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ABSTRACT

The role of teachers in achieving good quality education is universally acknowledged. What is less clear is what incentives are required to attract good teachers to teaching. Incentives, including teachers pay, need to be sufficient yet, in the light of fiscal resource constraints, not excessive.

This paper deals with the issue of teacher pay in South Africa before the introduction of the recent Occupation Specific Dispensation (OSD) for teachers, that was intended to offer more attractive lifetime incentives to teachers in order to attract quality teachers. The paper first reviews the literature on teacher pay internationally and for South Africa, before using recent South African household surveys to empirically compare the wage received by teachers to that received by non-teachers with a similar level of education.

Keywords: teacher pay, wages, labour market, incentives
JEL codes: J31, J45, I22

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1. INTRODUCTION: TEACHERS AND EDUCATIONAL QUALITY

It is widely recognized that teachers play a central role in determining the quality of education received by students (UNESCO, 2006: 1). Teachers are indeed understood to be the “central actors in education, facilitators of learning, bringers of knowledge, brokers of relationships between pupils and the societies in which they live” (Voluntary Services Overseas [VSO], 2002: 4). Within developing societies specifically, teachers are often seen as *the* major learning resource because in these societies working and living conditions are difficult, teaching resources are scarce and teachers are considered the only way in which society is able to achieve its educational aspirations. “Teachers’ interaction with learners is the axis on which educational quality turns” (VSO, 2002: 10).

Teachers are indeed considered the key enabling factor in improving educational quality (UNESCO, 2005: 160). But in developing countries, however, there is a great temptation to lower the minimum requirements that teachers must meet in order to join the profession, so as to deal with the rapid expansion of access to education which requires substantially more teachers. This is often achieved by allowing people with lower academic qualifications to enter teacher training and ultimately become teachers, thus potentially lowering the quality of education (UNESCO, 2005: 160). Teacher quality itself depends on a number of factors, including the individuals attracted to the teaching profession, what incentive these individuals have to perform well as teachers, and whether high ability teachers remain in the teaching profession (Harnani-Limarino, 2005: 63).

Hernani-Limarino (2005: 65) relates the recruitment, performance and retention of teachers directly to the “opportunity cost” of being a teacher, the most important of which is the wage that an individual who chooses teaching as a profession could earn in other professions. Additional factors influencing the opportunity cost of teaching are those affecting the kind of people who become teachers, the performance incentives that those attracted to the profession face, as well as the likelihood that high-ability teachers will in fact remain in the system (Hernani-Limarino, 2005: 65). Indeed a prominent area of contention within the economics of education literature is whether the pay offered to teachers is sufficient to ensure an acceptable quality of teaching within schools by attracting, recruiting and retaining an adequate number of “acceptable” teachers (Podgursky, 2005: 1). The argument is centered on the idea that education departments

lack the required resources to provide adequate professional development or to pay competitive salaries to teachers.

It is therefore clear that firstly, teachers play a pivotal role in the quality of education received by students, and secondly, that the wages received by teachers play a considerable role in determining the quality of teachers who enter the teaching force.

This discussion indicates that it is important to investigate which individuals become teachers. It is therefore necessary to compare the wage received by teachers to that received by non-teachers with a similar level of education. This report will start by reviewing the literature on teacher pay internationally (section 2) and for South Africa (section 3), before using the recent South African household surveys to empirically assess the relative earnings of teachers in section 4.

2. RELATIVE TEACHER PAY

Relative teacher pay is a measure of how the pay received by teachers compares to the pay received by non-teachers with comparable levels of education. Investigating relative teacher pay therefore involves estimating the wage that individuals who enter the teaching profession would receive in alternative occupations (Hernani-Limarino, 2005: 68), allowing one to take a view on whether teachers are well-paid relative to non-teachers.

From an economic point of view, what matters in terms of relative teacher pay is the degree of substitutability between professions (Podgursky, 2005: 3). The question is therefore whether the remuneration schemes associated with the teaching profession and non-teaching professions would induce teachers to switch from the teaching profession to other professions. One might extend the investigation further and look at how much relative pay structures would have to change to retain teachers, or for non-teachers to enter the teaching profession. Presumably individuals who are the most talented in their fields receive higher wages since employers are prepared to offer higher wages to more productive employees (assuming that the most talented workers are also the most productive workers) and may compete with each other to attract the best workers. Because of this, wages offered to talented workers increase in all sectors.

Relative teacher pay may be investigated in a number of ways. One of these is to look at the pay of teachers relative to that of similar individuals who have not chosen teaching as a profession. If the pay received by teachers is substantially below that received by workers in other professions with roughly the same level of educational attainment, there exists at least prima facie evidence that teacher pay is inadequate (Podgursky, 2005: 1).

Important to note is that although pay is the most important part of the labour contract, it is not the only component of the contract that determines firstly whether or not individuals join the teaching force, and secondly the quality and performance of those who do join the teaching force. Examples of other factors affecting teacher recruitment and performance are job stability, flexibility of work schedules, number of hours required at work, in-kind payments or vacations (Hernani-Limarino, 2005: 65-66) i.e. non-monetary factors. Indeed the size of a teacher's relative wage depends largely on these factors and so a more complete measurement of the opportunity cost of being a teacher requires more information on these non-monetary dimensions of teacher contracts (Hernani-Limarino, 2005: 66-67). However, a broader definition of opportunity costs may complicate the analysis as the wage gap between teachers and non-teachers is attributable on the one hand to differences in remuneration, and on the other hand to differences in labour supply (Hernani-Limarino, 2005: 67).

2.1 Differences in hours worked

A possible complication involved in comparing the wages of teachers to those in other professions is that there are significant differences in the number of hours worked for teachers and for non-teachers. Although hours worked can be controlled for by measuring hourly wages, it must be acknowledged that this feature of the teaching profession may have a significant separate impact on who is attracted to the teaching profession (Podgursky, 2005: 12). The fact that teachers do not work during school holidays and that (in most cases) the school day (and therefore the hours that teachers are required to be at work) is shorter than the time that non-teachers are required to be at work means that teachers effectively work fewer hours than non-teachers (Podgursky, 2005: 12). The teaching profession would therefore appeal more to individuals who value long vacations and short and more predictable working hours (for example women who have or who plan to have children). Conversely, the fact that as a teacher fewer

hours are “available” for work implies that even if teachers earned an hourly wage above that of non-teachers they may receive overall lower pay than non-teachers – a considerable disincentive to join the teaching profession (Podgursky, 2005: 12).

The hours involved in teaching may therefore have a considerable impact on who joins the teaching profession. Although not completely independent from the issue of teacher pay (since the hours that teachers work may restrict them from earning overall higher wages), it may have a separate and different effect in terms of determining which individuals become teachers.

The focus of this paper is whether the pay of South African teachers is “adequate”. In other words, does the remuneration scheme according to which South African teachers are paid result in the highest level of educational quality possible? The following sections look at this in greater detail.

3. THE CASE OF SOUTH AFRICA

3.1 Background

The late apartheid period saw a rapid extension of public provision of education to black South Africans, resulting in high and rising school enrolment rates. Thus when the ANC came to power in 1994, they inherited policies that required extremely high levels of public expenditure (with over 6% of GDP and more than 20% of the budget being spent on education).

Between 1993 and 1997, there was a considerable “swing” in the allocation of resources to poor (predominantly black) households. School education has proved to be an area in which social spending is particularly well-targeted, with further reallocation of resources in favour of the poor taking place through public spending on education (Seekings, 2004: 301; Van der Berg, 2006a).

Quality differentials are a prominent problem within the South African school system. Given the central role of teachers in the quality of education provided and the fact that teacher performance is largely driven by financial incentives, it seems logical to examine whether teacher pay is adequate in the South Africa school education system. Indeed teachers are at the heart of efforts to achieve a higher quality of schooling. This is the

case for a number of reasons, the first of which is the fact that teachers' salaries are the largest part of public spending of education. A shift in resources in favour of the poor in terms of education is effectively a shift of teachers to schools that poorer children attend. Secondly, teacher quality is very unevenly distributed, with some teachers proving to be outstanding and performing beyond the expectations of both the education system and the community at large, whilst others fail to prepare for class, do not comply with rules, or are generally incompetent. Thirdly, teachers and teacher unions encompass a "powerful vested interest willing and able to delay if not thwart policy reforms". Teachers are therefore a powerful political force in post-apartheid South Africa since they represent about 3% of employed adults in South Africa and as such form a potent political, cultural and economic group (Seekings, 2004: 303).

3.2 South African Teachers: an Overall Picture

3.2.1 Demographic Characteristics

The teaching force (like many other professions) has become considerably more feminine than it was in years past and was roughly 25 percentage points more feminine than the rest of the labour force in 1999 (Crouch, 2001: 5). This gap has continued to grow, and was almost 30 percent in the September 2006 Labour Force Survey (LFS). South African teachers also appear to be considerably more educated than other employed workers, with teachers having some 56% more years of education than other workers in 1999 (Crouch, 2001: 5). This gap had narrowed to 44% by 2006, mainly due to the increase in education amongst non-teachers. Teachers are also more unionized than the rest of the labour force and experienced more rapid increases in their unionization rates than the rest of the economy until 1999, after which it stabilized. The South African Democratic Teachers Union (SADTU) is one of the biggest unions within the Congress of South African Trade Unions (COSATU). SADTU explicitly supports the ANC in elections and specifically supports the ANC's pursuit of SADTU objectives (Seekings, 2004: 303).

Age is a further dimension along which teachers differ from the remainder of the South African workforce: while the average age of the workforce is decreasing, the average age of teachers in South Africa is increasing. Finally, in the early part of the transition amongst the white population participation in the teaching force increased relative to their participation in the rest of the workforce, while amongst the black population,

participation in the teaching force has decreased while it has increased in the rest of the workforce (Crouch, 2001: 5-6). This probably reflects new opportunities opening up for black teachers that were often not the case under apartheid.

In terms of income, Crouch (2001: 5) finds that during the late 1990's, teachers reported earning substantially higher salaries than other employed workers in the South African labour force (on average), in some cases up to 64% more than non-teachers (not accounting for the differences in hours worked between teachers and non-teachers). Further, the average nominal salaries of teachers increased faster over the first five years of democracy than they have for the rest of the workforce (Crouch, 2001: 5). As mentioned earlier, any comparison between the wages of teachers and those of non-teachers must take account of the fact that teachers' working hours differ substantially from those of non-teachers. In South Africa teachers report working substantially fewer hours than non-teachers do (in some cases up to 17% less). Given this difference in work hours between teachers and non-teachers, the hourly wages of teachers are even higher. In addition, teacher salaries grew faster than did the salaries of workers in the rest of the workforce (Crouch, 2001: 5-6).

3.2.2 Income Distribution of Teachers and Non-Teachers

A substantial part of the higher earnings of teachers can be explained in terms of their higher educational attainment relative to non-teachers in the labour market. However, there is still evidence that teachers shifted away from the bulk of the population with respect to earnings during the late 1990's. In 1995, 80.1% of the employed population earned less than the top 50% of teachers; by 1999, this had increased slightly to 84.3% of the employed population (Crouch, 2001: 13-14). Three quarters of South African teachers are in the top decile of earners, while the rest are in the second highest decile of earners and the mean earnings of teachers are roughly three times the mean earnings of all employed workers (Seekings, 2004: 304). It is therefore clear that teachers fell increasingly into the economic elite amongst employed individuals in South Africa. Indeed, if the unemployed were added to the picture, teachers rose to the very top of the income distribution (Crouch, 2001: 14).

On an international level, a general pattern of teacher relative wages is that teachers are initially a relatively privileged class within society. As the economy of the country in

question develops, the gap between teachers and the parents of the children they teach becomes smaller as teachers evolve towards the same income and social classes of parents. However, in South Africa this had not happened by 1999. In South Africa teachers have remained further from the income base of parents than the level of development in the country would predict. In this sense South Africa seemed to be developing differently to the general international pattern, given the divergence between the earnings of teachers and the parents of the children they teach (Crouch, 2001: 15). Seekings (2004: 303) describes teachers as a “relatively well-educated and affluent group within South African society” who are influential within both civil society and the ANC. The majority of South African teachers are indeed better off than all but roughly 10%-15% of the parents of the teachers in their classes so it is impossible to think of teachers as belonging to the same socio-economic class as the children they teach. Further it appeared that this gap was widening over the first five years of democracy (Crouch, 2001: 15).

3.2.3 Income Dynamics

Government policy aimed at eroding the differentials in teacher salaries has resulted in different experiences (along gender and racial lines) of salary changes (Hosking, 2000: 653). Indeed this government policy was aimed at bringing the salary scales of all teachers in line with that of white male teachers. Racial disparities in salary scales were eliminated in 1986 (excluding some of the homelands), while gender differences in salary scales were eliminated by 1992. Black female teachers therefore experienced the largest salary improvement while white males experienced the smallest salary improvement (Hosking, 2000: 653). Importantly, government policy aimed to eliminate the differentials that existed in salary scale disparities rather than those which existed in average wages, so disparities still exist in average wages across gender and race groups within the teaching profession. For example, in 1992 (by which time both racial and gender disparities in salary scales had been eliminated) the average wage of black female teachers was approximately half of what it was for white male teachers (Hosking, 2000: 653).

3.2.4 Policy of Pay Compression

A significant factor affecting teacher salaries is the role played by trade unions in compressing teacher salaries. After the political transition, trade unions called for

curtailment of teacher salaries at the upper end of the salary scale in favour of greater increases at the bottom end of the salary scale (Bot, 1996: 10). The Education Labour Relations Council suggested a 5% wage increase for teachers employed in the highest post levels and wages increases of up to 29% for teachers employed in the lowest post levels in 1997 (Bot, 1996: 10). Salary increases proposed by SADTU in 1998 were to increase the salaries of teachers at the lower end of the scales whilst the salaries of teachers at the upper end of the scale were not to increase at all (Hosking, 2000: 653). The motivation for this policy of pay compression was to reduce the extent to which increases in remuneration were achievable through additional qualifications. The policy therefore opposed the heavy weight that the salary structure placed on qualifications, as it was generally believed that this kind of emphasis resulted ultimately in an uncontrollable “paper chase” (Edupol, 1993: 26).

Gustafsson and Patel (2006: 71) refer to “the suspension of qualification- and experience-based increments in 1995, following pressure from the major teacher union”, but also note that “the salary structure adopted after 1995 continued to be based strongly on the 1995 baseline qualifications and years of experience of each teacher, even if increments linked to further progress were not possible”. This still affects patterns of remuneration today and partly account for the 12 percent higher wages paid to white teachers even after conditioning for education level, post sand province that were found for 2000 by Van der Berg (2006b: 52, 54)

Despite the suspension of qualification- and experience-based increments in 1995, following pressure from the major teacher union, the 2005 differentials across national quintiles in terms of teacher pay are a function of differences in the qualifications and, to a lesser extent, the years of experience of teachers. This is because the salary structure adopted after 1995 continued to be based strongly on the 1995 baseline qualifications and years of experience of each teacher, even if increments linked to further progress were not possible. This arrangement was in many senses a logical outcome of the labour relations environment of the time, which was characterised by divisions in the union movement largely based on the status that groups of teachers had occupied within the apartheid system. The biggest teacher union, the South African Democratic Teachers Union (SADTU), supported the suspension of qualifications and experience increments, and a stronger focus on general pay increases offering greater proportional increments to teachers at the lowest salary levels. Given that SADTU's membership

comprised the teachers with the lowest salaries on average, due to their on-average lower qualifications (in terms of years of training) and fewer accumulated years in the system, this was arguably a rational way for SADTU to maximise the benefits of its members, and minimise the benefits of historically advantaged teachers represented by other unions. The fact that SADTU was a major supporter of the new ANC government and also was a key to the maintenance of stability in the schooling system, made the ANC well-disposed towards accepting SADTU's position on salaries. It is important to recognise that these labour relations dynamics were at the heart of this first wave of spending equalisation across the post-apartheid schooling system. Though bringing quality schooling to the historically disadvantaged was implied, this was not the chief driving factor.

3.2.5 Demographic Dynamics

Crouch (2001: 26-27) reports that high rates of individuals joining the teaching force are found amongst younger, less educated individuals, since the relative advantage for this group is the greatest of all teachers. Indeed the fact that the salary increases experienced by this group of teachers are considerably higher than that of highly qualified teachers emphasises the degree of advantage that these teachers have over non-teachers in the South African workforce. He argues that this explains the higher joining rate amongst young less-educated individuals. However, young teachers also have a significantly high leaving rate from the teaching force. But young teachers who leave the teaching force are generally better educated. This trend may also be explained in terms of the large increases received by teachers at the lower end of the salary scale relative to those at the upper end. The fact that wage increases experienced by teachers with the highest qualifications were considerably lower than those of less qualified teachers implied that highly educated teachers faced poor lifetime earnings prospects in the teaching profession, since their pay advantage relative to non-teachers was likely to decline over time (Crouch, 2001: 27). Perhaps for this reason, younger teachers with higher levels of qualifications had a high leaving rate from the teaching force.

3.2.6 Perceptions of Teachers

There are strong feelings among South African teachers that their remuneration is substantially lower than what is available in non-teachers professions and that the current salary structure provides very little incentive to perform as a teacher (Hosking,

2000:654). A decade ago, Arnott and Chabane (1995: 31) reported that attrition rates (i.e. individuals leaving the teaching profession as a percentage of the total number of teachers) were highest amongst whites (10.3%), followed by Indians (5.7%), coloureds (4.8%) and blacks (3.7%). This probably reflected the options available to these teachers outside of teaching. Hosking (2000: 654) explained that the main reasons given for teachers voluntarily leaving the school system include first of all the idea that better career opportunities exist elsewhere. Secondly, they feared that “right-sizing” actions would result in deployment to outlying areas which were not very attractive areas of employment. Thirdly, they cited the lack of responsiveness of the current salary structure to performance as a major obstacle in the way of credible teacher incentives for performance. Finally, teaching provides teachers with insufficient time to become specialists in the field in which they teach.

It is therefore clear that the pay received by teachers is an area of great contention and one which plays a significant role in who joins the teaching force, who is prepared to remain in the teaching force, and how those in the teaching force perform as teachers. The original version of this paper was written before that by Gustafsson & Patel (2009), who approached this issue in similar fashion, but with the emphases more specifically on the wage negotiation process that was in full swing at the time of their writing.

4. EMPIRICAL ANALYSIS

4.1 Data

In attempting to answer the question “Are teachers well paid in South Africa”, the first issue one is confronted with is who to include in the sample of teachers. Using detailed occupation of employment codes from the OHS and LFS datasets, we can identify all individuals who were classified as working in the “primary education teaching professionals”, “primary education teaching associate professionals”² and “secondary education teaching professionals” occupations. By only including individuals in these categories in our sample of teachers, we choose to omit those who teach at a post-secondary or pre-primary level, as well as special education teachers, education methods specialists, school inspectors, principals and all other occupations classified

² According to the ISCO definitions applied by the ILO, primary education associates professionals perform very similar tasks as primary education professionals, but differ from these workers “depending on the specific tasks and degree of responsibility in executing them, as well as on the national educational and training requirements”. It therefore seems natural to also include these workers in our sample of teachers.

under the “other teaching professionals” category. The 1995 OHS used a slightly different classification as the other surveys, so that it is not possible to distinguish between primary and pre-primary teaching professionals. In subsequent surveys we observe that the ratio of primary to pre-primary teaching professionals is about 23 to 1, so this is unlikely to lead to large inaccuracies. We also use the detailed industry of employment codes to exclude all teachers working outside of the “education services” industry. This amounts to dropping fewer than 2% of teachers. Lastly, we also observe some workers who claim to be working as teachers at primary or secondary level, but who have only ever attained very low levels of education themselves. Since these individuals are far from typical, and may even represent coding errors, we omit all those teachers who have less than 10 years of educational attainment. This amounts to dropping less than 0.4% of the teacher sample. Of the remaining teachers 6% have less than completed secondary education, 7% have completed secondary education only, 51% have post-secondary qualifications but not university degrees, and 36% have university degrees.

Table 1: Size of teacher sample

Survey	Number of teachers	Teachers as percentage of employed population
OHS1995	1,097	3.5%
OHS1996	316	2.2%
OHS1997	678	2.5%
OHS1998	594	3.4%
OHS1999	637	2.5%
LFS2000a	277	2.6%
LFS2000b	789	2.8%
LFS2001a	746	2.5%
LFS2001b	874	3.4%
LFS2002a	924	3.3%
LFS2002b	859	3.4%
LFS2003a	896	3.6%
LFS2003b	770	3.1%
LFS2004a	799	3.3%
LFS2004b	818	3.3%
LFS2005a	841	3.2%
LFS2005b	863	3.3%
LFS2006a	850	3.2%
LFS2006b	840	3.2%
TOTAL	13,628	3.1%

In some cases it will be useful to compare the teachers to other public sector workers. Unfortunately, unlike the more recent Labour Force Surveys, the October Household Surveys did not include a question that allows us to identify public sector workers directly, but a fairly accurate proxy can be created using the detailed occupation and industry information.

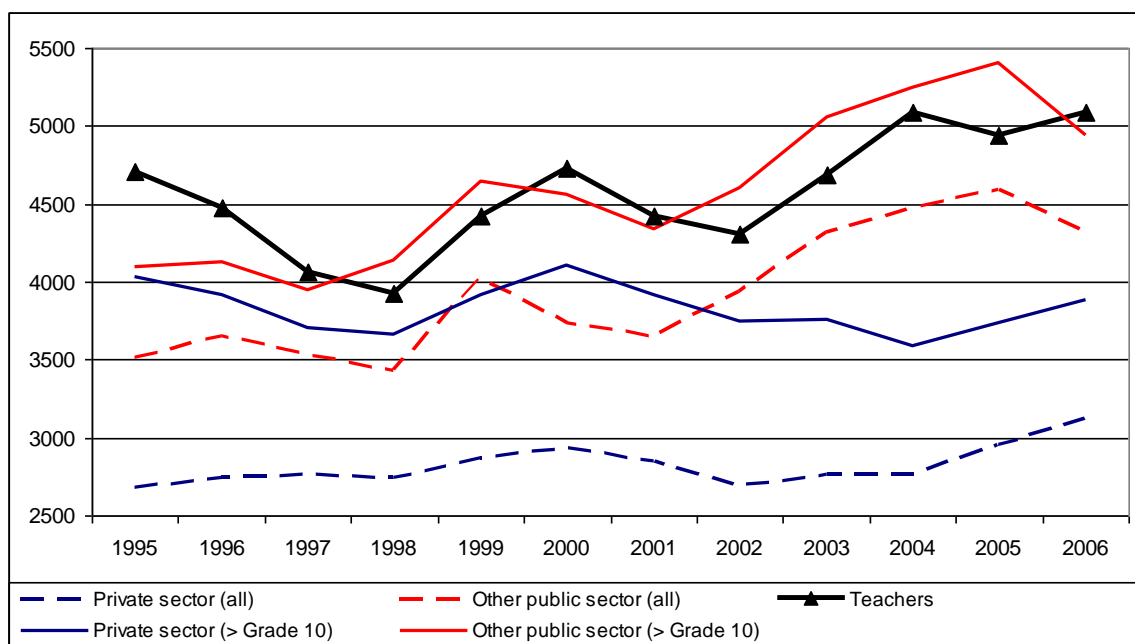
In order to determine whether South African teachers are well-paid or not, we need to compare them to a group of workers who are as similar as possible to the teachers themselves. For this comparison to be valid, this counterfactual group of workers cannot be systematically different from the teachers in any other aspect than their choice of occupation. The simplest way of doing this is to merely compare the average teacher salary to that of subsamples of other South African workers. Burger and Yu (2006) showed that inconsistencies in questionnaire design meant that sensible comparisons of earnings across surveys could only be made after excluding informal sector workers (about 30% of the total employed sampled since 2000), the self-employed (an additional 7%) and those earning more than R200 000 per month in 2000 prices (fewer than 0.1%).

4.2 Unconditional wage differential

Figure 1 below compares the monthly earnings of teachers in the different years between 1995 and 2006 to that of other public sector employees and private sector workers. Over the period as a whole, the average teacher earned slightly more (about 20%) than their counterparts elsewhere in the public sector, and much more than those in the private sector (about 60%). Teachers' average monthly earnings increased by 0.8% per year over the period as a whole, whereas the earnings of other public sector workers rose by 2.1% per year, which led to a narrowing of the gap between the two groups. The earnings gap is partly explained by the difference in education between these groups: teachers on average have completed 13.7 years of education, compared to 9.9 years of education in the private sector and 11.1 years in the public sector. Comparing the much better educated teachers with the rest of the employed may therefore be less useful than a comparison with public and private sector workers with comparable levels of educational attainment. Figure 1 also shows the earnings for public and private sector workers with at least a grade 10 education. It can now be observed that teachers do only slightly better than private sector workers with at least a grade 10 education while earning about the same as other public sector workers with comparable

levels of educational attainment. It should be noted that most teachers have some form of post-secondary qualifications, whereas the bulk of private and public sector workers do not (even after excluding all those with less than grade 10). In the South African labour market qualifications beyond completed secondary school earn a large premium, so that including the large group of workers with at least ten years of education but no more than completed secondary school in the reference groups in Figure 1 may make teacher earnings seem large in comparison.

Figure 1: Comparison of public and private sector monthly earnings (2000 prices), by year

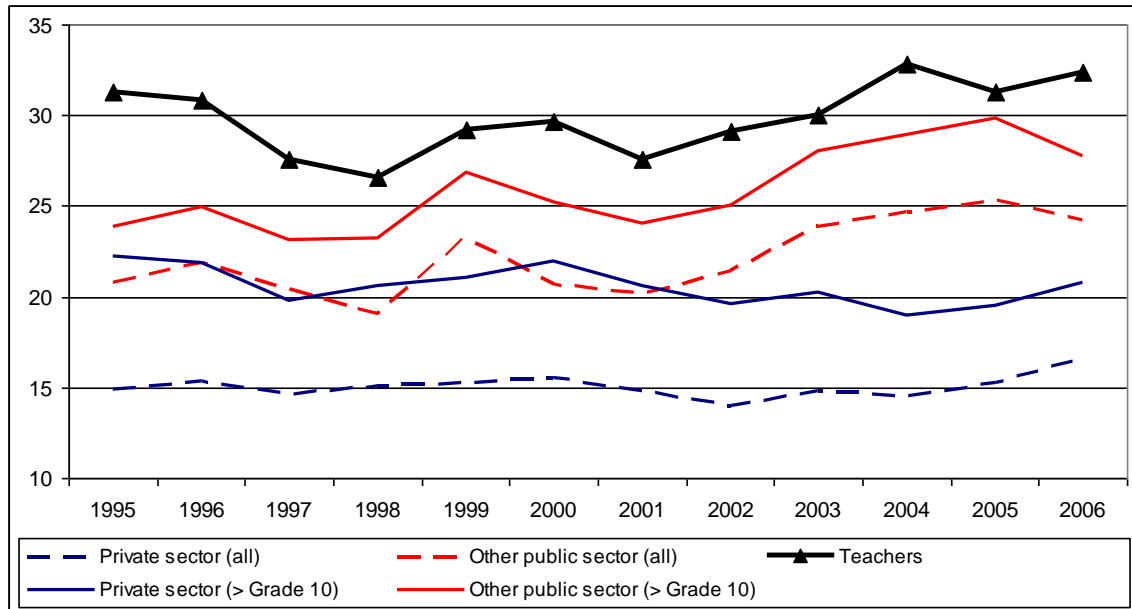


Notes: Authors' own calculations from OHS's between 1995 and 1999, and September rounds of 2000 to 2006 LFS datasets. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed.

Teachers generally work fewer hours per week than other workers. This trend can also be observed in South Africa, where teachers work 37 hours compared to 43 and 45 respectively for public sector and private sector workers with at least a grade 10 education. Therefore, we would expect average teacher earnings to be lower than that of other workers, even if they earned a similar hourly wage rate. Figure 2 repeats the comparison from Figure 1, but this time by comparing the hourly wage rates, rather than the monthly earnings, of teachers, other public sector workers and private sector employees. Not surprisingly, teachers can be observed to do even better in terms of their wage rates than when comparing monthly earnings. Teachers can also be seen to

earn more *on an hourly basis* than workers in the public or private sector with comparable levels of education.

Figure 2: Comparison of public and private sector hourly wage rates (2000 prices), by year



Notes: Authors' own calculations from OHS's between 1995 and 1999, and September rounds of 2000 to 2006 LFS datasets. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed.

4.3 Conditional wage differential

The preceding section highlighted the importance of controlling for differences in education and hours worked in comparing teachers to non-teachers. Table 2 displays the means of different variables often associated with wage differences in South Africa, for different subgroups of the workforce. It can be observed that teachers are generally older than other workers, have worked for their current employers for much longer, and are more likely to be part of a trade union. All of these characteristics should put the average teacher in a favourable position in terms of earnings potential, compared to the average non-teaching worker. On the other hand, teachers also contain a larger share of women and blacks when compared to the rest of the workforce, and because their distribution needs to follow that of the population as a whole to serve all communities, they are more likely to live in rural areas or provinces that are usually associated with higher unemployment and lower wages (such as the Eastern Cape, Mpumalanga or Limpopo).

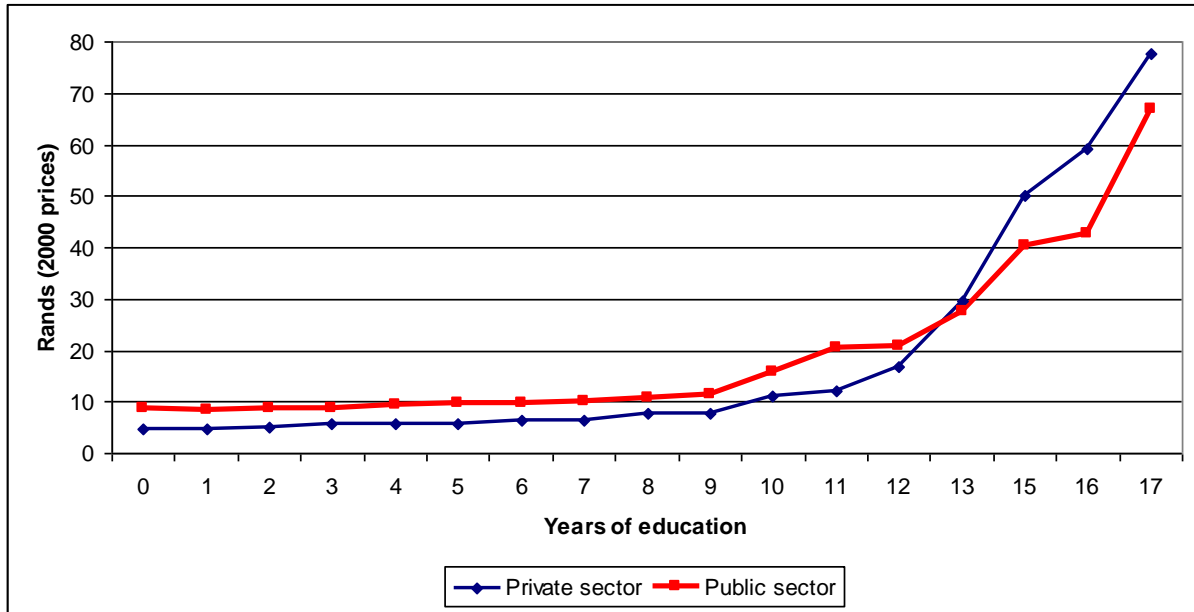
Table 2: Means of selected variables for different samples of workers, September 2006

	Teachers	Private sector	Public sector	Teachers	Private sector	Public sector
	Means			Standard deviation		
Years of education	13.82	11.53	12.64	1.61	1.27	1.60
Age	41.80	31.07	37.82	8.70	11.28	9.46
Years of tenure	12.42	5.01	9.05	9.70	6.50	8.33
Female	0.71	0.51	0.47	0.45	0.50	0.50
Black	0.69	0.70	0.66	0.46	0.46	0.47
Coloured	0.10	0.08	0.12	0.31	0.28	0.33
Indian	0.02	0.04	0.02	0.14	0.20	0.15
White	0.19	0.17	0.19	0.39	0.38	0.39
Rural*	0.32	0.25	0.15	0.47	0.43	0.36
Western Cape	0.09	0.12	0.14	0.29	0.33	0.35
Eastern Cape	0.17	0.09	0.14	0.38	0.29	0.35
Northern Cape	0.02	0.02	0.03	0.13	0.13	0.18
Free State	0.06	0.06	0.09	0.24	0.24	0.28
Kwazulu-Natal	0.21	0.20	0.19	0.41	0.40	0.39
Northwest	0.09	0.07	0.06	0.28	0.25	0.24
Gauteng	0.18	0.29	0.21	0.38	0.45	0.41
Mpumalanga	0.07	0.07	0.06	0.25	0.25	0.24
Limpopo	0.12	0.09	0.08	0.33	0.28	0.27
Union	0.76	0.20	0.63	0.42	0.40	0.48
Household head	0.48	0.33	0.59	0.50	0.47	0.49
Married	0.70	0.37	0.60	0.46	0.48	0.49
Household size	4.12	4.64	3.96	2.03	2.70	2.26
Average hours worked per week	37.08	45.34	42.07	7.65	14.36	11.51

* Due to difference in sampling design, the rural variable was not available in the March or September 2006 LFS's. The values in this table are from the September 2005 dataset.

Moving beyond simple descriptive statistics, we now control for the full range of characteristics in order to determine whether teachers would be paid more or less if they chose not to become teachers. The simplest manner in which to do this is to include a teacher dummy variable in an earnings regression, but as we will show this method can also lead to very different results, depending on how we choose to represent the effect of education on earnings. Figure 3 plots the average wage rate for public and private sector workers with different levels of educational attainment. Public sector workers earn a premium up to attaining 12 years of education, after which point workers actually do better in the private sector.

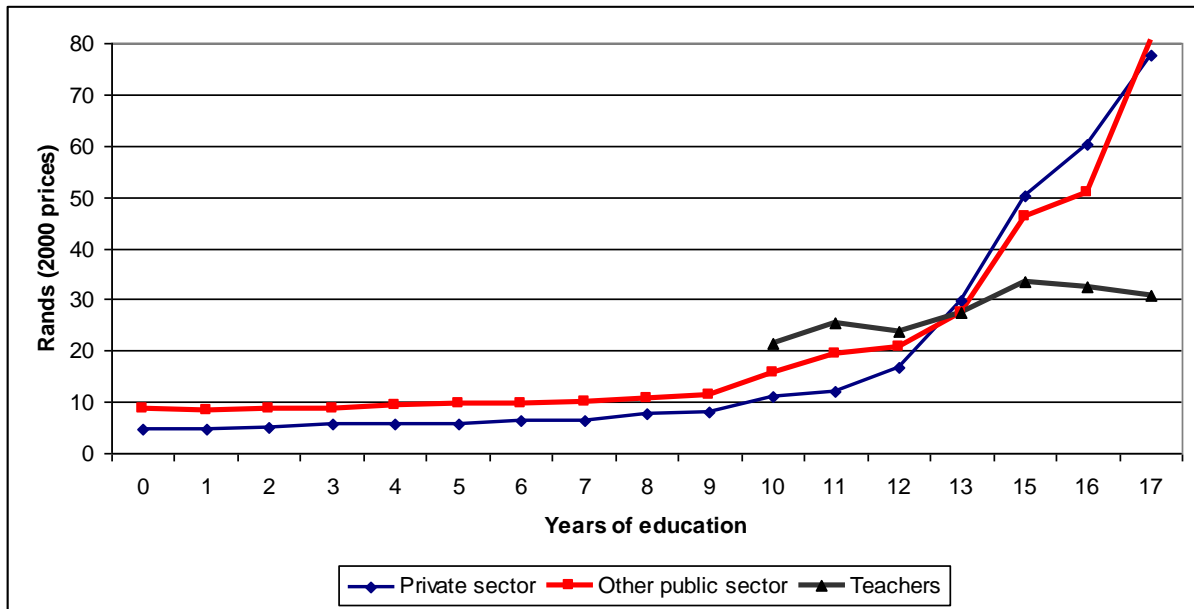
**Figure 3: Comparison of public and private sector hourly wage rate (2000 prices):
2000-2006**



Notes: Authors' own calculations from LFS1-LFS13 datasets. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed.

Figure 4 shows that most of the public sector penalty associated with post-secondary education is ascribable to the low wages earned by teachers. Whereas additional education is associated with rapidly increasing wages outside of teaching, teachers with more education only do marginally better.

Figure 4: Comparison of teacher, other public sector and private sector monthly earnings (2000 prices): 2000-2006



Notes: Authors' own calculations from LFS1-LFS13 datasets. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed.

Table 2 reports the result of an OLS regression on the log of real monthly earnings (deflated using the South African Reserve Bank's CPI series). The coefficients for a regression on the sample as a whole are replicated in the first column, and show that after controlling for differences in potential experience, population group, gender, geography and education (as well as year dummies), teachers are found to earn 21% more on average than public sector workers, who in turn earn 48% more than private sector workers. Although race and gender still have a pervasive effect on South African labour markets, reducing the explanatory variables to education and experience alone still yields an R^2 of 0.38 (as opposed to 0.48). When the sample is restricted to those workers with at least a grade 10 education (regression 2), the teacher premium becomes more or less negligible (2%), although most teachers would still benefit from the 38% public sector premium. Including education quadratically (regression 3) makes little difference to this result, but including education as a set of dummy variables reduces the public sector premium to 34% and actually turns the teacher premium *negative*. Allowing the teacher coefficients to differ by time period does not point towards a strong trend over time.

Table 2: OLS regression on log of monthly earnings (2000 prices) of formal sector workers between 1995 and 2005

	Regression 1 Whole sample	Regression 2 At least grade 10	Regression 3 At least grade 10	Regression 4 At least grade 10
Constant	5.761 (0.010)	4.410 (0.020)	3.430 (0.096)	6.684 (0.012)
Experience	0.037 (0.000)	0.060 (0.001)	0.060 (0.001)	0.060 (0.001)
Experience squared (x 1000)	-0.358 (0.009)	-0.960 (0.017)	-0.963 (0.017)	-0.957 (0.017)
Female	-0.317 (0.003)	-0.285 (0.004)	-0.287 (0.004)	-0.291 (0.004)
Coloured	0.207 (0.005)	0.342 (0.007)	0.342 (0.007)	0.346 (0.007)
Indian	0.413 (0.008)	0.425 (0.009)	0.424 (0.009)	0.433 (0.009)
White	0.752 (0.004)	0.708 (0.005)	0.707 (0.005)	0.705 (0.005)
Rural	-0.298 (0.004)	-0.238 (0.006)	-0.237 (0.006)	-0.240 (0.006)
Eastern Cape	-0.134 (0.007)	-0.060 (0.008)	-0.063 (0.008)	-0.061 (0.008)
Northern Cape	-0.189 (0.010)	-0.132 (0.015)	-0.134 (0.015)	-0.129 (0.015)
Free State	-0.177 (0.007)	-0.145 (0.009)	-0.146 (0.009)	-0.142 (0.009)
Kwazulu-Natal	-0.023 (0.006)	-0.037 (0.007)	-0.039 (0.007)	-0.032 (0.007)
Northwest	0.099 (0.007)	0.064 (0.010)	0.063 (0.010)	0.066 (0.010)
Gauteng	0.153 (0.005)	0.146 (0.007)	0.145 (0.007)	0.150 (0.007)
Mpumalanga	0.051 (0.007)	0.006 (0.010)	0.003 (0.010)	0.007 (0.010)
Limpopo	0.013 (0.008)	-0.012 (0.010)	-0.015 (0.010)	-0.024 (0.010)
Teacher	0.187 (0.008)	0.018 (0.008)	0.020 (0.008)	-0.035 (0.009)
Public sector	0.390 (0.004)	0.319 (0.005)	0.316 (0.005)	0.294 (0.005)
Years of education	0.122 (0.001)	0.225 (0.001)	0.380 (0.015)	
Years of education squared			-0.006 (0.001)	
Grade 11				0.161 (0.007)
Grade 12				0.383 (0.006)
Diploma				0.824 (0.007)

Bachelor's degree				1.122 (0.009)
Honour's degree				1.220 (0.011)
Master's degree				1.238 (0.032)
Observations	260180	149890	149890	149890
Adjusted R-squared	0.4807	0.4173	0.4177	0.4244

Notes: Authors' own calculations from OHS's between 1995 and 1999, and all rounds of 2000 to 2005 LFS datasets. Regression also includes set of year dummies. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed. Standard errors in parentheses.

4.4 Oaxaca decomposition

The regressions in Table 3 restrict the teacher-effect to a shift in the constant, and therefore assume that there is no difference in the effects of the explanatory variables on earnings between teachers and non-teachers. This can be overly restrictive, and so we use Oaxaca-Blinder decompositions to identify the conditional earnings gap, which allows all the model coefficients to differ between teachers and non-teachers. These decompositions are calculated using the regression coefficients from the non-teaching group as the reference wage structure, since it is accepted that earnings in the teaching profession are subject to political considerations and will therefore not be an accurate reflection of worker productivity. The difference in the average log of earnings for the teaching and non-teaching groups can therefore be decomposed in the following manner:

$$\overline{\ln W_T} - \overline{\ln W_N} = (\bar{X}_T - \bar{X}_N)\beta_N + \bar{X}_T(\beta_T - \beta_N)$$

where W_i represents the monthly earnings of group i ,

subscripts T and N are used to denote teachers and non-teachers,

\bar{X}_i represents the average set of personal characteristics of group i , and

β_N denotes the labour markets returns to the personal characteristics in vector \bar{X}_i .

The first term on the right-hand side of the equation represents the part of the earnings gap that is ascribable to the differences in the average set of personal characteristics³ between teachers and non-teachers, and the second term represents the differences in the way that the labour market rewards the same characteristics in teachers and non-teachers.

³ Given the South African history of labour market discrimination against blacks and females, and the fact that we control for race and gender in Oaxaca-Blinder decompositions, we refrain from ascribing the part of the earnings gap associated with the higher proportion of females and blacks working teachers as part of the "productivity differential".

Figure 5 below shows this decomposition of the log of monthly earnings differential between teachers and private sector workers with at least grade 10 education. We can observe that most of the gap is initially explained by differences in the returns to characteristics, but over time the wage gap in favour of teachers increases, mainly due an improvement in the average level of teacher characteristics vis-à-vis that of private sector workers. Figure 1 showed that between 1995 and 2005 the average teacher salary rose slightly, whereas the average private sector wage (for those with grade 10 or more) declined marginally. This decline is solely due to private sector workers with grade 10, grade 11 or grade 12, since the earnings of workers with post-secondary qualifications increased over the period. The decrease experienced by private sector workers without some form of higher education is due to the rapid expansion of secondary education – and therefore a rapid increase in the supply of workers with these qualifications – as well as the continually rising demand for highly skilled labour at the cost of semi-skilled and unskilled workers. The increasing wage gap observed in Figure 5 is therefore not due to a further widening gap in characteristics between the two groups, but rather to an increase in the rewards to the education gap that already existed in 1995.

Figure 5: Oaxaca-Blinder decomposition of monthly earnings gap between teachers and private sector workers with at least grade 10 (2000 prices), by year

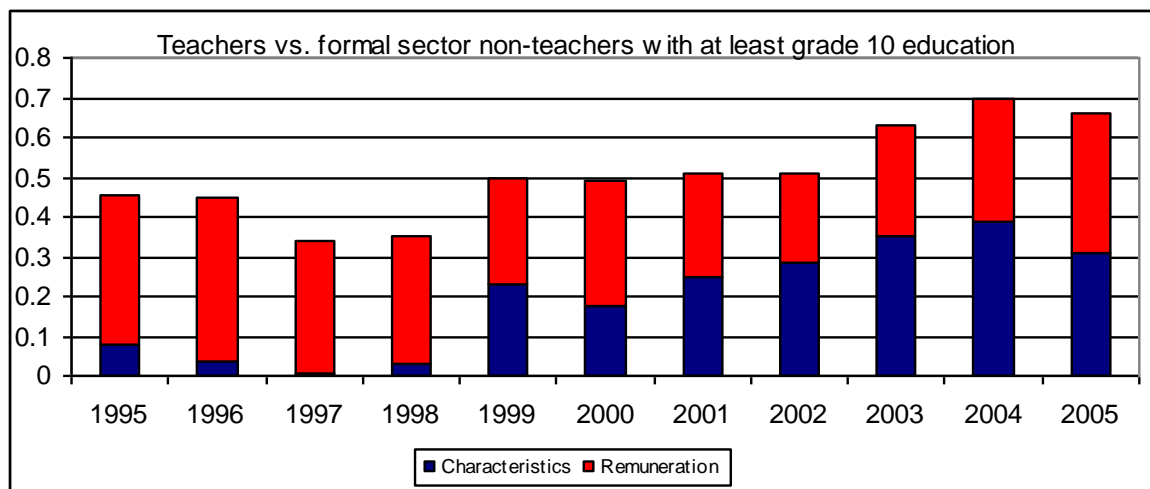


Figure 6 repeats the analysis, but now by comparing teachers with other public sector employees (with at least grade 10). Most of the earnings differential between these two groups is now explained by the differences in the average level of characteristics, rather

than differences in the returns to these characteristics. This component did not change much over the period under consideration, although there appears to have been a slight trend away from teachers benefiting from the differential returns to characteristics, and towards the benefit of other public sector workers.

Figure 6: Oaxaca-Blinder decomposition of monthly earnings gap between teachers and public sector workers with at least grade 10 (2000 prices), by year

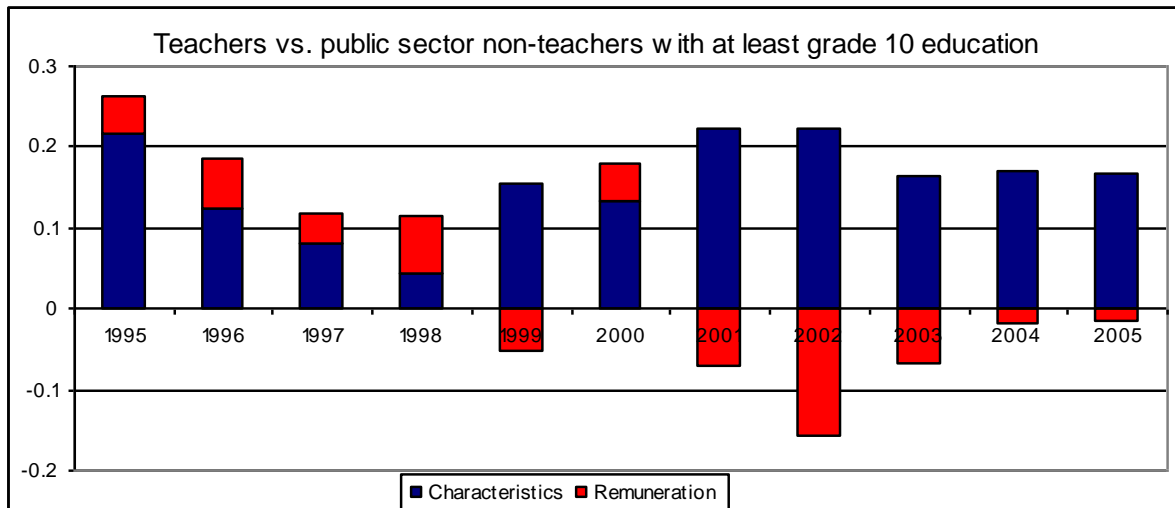


Table 3 reports the regression results for teachers, private sector workers and other public sector workers, for September 2005. It can be observed from the adjusted R^2 's that earnings in the private sector are more closely correlated to observable characteristic than in the public sector, and much more so than in the teaching profession. The coefficient results will now be discussed in turn. We did not include tenure in the regression, due to the high degree of collinearity with experience amongst teachers. It was also decided to omit union membership from the model. Since teachers in public schools are all covered by union-negotiated wage agreements, it is not clear how to interpret the union coefficient in an earnings regression for teachers.

Table 3: OLS regression on log of monthly earnings (2000 prices) of formal sector workers in September 2005

	Teachers	Private sector	Other public sector
Constant	7.742 (0.180)	7.022 (0.044)	7.673 (0.096)
Experience	0.033 (0.010)	0.052 (0.004)	0.029 (0.007)
Experience squared (x 1000)	-0.524 (0.224)	-0.783 (0.084)	-0.339 (0.157)
Female	0.016 (0.044)	-0.329 (0.020)	-0.228 (0.033)
Coloured	0.209 (0.112)	0.410 (0.035)	0.203 (0.065)
Indian	-0.146 (0.142)	0.609 (0.045)	0.205 (0.091)
White	0.164 (0.071)	0.758 (0.025)	0.314 (0.043)
Rural	-0.067 (0.052)	-0.292 (0.034)	-0.157 (0.051)
Eastern Cape	-0.119 (0.120)	-0.129 (0.043)	0.091 (0.072)
Northern Cape	-0.173 (0.186)	-0.208 (0.082)	-0.224 (0.107)
Free State	-0.029 (0.135)	-0.292 (0.050)	0.002 (0.076)
Kwazulu-Natal	-0.142 (0.124)	-0.246 (0.038)	-0.128 (0.068)
Northwest	-0.069 (0.138)	0.019 (0.052)	0.031 (0.081)
Gauteng	-0.162 (0.121)	0.108 (0.033)	0.208 (0.065)
Mpumalanga	-0.133 (0.140)	-0.140 (0.051)	-0.092 (0.097)
Limpopo	-0.053 (0.129)	-0.134 (0.056)	-0.001 (0.086)
Grade 10	-1.300 (0.278)	-0.402 (0.029)	-0.581 (0.066)
Grade 11	0.203 (0.111)	-0.240 (0.028)	-0.298 (0.057)
Diploma	0.205 (0.076)	0.440 (0.032)	0.248 (0.042)
Bachelor's degree	0.401 (0.085)	1.026 (0.049)	0.743 (0.070)
Honour's degree	0.529 (0.085)	0.955 (0.060)	0.858 (0.065)
Master's degree	0.596 (0.174)	1.434 (0.105)	1.578 (0.103)
Observations	770	6517	2059

Adjusted R-squared	0.1277	0.4242	0.3376
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Notes: Authors' own calculations from OHS's between 1995 and 1999, and all rounds of 2000 to 2005 LFS datasets. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed. Reference group: African male matriculants residing in the urban Western Cape. Standard errors in parentheses.

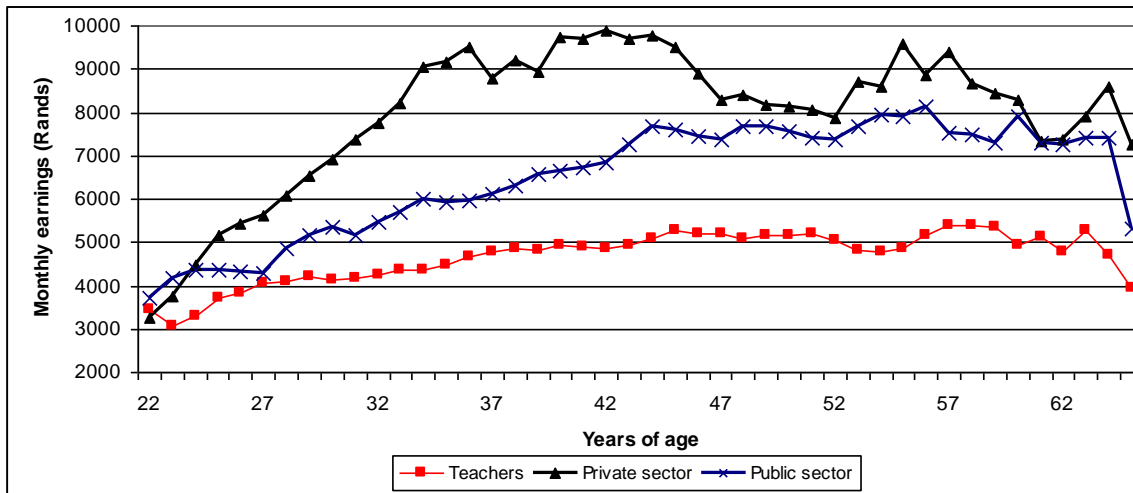
4.4.1 Education

Teachers receive returns to additional years of education, but except for moving from grade 10 to grade 11, these returns are considerably less than what is received by workers in the private and public sector. This is consistent with what was observed in Figure 4.

4.4.2 Experience

All three groups receive increasing but concave returns to potential experience, but this increase is much steeper in the private sector than in either the teaching profession or in the rest of the public sector. Although the regression coefficients show that the initial increase in earnings associated with more years of experience is (marginally) steeper in the education sector than in the rest of the public service, these returns also decrease at a quicker rate, so that the experience profiles (after controlling for the other characteristics) are very similar for these two groups of workers. Merely plotting the average earnings levels for workers of different ages (with at least grade 10) show that at early ages teacher salaries are marginally higher than for public or private sector workers, but that earnings rise slightly slower over the life-cycle. A more pronounced difference in the earnings profiles is observed when restricting our sample to only those with post-secondary qualifications (Figure 8). Teachers earn a salary that is very similar to that of private and public sector employees at an age of 22, but their earnings-age profile is much flatter, leading to a large earnings gap appearing at later ages. By the age of 30 the earnings of teachers are exceeded by that of private and public sector workers (with post-secondary qualifications) by 77% and 24% respectively. By the age of 40 that differential has climbed even further, to 96% and 36%.

Figure 8: Comparison of teacher, other public sector and private sector monthly earnings (2000 prices) for workers with more than completed secondary education: 2000-2006, by age



Notes: Authors' own calculations from all rounds of 2000 to 2006 LFS datasets. Excludes informal sector workers, those earning more than R200 000 per month and the self-employed.

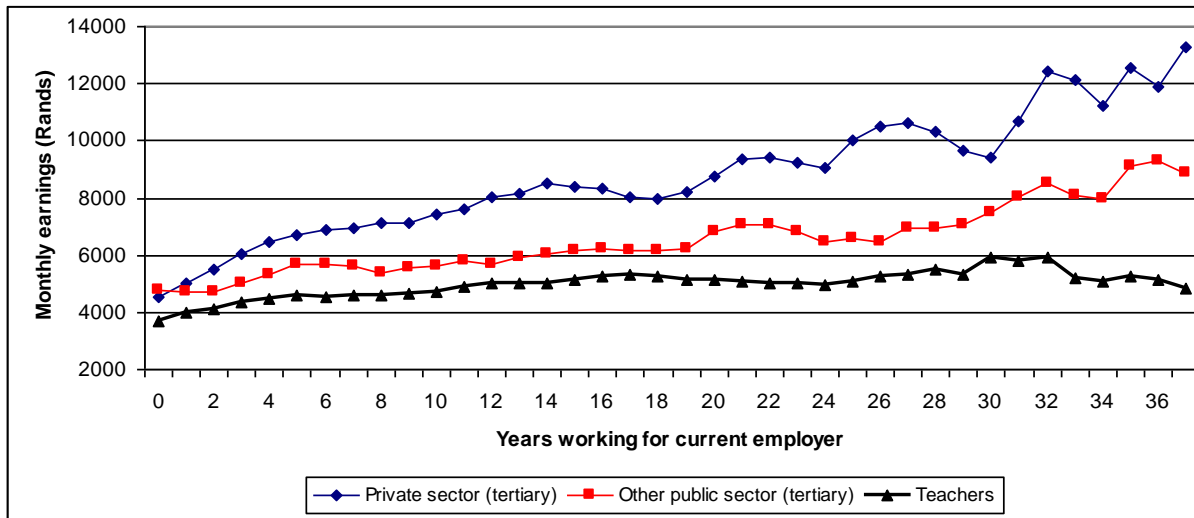
4.4.3 Tenure

Due to the high degree of collinearity between tenure and years of experience for teachers (who can only change their employer by leaving the public school system) the regressions in table 3 were estimated by including only experience and not tenure. However, plotting years of tenure against the average earnings of the three groups of workers indicate that teachers gain less from staying at their current employers for longer. Again the effect is even stronger when restricting our sample to only those with post-secondary qualifications (Figure 9). The returns to tenure are substantially smaller for teachers than for workers elsewhere in the public sector, and even lower when compared to private sector employees.

4.4.4 Gender and Race

Despite almost a decade of affirmative action policies, race and gender are still highly correlated to earnings and unemployment in South Africa. Table 3 shows that the earnings penalty associated with being a women, or with being black, coloured or Indian rather than white, is considerably less in the public than in the private sector, and much smaller in the teaching profession than in the rest of the public sector.

Figure 9: Comparison of teacher, other public sector and private sector monthly earnings (2000 prices): 2000-2006, by years of tenure



4.4.5 Area of residence

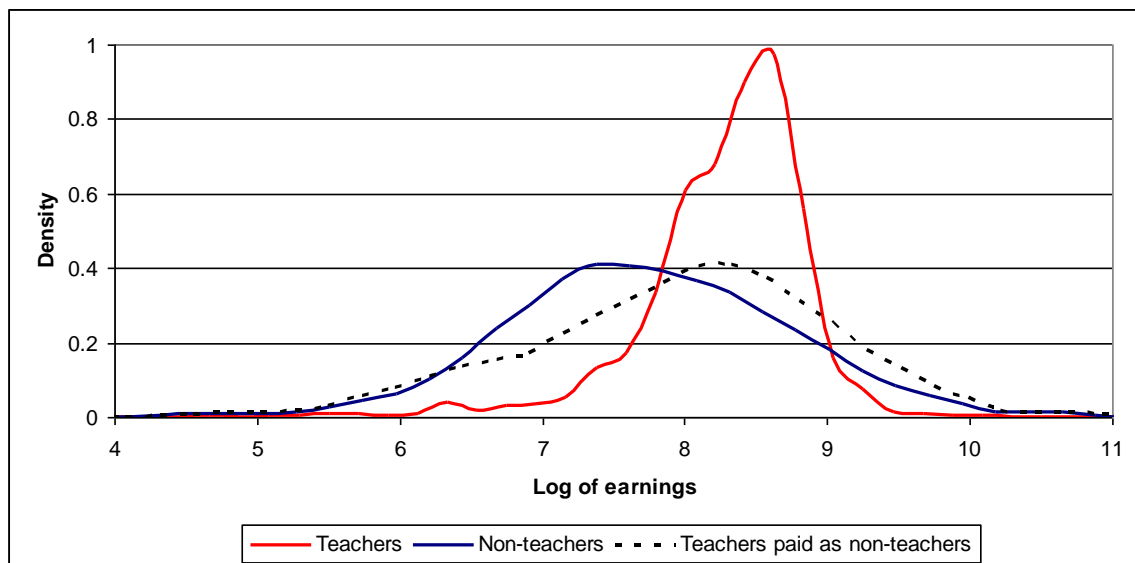
Table 3 also shows that the earnings disparities associated with differences in geography (either rural-urban or provinces) is much lower amongst teachers than amongst non-teachers in either the private or the public sector.

4.5 Lemieux decomposition of earnings distribution

The Oaxaca decomposition allows an investigation into the causes of the differences in the *average* earnings between teachers and some reference group. However, it is not just the difference at the means of these earnings distributions that shape the incentives for teachers. Workers with above-average endowments of productive characteristics will be more interested in how the earnings of teachers at the top of their earnings distribution compares to that of an alternative occupation. Lemieux (2002) developed a technique that uses the re-weighting of observations to decompose the earnings distribution into “characteristics” and “remuneration” components. Essentially, we re-weight the non-teachers so that they resemble teachers in terms of their personal characteristics. The resulting earnings distribution will therefore represent what the earnings of non-teachers would look like if they had the same characteristics of teachers or, equivalently, what teachers’ earnings distribution would be if they were paid according to the wage structure of non-teachers.

Figure 10 compares the earnings distribution of teachers (on a log scale) with that of private sector workers with more than a grade 10 education. Except for the fact that most of the teachers clearly earn more than private sector workers, private sector earnings are much more widely dispersed. The simulated earnings distribution of teachers paid according to the private sector wage structure is also shown. Interestingly, this distribution is not as narrowly distributed as teachers' earnings, which implies that most of the lack of variation in teacher salaries is due to wage compression in the education sector, rather than to the homogeneity of teachers.

Figure 10: Decomposition of teacher and private sector monthly earnings distributions (2000 prices): 1995-2005



Note: Authors' own calculations from OHS's between 1995 and 1999, and September rounds of 2000 to 2005 LFS datasets. Excludes workers with less than grade 10 education, informal sector workers, those earning more than R200 000 per month and the self-employed.

Table 4 compares the (approximated) actual teacher earnings at different points of the distribution to that of the earnings distribution for teachers paid as non-teachers, as shown in Figure 10 above. At the bottom of the earnings distribution teachers enjoy a large wage premium compared to what they would have earned in the private sector. This premium shrinks as one moves up the wage distribution and turns into a penalty at the 75th percentile. This suggests that – as long as the differences in wage structures do not merely reflect differences in unobserved heterogeneity – the incentives are such as to attract those with a poorer endowment of productive characteristics into the teaching

profession, where they will earn more than in the private sector, while pushing those with a more favourable set of characteristics into the private sector.

Table 4: Actual and simulated teacher earnings at different percentiles: 1995-2005

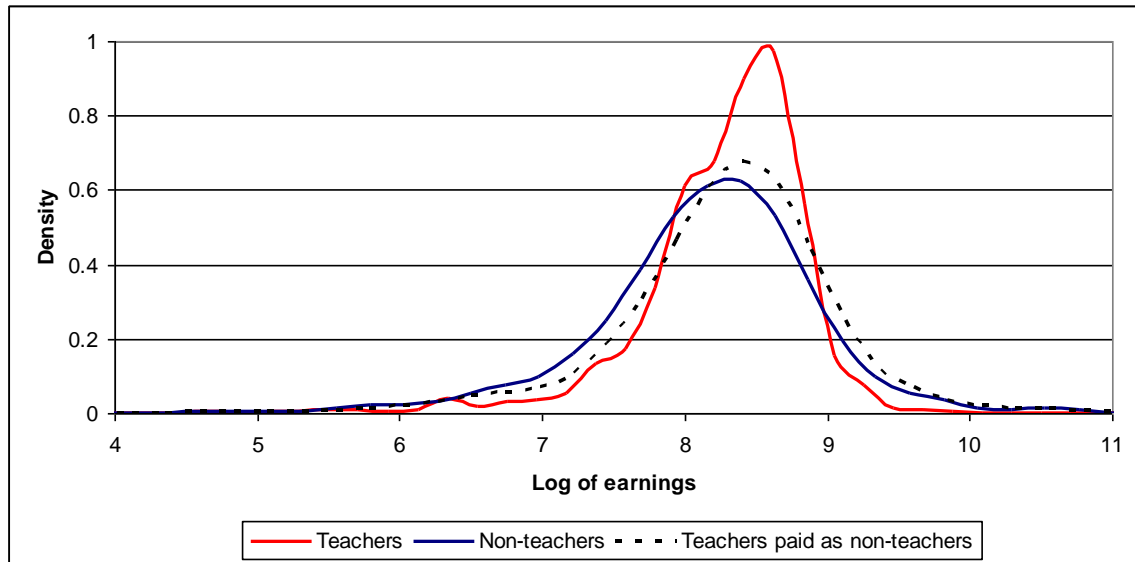
Percentile	Actual teacher earnings	Teacher earnings on non-teacher earnings structure	Teaching premium
5 th	1 087	302	259%
10 th	1 523	462	230%
25 th	2 225	1 042	114%
50 th	3 191	2 228	43%
75 th	4 184	4 202	0%
90 th	5 159	7 428	-31%
95 th	5 770	10 339	-44%

Note: Authors' own calculations from OHS's between 1995 and 1999, and September rounds of 2000 to 2005 LFS datasets.

Comparing teachers to non-teachers elsewhere in the public sector (Figure 11) shows that the distribution of public sector wage earnings resemble that of teachers much more closely than did the private sector. Using the Lemieux-technique to generate the earnings distribution for teachers paid as non-teaching public sector workers, it can be observed that this distribution lies slightly to the right of non-teacher earners (teachers have a more favourable distribution of personal characteristics) and is not as narrowly distributed as that of teachers (wage compression exists in the teaching profession, even compared to the rest of the public sector).

Table 5 reports the wage premia for teachers relative to what they would have earned in the rest of the public sector. Similarly to what was found when comparing teachers to the private sector, teachers at the bottom end of the distribution can be seen to benefit from the wage compression, whereas those at the top are penalised relative to their public sector counterparts. The incentive structure is therefore the same as before: the best teachers will find it attractive to leave the profession for other public sector employment, whereas the least productive public sector workers may be drawn into teaching.

Figure 11: Decomposition of teacher and other public sector monthly earnings distributions (2000 prices): 1995-2005



Note: Authors' own calculations from OHS's between 1995 and 1999, and September rounds of 2000 to 2005 LFS datasets. Excludes workers with less than grade 10 education, informal sector workers, those earning more than R200 000 per month and the self-employed

Table 5: Actual and simulated teacher earnings at different percentiles: 1995-2005

Percentile	Actual teacher earnings	Teacher earnings on non-teacher earnings structure	Teaching premium
5 th	1087	677	61%
10 th	1523	1132	35%
25 th	2225	1906	17%
50 th	3191	2965	8%
75 th	4184	4376	-4%
90 th	5159	6375	-19%
95 th	5770	8417	-31%

Note: Authors' own calculations from OHS's between 1995 and 1999, and September rounds of 2000 to 2005 LFS datasets.

5. THE DECISION TO BECOME TEACHERS

The preceding section analysed the manner in which the wage structure could shape the incentives to join or leave the teaching profession. This section will attempt to look at the movement of groups of individuals born in the same year, in order to gauge whether these incentives have had an observable impact on the decisions of workers.

Figure 10 shows the share of all employed workers who are working as teachers, for the group of individuals who were born in the same year, at different points in their lives. Moving averages were used to smooth the data, both over time and across birth cohorts.⁴ Except for the inverse u-shaped employment rate that is observed over the life-cycle, we now also observe that within the group of employed workers, the share of teachers is initially low (maybe as people are finishing their education), increases up to an age of 40 and then starts to decline. Interestingly, the decline in the proportion of workers employed as teachers after the age of 40 does not appear to be due to people leaving the teaching profession, but rather due to the fact that a smaller share of workers in these cohorts had taken up teaching as a profession in the first place.

Figure 10: Share of employees working as teachers, by year and age

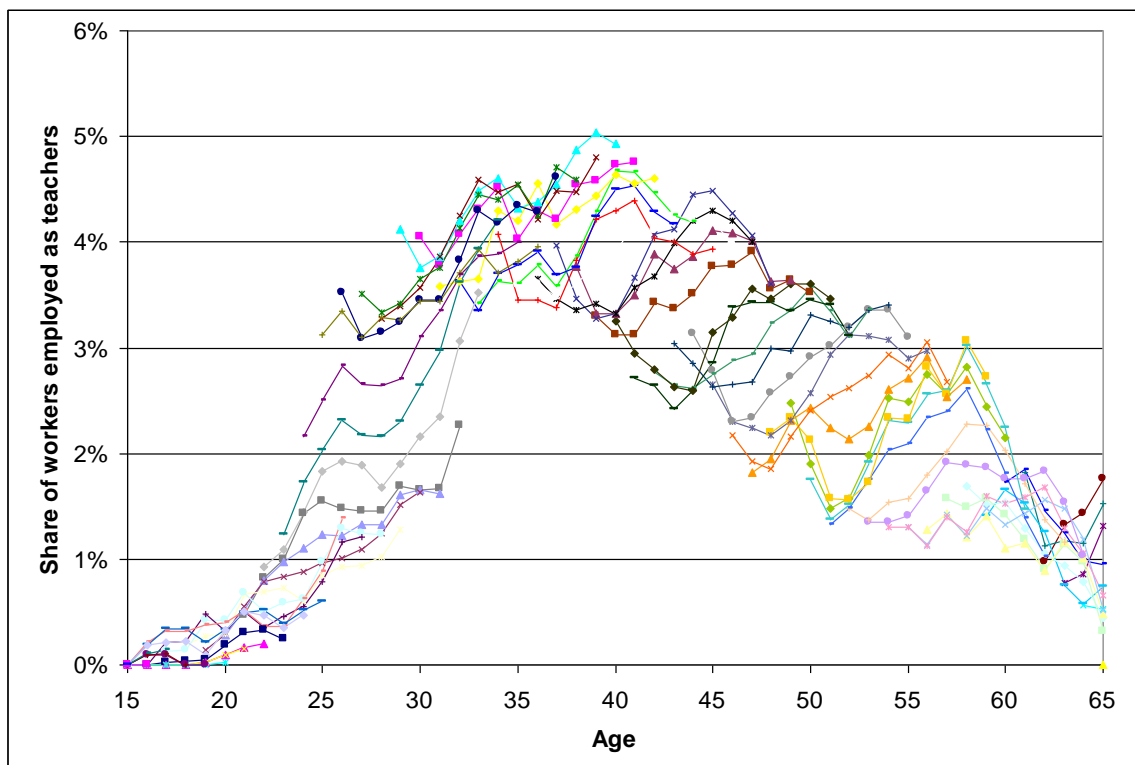
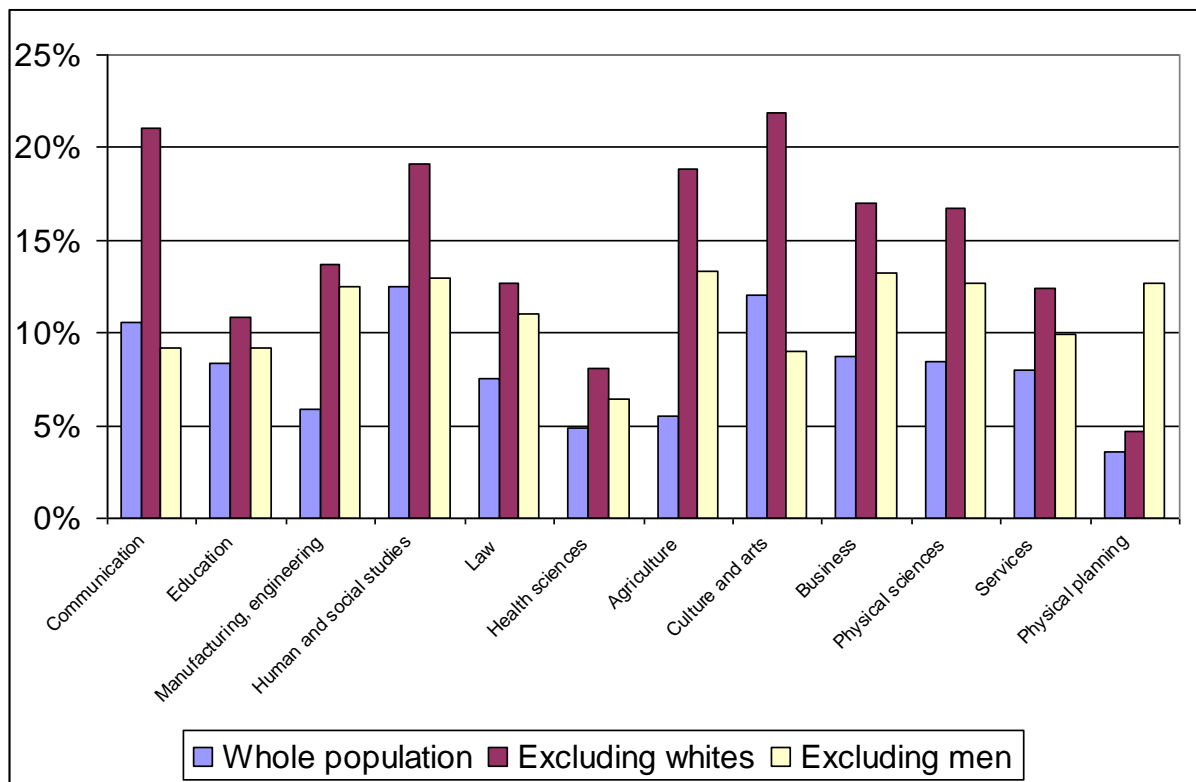


Figure 11 below graphs the unemployment rates experienced by workers with some level of post-secondary qualification, by their field of study. When comparing the total population, we observe that the unemployment rate for people with qualifications in the

⁴ A point in figure 10 that represents a group of age 20 in year 2000 was therefore the (unweighted) average of the birth cohorts who were aged 19, 20 and 21, followed in years 1999, 2000 and 2001. This restricts large jumps between different birth cohorts, as well as discontinuities of the same cohort over time.

field of “education, training and development”, is more or less at the average of what is observed for other fields of study. If we exclude either men or whites from the sample, we can observe that the probability of finding work with a qualification in the field of education actually exceeds that associated with most other fields of study. If this is combined with the lenient entry requirements for a teaching degree or diploma relative to some of the other low-unemployment fields of study such as medicine, then it is possible that individuals choose to accept the lower earnings associated with the teaching profession in exchange for the higher probably of finding paid formal sector employment. Given the high unemployment rates that have been observed in South African over the past few years, this may provide a strong incentive towards entering the teaching profession.

Figure 11: Unemployment rate experienced by workers with tertiary qualifications (2000-2004), by field of study



6. Conclusion

This report analysed the earnings of teachers in South Africa in order to determine whether these workers are adequately compensated or not. Although the average teacher earns substantially more than the average worker elsewhere in the labour market, this is largely due to the higher levels of education that they possess. Oaxaca decompositions show that the average teacher earns more than the average private sector worker mainly due to the more favourable levels of personal characteristics, whereas the wage premium they earn relative to other public sector workers can be ascribed to differences in the wage structures. Regression analysis showed that teachers receive much smaller returns to additional years of education, experience or tenure, which may serve as a disincentive to invest further in human capital, or to stay in the teaching profession. Lemieux-decompositions revealed that, relative to both the public and private sectors, teachers at the top end of the earnings distribution are underpaid, whereas teachers at the bottom end are overpaid. This compression of wages could mean that teachers with the most favourable sets of labour market characteristics will leave the teaching profession, whereas those with least favourable endowments will find it attractive to stay. A brief cohort-panel analysis appears to indicate that the share of all workers employed in the teaching profession takes on an inverse u-shape, not because teachers tend to leave the education system at certain ages, but rather due to the lower share of workers, amongst older generations, that entered teaching in the first place. A possible explanation for the lack of a stronger response to these incentives could be that, amidst very high and rising unemployment rates, acquiring a qualification as a teacher was associated with a fairly high probability of finding work in South Africa.

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