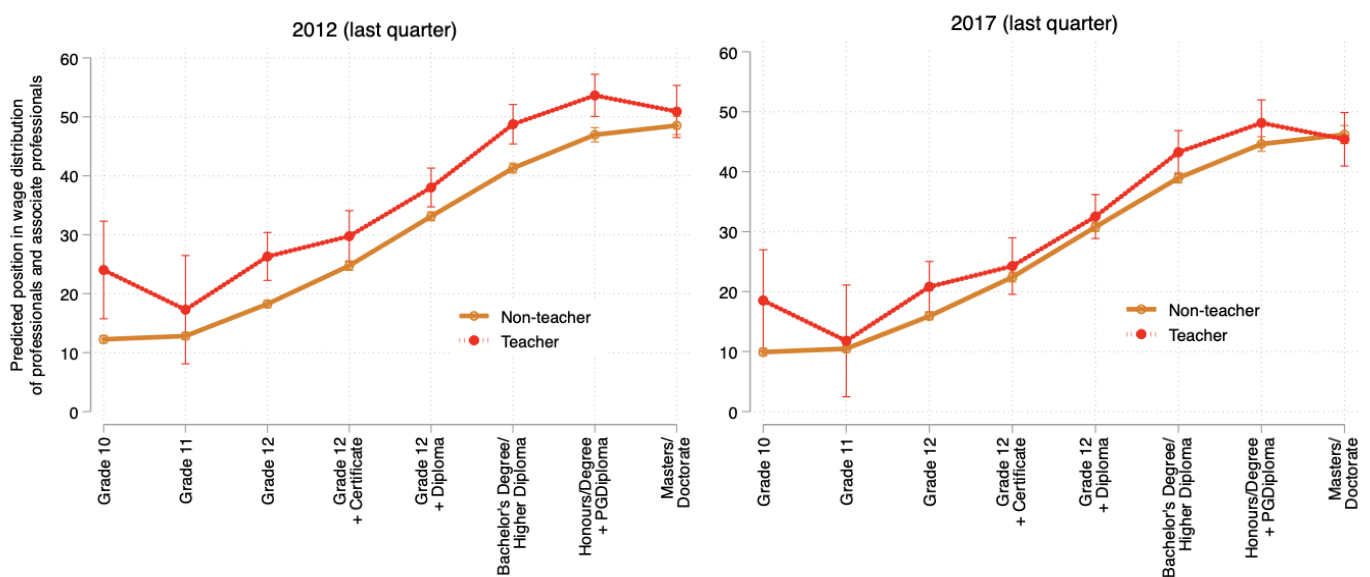
Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted. Predictive margins are estimated using the margins command in Stata.

Education is estimated to have a very strong positive association with an individual's position in the wage distribution. A formal sector worker who has only attained a Grade 10 is expected to fall 30 percentage points lower in the wage distribution than an individual who is similar in all other socio-demographic traits but is in possession of a bachelor's degree. However, a teacher in possession of a Grade 10 is expected to place 9 percentage points further up the wage distribution than their non-teaching, similarly educated counterpart. This concurs with Armstrong (2015) and Burger and Van der Berg (2010) who found evidence of a large wage premium for teachers at the bottom of the earnings distribution when compared to what they would have earned in the private sector. The greater 'returns' to education dissipate beyond a bachelor's degree.

Figure 13 established that teachers placed higher in the wage distribution than non-teachers, all else constant, but there was no accounting for differences in skills linked to type and level of occupation. Figures 14 and 15 plot the predictive margins by qualification level — again controlling for differences in observable sociodemographic characteristics — with comparisons made between teachers and two comparison groups of workers: formal sector professionals and associate professionals; and public sector workers. As mentioned in section 3 of this paper, teachers are classified as either professionals or associate professionals (PAP) depending, and from Table 2 we saw the qualifications of teachers to most closely align with that of this broad group of occupations. Public sector workers serve as a good comparison group for teachers, since 90% of teachers are employed within the public sector, and they show similar socio-demographic profiles in terms of race, gender, and geographic location.

Teachers' expected position in the PAP wage distribution was about 10 percentage points above their non-teacher PAP counterparts in 2012 (Figure 14, top frame). By 2017, however, teachers' rankings were no longer significantly different from what is expected for non-teachers (Figure 14, bottom frame). The position of teachers relative to non-teacher PAPs, therefore, worsened slightly between 2012 and 2017 (± 3 -4 percentage points), although this change is not statistically significant. Toward the end of 2017, the expected position of teachers with some post-secondary — but not degree equivalent — qualification was the 24th-32nd percentile of the PAP wage distribution; 30% of primary school teachers fall into this education category. Teachers with a degree or postgraduate qualification are expected to be 20 percentage points higher in the PAP wage distribution; more than half of primary school teachers and almost all secondary school teachers are at this level of education.

Figure 14: Teachers' conditional pay positions relative to professionals and associate professionals, 2012 Q4 vs 2017 Q4

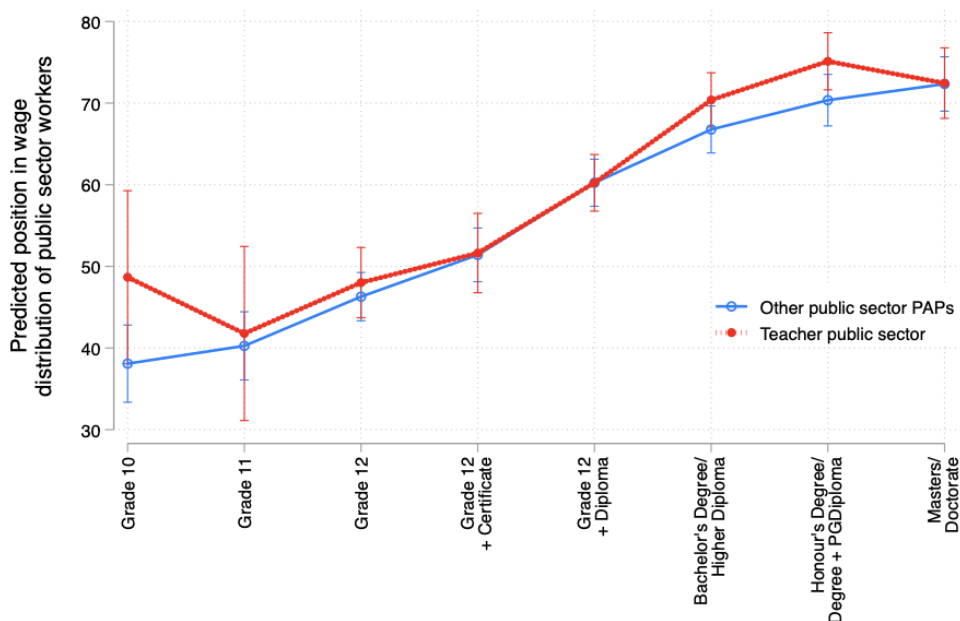


Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education and employed as a professional or associate professional (PAP). The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted. Predictive margins are computed from a tobit regression (lower limit = 0, upper limit = 100), where the dependent variable is the individual's position in the wage distribution of professional and associate professionals as dependent variable, and controls include survey wave, teacher, gender, race, marital status, union status, sector of employment, geographic location type, province, and level of education dummies, as well as potential experience (age - 6 - years of education) mean centered around 10 years.

The average teacher ranks quite a bit higher in the public sector wage distribution than they did in the wage distribution of all PAPs (Figure 15)⁹. For example, whereas a teacher with an honours degree or bachelor's degree with postgraduate diploma is expected to fall roughly midway in the PAP wage distribution, they are expected to fall at the 75th percentile of the public sector wage distribution. Furthermore, and similar to Figure 14, a teacher is not expected to earn any differently from other public sector PAPs with the same level of education, all other things being equal. Figure 16 repeats the analysis of Figure 15, except the comparison made is to an *earnings* distribution. The position of public sector teachers within the public sector earnings distribution has dropped by roughly 5 percentage points at all levels of education (aside from Grade 10 where teachers' position has fallen from 49% in the wage distribution to 40% in the earnings distribution). This difference is expected given teachers' lower reported weekly hours.

Figure 15: Public sector teachers' and non-teacher PAPs' conditional pay (wage) positions relative to public sector employed, 2017 Q4

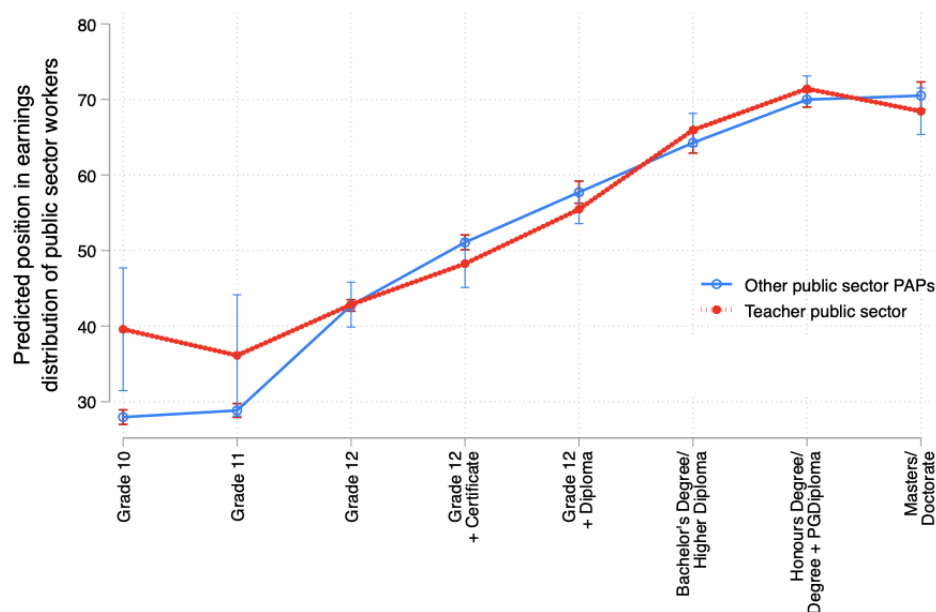


Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education, and employed in the public sector.. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted. 95% confidence intervals indicated.

⁹ The position of teachers in the public sector wage distribution did not shift significantly over the five-year period, and so only the expected pay position of teachers in the public sector wage distribution for 2017 Q4 is plotted.

Figure 16: Public sector teachers' and non-teacher PAPs' conditional pay (earnings) positions relative to public sector employed, 2017 Q4



Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education, and employed in the public sector.. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted. 95% confidence intervals indicated.

6. Conclusion

Trends in average and median earnings disguises an important factor in teachers' pay: what induces an individual graduate to enter the teaching profession is not pay in teaching but relative pay when comparing earnings in teaching with potential 'foregone' earnings associated with an alternative career. The analysis of this paper builds on earlier research on teachers' relative pay in South Africa using the Post-Apartheid Labour Market Series (PALMS) that harmonizes the LFSs and QLFSs. On average, teachers had higher hourly real wages than at least 70% of all formal sector paid-employed people in South Africa in 2017.

The expected position of teachers in the wage distribution is also higher than other professionals and associate professionals (PAP). When compared with degreed PAPs — that is, those with a degree or a post-bachelor's qualification — teachers' average position has improved over time, and by 2017 had converged on the average position of a degreed PAP. These trends are largely due to the higher levels of and increasing returns to education that teachers possess. Earlier analyses of labour force survey data for the 2000-2007 period had conversely found the advantage of entering the teaching profession to diminish with educational attainment.

The descriptive analysis of this paper also showed teachers to differ significantly from other groups of workers on several socio-demographic characteristics. Teaching continues to be a highly feminized and unionized profession relative to other private sector occupations, as well as comprising a larger share of individuals aged 50 years

and older. Furthermore, given their employment within the community service industry, teachers' geographical distribution tends to follow that of the general population, and so larger shares of teachers are found to reside in rural and non-metro areas when compared to private sector workers. Conditioning on productive and sociodemographic characteristics, the analysis of this paper found teachers' expected position in the wage (and earnings) distribution to be no different from that of their public and private sector professional counterparts.

A teacher's expected position in the pay distribution is also shown to be strongly associated with level of education such that a teacher with a bachelor's degree or higher places at the 70th-75th percentile, and at least 15 percentage points higher in the distribution than teachers with lower qualifications. Therefore, it appears that lower returns to education and experience that may have served as disincentives to teachers from acquiring higher qualifications or to remain in teaching no longer appears to be a factor.

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Appendix

Table A1: Hourly wage (2015 prices) distribution, 2000 - 2017

	25 th percentile	50 th percentile (median)	75 th percentile	Average	IQR ÷ median	# observations
Teachers						
2000	48.08	71.18	90.40	100.49	42.31	771
2004	55.41	79.38	99.23	86.69	43.82	829
2007	54.89	75.93	100.37	82.10	45.48	1 004
2010	53.84	88.11	123.82	96.42	69.98	1 835
2013	49.04	95.23	129.47	101.50	80.43	1 439
2014	40.28	97.91	143.41	120.96	103.13	1 133
Public sector non-teachers						
2000	28.40	50.09	79.10	79.58	50.7	2 442
2004	31.01	49.61	78.81	62.69	47.8	2 555
2007	31.84	52.30	83.68	66.54	51.84	3 171
2010	30.09	63.39	103.16	84.37	73.07	10 003
2013	23.63	59.16	107.28	96.43	83.65	10 065
2014	13.20	42.60	94.64	74.40	81.44	7 310
Private sector non-teachers						
2000	15.03	27.05	54.09	75.36	39.07	5 925
2004	12.33	21.48	39.87	36.72	27.55	7 780
2007	13.68	23.24	45.74	44.62	32.06	10 063
2010	16.76	31.64	68.77	58.63	52.01	26 214
2013	14.55	27.95	69.93	71.61	55.38	26 906
2014	14.56	24.58	58.24	53.73	43.68	21 664

Table A2: Tobit regression on percentile in hourly wage (2015 prices) distribution between 2012 Q3 and 2017 Q4

Sample:	All formal sector paid employed	Public sector paid employed	Formal sector professional and associate professionals
Constant	67.18*** (1.011)	59.33*** (1.222)	61.10*** (1.054)
Teacher ^a	4.90*** (1.45)	4.56*** (1.220)	1.80 (1.185)
Experience (mean centered)	0.30*** (0.013)	0.41*** (0.029)	0.24*** (0.035)
Experience squared (x 1000)	-3.10*** (0.687)	-3.247** (1.199)	-3.11*** (1.593)
Male	4.53*** (0.161)	4.57*** (0.262)	4.31*** (0.296)
Coloured	3.51*** (0.399)	1.11* (0.460)	-0.73 (0.695)
Indian	6.45*** (0.515)	1.11 (0.901)	0.69 (0.733)
White	12.04*** (0.337)	3.99*** (0.603)	5.40*** (1.593)
Private sector	-5.98*** (0.486)		-3.76*** (0.264)
Grade 10	-30.24*** (1.051)	-36.22*** (1.176)	-29.51*** (1.959)
Grade 11	-29.80*** (1.073)	-35.33*** (1.248)	-31.66*** (1.414)
Grade 12	-21.08*** (0.917)	-22.68*** (1.212)	-21.22*** (1.276)
Grade 12 + Certificate	-12.64*** (0.707)	-14.46*** (1.033)	-15.71*** (0.906)

Sample:	All formal sector paid employed	Public sector paid employed	Formal sector professional and associate professionals
Grade 12 + Diploma	-5.49*** (0.356)	-6.99*** (0.780)	-8.33*** (0.556)
Honours degree/ Degree + PG Diploma	-0.07 (0.690)	5.64*** (0.774)	3.94 (0.785)
Masters/Doctorate	-0.86 (1.314)	5.97*** (1.163)	5.50*** (0.840)
Grade 10 x Teacher	9.38* (4.37)	10.24** (3.371)	4.34 (4.574)
Grade 11 x Teacher	-5.58 (6.64)	6.02 (5.120)	0.07 (5.287)
Grade 12 x Teacher	-0.06 (1.147)	0.201 (1.348)	-1.96 (1.350)
Grade 12 + Certificate x Teacher	-3.96 (2.522)	-3.98 (2.574)	-2/70 (2.116)
Grade 12 + Diploma x Teacher	-2.67 (1.467)	-3.60* (1.507)	-1.906 (1.452)
Honours degree/ Degree + PG Diploma x Teacher	-0.065 (0.690)	-0.79 (0.855)	0.67 (1.256)
Masters/Doctorate x Teacher	-0.862 (1.314)	-3.55* (1.506)	-2.61 (1.653)
Rural	-5.789*** (0.287)	-3.50*** (0.459)	-1.87** (0.602)
Non-metro	-5.02*** (0.369)	-5.66*** (0.523)	-5.73*** (0.753)
Married	-3.16***	-2.67***	-2.49***

Sample:	All formal sector paid employed	Public sector paid employed	Formal sector professional and associate professionals
	(0.168)	(1.222)	(0.369)
Province fixed effects	Yes	Yes	Yes
Survey wage fixed effects	Yes	Yes	Yes
Number of observations	186,648	53,429	41,858

Source: own calculations using PALMS data.

Notes: Sample includes individuals aged 21-64 years old with at least 10 years of education. The sample excludes informal sector workers, those earning more than R200,000 per month (2015 prices), the self-employed, and outliers as flagged in the PALMs. Data are weighted. Experience is calculated as age - 6 - years of education. Standard errors shown in parentheses are clustered at the survey wave level. *** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$.

^a This coefficient represents an average of the coefficients on the interaction between the teacher indicator and survey wave fixed effects.