

A SOCIETY DIVIDED

HOW UNEQUAL EDUCATION QUALITY LIMITS SOCIAL MOBILITY IN SOUTH AFRICA

Synthesis report for the Programme to Support Pro-Poor Policy Development (PSPPD)

Eldridge Moses, Servaas van der Berg and Kate Rich



planning, monitoring
and evaluation

Department:
Planning, Monitoring and Evaluation
REPUBLIC OF SOUTH AFRICA



PSPPD
PROGRAMME TO
SUPPORT PRO-POOR
POLICY DEVELOPMENT





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February 2017

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Department of Economics, University of Stellenbosch

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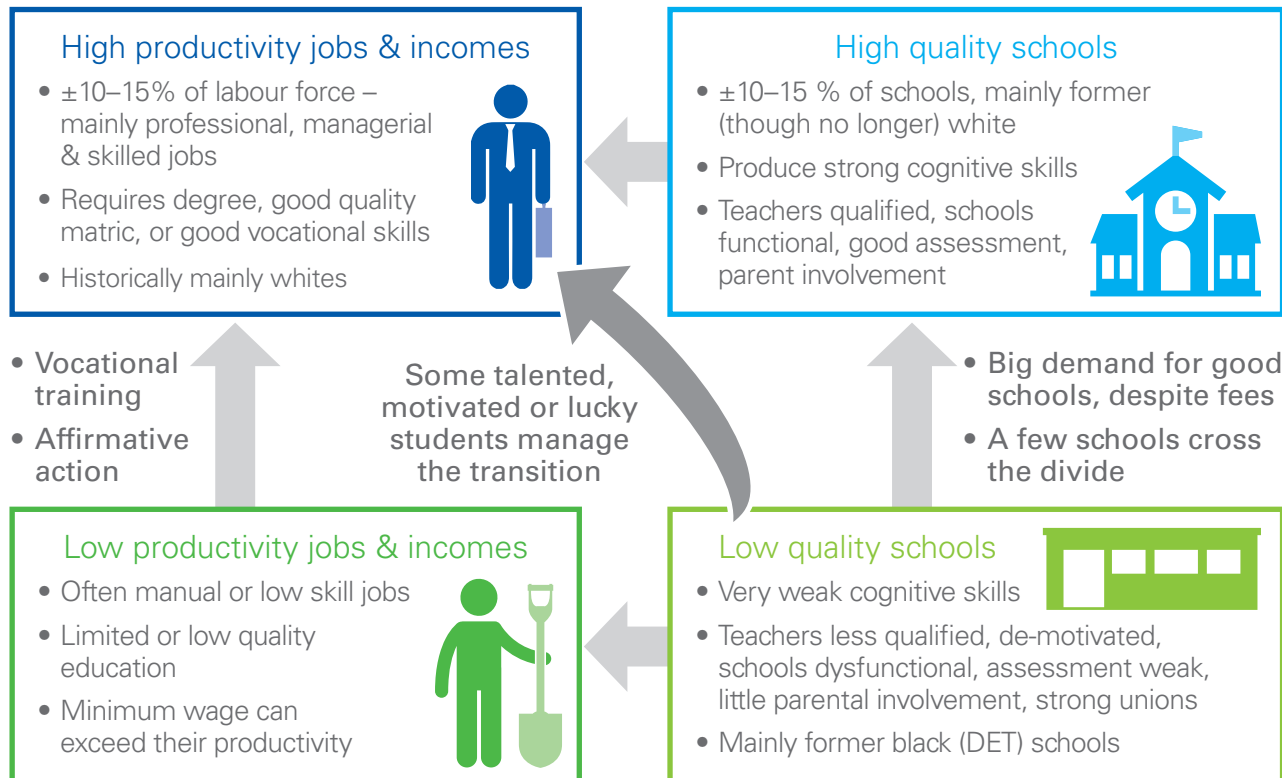
Executive summary

Background and context

The central focus of this research project is the investigation of the role of education in promoting social mobility for the poor in the highly unequal South African economic landscape. The investigation is of particular relevance in a country where the rapid expansion of educational attainment since the 1970s has not produced the desired labour market outcomes for many South Africans, for the most part perpetuating patterns of poverty and inequality along the apartheid dimensions of race and geography.

Given the deep structural nature of inequality in South Africa, this report employs a conceptual framework (shown in Figure E1) to illustrate how differences in education quality offered to South African learners are at the root of income inequality that persists two decades into democracy. The grim labour market prospects facing South Africa's young adults are in large part attributable to an education system that still manages to produce vastly different education outcomes that favour a small elite in the wealthy part of that system and disadvantage predominantly black and coloured learners in the less affluent part of the system.

Figure E1: *South Africa's dualistic school system and labour market*



Source: Van der Berg (2015).

A small minority of learners attend functional, high quality (mostly former white) schools, staffed by qualified teachers and characterised by good management, assessment and parental involvement. Learners graduating from these schools have relatively good chances of entering the upper end of the labour market, often (but not always) first acquiring some form of tertiary education. The high productivity jobs in this part of the labour market offer high returns. Traditionally this part of the labour market has been dominated by whites, but the removal of apartheid era restrictions, government interventions (such as black economic empowerment and affirmative action) and improved access to better quality education for some black children have allowed a relatively small black minority to achieve upward social mobility through the labour market.

In contrast, the majority of South Africa's (mostly black) learners attend formerly black schools. These schools, that typically also suffer from poor management, little parental participation and poor assessment, produce poor cognitive outcomes, which are poorly rewarded in the labour market, resulting in low employment probabilities and low wages from unskilled occupations. While the transition from low quality schools to low productivity jobs is relatively deterministic, it is possible for individuals from this part of the education system to access the high productivity part of the labour market through vocational training, affirmative action or other forms of labour market mobility.

This conceptual framework is used throughout the report to discuss how education, and particularly education quality, are critical inputs in advancing social mobility for South Africa's economically vulnerable citizens.

Methodology

The work is an amalgamation of existing and ongoing work in the Department of Economics and the Research on Socio-Economic Policy group at Stellenbosch University, and new work produced specifically for the PSSPD IIb project. The project is comprised of the following components:

- A literature review which summarises some recent international and local research investigating education attainment and quality, and the impact of both on labour market outcomes and next-generation education opportunities.
- A thorough investigation of educational attainment and quality in South African schools using historical Census data and data from recent international standardised assessments such as the Trends in International Mathematics and Science Study (TIMSS) and Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ), and local standardised assessments such as the Annual National Assessment (ANA), National School Effectiveness Study (NSES) and learner performance and administrative data from the Department of Education's Education Management Information System (EMIS) and Higher Education Management Information System (HEMIS).
- Analysis of the National Income Dynamics Survey (NIDS) and the Post-Apartheid Labour Market Series (PALMS) to determine the roles of educational attainment and quality in labour market employment probabilities and earnings.
- Investigations of other large scale surveys that may yield information on education-social mobility relationships.

Main findings

The most important findings in this report are:

1. **Education quality still poor** – International and national standardised assessment results show that while educational attainment has converged dramatically over time between races, poor schools still lag far behind their affluent counterparts in learning outcomes. By Grade 9, learners in poor (mostly black) schools, have a backlog of approximately 3.5 years relative to their rich school counterparts.
2. **Large & early learning gaps** – Substantial learning gaps between learners in different schools are observable as early as the middle primary school years, making a strong case for decisive intervention as early as possible in a child's schooling career. As early as Grade 4, fewer than 30% of learners in the poorest 40 percent of schools are performing above international low learning benchmarks.
3. **Importance of post-matric education** – Educational attainment is an important predictor of labour market outcomes, with years of education completed beyond Grade 12 offering extraordinarily high returns to educational investment, both in terms of employment probabilities and wages earned. In 2007 the wage per hour of someone who had achieved a degree was three times as large as for someone who had achieved only a matriculation.
4. **Centrality of school quality** – New empirical evidence suggests that school education quality, usually omitted from earnings functions because of lack of data, is also strongly positively associated with future earnings. Therefore, learners who attend poor quality schools generally earn substantially less than those who attend good quality schools, even when they have the same education levels.
5. **Unmet expectations** – The consequences of unequal education opportunities are particularly dire for many of South Africa's black youth, who despite having more education than previous generations and no longer facing discriminatory labour market legislation, have no better employment probabilities than older labour market participants. Thus, despite having achieved objective social mobility in terms of education, subjectively young black South Africans have not achieved as much as they would have liked relative to older generations who were less educated and subject to discriminatory labour market legislation.



By Grade 9, learners in poor (mostly black) schools, have a **backlog of approximately 3.5 years** relative to their rich school counterparts.



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The findings are indicative of a dualistic education system that limits social mobility for the poor and perpetuates apartheid-era patterns of labour market inequality. The majority of South African learners essentially follow a learning trajectory that ultimately leads to poor access to tertiary education and poor labour market outcomes, which in turn perpetuate a cycle of desperation for generations to come that is almost impossible to escape from through the education system in its current state. The persistence of deep inequality two decades after apartheid is a powerful indictment of the South African education system's failure to overcome past injustices, despite considerable shifts in government spending to poor schools. It is therefore of utmost importance that South Africa addresses inequalities in educational opportunity inequalities as early as possible to promote social mobility for the poor.

In previous research for PSPPD, ReSEP has investigated the education system in more depth, with a focus inter alia on the binding constraints to educational improvement. A central finding in this regard, which is enhanced by the analysis in this report, is that early interventions are crucial, and that there is a clear need for a focus on getting reading right in the first years of primary school. Readers are referred to two of these studies for further analysis of policy recommendations: The report on *Binding Constraints in Education* (Van der Berg *et al.*, 2016) and *Laying Firm Foundations* (Spaull *et al.*, 2016).

This report has demonstrated how social mobility, and thus also poverty and income distribution, is closely linked to the quality of education that South Africa society provides for its children. The imperative to improve on this cannot be clearer, and requires wider debate, more experimentation and improved implementation of policies in education to create a better future for the millions of children currently caught in a cycle of poverty.

1 Introduction

“An equitable society would not allow circumstances over which the individual has no control to influence her or his basic opportunities after birth. Whether a person is born a boy or a girl, black or white, in a township or leafy suburb, to an educated and well-off parent or otherwise should not be relevant to reaching his or her full potential: ideally, only the person’s effort, innate talent, choices in life, and, to an extent, sheer luck, would be the influencing forces. This is at the core of the equality of opportunity principle, which provides a powerful platform for the formulation of social and economic policy—one of the rare policy goals on which a political consensus is easier to achieve.” (World Bank, 2012).

The role of educational attainment in the promotion of social mobility has long been one of the central issues in political, economic and sociological debate. A considerable body of international and South African research points to education’s increasing importance in determining labour market outcomes and economic growth and upon first sight, would suggest that countries need only to improve access to education at all levels to improve labour market and growth prospects (Mankiw, Romer, Weil, 1992; Barro, 2001), and by extension reduce inequality.

Yet despite the rapid expansion of educational attainment amongst South Africa’s non-white population since the 1970s and large scale resource shifts in social spending targeted towards the poor, the predicted role of education as an uplifting intermediary link between initial socioeconomic background and later socioeconomic class has been less robust than was previously believed. A number of possible reasons have been put forward to explain the limited impact of educational attainment on social mobility. Many of these relate to the labour market, where slow job creation, work-place discrimination, institutionally determined wages and demand-supply mismatches are some of the factors often cited as reasons why convergence in educational attainment between races has produced unspectacular social mobility trends in South Africa.

The most compelling argument for the weak link between education and social mobility is that educational attainment in years does not uniformly reflect learning outcomes (see Louw *et al*, 2006; Van der Berg, 2007; Spaull, 2013). As will become clear in the rest of this report, each additional year of education in weakly performing schools is unlikely to produce the same learning outcomes as an additional year in a well-functioning school. The disparities



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in learning outcomes between races today has its roots in an education system previously divided along racial lines, with government spending disproportionately favouring whites. While the political transition in 1994 ushered in a government whose ideologies were significantly more pro-poor, many of the country's institutions continued to operate *de facto* along racial lines, much as they did under apartheid. This inertia is particularly apparent in South Africa's education system that continues to provide education quality of a standard similar to that found in developed countries to a small elite, while the majority of learners (mostly black) attend schools that for the most part are as dysfunctional as they were under apartheid.

While the human and physical resource deprivation under apartheid in the former black part of the school system undoubtedly contributed to the dysfunctionality of many of these schools, weak functioning in schools is further exacerbated by intangible elements such as weak management, low levels of cognitive demand and poor teacher and learner discipline. This school-level dysfunctionality combined with the lower socioeconomic background of learners combine to make social mobility through the education system particularly difficult for children in the poorer part of the education system.

This report argues that addressing the causes of inequality in the education system is necessary for sustainable social mobility. The failure to offer children of all backgrounds the opportunity to realise their true potential through more and especially better quality education perpetuates the cycle of inequality along the lines of race, location and socio-economic status. In Chapter 1 an overview of South African inequality trends, social mobility theory, international literature and the framework for analysing social mobility in South Africa is presented. Chapter 2 describes how the labour market in South Africa is both a cause and result of educational inequality. This is followed by Chapter 3 which describes how the South African education system in many ways still functions as two separate entities.

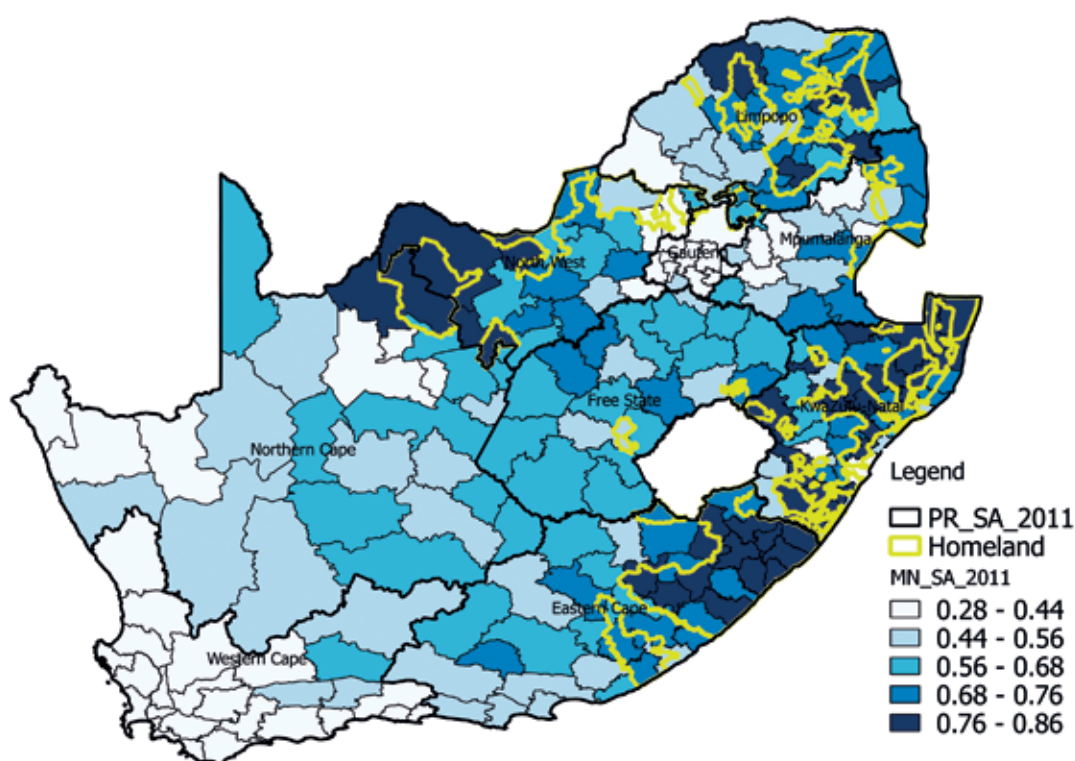
2 EDUCATION AND SOCIAL MOBILITY IN SOUTH AFRICA

2.1 Inequality in South Africa: recent trends

Despite South Africa's classification as an upper middle-income country based on its economic structure, it fares poorly on a number of quality of life indicators such as life expectancy, infant mortality and access to basic services. Statistics South Africa's (2016) mid-year estimates find that life expectancy was 62.4 years and infant mortality was 33.7 deaths per 1000 live births, both on par with lower-middle and lower income countries. Both indicators are symptoms of an extremely inequitable distribution of human capital (health and education) and other resources. A relatively small group of South Africans enjoy a standard of living similar to that of developed country citizens, while the poorest 20% of the population has spending power on par with the poorest developing countries (Van der Berg, 2014: 198).

Poverty in South Africa still has a strong rural dimension, with much of the country's poverty concentrated in the former homelands, the areas set aside for blacks during the apartheid period, shown by the yellow borders in Figure 2.1. The Eastern Cape, Kwazulu-Natal, Limpopo and North West Province (where most of the former homelands were concentrated) account for 61% of South Africa's poverty burden (Moses, 2017).

Figure 2.1: Poverty headcount by municipality (2011)



Source: Moses (2017).

The concentration of poverty in the former homelands has its roots in the systematic exclusion of black South Africans from full economic and political participation during the apartheid era. That exclusion, along with sustained inequality in government spending in all spheres (such as basic services, education, health, housing and social grants) is a large contributing factor to the persistent poverty plaguing the former homelands and inequality between races. That inequality has remained persistently high over time, with a particularly large increase in inequality between 1995 and 2001, as shown by the Gini coefficients in Table 2.1 below (confirmed by a number of authors such as Yu, 2009; Ardington *et al.*, 2005). Since 2001, overall inequality has remained relatively stable and high over time, although there have been small decreases in inequality between race groups over the same period.

The confounding combination of a rise in overall inequality and a decrease in inequality between races can be reconciled by considering the *intra*-racial inequality trends over time (in the first four columns of Table 2.1). Between the mid-1990s and 2011 inequality within race groups has increased substantially. The increased inequality within race groups can be explained in large part by a substantial upward movement of other race groups into a middle class that was previously dominated by whites (Van der Berg *et al.*, 2008).

Table 2.1: *Intra-group income / expenditure inequality: Gini coefficients 1970 to 2011*

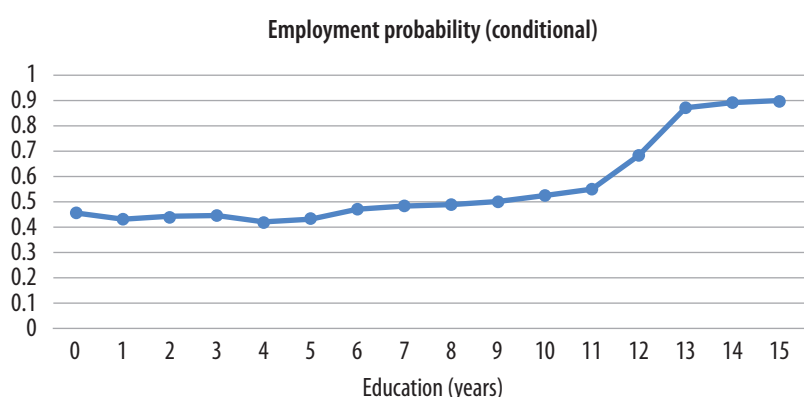
	Blacks	Coloureds	Indians	White	Total
Census 1970	–	0.53	0.42	0.43	–
Census 1975	0.49	–	–	–	–
IES 1995	0.57	0.52	0.49	0.47	0.66
IES 1995 (expenditure)	0.58	0.52	0.49	0.47	–
Census 1996	0.68	0.57	0.53	0.52	–
Census 1996 (SRMI)	0.62	0.53	0.48	0.46	0.69
IES 2000	0.59	0.55	0.51	0.49	–
Census 2001 (post-SRMI)	0.65	0.6	0.58	0.57	0.76
Community Survey 2007 (post SRMI)	0.66	0.62	0.61	0.56	0.74
Census 2011 (post SRMI)	0.72	0.66	0.64	0.57	0.75

Source: 1970 to 2007 figures: Van der Berg & Louw (2004); Yu (2009: 41, Table 2). 2011 figures: Own calculations based on Census 2011 data.

The removal of apartheid-era labour market discrimination therefore benefited a number of blacks, coloureds and Indians, but as the rising intra-racial Gini coefficients show, many previously disadvantaged citizens remained relatively disadvantaged in the post-apartheid era. Education has increasingly become the dividing line between affluence and poverty within groups, with highly educated black individuals being able to take advantage of increased opportunities for mobility due to the overhaul of labour market legislation and being able to benefit from new opportunities in the labour market. Unfortunately, slow yet technology-intensive economic growth did not benefit the less educated, resulting in increasingly precarious employment opportunities for individuals with less than a Grade 12 qualification. The difference in employment probability between the educated

and less educated is shown below in Figure 2.2, which shows the conditional probability of employment in 2007 (Van der Berg, 2014: 212). From the figure below it is evident that that up to Grade 11 there is very little increase in employment probability for every additional year of education. However, from Grade 12 onwards, the probability of employment increases dramatically, with tertiary graduates on average enjoying an employment probability of close to 90 percent.

Figure 2.2: *Conditional probability of employment, 2007*



Source: Van der Berg (2014).

The relationship between educational attainment and wages is similarly convex, with relatively little reward for every additional year of education before Grade 12 (matric), and very high returns for every additional year of education completed from Grade 12 onwards. The powerful link between education and labour market outcomes from Grade 12 is therefore partly attributable to the signalling effect of passing the externally assessed matric examination¹ (evidenced by employment probabilities), but also because of actual higher productivity (evidenced by higher wages for higher levels of education once employed).

At the root of South Africa's persistent poverty and income distribution problem are widespread unemployment and severely unequal wage distributions for the employed. Educational attainment, and education quality (as will be demonstrated later on in Chapter 3 of this report), are inextricably bound to labour market outcomes. This relationship therefore supports the case for increased educational attainment for social mobility, both intergenerationally and for individuals.

¹ In South Africa, as in a number of developing countries, learners are sometimes routinely promoted despite learning very little. Learning deficiencies therefore only become apparent in the externally assessed National Senior Certificate Examination.



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BOX 1: Migration and social mobility in South Africa

Poverty in South Africa is strongly associated with geography. As Figure 2.1 showed earlier, poverty headcount rates are highest in South Africa's former homelands. The poverty gap ratio (or depth of poverty), which measures the extent to which people are below the poverty line relative to what incomes would have been if everyone was exactly on the poverty line, is shown below in Figure 2.3. Poverty is deepest in the former homelands (shown by yellow borders).

Internal migration offers individuals a more immediate (and often less costly) means of changing personal and household living standards than investing in more education. Unsurprisingly, as Figure 2.4 shows, municipalities within former homeland borders also have the lowest net internal migration rates (darker areas have more out-migration than in-migration).

Conventional migration theory holds that individuals are most likely to migrate when the expected wage (considering also the probability of employment) in the destination region is higher than the wage in the sending region. Therefore, migration will occur until average expected wages are equalised between regions. Figure 2.5 shows an earnings function for migrants and non-migrants between the ages of 15 and 49 years based on data from Census 2011. The reference groups, shown by the dashed vertical line, are black males, individuals between the ages of 15 and 19 years, with no schooling, who live in rural areas and do not migrate. On average, whites earn more than Indians, who in turn earn more than coloureds, who themselves earn more than blacks (the reference group). Women earn less than men, while being older (having more labour market experience) is associated with higher wages.

The powerful role of location as a determinant of income is shown by the urban premium in wages. Changing location is also beneficial to migrants. In every case, interprovincial migrants earn more than their non-migrant counterparts (after controlling for a number of other factors).

Figure 2.3: Poverty gap (depth of poverty) by municipality, 2011

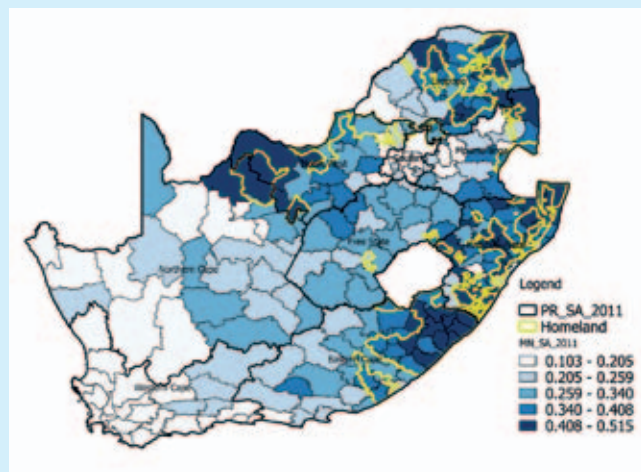


Figure 2.4: Net inter-municipal migration rates, 2011

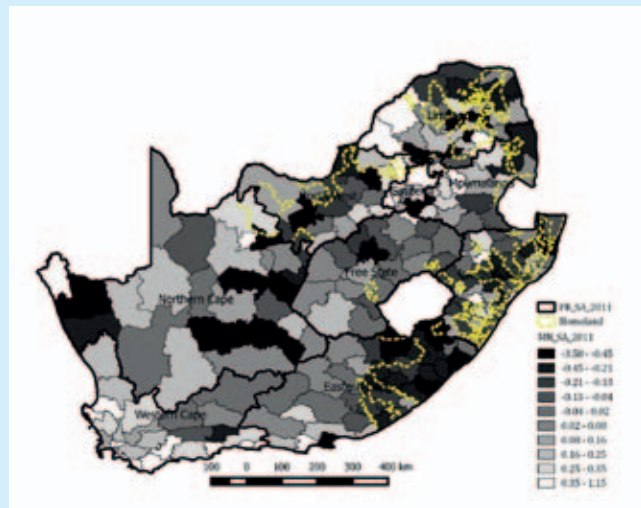


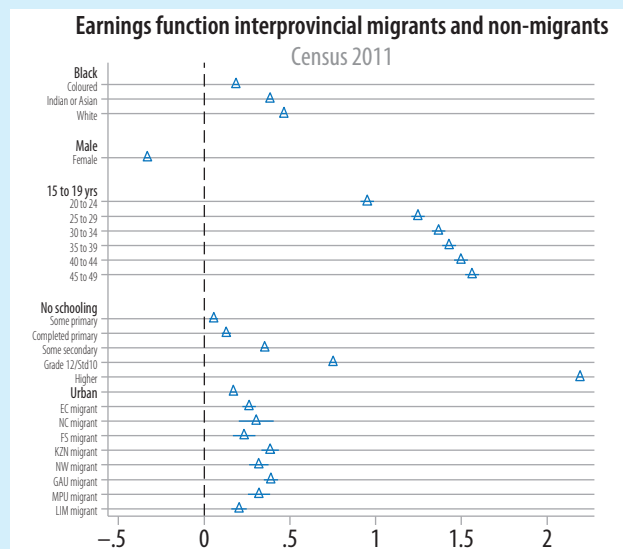
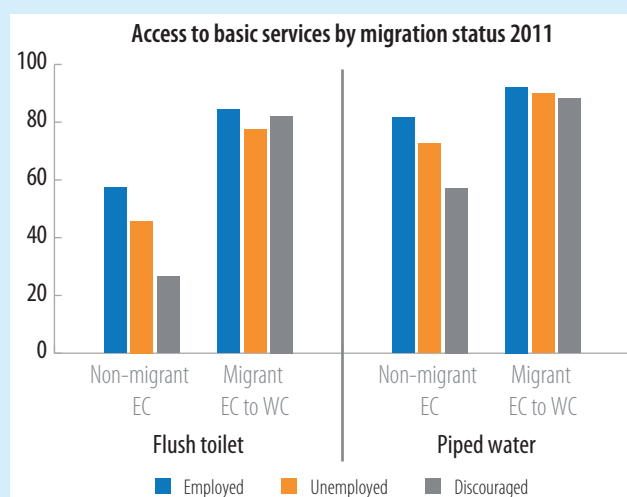
Figure 2.5: *Earnings functions for provincial migrants and non-migrants, 2011*

Figure 2.5 shows the factors associated with the log income of employed individuals between the ages of 15 and 49 years. The vertical dashed reference line shows the reference group (listed in bold text) for a particular explanatory variable. Within each category (such as age or race), the distance from the reference line shows how much more or less (in log rands) that group earns relative to the reference group. For example, for race “black” is the reference group. So, relative to the black reference group, coloureds earn more, Indians earn more both than coloureds and blacks, while whites earn the most.

Source: Own calculations based on Census 2011 data.

Figure 2.6: *Access to basic services by migration status, 2011*

In addition to labour market benefits, access to social services in migrant destinations are often better than in sending regions. Figure 2.6 shows access to basic services for adult Eastern Cape non-migrants and migrants from the Eastern Cape to the Western Cape, by employment status. Regardless of employment status, migrants from the Eastern Cape enjoy far better access to sanitation and piped water than their non-migrant counterparts.

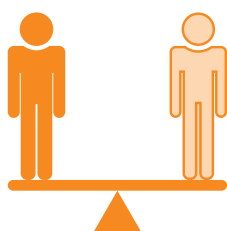
Source: Own calculations based on Census 2011 data.

Migration therefore offers individuals an opportunity to achieve social mobility through the labour market and through improved access to basic services, which through their impacts on health can improve labour market and education outcomes.

2.2 Education and Social Mobility

Upon assuming power, South Africa’s post-1994 government was faced with tremendous inequalities in the provision of education, health and basic services. The enduring legacy of apartheid still makes itself felt today by vast disparities in the distribution of income, access to services, and unemployment and poverty burdens. Two decades after the *de jure* dismantling of apartheid, South Africa’s socioeconomic landscape is still visibly divided along racial, geographic and gender lines, with the average white South African being considerably more affluent than black South Africans.

Nevertheless, South Africa has witnessed unprecedented upward social mobility from the lower class into the middle class, with much of that mobility being concentrated amongst the black population.



Two decades after the *de jure* dismantling of apartheid, South Africa's socioeconomic landscape is still visibly divided along racial, geographic and gender lines

Between 1993 and 2008 South Africa's middle class absorbed an additional 3 million black people, increasing their share of the middle class from just under 30 percent to more than 50 percent within 15 years (Visagie, 2015). Considered in isolation, the magnitude of the upward movement for blacks is suggestive of an economy that is increasingly becoming more dynamic and inclusive, conditions generally associated with improved economic and political stability (Easterly, 2001).

However, recent increases in the frequency and violence of service delivery protests suggest serious dissatisfaction with social and economic conditions amongst large parts of the population. It appears to point to a serious imbalance between a minority of highly educated who could take full advantage of the changing political and economic landscape, and those whose prospects of social mobility are limited by deteriorating labour

market prospects. In a more meritocratic but unequal environment the public education system is universally regarded as a crucial link between initial poverty in childhood years and eventual mobility into a higher socioeconomic class. In this section the role of the public education system in promoting social mobility will be described, followed by a discussion of how socioeconomic status is transmitted inter-generationally through education in South Africa.

2.2.1 Public education and social mobility

The strong relationship between socioeconomic background and educational outcomes, coupled with high returns to education, means that education systems often fail to contribute much towards social mobility from one generation to the next. Yet there is some evidence that countries that spend more on education have higher social mobility, which offers some hope that it is possible for education to act as an equalising force. However, it must be noted that none of the studies outlined below give evidence of a *causal* relationship. It could be that the observed relationship between mobility and education expenditures simply reflects some other characteristic of countries that is related to both. Furthermore, higher public education spending on its own is unlikely to improve outcomes, unless these resources are used effectively (Hanushek, 2003).

According to the model of Solon (2004) that is later discussed in more detail, intergenerational mobility should increase the more progressive education spending is. Several empirical studies have examined the relationship between public education expenditure and intergenerational mobility. Chevalier *et al.* (2009) show that public education spending is positively related to intergenerational mobility across European countries and the USA, but that the expansion of access to tertiary education for successive generations does not appear to have increased educational mobility substantially.

Ichino *et al.* (2011) model differences in intergenerational persistence across countries in terms of differences in political institutions and their effect on public education. They find a negative association between public education expenditures and intergenerational persistence – in other words, higher expenditures on public education are associated with a greater level of mobility. Primary education expenditures in particular are strongly correlated with mobility.

Blanden (2009) also finds that education spending as a percentage of GDP is positively correlated with social mobility across countries (or negatively correlated with intergenerational persistence). However, he finds no clear pattern indicating that primary schooling expenditure is more important for mobility than expenditures on the secondary phase.

Mayer and Lopoo (2008) analyse the relationship between mobility and various forms of government spending across US states. They find that states that spend more have higher intergenerational mobility, especially for low-income children. The category of state spending that has the largest association with the future incomes of low-income children is primary and secondary education.

Behrman *et al.* (1998) find no significant effect of public education spending as a proportion of GDP on intergenerational schooling mobility in Latin America. However, government spending on primary education per child of primary school age is positively and significantly related to intergenerational schooling mobility (though for only one of their two schooling mobility indices). Furthermore, average school quality, as measured by the average education of teachers, is positively and significantly associated with intergenerational schooling mobility for both indices. The authors suggest that the lack of any significant relationship between overall education spending and mobility could be because once spending on primary education and school quality is taken into account, total education spending may reflect education spending that disproportionately benefits the rich.

This brief review of the literature suggests that more spending on education is likely to be positively related to social mobility. That will only be the case, however, if more education spending does lead to improved learning. However, as Berhman (1998) finds, both education quality (a supply side factor) and home background (demand side) are important predictors of social mobility. As the next section shows, socioeconomic status is for the most part inter-generationally persistent. Children from affluent homes are likely to attend well-functioning, well-resourced schools, while their poorer counterparts, already disadvantaged by poverty, languish in schools that are less able to promote cognitive skill development and that are often more poorly resourced.

2.2.2 The intergenerational transmission of socioeconomic status and education in South Africa

Two important theoretical papers have related intergenerational persistence to differing investment in human capital by rich and by poor parents. In these models, the persistence of income or earnings across generations (i.e. limited intergenerational mobility) occurs because children of better-off parents tend to inherit better endowments, transmitted both genetically and through “nurture”, as well as because better-off parents are able to invest more in children’s human capital. Becker and Toms (1986) developed a model of intergenerational mobility that modeled children’s income as a function of parents’ investment in their children’s human capital, as well as of endowments inherited from parents, including genetically inherited traits such as ability, aspects of culture and family connections. In their model, parents’ utility depends on both their own consumption and the consumption of their children, which is determined by the human capital invested in their children. Parents allocate expenditure between their own consumption and investments in the human capital of their children. Credit constraints may limit optimal investment in children’s human capital by poor parents, as they cannot provide the collateral for loans to invest in their children’s education, even if such education may bring large financial rewards.

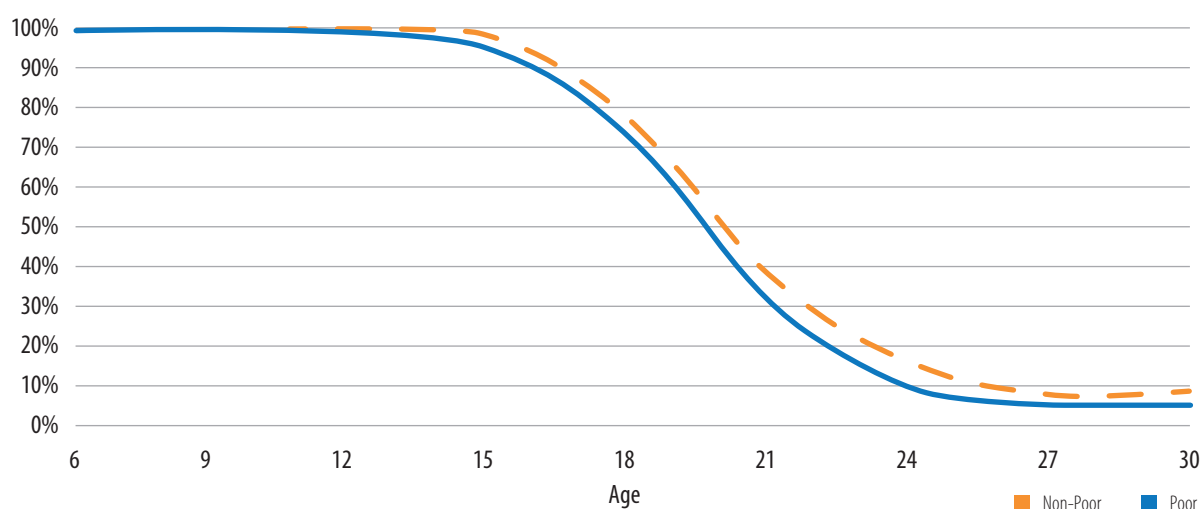
Solon (2004) expanded this model. In his model, intergenerational mobility is related to the inheritability of characteristics that are rewarded in the labour market, the effectiveness of investment in human capital, the returns to human capital in the labour market, and how progressive public human capital investment is. The more productive *private* investment in human capital is, the lower intergenerational mobility is likely to be, as children from rich backgrounds tend to experience more of this advantage. On the other hand, as *public* human capital investment becomes more progressive, intergenerational mobility increases.

Behrman *et al.* (1998) explain how a number of factors (market imperfections) may result in different households facing different benefits and costs and thus result in them making different investments in their children's human capital. High income households may be able to access better quality schools, raising the benefit of schooling to them and thus giving them an incentive to invest in higher levels of education. Second, the costs of investments that are complementary to schooling, such as time spent helping children with homework or investing in children's health, are often lower for more affluent, better educated parent. Finally, highly educated parents may have access to social networks that enable their children to obtain highly paid jobs, which again raises the marginal private benefit of investment in their children's education.

There are wide gaps in the educational achievement of children from different socioeconomic status backgrounds in South Africa. Children face unequal opportunities across the life course – children from middle-class households are much more likely than those from poor households to complete primary school on time, reach matric, receive some tertiary education or find employment (Zoch, 2013). Parents' education, in particular that of mothers, is strongly related to their children's education outcomes (Lam, 1999; Timaeus, Simelane and Letsoalo, 2013; Zoch, 2013). The relationship between socioeconomic status and educational outcomes is particularly strong in South Africa – even more so than in the USA, where socioeconomic status and educational outcomes are also strongly related (Taylor and Yu, 2009).

The average socioeconomic status of learners in a school has a stronger association with learners' performance than their own socioeconomic background, but learners' own socioeconomic status has a strong influence on what school they attend (Taylor and Yu, 2009) and their respective enrolment rates. Burger and Zoch (2016) use data from the National Income Dynamics Survey to track individuals' school and labour market progression from 2008 to 2014. Figure 2.7 shows the probability of being enrolled for black non-poor and poor blacks. While there is almost universal enrolment for all races until age 12, there is substantial divergence between black and white from that point on, and also between non-poor and poor blacks.

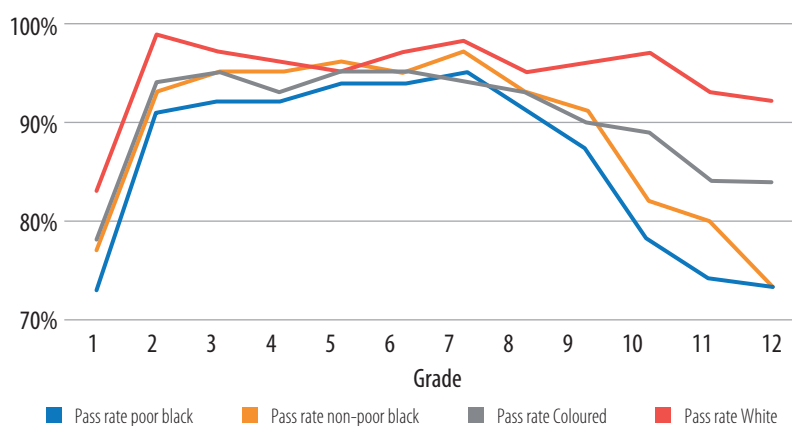
Figure 2.7: *Probability of a black person being in enrolled in education by age, 2008 to 2014*



Source: Burger and Zoch (2016).

Figure 2.8 compares the matric pass rate of three race groups across all 12 school grades. The probability of passing differs not only between race groups but also between grades. Figure 2.8 shows that the average probability of passing grade 2 to grade 7 is roughly 93% for blacks, 95% for coloureds and 97% for whites. The probability of passing decreases from grade 7 onwards for all race groups. Black learners from poor homes are demonstrably less likely to pass a grade than black non-poor learners, with visible differences between the two groups settling in as early as Grade 2.

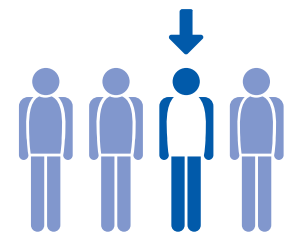
Figure 2.8: *Pass rates by race and Grade (2008 to 2014)*



Source: Burger and Zoch (2016).

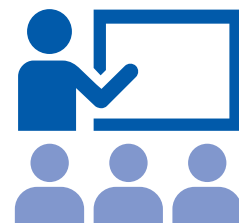
Socioeconomic status has a much stronger influence on educational achievement in rich rather than poor schools. In most poor schools, not even relatively well-off students perform well. In rich schools where learners' socioeconomic status is more strongly related to their performance, even poor children nevertheless perform relatively well. Poor schools are less able to mitigate the effects of a learner's disadvantaged background (Van der Berg, 2008). Rather than promoting social mobility by weakening the link between children's home backgrounds and their school performance, the South African school system entrenches existing inequalities, thus limiting social mobility.

Black children who attend historically white schools perform significantly better than their peers who remain in historically black schools. Coetzee (2014) shows that attending a former white school increases black children's mathematics and English test scores by 0.5 and 0.7 standard deviations respectively, even after considering those characteristics that make children more likely to attend a former white school. This is equivalent to more than a year's worth of learning. This suggests that accessing higher quality, well-



Black learners

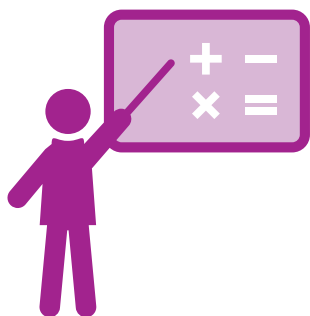
from poor homes are demonstrably less likely to pass a grade than black non-poor learners, with visible differences between the two groups settling in as early as Grade 2.



Attending a former white school increases black children's

mathematics and English test scores by 0.5 and 0.7

standard deviations respectively equivalent to more than a year's worth of learning



Only 5%
of all quintile
1–3 schools,
serving only 3%
of the total learner
population, perform
on average at a level
that could lead on
to obtaining
a Bachelor's
pass in matric



functioning schools can help to improve children's life chances, disrupting the intergenerational transmission of socioeconomic status and thus promoting social mobility. More recent research based on tracking children across schools finds similarly large effects of attending a better performing school (Coetzee and Van der Berg 2017). However, to the extent that socioeconomic background determines what school a child ends up in, the school system merely serves to perpetuate existing patterns of inequality.

One of the ways of escaping poverty that is mentioned in the framework described later in this chapter is that poor schools may perform well enough to allow some of their learners to reach and perform well in matric and to continue on to university. Kotzé (2017) draws on two uniquely constructed datasets using Annual National Assessments and the School Monitoring Survey to investigate the prevalence of such poor schools which manage to perform above the demographic expectation. She finds that only 5% of all quintile 1–3 schools, serving only 3% of the total learner population, perform on average at a level that is broadly consistent with a low international benchmark and that could lead on to obtaining a Bachelor's pass in matric. She estimates that poor learners who attend such schools gain up to a year of additional learning relative to their peers in weakly performing schools. Characteristics associated with such good performance of poor schools are strong school management and governance and supportive bureaucratic accountability. Her estimates of the number of poor children being able to follow this route out of poverty, i.e. through performing well in matric, is similar to those shown in the figure from Van Broekhuizen *et al.* (2016) presented in Chapter 3, that only 3 to 4% of the children starting secondary school in quintiles 1–3 achieve Bachelor's level passes, i.e. a level of performance that can lead on to university studies.

Using data from the National Income Dynamics Study (NIDS), Hofmeyr (2017) investigates the role of household structure on educational outcomes. Given the fragility of households in South Africa, much of it generated by a century of migrant labour, this is an important issue. Her analysis paper suggests a strong correlation between home background and the educational outcomes of a sample of South African youths. She finds that, broadly speaking, the co-residence of biological parents in the household is positively associated with educational outcomes of children.

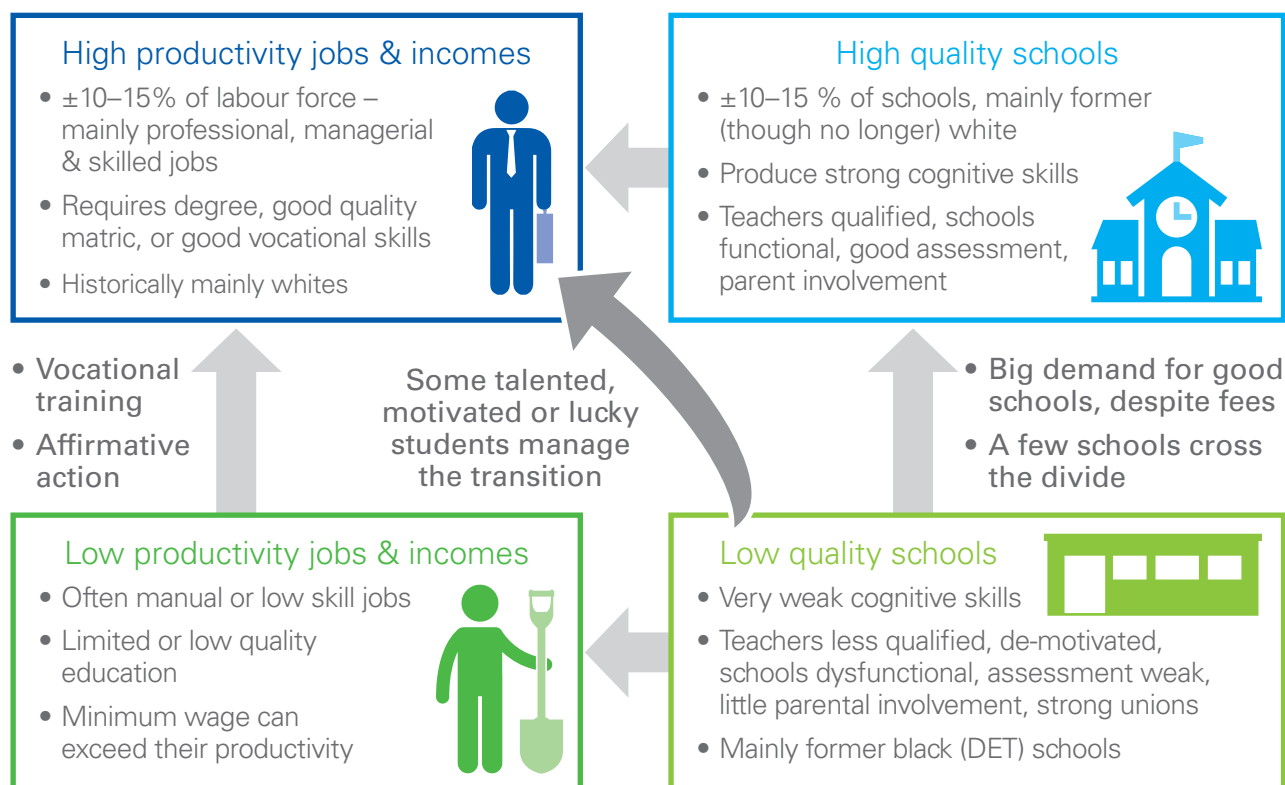
The foregoing literature suggests that government has a large role to play in providing opportunities for poor children to access and complete good quality education in order to escape from

poverty. In the next section a conceptual framework for analysing social mobility through education is presented. This framework will be used throughout the rest of this report to describe how the dualistic nature of the education system perpetuates labour market inequalities in South Africa, long after the demise of apartheid.

2.3 Education quality as a tool for social mobility in South Africa: a conceptual framework

The grim labour market prospects facing poor young adults are in large part attributable to an education system that still produces vastly different education outcomes that favour a small elite in the wealthy part of that system and disadvantages most black and coloured learners in the less affluent part of the system. The strong link between education quality and labour market outcomes in South Africa is shown below in Van der Berg's depiction of the dualistic natures of both the school system and the labour market (Figure 2.9). A small minority of learners attend functional, high quality (mostly former white) schools, staffed by qualified teachers and characterised by good management, assessment and parental involvement. Learners graduating from these schools have relatively good chances of entering the upper end of the labour market, usually often after also acquiring some form of tertiary education. The high productivity jobs in this part of the labour market offer high rewards. Traditionally this part of the labour market has been dominated by whites, but the removal of apartheid era restrictions, government interventions (such as black economic empowerment and affirmative action) and improved access to better quality education for blacks have allowed a relatively small black minority to achieve upward social mobility through the labour market.

Figure 2.9: *South Africa's dualistic school system and labour market*



Source: Van der Berg (2015).

In contrast, the majority of South Africa's learners attend formerly black schools. In such schools, teachers generally have less formal education than their former white school counterparts, while these schools typically also suffer from poor management, little parental participation and poor assessment. As a consequence, these schools produce poor cognitive outcomes, which are poorly rewarded in the labour market, resulting in low employment probabilities and low wages for those who do find jobs in unskilled occupations.

Social mobility in such a world of double dualism between the school system and the labour market can occur in four possible ways. Children from a poor homes can gain entry to the upper end of the labour market (i) through attending more affluent schools, (ii) through some schools serving the poor performing well, (iii) through entering the lower end of the labour market and then somehow being upwardly mobile within the labour market, or (iv) through some children in weaker performing schools nevertheless performing well enough to complete matric and then gaining access to universities or colleges.

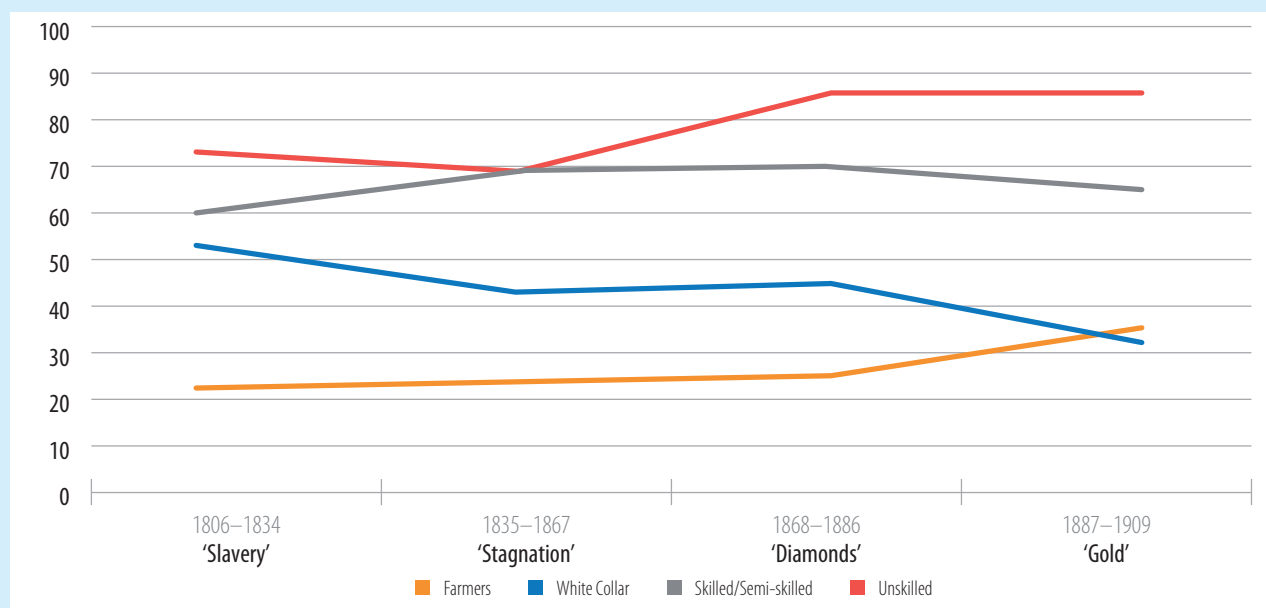
Throughout this report this framework will be used to discuss how improvements in access to education, and particularly education quality, are critical inputs in advancing social mobility for South Africa's economically vulnerable citizens. The next chapter considers to what extent the South African education system provides opportunities for poor children to achieve social mobility through education.

BOX 2: Intergenerational mobility during South Africa's mineral revolution

Cilliers and Fourie (2017) use a genealogical data set to investigate who benefited from the late 19th century mining boom in South Africa's northern interior. Whites, who held political power since the 17th century and through much of the 20th century, clearly benefited the most from South Africa's mineral revolution but up to this point, it is unclear who within this group benefited the most.

Cilliers and Fourie (2017) create father-son pairs from the South African Families database, which contains complete registers of all settler families and their descendants until 1910. They use these father-son pairs to investigate whether there has been any intergenerational occupational mobility. The absolute intergenerational mobility is shown below in Figure 2.10. There is increasing intergenerational mobility in absolute terms – by the final period (1887 to 1909) 35% of sons of farmers left farming compared to 21% initially. Over time, the decline in the mobility of white collar workers and the increased mobility of unskilled and skilled and semi-skilled workers are remarkable. The patterns in Figure 2.10 are suggestive of a changing labour market in response to the changing drivers of economic activity. However, if one controls for the changing structure of the labour market, a more nuanced story emerges (shown in Figure 2.11).

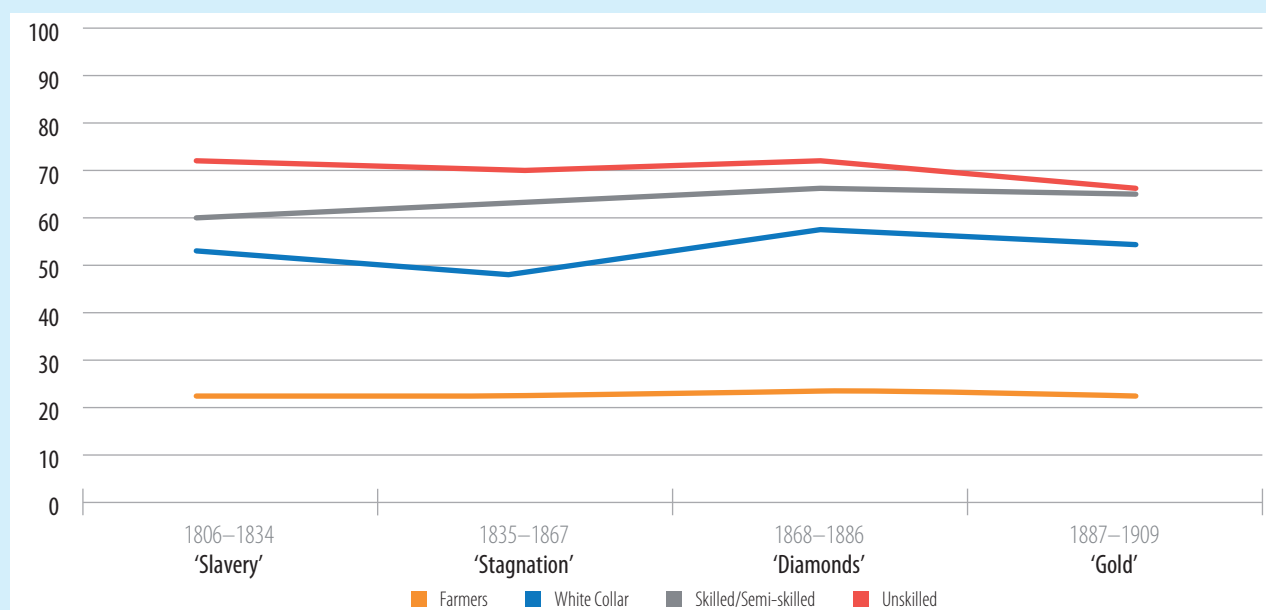
Figure 2.10: *Absolute intergenerational mobility: proportion of sons experiencing occupational mobility, by father's occupational group, over time*



Source: Cilliers and Fourie (2017).

Figure 2.11 shows the relative intergenerational mobility of sons, after controlling for changes in labour market structure. The sons of farmers and unskilled workers experienced very little mobility over time, while the sons of semi-skilled and skilled workers benefited from occupational improvements relative to their fathers, as there were fewer barriers to entry into the upper class.

Figure 2.11: *Relative intergenerational mobility: proportion of sons experiencing occupational mobility, by father's occupational group, over time.*



Source: Cilliers and Fourie (2017).

Cilliers and Fourie (2017) offer two possible explanations for intergenerational mobility for the period: geography and migrant status. Those residing closest to mines exhibited the most intergenerational mobility, while those further away showed lower probabilities of mobility. Sons of locally-born fathers were less likely to be intergenerationally mobile than sons of immigrants. Immigrants may have had wider social networks and more access to capital and may have been better educated, allowing them to take advantage of the growing demand for skilled occupations.

The main result from the study is that the benefits of rapid structural transformation of an economy are not evenly distributed. Those at the bottom do not necessarily benefit most, as seen by the relative occupational stagnation of sons of unskilled fathers. Quite often, it is those with the requisite skills and education who are able to benefit most from rapidly changing economic structures. Though circumstances differ, these lessons from history offer interesting glimpses into factors that may influence mobility in various contexts.

3 UNEQUAL CHANCES: THE EDUCATION SYSTEM

As Chapter 3 will attest, much of South Africa's inequality is rooted in the labour market, where young and poorly educated workers face extraordinarily poor employment and earnings prospects. Inequality in education opportunities leads to inequalities in labour market outcomes, which in themselves limit opportunities for future generations to obtain good education and labour market success. A convincing body of South African evidence (Van der Berg, 2007; Spaull, 2013; Burger, 2016) concludes that the severe inequalities that exist are visibly entrenched as early as the primary school years.



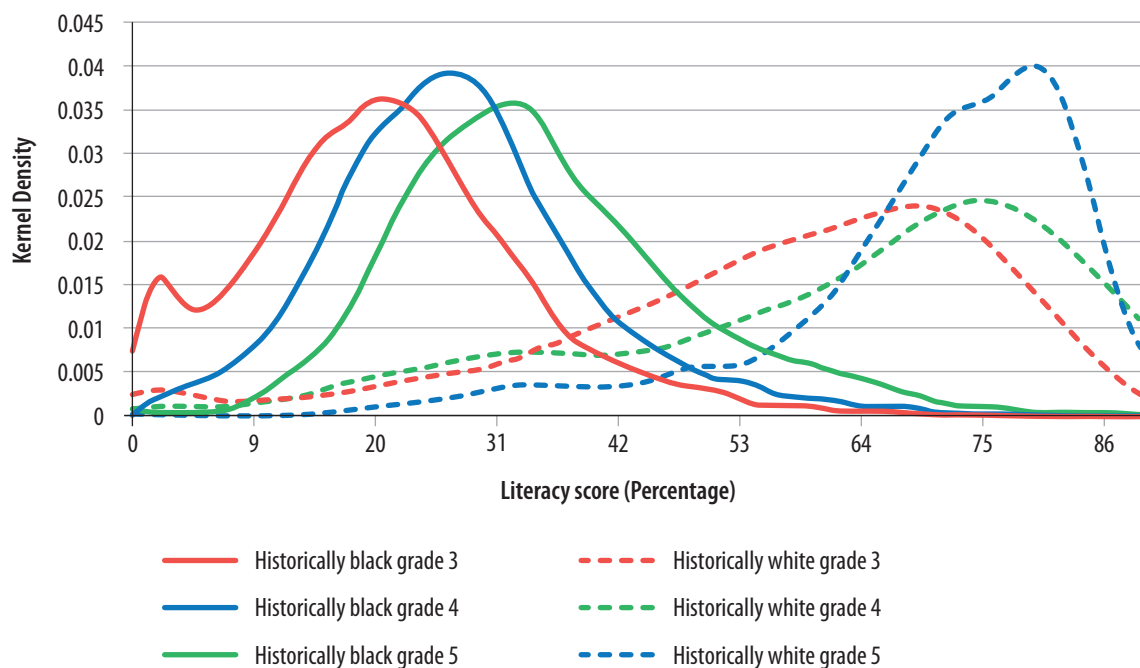
Race,
geographical
location
and socio-economic
status still predict
how a child will
perform in
school.

Much of the research on South African educational performance confirms the continued *de facto* existence of two very different public school systems: a smaller, better-performing system attended by the wealthiest South African learners, and a much larger, less efficient system accommodating the vast majority of learners (Fleisch 2008). While the dismantling of apartheid provided some blacks with hitherto unprecedented access to education and labour market opportunities, inequality in educational outcomes still manifests itself along much of the same dimensions as before 1994. Race, geographical location and socio-economic status, still almost inexorably linked two decades into democracy, to a large degree determine how a child will perform in school. Learners in the former black part of the school system perform at considerably lower levels than learners in historically white schools. Figure 3.1 shows the distribution of literacy test scores for the 2007 Grade 3 cohort from the National School Effectiveness Study between 2007 and 2009 (Taylor, 2011).² The solid line curves show Grades 3, 4 and 5 in former black schools, while the dashed curves represent learners in the same grades in former white schools. The vast performance differences between learners in different parts of the school system are immediately apparent.

² Kernel density curves such as these are best read as if they show continuous histograms, i.e. the distribution of performers across different levels of test scores. The highest point on each curve is then the modal value, i.e. the test score that most frequently occurs.

In Grade 3, learners in historically black schools perform substantially worse than learners in historically white schools. As learners progress to Grade 5, the already limited overlap in performance between the two race groups becomes even smaller. That overlap occurs at the top end of the black distribution and the bottom end of the white distribution. In other words, the worst performers in historically white schools and the best performers in historically black schools perform at roughly similar levels.

Figure 3.1: Literacy scores for 2007 Grade 3 cohort, 2007 to 2009



Source: Taylor (2011).

The small degree of overlap in performance between historically black and white schools is an indictment of an education system that mostly still operates as two sub-systems, with one producing substantially different learning outcomes to the other. The magnitude of the performance gap is apparent from how much to the left the Grade 5 distribution of black children lies compared to the Grade 3 distribution of white learners, despite that latter group being two years younger.

In this chapter a brief overview of the growth in South African educational attainment over time is given before delving into the education system's performance in recent years. A case will be made that the staggering inequalities in educational opportunity and outcome that manifest themselves as labour market inequalities later on, are cultivated as early as the first few primary school years, and follow learners throughout their school and higher education careers. Thereafter South Africa's higher education sector, where access is still limited because of a combination of financial constraints and failures in the basic education system, will be discussed.

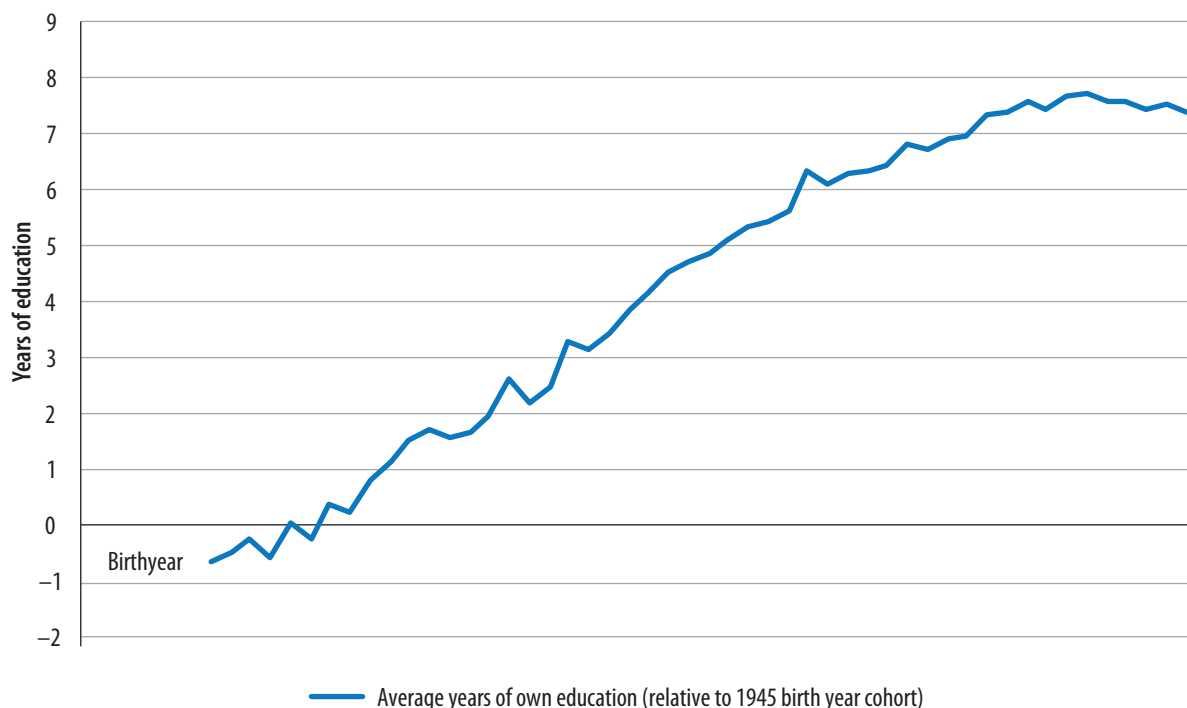


On average black individuals born in 1990 have 8 more years of education than those born in 1945

3.1 Spectacular growth in educational attainment over time

Historically, South Africa has spent more on education than most developing countries, spending R189.5 billion on basic education in 2014/15. The sustained spending shifts in favour of former black schools has been evident since at least the 1970s (Van der Berg, 2008), resulting in growth in average educational attainment that is nothing short of spectacular. Figure 3.2 shows the average educational attainment of black South Africans, relative to the 1945 birth year cohort: for example, on average those black individuals born in 1990 have 8 more years of education than those born in 1945. Educational mobility has occurred in both absolute terms and relative to the white population, whose educational attainment remained relatively stable over time.

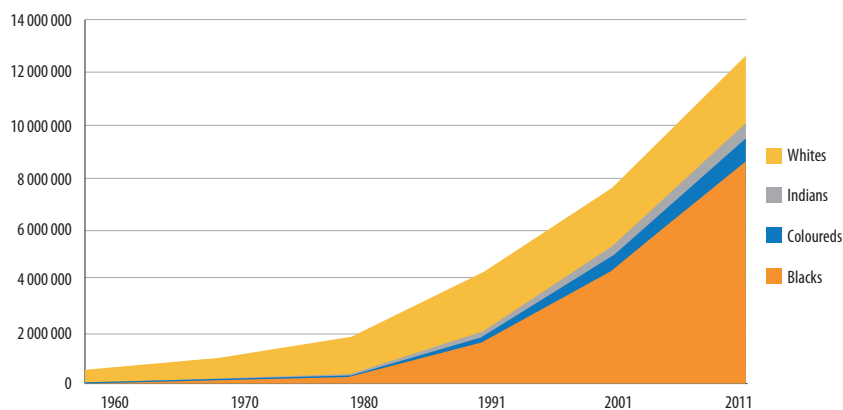
Figure 3.2: *Educational attainment growth for black South Africans, by birth cohort*



Source: Von Fintel and Von Fintel (2017), based on NIDS data.

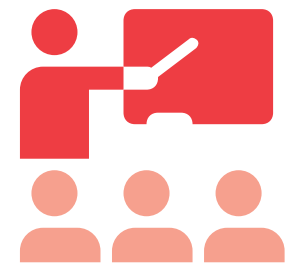
Educational convergence between races is also evident in Figure 3.3, which shows the absolute numbers of individuals who had attained at least a Grade 12 school-leaving certificate (matric) between 1960 and 2011. In the 1960 census just 17 980 members of the black population had matriculated; by the 2011 census that figure had increased to 8 462 047. The racial differentials in educational attainment in the two decades coinciding with the post-apartheid era (from 1991 to 2011) are particularly noteworthy – while the number of white individuals with at least Grade 12 grew by only 16% over the period, the number of black matriculated individuals grew by 454% (and by 269% and 168% for coloureds and Indians/Asians, respectively).

Figure 3.3: Number of individuals with matric 1960 to 2011 (by race)



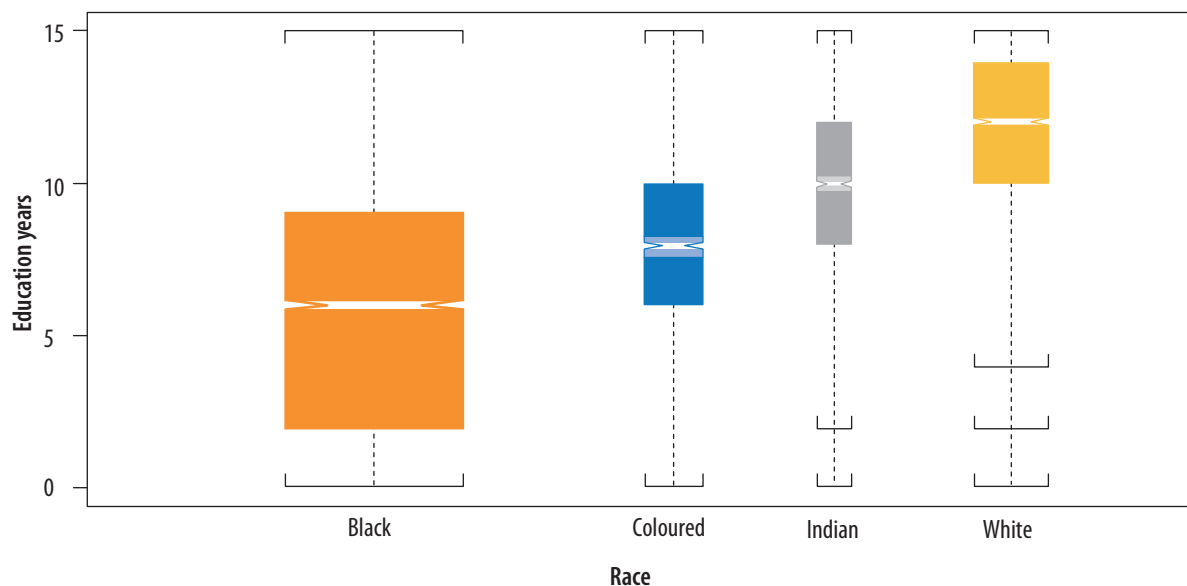
Source: Own calculations from Census data.

Despite the spectacular gains made before democracy in terms of producing matriculants, there were still substantial inequalities between races in terms of educational attainment at the time of the transition (Van der Berg *et al.*, 2002). Figure 3.4 below shows a boxplot of educational attainment for individuals aged 25 years and older by race in 1993, with the width of the boxes being indicative of race group size relative to the total population size. The median educational level in 1993 (represented by the line within the boxes) for blacks was approximately 6 years while the white median was approximately 12 years of education.



The median educational level in 1993 for blacks was approximately 6 years while the white median was approximately 12 years of education

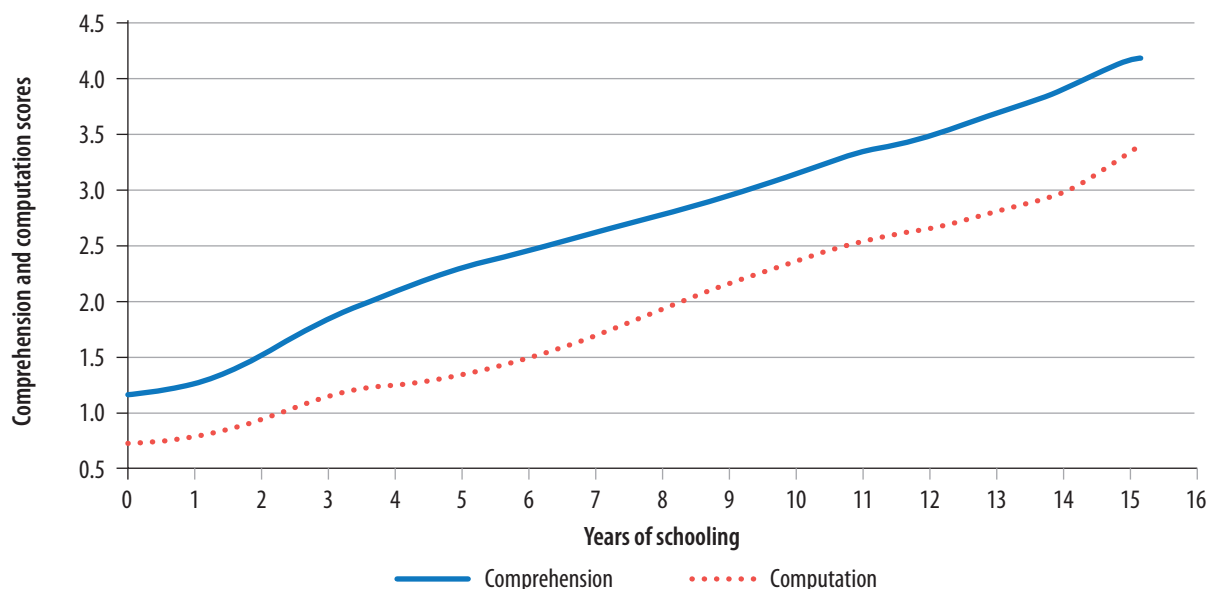
Figure 3.4: Educational attainment for individuals aged 25 years and older, by race (1993)



Source: Van der Berg *et al.* (2002: 292) based on analysis of data from the 1993 Project for Statistics on Living Standards and Development.

While the pre-democracy educational attainment differences were substantial, a perhaps more serious consequence of segregated and unequally resourced education was the differentials in education quality between schools serving the different races. The comprehension and computational ability tests in the 1993 Project for Statistics on Living Standards (results shown in Figure 3.4) revealed the shocking degree of dysfunctionality in the black education system.

Figure 3.5: *Comprehension and computation test scores (out of 14) for black individuals in 1993, by completed years of education*



Source: Moll (1998: 274).



Black learners

in 1993 would have required about

10 more years of schooling than whites

to perform on par with their white counterparts

The tests, scored out of 14, were designed to be comparable in difficulty to Grade 7 examinations, though later evaluations of the literacy test found that its complexity was actually more fitting for evaluating Grade 3 or 4 learning (Moll, 1998: 272). While the average Asian and white scores at all levels of education were 7 or more out of 14, even the average black test-taker with 12 years of education failed the test with a score of 5.7. Regression analysis by Case and Deaton (1999) imply that the racial deficit in cognitive development measured by the test implied that black learners in 1993 would have required about 10 more years of schooling than whites to perform on par with their white counterparts.

While educational expansion had translated into increased educational attainment for black South Africans, that educational attainment did not always reflect actual learning. By 1993, the end of the apartheid era, vast inequalities in educational quality remained, effectively curtailing labour market success for many black South Africans. While race is no longer the *de jure* divider of education quality and labour market outcomes, its continued close relationship with socioeconomic status means that the education system today is still largely split in two by race. This is further analysed in Section 2.2.

3.2 Inequality in education quality: recent evidence

South Africa's education system was overhauled substantially since 1994. Spending on education has become relatively well targeted towards the poor, with spending inequalities largely eliminated (Gustafsson & Patel, 2006; Van der Berg and Moses, 2012). Yet, in spite of considerable shifts of resources towards the poor, standardised local and international tests still reveal stark disparities in learning outcomes along similar dimensions as under apartheid.

Examination of educational performance shows the continued existence of a dualistic system that on the one hand provides education of a quality comparable to that of developed countries to children in one part of the system, and on the other hand, fails to prepare most learners adequately for the demands of the labour market or further studies. Figure 3.6 below shows South African Grade 4 learners' reading scores in the Progress in International Reading Literacy Study 2011, by school quintile³. This so-called prePIRLS assessment was specifically geared to test learners in the language that their schools used from Grades 1 to 3 (in most cases this would be the student's home language).

The dualistic nature of South Africa's education system is apparent in the large performance gap between quintile 5 schools (shown by the bold black curve) and the rest of the education system.

58%

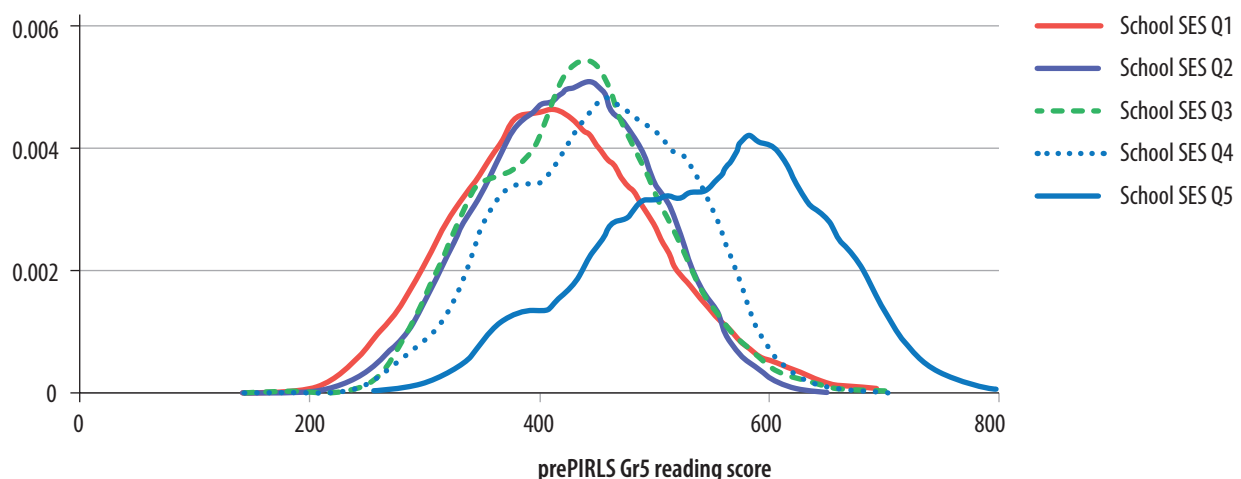
of the Grade 4 learners
**could not read
for meaning**
in any language while

29%

were reading illiterate. Learners who cannot read for meaning are at risk of becoming part of the "silently excluded".



Figure 3.6: PrePIRLS Grade 4 reading scores, by quintile (2011)



Source: Shepherd (2016).

³ These "quintiles" are calculated from data on possessions in the home. Schools are then classified based on the average asset score into quintiles, with schools serving the poorest 20 percent of learners in quintile 1 and those serving the wealthiest 20 percent of learners).



South African pupils' performance in both

Mathematics and Science improved

more than 2 grade levels between

2002 and 2015

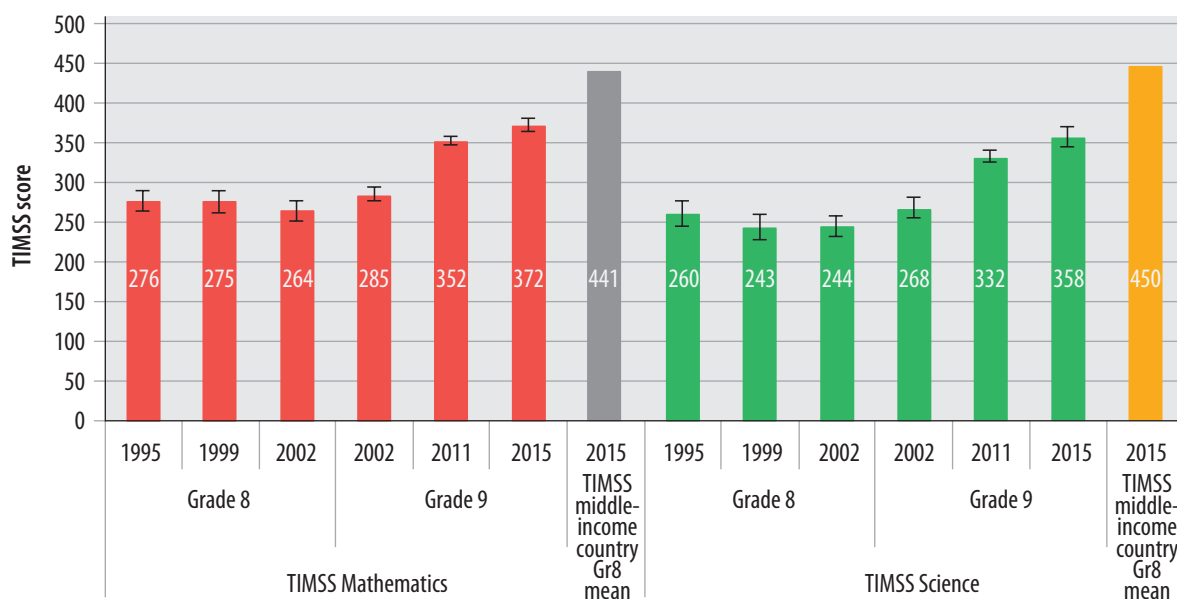
but South Africa's average is 2–3 grade levels below the middle-income country average in Mathematics and Science.

Altogether 58% of the Grade 4 learners tested in the nationally representative sample of 341 schools could not read for meaning in any language while 29% were reading illiterate (Spaull, 2016). Learners who cannot read for meaning are at risk of becoming part of the “silently excluded”, whose early reading backlogs accumulate over time, preventing them from participating fully in academic environments.

The early reading backlogs that many learners have in the poorer parts of the South African school system spill over into other subjects in later grades as well. South Africa's performance in TIMSS between 1995 and 2015 is shown below in Figure 3.7. The y-axis is delineated in 40-point increments, which is accepted to be roughly equivalent to one year's learning. While there are no remarkable changes in scores between 1995 and 2002, 2015 South African Grade 9 pupils scored 108 and 82 points higher than their 2002 counterparts in Mathematics and Science, respectively (Spaull, 2013: 17). In effect, this means that the average South African pupils' performance in both Mathematics and Science improved more than 2 grade levels between 2002 and 2015.

In isolation, the performance increases are heartening, but relative to other middle-income countries, South Africa's average is 2.0 grade levels below the middle-income country average in Mathematics and 2.3 grade levels below in Science. The learning gap between pupils from South African and other middle-income countries is all the more apparent in light of the fact that South African *Grade 9* pupils were tested while all other countries' *Grade 8* pupils were tested.

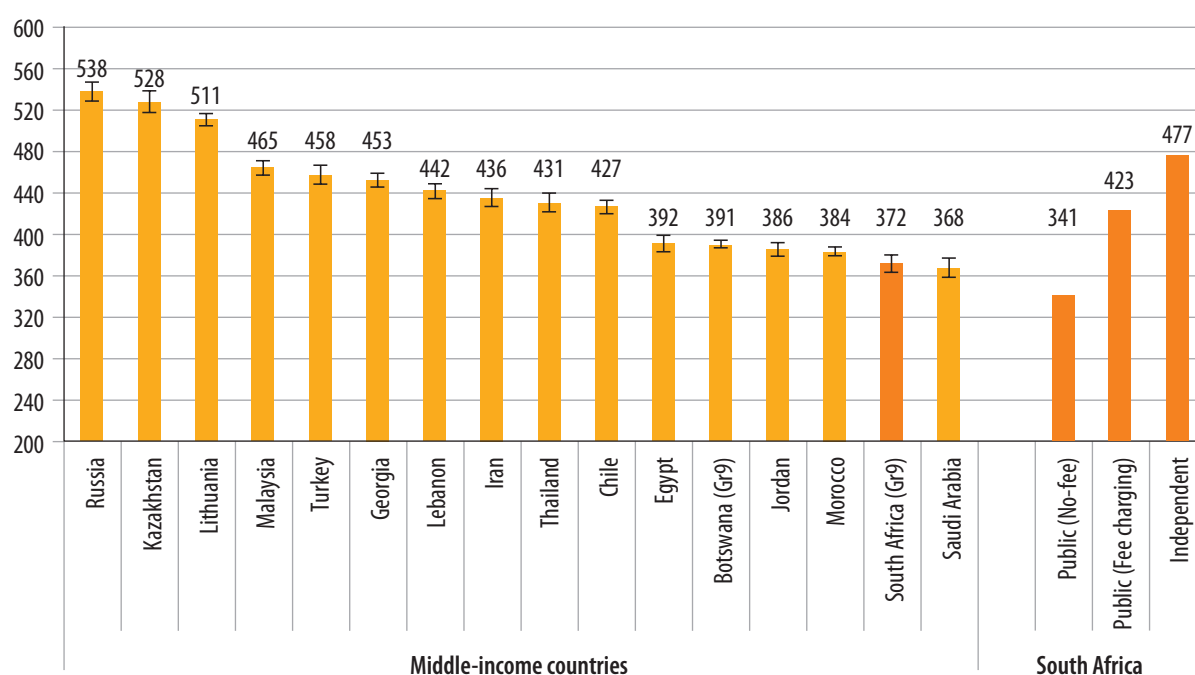
Figure 3.7: South African TIMSS Mathematics and Science scores (1995 to 2015)



Source: Spaull (2017), with figures from Howie & Hughes (1998), Reddy (2006) and Mullis et al (2012, 2016)

The improvement in the TIMSS averages shown above, while encouraging, masks another salient feature of the South African education system: the fact that education outputs are not evenly distributed. Once South Africa's TIMSS performance is categorised by quintile⁴ the vast educational quality differentials still present in the South African school system become apparent (Spaull, 2013: 18). Figure 3.8 below shows South Africa's 2015 average mathematics score by school type, relative to other middle-income countries. While the average South African learner in the top two asset quintiles (shown on the graph as "fee charging") score close to the middle-income mean score of 441 points, learners in the bottom three quintiles ("no-fee schools") score 2 grade levels below their counterparts from wealthier schools.

Figure 3.8: South African TIMSS Mathematics scores (2015)

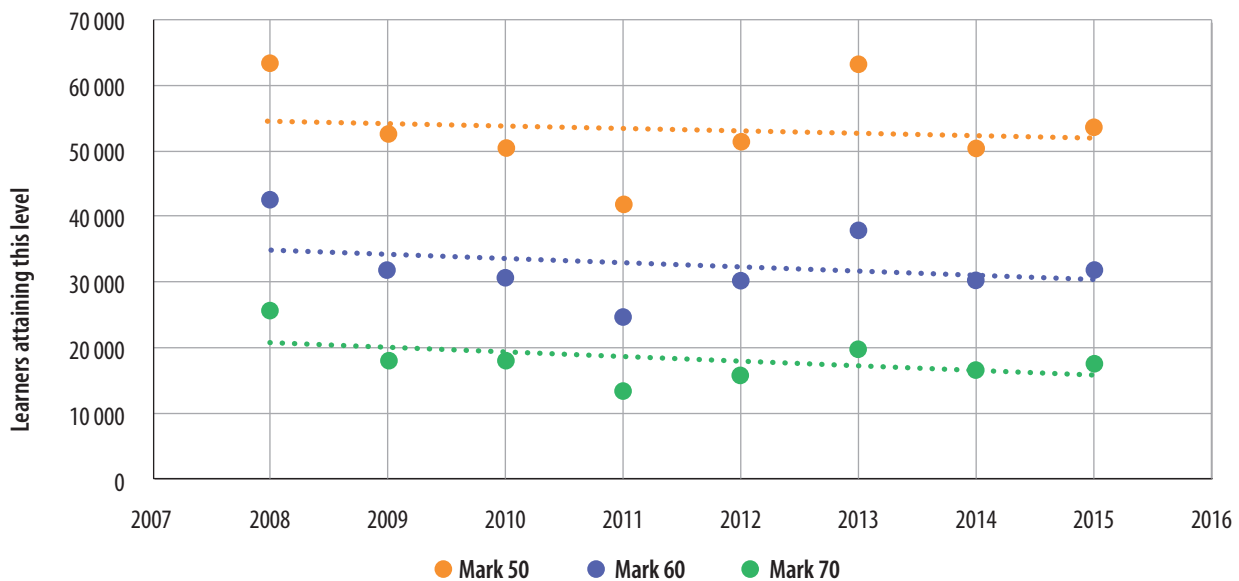


Source: Spaull (2013); 2015 data from Reddy *et al.* (2016).

South Africa's performance improvements in TIMSS over time have led some researchers to question why the same improvements cannot be seen in the local externally assessed National Senior Certificate examinations. The Grade 12 Mathematics marks for learners who pass have declined on average since 2008. Figure 3.9 shows the performance trends for full-time Grade 12 learners in mathematics at the 50, 60 and 70% levels (Gustafsson, 2016). At face value, the downward trends appears worrying, particularly so when one considers the 70% performance level (a B symbol or higher) which declined at an annualised rate of 3.8% for the 2008 to 2015 period. This stark decline in the number of high-level achievers performing at the 70% level may suggest that mathematics marks are not strictly comparable across years, particularly because learners achieving at these high levels are quite often located in schools with relative performance stability over time.

⁴ South African public schools are classified by wealth into five quintiles, with quintile 1 representing the poorest 20 per cent and each successive quintile representing the next poorest 20 per cent (up to quintile 5 representing the wealthiest 20 per cent of learners).

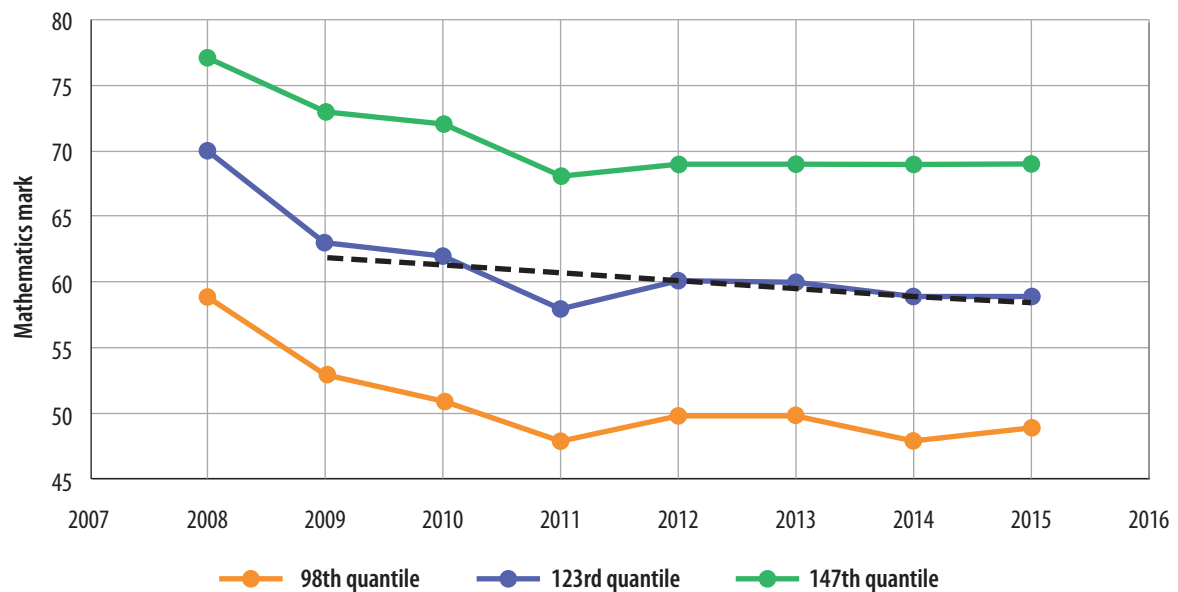
Figure 3.9: Trends in mathematics marks trends for full-time Grade 12 learners, unadjusted for changes in difficulty levels



Source: Gustafsson (2016: 4).

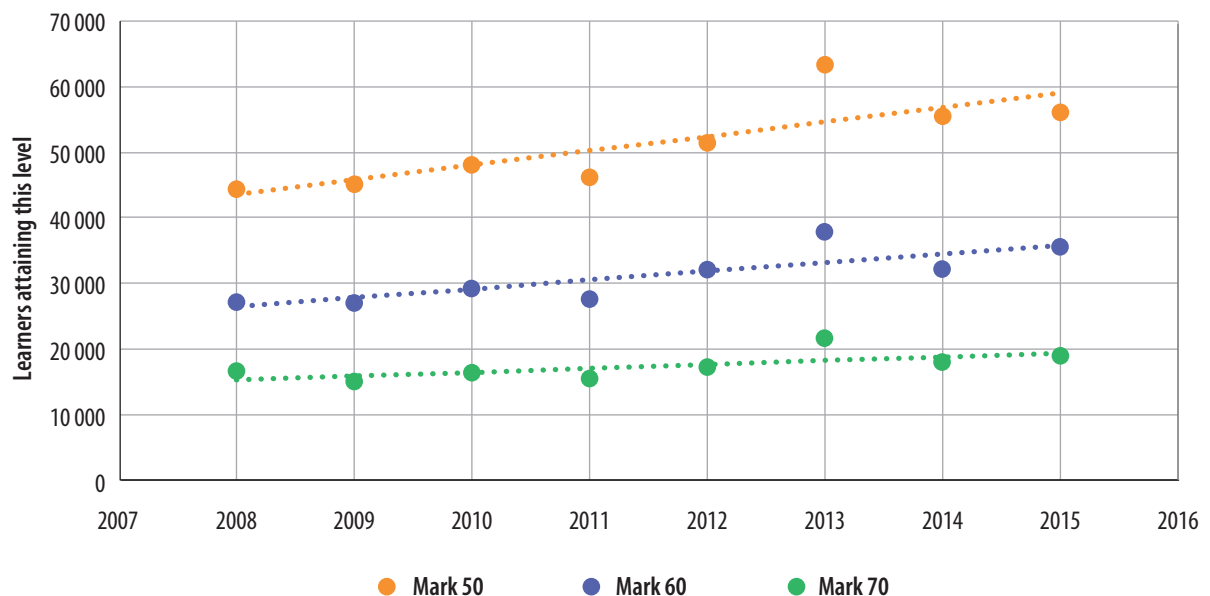
To adjust for possible inconsistency in the testing standard across years in mathematics and science, Gustafsson (2016: 7) selected 32 well-performing schools that satisfy a number of stability criteria to serve as performance benchmarks for the years 2008 to 2015. Learners were then divided into 200 performance quantiles to determine their positions relative to other students who wrote mathematics in the same year. Assuming that school performance and school performance distributions are relatively stable over time, it is possible to determine with some confidence what marks learners could have achieved had they written the mathematics examination in different years.

The results, presented in Figure 3.10, confirm the suspicion that the difficulty of the mathematics examination fluctuated between 2008 and 2015. The general downward trends for learners performing at the 98th, 123rd and 147th quantile (corresponding to the 50, 60 and 70% average between 2008 and 2014, respectively) suggest that the difficulty of Grade 12 mathematics examinations had increased over time. For example, learners in the 98th quantile (roughly equivalent to a 50% average across years) would have achieved 58% in 2008 and 48% in 2015. Similarly, learners in the 147th quantile (roughly equivalent to a 70% average across years) would have achieved 77% in 2008 but only 69% in 2015.

Figure 3.10: Mathematics marks for 32 stable schools, 2008 to 2015 (by select quantile)

Source: Gustafsson (2015: 8).

The apparent performance inconsistency across years therefore provides justification for an 'adjustment' of mathematics marks to reduce the impact of measurement error in a bid to get more comparable estimates of mathematics performance across years. Applying such an 'adjustment' to the raw mathematics marks in Figure 3.9 produces entirely different trends in the numbers of learners performing at the 50, 60 and 70% levels (shown in Figure 3.11 below).

Figure 3.11: Mathematics mark trends for full-time Grade 12 learners (adjusted)

Source: Gustafsson (2016: 25).



The numbers of learners achieving at performance levels of 50, 60 and 70% have generally increased between 2008 and 2015.

The results in Figure 3.11 convincingly demonstrate that the numbers of learners achieving at performance levels of 50, 60 and 70% have generally increased between 2008 and 2015. The average annual growth in learners achieving these marks between 2008 and 2015 were 4.3%, 4.5% and 3.4% respectively. This finding thus contrasts with the conventional view that there was a contraction of high-performing learners in mathematics for the period. Encouragingly, after “adjusting” the marks for possible differences in difficulty, Gustafsson (2016) notes a large increase in the numbers of black and coloured learners achieving higher mathematics marks. This provides further support for the findings from TIMSS that some improvement in performance has been taking place.

The recent evidence on education quality in South Africa shows an education system that generally only produces good education outcomes for a small minority of learners in affluent schools. Pre-PIRLS shows that the learning gaps observed in secondary school are already present and growing as early as Grade 4, suggesting that interventions should be targeted as early as possible. Section 2.3 presents more evidence of these early learning gaps and makes a case for intervention as early as possible to mitigate the cumulative damage done to poor learners throughout their school careers.

3.3 Inequality from the outset: The case for early intervention

The international literature shows that cognitive gaps between children of different socio-economic backgrounds are established well before they enter school, and widen as they progress through the school system, despite the school system being seen by many as the primary mechanism for reducing inequality. These early school and home environment inequalities persist into the labour market, where poor employment and wage prospects for the poor deterministically could assign future generations to the same fate as their predecessors.

Almond and Currie (2010) show that child and family characteristics at the age of seven can explain as much of the variation in adult outcomes, such as earnings and probability of employment, as years of schooling. This means that socioeconomic status begins to influence children’s abilities and potential from the very beginning of life, thus transmitting socioeconomic status from one generation

to the next and hindering social mobility. This suggests that the earlier education (or other) interventions happen, the greater the chance that they will be successful.

Cunha and Heckman (2007) provide a more formal argument for early investment in children. In their model, investments at different stages of childhood build upon one another. Skills (both cognitive and non-cognitive) acquired during one stage of childhood foster the development of other skills (“self-productivity”) and increase the productivity of subsequent investments in children (“dynamic complementarity”). In other words, skills learnt early in life enable children to get more out of school as they get older. However, early investments need to be followed up by later investments to be fully effective. This makes it critical to invest in education as early in a child’s life as possible to reduce the impact of socioeconomic disadvantage and intergenerational transmission of socioeconomic status. But early investments also need to be followed up by high-quality education throughout a child’s school career.

The enduring impact of childhood circumstance, and its power in predicting future cognitive performance, is particularly evident in the South African context. Using South Africa’s Annual National Assessments⁵, Van der Berg (2015) finds that educational attainment gaps between the poor and the more affluent are cemented as early as the middle of primary school already. Figure 3.12 shows South African learners, proportional to the Grade 1 entering cohort size, who are not over-aged and who are performing better than one standard deviation below the white and Indian average⁶, by grade and school quintile. The results show a relatively steep downward trajectory in the number of learners on track in the primary school years. By Grade 4, fewer than half of the learners who had started Grade 1 three years earlier would be appropriately aged and performing at or above the low international benchmark. The decreases in the proportions of on-track learners are most marked in school quintiles 1 and 2 (representing the poorest 40% of schools), where only one-third of learners starting Grade 1 would be on track by Grade 4.



By Grade 4,
fewer than half of
the learners who had
started Grade 1
three years
earlier

would be
appropriately aged
and performing
at or above
the low
international
benchmark.

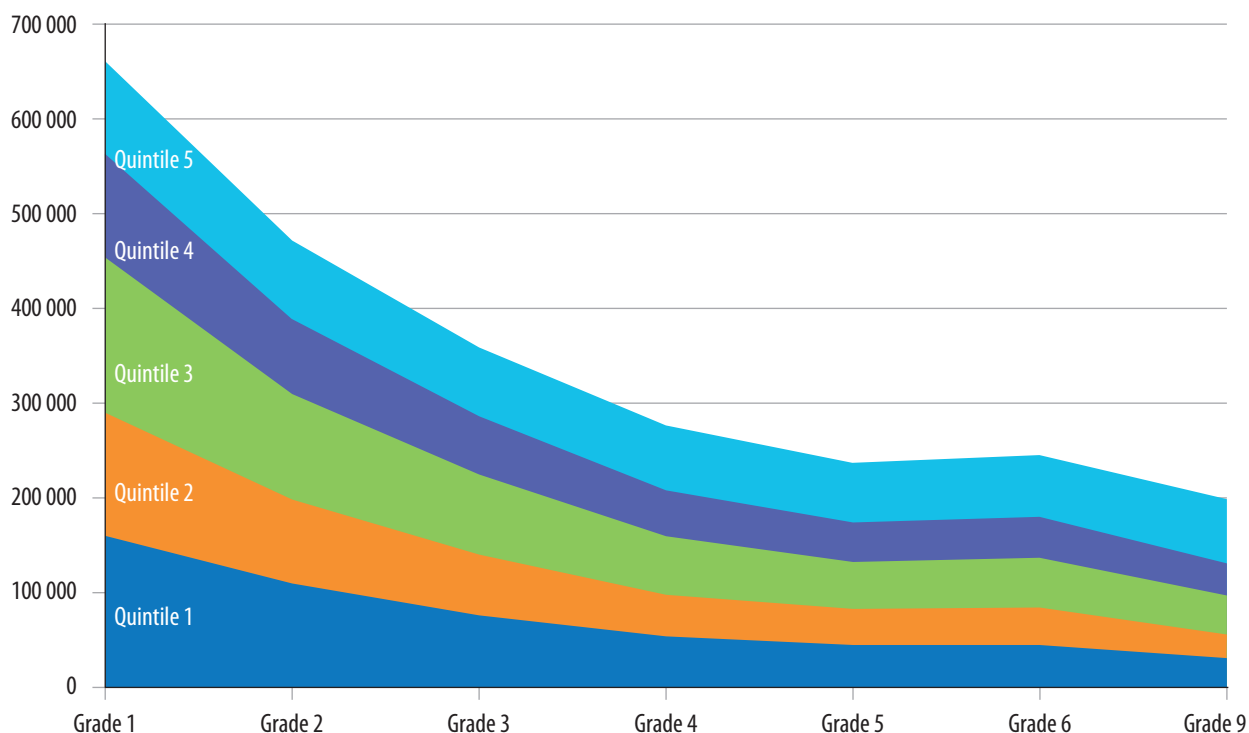


In school
quintiles 1
and 2 only
one-third of
learners starting
Grade 1
would be
on track
by Grade 4.

⁵ The ANAs were standardised national assessments for learners in the foundation, intermediate and senior phases

⁶ White and Indian learners in South Africa who are not overaged attain close to the average Mathematics score in TIMSS. In TIMSS the low international benchmark is set at one standard deviation below the average, which suggests that learners performing at one standard deviation below the white and Indian ANA average would also be attaining close to the TIMSS low international benchmark.

Figure 3.12: *Number of students on track by Grade and school quintile (ANA, 2012)*



Source: Van der Berg (2015: 10).

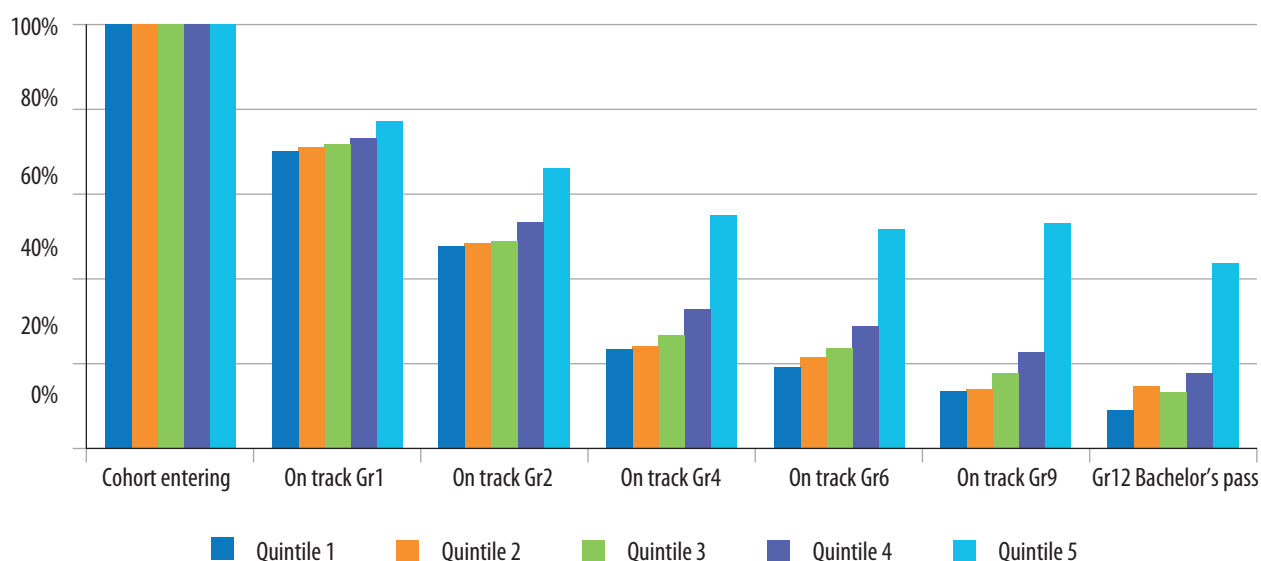


The glaring
learning deficits
already visible at
Grade 4
suggest an urgent
need for
remedial action
as early as possible

Figure 3.13 presents the same results, but in addition also shows the percentage of the entry cohort attaining a Bachelor's pass in Grade 12 (which makes learners eligible for entry to university). The shape of the distribution of Bachelor passes across quintiles is very similar to that for on-track students in Grade 4, demonstrating that the educational attainment (and quality) gaps between learners of different socio-economic backgrounds observed in the Grade 12 national assessments set in as early as primary school.

These results provide a strong argument for early learning interventions. While drop-out (through poor performance and repetition) is another notable problem between Grade 6 and Grade 9, the glaring learning deficits already visible at Grade 4 suggest an urgent need for remedial action as early as possible.

Figure 3.13: Proportion of entering cohort on track in various Grades ANA 2012 (to Grade 9) and Bachelor passes, by national school quintile



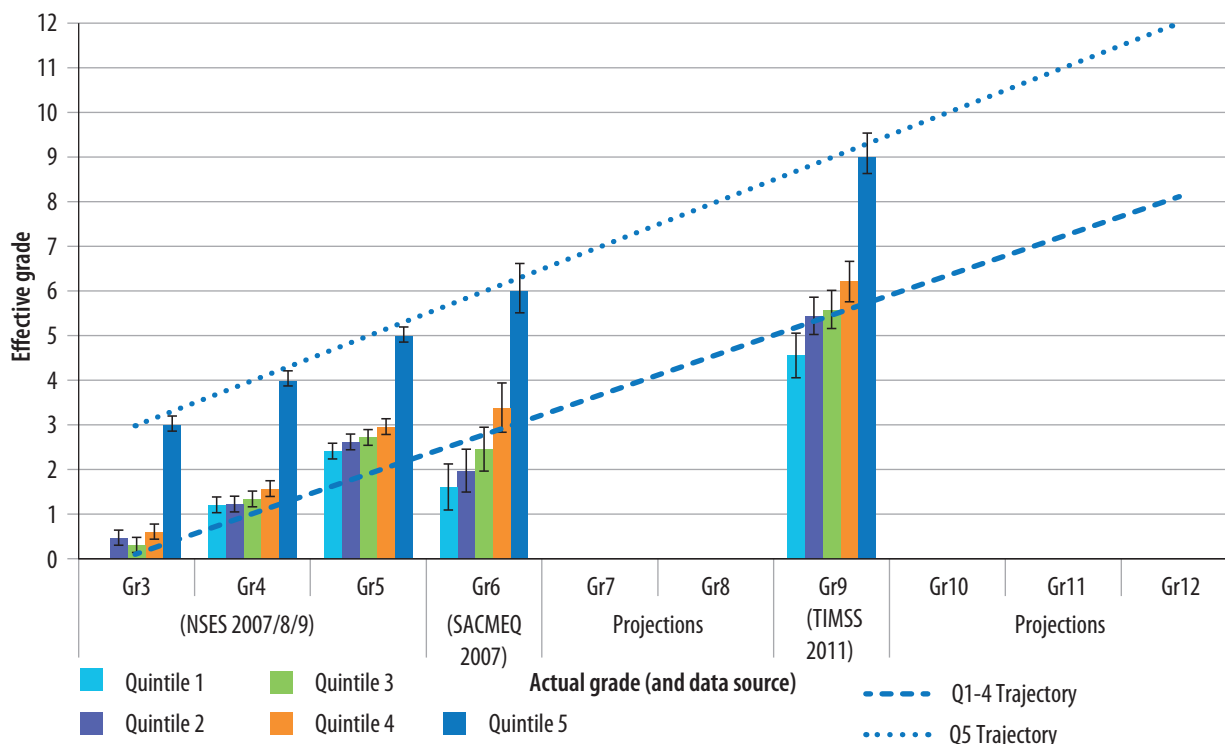
Source: Van der Berg (2015).

This finding of substantial early learning deficits is mirrored by previous work by Spaull and Kotzé (2015). Combining data from the National School Effectiveness Study (NSES), Southern African Consortium for Monitoring Education Quality (SACMEQ) and the Trends in Mathematics and Science Study (TIMSS) are combined to construct a learning trajectory from Grades 3 to 9, they compare effective grades (years of learning effectively completed) with the grade that learners are currently in (shown in Figure 3.14). They find that by Grade 3, the effective learning gap between learners in quintile 5 and learners in other schools is almost 3 years. The gap widens to 3.5 years by Grade 9, with a projected gap of 4 years by Grade 12. This echoes the finding that debilitating learning backlogs are evident in the early primary school years already, backlogs that essentially preclude many poor children from meaningful subsequent learning.



By Grade 3,
the effective learning
gap between
learners in
quintile 5
and learners in other
schools is almost
3 years

Figure 3.14: South African Learning Trajectories by School Quintiles



Source: Spaull and Kotzé (2015).



Intervene

as early as possible,
with a particular
focus on

quality in
Grade R and
the primary
school grades

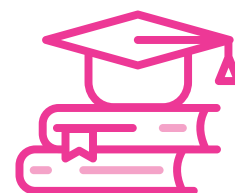
These findings make a strong case for what is increasingly regarded as being the most cost-effective solution in a resource-constrained society – intervene as early as possible, with a particular focus on quality in Grade R and the primary school grades (Van der Berg *et al.*, 2013: 3), to minimise the cumulative learning deficits associated with poverty. Shepherd (2016) shows, using TIMSS data, how difficult it is for even the most able learners in weak schools to perform at levels commensurate with their ability. This means that in some cases even students who have great potential may fail to gain entry into university.

The results in this section show that the probability of passing matric well and transitioning into high-return tertiary studies is extremely low as early as the foundation phase for learners in poor schools. By all accounts, it appears as if the bulk of the South African education system cannot produce the quality of education needed for learners to acquire the necessary skills for social mobility through further education and the labour market. Of particular concern is the weak performance in mathematics which, as the next section demonstrates, is generally indicative of future success at university.

3.4 Access to and performance at university

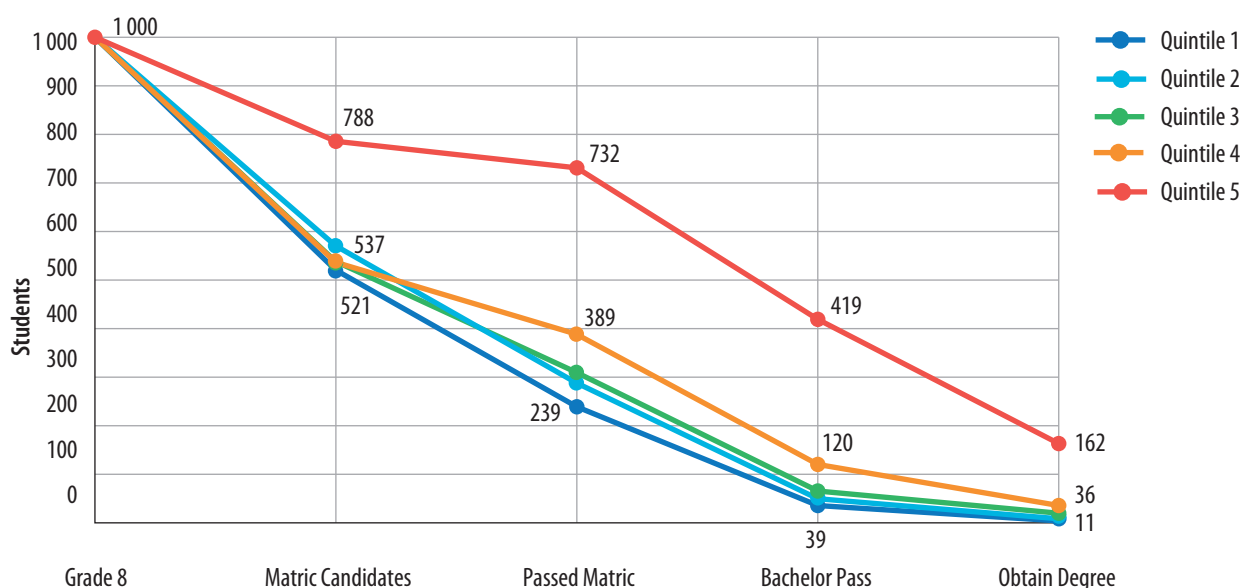
South Africa's youth unemployment rate in 2016, at approximately 50%, is amongst the highest in the world and is likely to remain as high in the foreseeable future (ILO, 2016). The fact that half of South African youth entering the labour market are not able to find a job is deeply troubling.

One suggested response to the high levels of unemployment of young adults is expanding access to tertiary education so that more South Africans can take advantage of the relatively high returns to higher education. However, access to higher education, either through school performance or financial constraints, remains highly unequal. Figure 3.15 shows how socioeconomic inequalities during childhood education persist into early adulthood, with school socioeconomic quintile being strongly predictive of university access and success. While most South African children start secondary school (grade 8), the graph shows how these numbers drop off between Grade 8 and matric, and then how the numbers that pass matric are even smaller, and that those achieving a Bachelor's pass are an even smaller group. What is also noticeable is how starkly the patterns differ between those learners in quintile 5 and those in the bottom three quintiles. While Bachelor's passes in matric are achieved by almost 42% of the quintile 5 entrants into high school, the proportion in quintile 1 is only 3.9%, and there is little difference in the patterns in the bottom three quintiles.



While **42%** of the quintile 5 entrants into high school will earn a **Bachelor's pass**, only **4%** of quintile 1 learners will do so

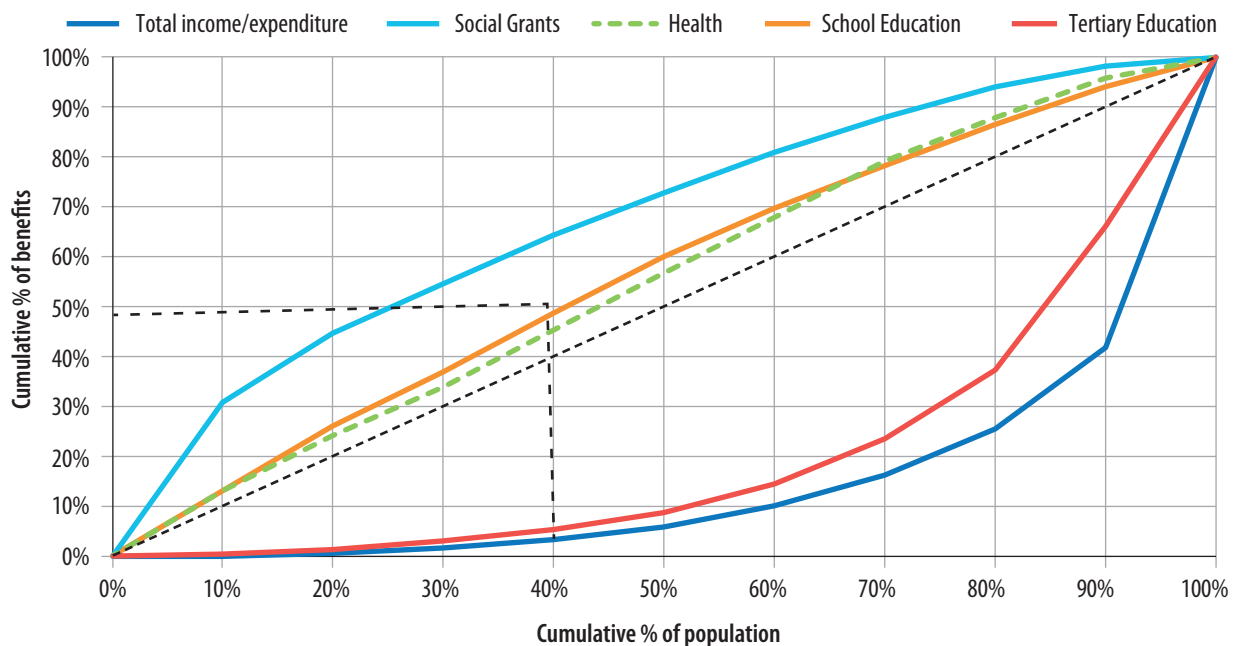
Figure 3.15: University access and success for the 2008 matric cohort (i.e. the 2004 Grade 8 cohort)



Source: Own calculations based on Van Broekhuizen *et al.* (2016).

While 16.2% of learners in quintile 5 schools go on to earn degrees within six years after matric, just more than 1% of learners from quintile 1–3 schools achieve the same feat. The restricted access to university for learners from poor schools ensures that public spending on tertiary education remains pro-rich (Van der Berg and Moses, 2012). Benefit incidence or concentration curves for government spending on various departments are shown below.⁷ Figure 3.16 reveals that tertiary education spending is decidedly pro-rich, with the poorest 40% of South Africa’s population only receiving 5% of government spending on tertiary education. The unequal spending is largely attributable to access issues related to academic performance at school, and financial constraints.

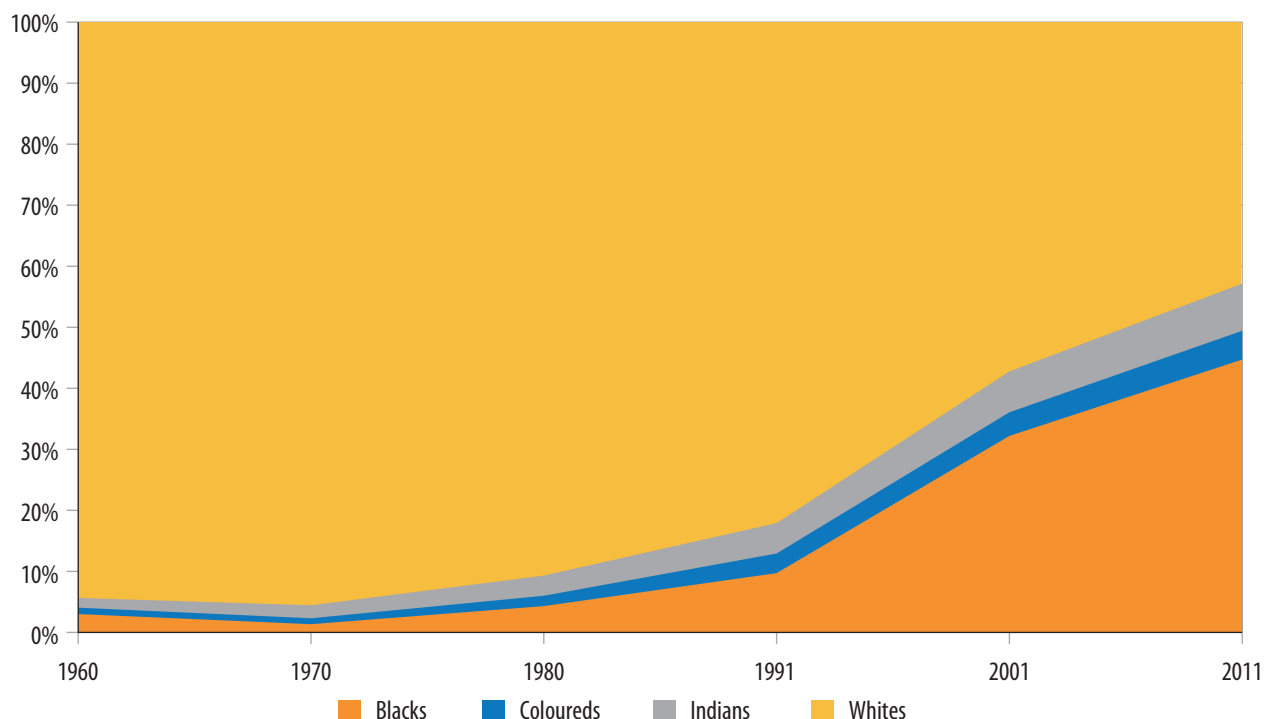
Figure 3.16: *Social spending by spending category, 2006*



Source: Van der Berg & Moses (2012).

While government spending on tertiary education mirrors the prevailing income/expenditure inequality quite closely (in other words, it does little to reduce existing income equality), Figure 3.17 shows that the racial composition of degree holders has changed substantially between 1960 and 2011. Whites, who represented more than 90% of all degree holders in the population between 1960 and 1980, made up only 43% of all degree holders by 2011.

⁷ Like Lorenz curves, benefit incidence or concentration curves are a graphical representation of inequality. The population is arranged from poorest to richest and placed. The X-axis represents the cumulative percentage of the population. The diagonal 45-degree line indicates equally distributed spending (e.g. the poorest 40% receive 40% of the benefits of social spending, and so forth). Any curves above the line, such as the one for school education, indicate pro-poor spending, i.e. the poorest 40% receives more than 40% of social spending on education (in this case 47%).

Figure 3.17: *Racial composition of degree holders, by race (1960 – 2011)*

Source: Own calculations based on Census data 1960 to 2011.

As encouraging as the growth in black tertiary graduates is, university access and success while at university are still highly unequal. The dualistic school system reduces the majority's chances of accessing higher education. Of the student cohort who entered Grade 1 in 1997 (the 2008 matric cohort), only 60% wrote the matric examinations in 2008, with only 37%⁸ of the original group passing matric (Van Broekhuizen, 2016). Only 26% of the 1997 Grade 1 cohort achieved a pass that qualified them for university entrance. 12% of the cohort accessed university, and only half of that group completed an undergraduate qualification within 6 years after matric.

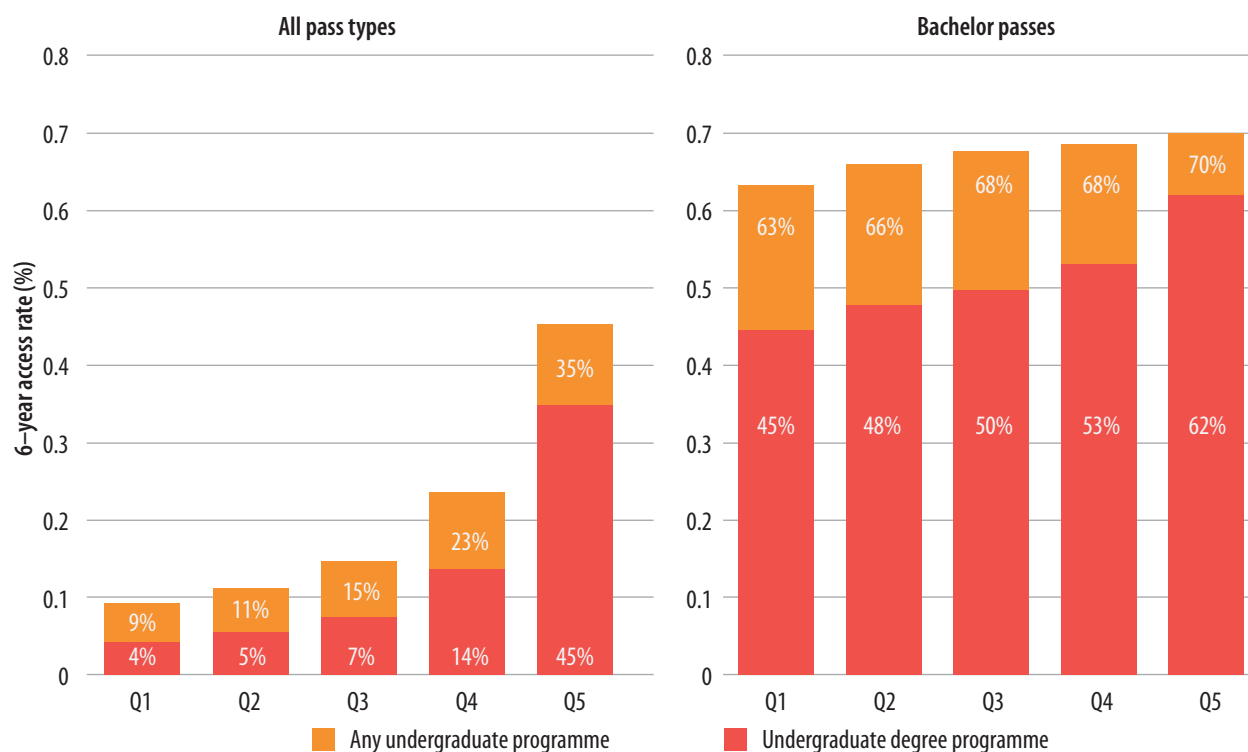
Figure 3.18 shows that school quintiles (roughly indicative of average learner socioeconomic status) are strongly predictive of access to university. While less than 14% of learners in matric from quintile 1 schools enrolled for any undergraduate programme within 6 years, the comparable figure for matric learners from quintile 5 schools is 80%. The very sharp rise in the slope of the SES-access relationship between quintile 4 and quintile 5 suggests that learners in the most affluent schools gain much more from education relative to most others.



Less than **14%** of learners in matric from **quintile 1** schools enrol for **any undergraduate programme** within **6 years**

⁸ The pass rate of 37% refers to the proportion of Grade 1 learners starting school in 1997 who eventually pass matric. The pass rate for learners who made it to Grade 12 and wrote the matric examinations in 2008 was 62%.

Figure 3.18: University access rates by school quintile – all candidates versus Bachelor candidates

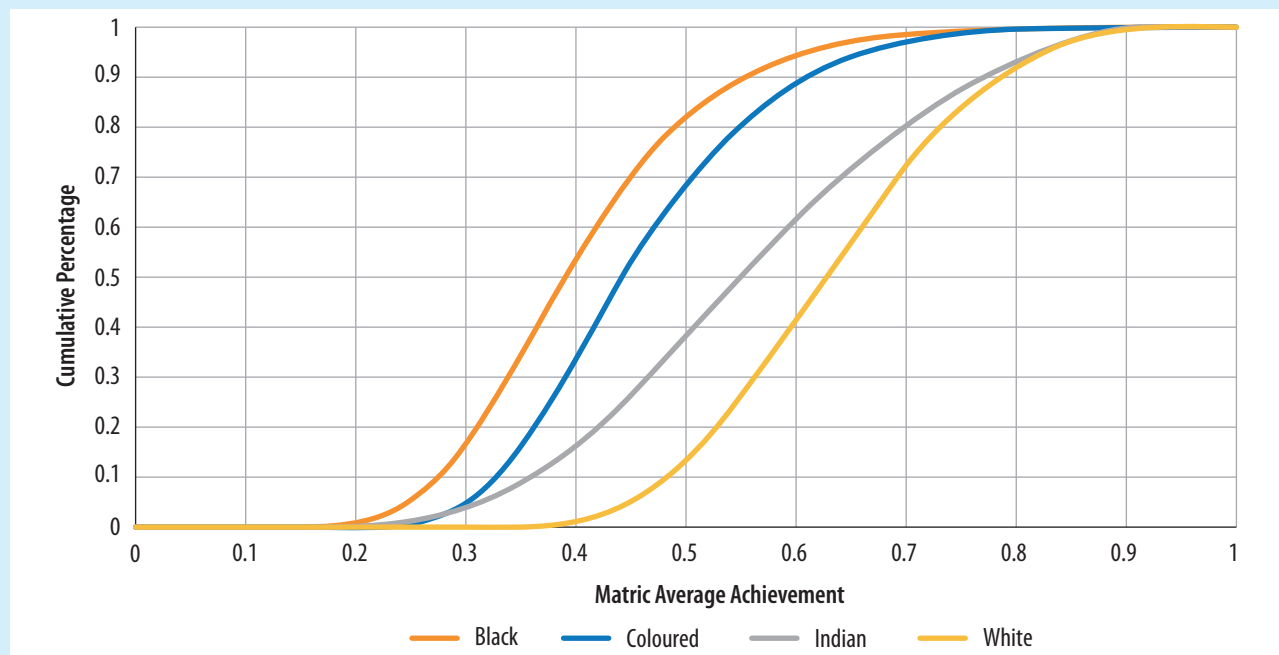


Source: Van Broekhuizen *et al.*, 2016.

Because socioeconomic status is still almost synonymous with race, a casual observer may be tempted to believe that differentials in access rates by race are due to discrimination. As Box 3 shows, once school performance is accounted for, there are not large differences between blacks and whites in terms of access to university. This finding emphasises the importance for future social mobility of improving education quality in those parts of the education system that fail the majority.

BOX 3: The Importance of matric performance for University outcomes

Beyond the value of matric as a determinant of access to university, the student's average mark is also expected to be a good indicator of how well prepared he/she is for the intellectual and emotional demands associated with university enrolment (Van Broekhuizen *et al.*, 2015). Figure 3.19 shows the cumulative matric average achievement for learners who wrote the matric examinations in 2008. Cumulative distribution functions (CDFs), such as the one below, show the percentage of learners that achieve at and below a certain performance level. The CDFs below show glaring performance inequalities by race – while 40 percent of white learners achieved less than 60 percent in their matric examination in 2008, the comparable figure for black learners was 95 percent. By implication, 60 percent of white learners writing the matric examination achieved 60 percent or more, while only 5 percent of their black counterparts did.

Figure 3.19: Cumulative matric average achievement distribution for the 2008 matric cohort, by race

Source: Van Broekhuizen *et al.* (2015).

As matric performance is positively related to university access and performance, the stark performance differentials in the secondary education part of the education system spill over into the higher education sector. The linear probability regressions in Tables 3.1 and 3.2 overleaf confirm the racial differentials in university access, conversion, completion and dropout. Table 3.1 shows the relationship between race and university outcomes for the 2008 national matric cohort, before controlling for matric performance and the type of pass achieved. Since the reference group is black learners, the 1-year access results shown in the first column reveal that both white and Asian matriculants are about 26 percentage points more likely than black matriculants to gain access to a university (coloured learners are 4 percentage points more likely).

The significant racial differences in university access are evident even when accounting for delayed access to university in the second column showing 6-year access to university. The pattern is much the same for throughput and retention, with whites 18 percentage points more likely than blacks to complete an undergraduate qualification within 6 years after enrolment and 14 percentage points less likely to drop out within five years.

Table 3.1: Regression: Undergraduate access, completion, conversion and dropout rates – no controls

	1-year access	6-year access	6-year conversion	6-year completion	5-year dropout
Coloured	0.040***	0.032***	0.018***	0.003	0.015***
Asian	0.263***	0.267***	0.168***	0.086***	-0.092***
White	0.256***	0.308***	0.227***	0.181***	-0.140***
N	560 921	560 921	560 921	72 537	72 537
Adjusted R^2	0.056	0.052	0.048	0.023	0.018

Source: Van Broekhuizen *et al.* (2015).

Table 3.2 below controls for the type of pass achieved and the learner's average mark in the matric examination. The results underscore the importance of matric achievement in university access and outcomes at university once enrolled. In contrast to the previous table where whites are considerably **more** likely to access university in the year following matriculation, Table 3.2 reveals that once the type of pass and matric average is controlled for, white matriculants are actually 12.6 percentage points **less** likely than black learners to access university. Even 6 years after matric, whites are significantly less likely than blacks to access university, once matric performance is accounted for.

The fourth column in Table 3.2 shows racial differentials in completion within 6 years after matric, relative to the black population, the reference group in these regressions. The results show that once the type of pass and average matric mark are taken into account, there are no significant differences in completion between black and white university students.

Table 3.2: Undergraduate access, completion, conversion and dropout rates – controlling for matric performance

	1-year access	6-year access	6-year conversion	6-year completion	5-year dropout
Coloured	-0.032***	-0.076***	-0.036***	-0.038***	0.063***
Asian	0.001	-0.074***	-0.038***	-0.066***	0.059***
White	-0.126***	-0.182***	-0.076***	-0.005***	0.043***
Bachelor pass	0.244***	0.312***	0.155***	0.007***	-0.068***
Matric average	0.0126***	0.012***	0.012***	0.014***	-0.012***
N	560 926	560 926	560 926	72 526	72 526
Adjusted R ²	0.379	0.443	0.294	0.095	0.109

Source: Van Broekhuizen *et al.* (2016).

From the results in Tables 3.1 and 3.2 it appears that racial differentials in favour of whites in terms of access to and success while at university are driven in large part by differences in performance in the matriculation examination. The findings here suggest strongly that interventions should focus on basic education to reduce racial differentials in university access and success.

White learners are

25.6 %

points more likely to access university than black matriculants in the year after Matric.

However, once Matric



examination performance is controlled for, white learners are

12.6 %

points less likely to access university than black learners in the year after Matric.

3.5 Conclusion

Rising demand for education along with significant pro-poor shifts in education spending away from previously white schools to previously black schools have produced a significant growth in educational attainment, with substantial reductions in the attainment gap between black and white people. However, despite almost universal access to education, the education system essentially still generally produces only a relatively small group of learners equipped to pursue university education, and a large group of mostly black, mostly poor learners with significant learning backlogs in the weaker and poorer part of the school system. As chapter 3 will show, inequalities in education quality and the resultant inability of many learners to access and complete university education, prevent many South Africans from participating meaningfully in the labour market. Given the strong relationship between

present generation labour market success and next-generation access to good quality education, it is likely that the South African economy will remain highly unequal for some time to come, unless serious steps are taken to address learning gaps as early as possible in the formal education system.

4 UNEQUAL CHANCES: LABOUR MARKET INEQUALITY

Education is widely considered to be a key policy objective to promote social mobility. Development economists have long held that the primary benefits of attaining more education are improved labour market prospects in the forms of improved employment probabilities and higher earnings, through education's role in improving productivity. More education is also believed to bestow upon its beholder non-pecuniary benefits such as health and enhanced ability to integrate into and function successfully in mainstream society, both of which in turn are likely to improve both education and labour market outcomes.

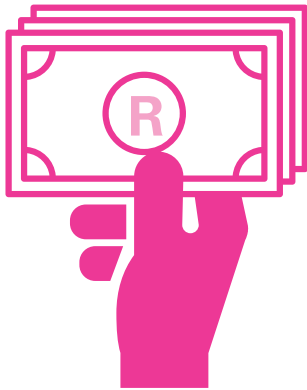
Educational attainment has historically enjoyed a strong, positive relationship with economic growth. Barro (2001) and other researchers showed convincingly that increases in educational attainment were significant contributors to economic growth between the 1960s and the 1990s. Findings that education would increase labour productivity and growth provide justification for the rapid expansion of education in many developing countries, including South Africa.

Yet, unemployment nevertheless remains largely intractable and returns to education are relatively low for individuals with no tertiary qualification. The labour market is characterised by a growing skills mismatch created by the combination of an increasing labour market demand for highly skilled individuals, and an education system that is unable to meet that demand satisfactorily.

This chapter will demonstrate that beyond educational attainment, quality of education is an important predictor of labour market outcomes. This then becomes a vital consideration in formulating policy to promote social mobility. The chapter first considers the returns to educational attainment in the form of wages and employment probabilities, followed by a discussion of whether social mobility for black South Africans can be observed over time. Next a brief analysis is presented of how mobility in terms of educational attainment has not produced the desired outcomes for many younger black labour market participants. Finally, the importance of education quality in labour market outcomes is discussed.

4.1 Labour market returns to educational attainment in South Africa

Human capital theory, in its simplest forms, holds that investments in human capital eventually reward individuals with earnings higher than would be the case in the absence of such investments. The early empirical work dedicated to these returns to investment in education typically followed Mincer's (1974) earnings function framework, with much of the research implicitly assuming that each additional year of education increases earnings at a uniform rate for all individuals and all levels of



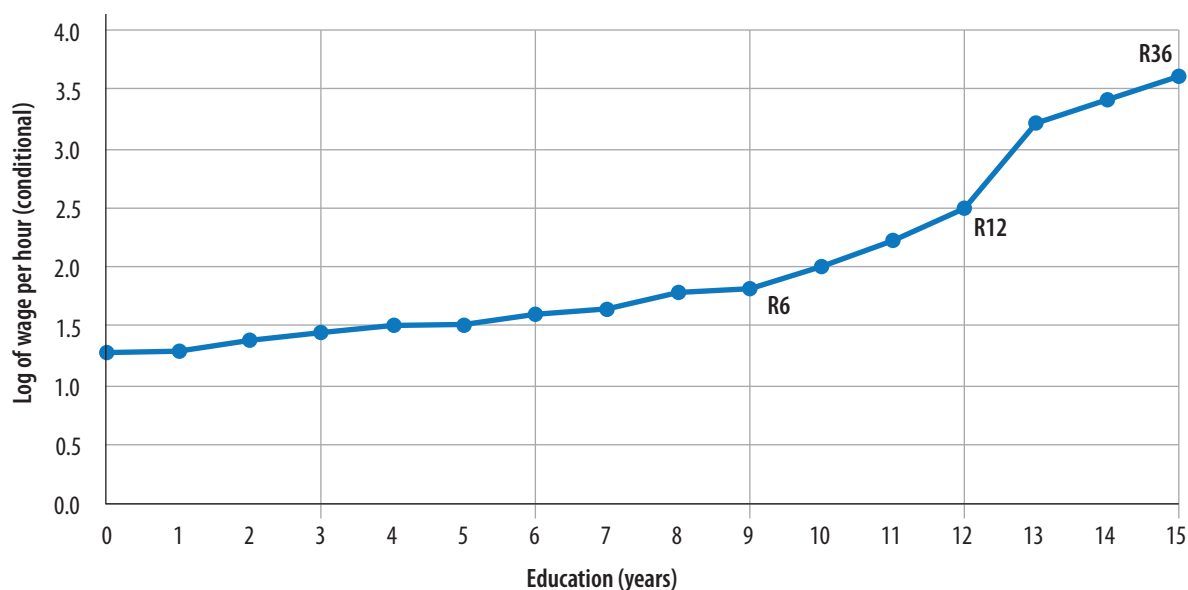
In 2007

the average wage per hour of someone who had achieved a degree was R36, compared with R12 for someone with a matric and R6 for someone with grade 9.

schooling. That assumption was relaxed in later years as it became clear that the education-earnings relationship was not a strictly linear one. This realisation resulted in more flexibility in modelling, with early work in this direction finding that lower levels of education yielded higher returns to education than higher levels of education (Psacharopolous, 1973, 1985; Psacharopolous and Patrinos, 1994). However, later research found evidence in favour of a convex education-earnings relationship (where returns to education are higher at higher levels of education). This has been particularly conclusive in middle-income developing countries, where abundant supplies of unskilled and semi-skilled labour and relative shortages of highly skilled labour exist (see for example Siphambe, 2000; Keswell and Poswell, 2004).

The South African labour market exhibits the expected strongly convex relationship between education and earnings, offering very high returns to persons with high levels of education, and on the other hand, rewarding those individuals with low levels of education with very low returns, with such returns only rising more rapidly once a person reaches a level of matric or higher. Figure 4.1 shows the relationship between the hourly wage rate and years of education for a representative South African in 2007. The graph has a convex shape, i.e. it rises sharply at higher levels of education.

In 2007 the average wage per hour of someone who had achieved a degree was R36, while it was only R12 for someone who had achieved only a matriculation, if they were otherwise similar individuals. Thus a degree was associated with a threefold increase in income, a very high return indeed on investment in university education. In contrast to that, someone with grade 9 earned only R6 per hour, about half the earnings of the average matriculant. From this it is apparent how greatly education contributes to the gap between the wealthy and the less wealthy. This wage premium for the highly educated in South Africa can be ascribed to the large demand for highly qualified people, who are in short supply, while the demand for relatively unskilled workers is limited, and there is a surplus of such workers.

Figure 4.1: *Log of hourly wage rate, by completed years of education (2007)*

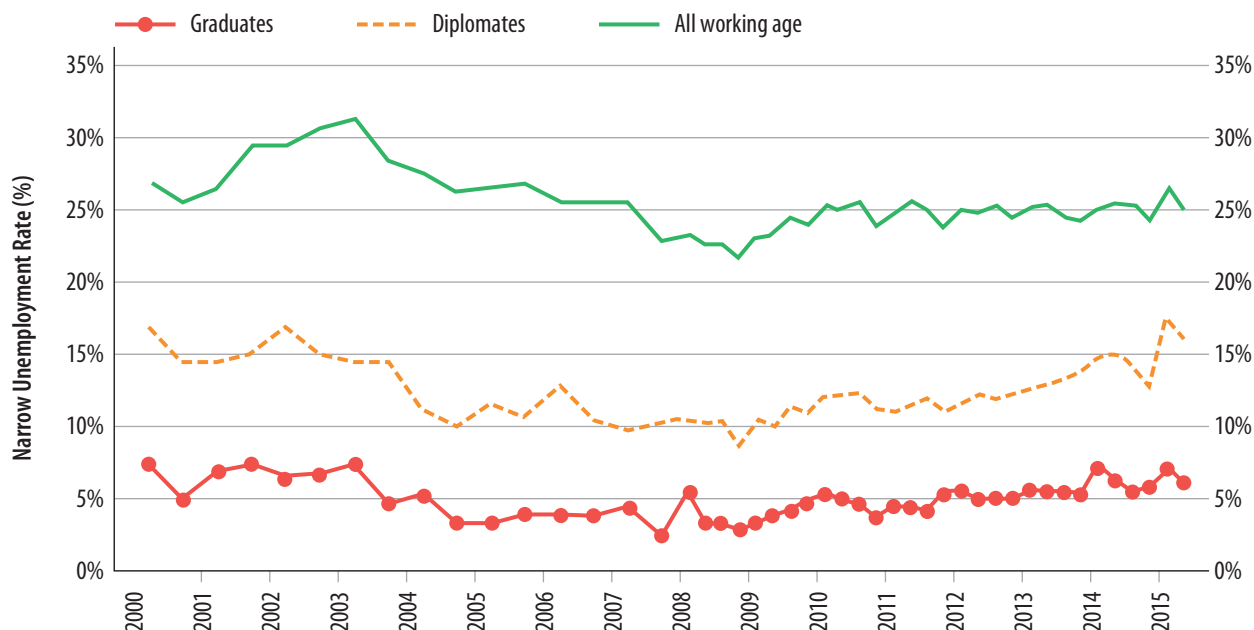
Source: Own calculations from the Labour Force Survey.

It can be expected that as the economy grows, there would be a further increase in the demand for skilled labour, with the consequence that the wage premium may even increase – unless education and schooling can keep up with the rapidly growing demand for highly skilled workers.

Just like for the monetary returns to education, there is a similar convexity when considering the relationship between education and the probability of being employed. This probability hardly increases for education levels between 0 and 10 years, but for those with a matric and particularly those with more than a matric certificate, the probability of employment is much higher. Amongst graduates, the probability of employment is in fact exceedingly high in an international perspective (Van Broekhuizen and Van der Berg, 2015).

Unequal educational attainment opportunities manifest in the labour market as a large unemployment burden disproportionately borne by young people. School-leavers with poor skills and work-relevant competencies enter a labour market that already fails to accommodate more than a quarter of the existing labour force, and that is particularly unforgiving of jobseekers who have not completed some form of post-secondary education. This is evidenced by Figure 4.2 which shows the narrow unemployment rates between 2000 and 2015, by educational attainment category (Van Broekhuizen, 2016).

Figure 4.2: *Narrow unemployment rates 2000 to 2015, by educational attainment category*



Source: Van Broekhuizen, 2016.

Another reason extended for poor labour market outcomes for non-graduates is the so-called ‘paradox of progress’, a term used by Bourguignon and his co-authors (2005) to refer to a phenomenon often encountered in developing countries, namely that as educational attainment levels increase, income inequality may worsen. As more people reach higher levels of education, the gap between the educated and the less educated may simply become more apparent, whereas that may not have been the case when there was only a small sliver of the population with high levels of education.

Standard labour economics distinguishes a composition (endowment) effect (changes in the highest grade attained) and a pay structure effect (changes in the returns to education) on earnings as time passes. It is possible to decompose trends in wage inequality into these effects, which then also allows an estimation of the strength of the paradox of progress.

Table 4.1 is based on the PALMS data series for the labour market. It shows that the Gini coefficient⁹ for wages rose from 54.4 to 59.7, i.e. by 5.2, in the period 1994-2000. Almost a third (1.5) of this increase was simply the result of the rise in levels of education. This was calculated by determining what change would have occurred if wage levels at each level of education had remained constant whilst only the education expansion of that period had occurred. For the period 2001 to 2011, the Gini rose by 2.3. If only educational attainment had risen, the Gini would nevertheless have risen by 0.9 only.

⁹ Although the Gini coefficient is usually expressed as a proportion, it has now become quite common to multiply that value by 100, so that a Gini coefficient of 0.60 would be referred to as a Gini coefficient of 60. As that is easier to interpret in tabular form, this convention is also followed here.

Table 4.1: *Effect of change in educational distribution on wage inequality*

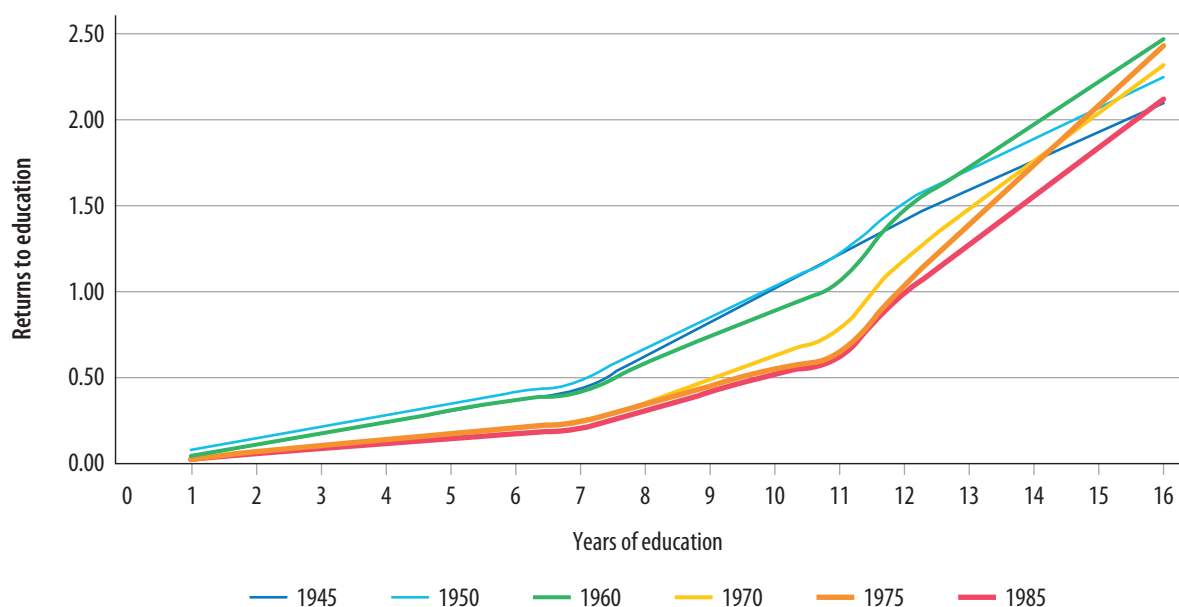
Period	Gini at beginning of period	Gini at end of period	Change in Gini	Change in Gini that would have occurred had education improved, but returns remained constant
1994–2000	54.4	59.7	5.2	1.50 (0.0005)***
2001–2011	58.6	60.9	2.3	0.90 (0.006)***

Standard error in brackets. Significance levels obtained using 200 bootstrap estimations.

Source: Shepherd & Van der Berg 2016., based on Palms 1994–2012.

These results indicate that the paradox of progress may be one of the factors behind increasing wage inequality in South Africa, so that, given the structure of the labour market and education system, more education currently still tends to worsen inequality. More importantly, though, the data indicates that the returns to higher levels of education are still rising, and that contributes even more to worsening inequality. This is in contrast to available international evidence (e.g. from Latin America) that suggests that a fall in returns to education is a common factor in declining earnings inequality.

One of the primary causes of this paradox in the South African situation is that even though educational attainment, i.e. levels of education achieved by the population, grew quite substantially even during apartheid, the quality of such education was extremely weak, something which remains a problem today. Figure 4.3 shows clearly how the returns to education profile is relatively flat between 1 and 7 years of completed education, followed by a slightly steeper gradient between 7 and 11 years, and how it then rises sharply from 12 year of education onwards for the 1985 birth year cohort.

Figure 4.3: *Returns to education by birth year cohort*

Returns normalised to 0 for persons with no schooling. Wage regression estimated on pooled dataset (1994–2011) with $\log(\text{wage})$ as dependent variable; time, age (quadratic) and birth cohort effects included as controls.

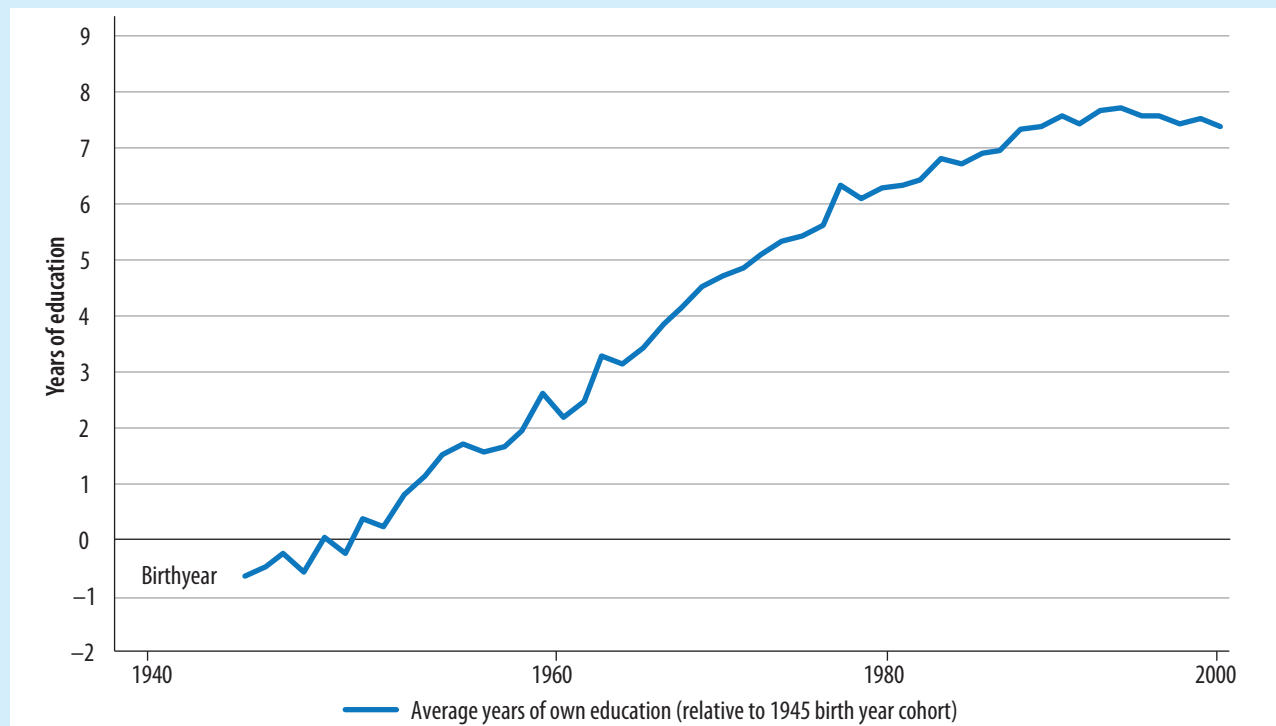
Source: Shepherd & Van der Berg 2016., based on Palms 1994–2012.

Whilst other factors operated to reduce Latin American inequality substantially in the past two decades, it is likely that high relative returns for the highly educated, in terms of employment probabilities and wages once employed, will remain for some time to come in the South African economy that produces jobs slowly in a fragile macroeconomic environment. Mismatches between skills demand and supply create conditions for unfulfilled expectations (see also Box 4), which could contribute to political instability.

BOX 4: Unfulfilled expectations: The gap between objective and subjective social mobility

South Africa has undergone massive educational expansion in the last half of the 20th century. Figure 4.4 shows that black individuals born in the 1990s have almost 8 years more education than those born in 1945, the reference year for the graph. Thus, *objectively* there has been social mobility in terms of educational attainment.

Figure 4.4: Average education attainment advantage of black individuals, by birth year compared to those born in 1945



Source: Von Fintel & Von Fintel (2017).

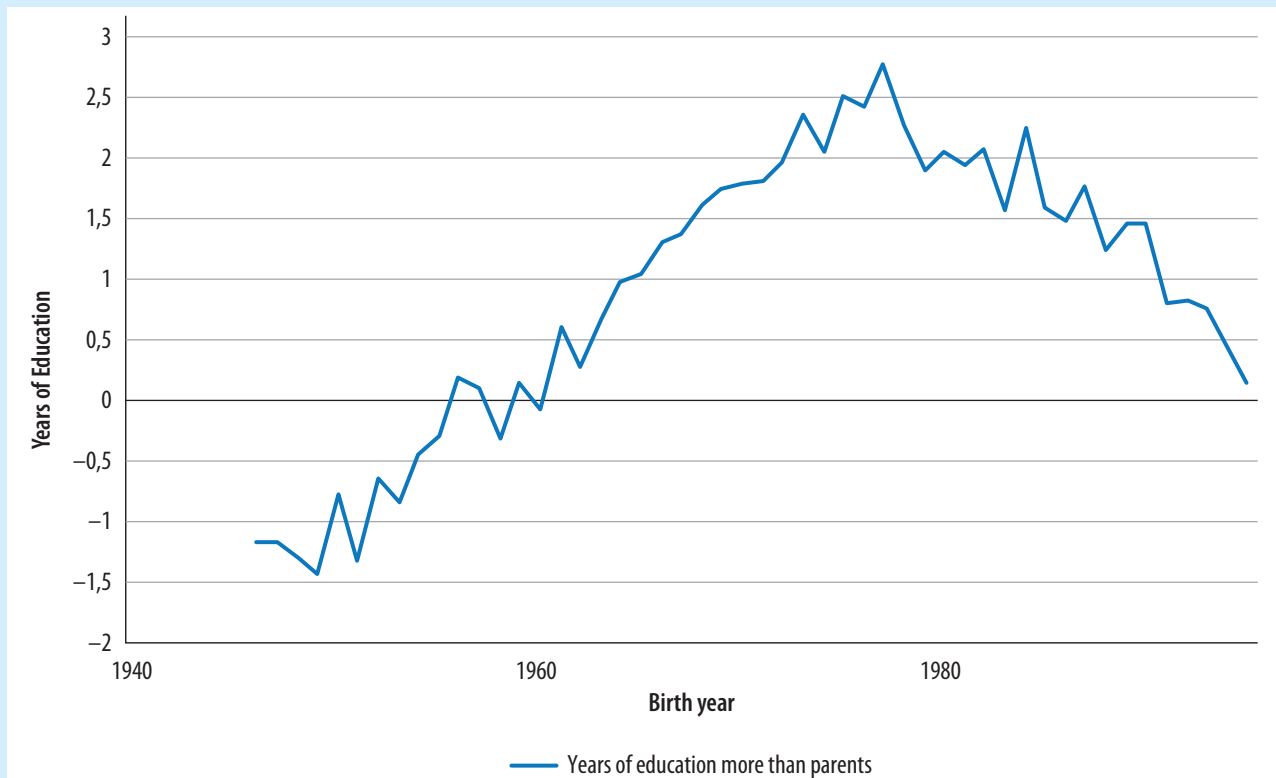
The figure shows the average educational advantage in educational attainment of each birth cohort compared to those born in 1945. For example, on average black individuals born in 1960 attained about 2 years more of education than those born in 1945.

By all expectations, this growth in human capital should have stimulated social mobility and have bridged socioeconomic gaps across race groups. Yet despite the massive differences in their educational attainment and the removal of state-sanctioned job discrimination, younger generations of black South Africans do not perceive themselves as having moved up the socioeconomic ladder during their lifetimes any quicker than older generations have.

Two possible explanations for these trends:

1. Mobility and expectations are *subjectively* measured. Perceived mobility is therefore not necessarily linked to absolute increases in welfare across generations, but relative to another group against which progress is judged. It is therefore notable that while education expanded in absolute terms for younger generations, it did not always do so in relative terms. Figure 3.5 shows educational attainment differences between black individuals and their best educated parents.

Figure 4.5: Educational attainment differences between children and best-educated parent



Source: Von Fintel & Von Fintel (2017).

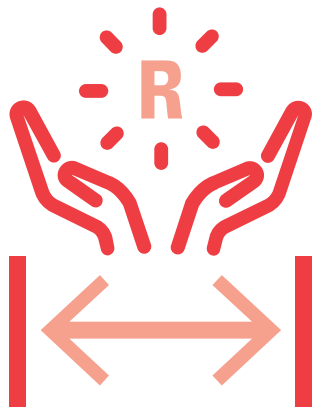
Compared to their own parents, the generation born between 1960 and 1980 progressively received more education than their parents; while the post-1980 generation still attained more education than their parents, the extent of the “progress gap” declined, with children no longer out-pacing their parents by as much as earlier generations did.

Hence, *relative* mobility declined and individuals perceive to have achieved no more social mobility than previous generations.

2. Despite large-scale educational expansion among blacks, the probability of employment has remained static across generations. This finding is even more noteworthy when compared to whites, where one additional year of education relative to their parents increases the probability of them being employed by 1.7%, while for blacks an additional year of education relative to their parents increases their employment probability by 1%. This suggests that obstacles other than a lack of human capital prevent access to the labour market, such as a racially discriminatory labour market (Burger, Jafta & Von Fintel, 2016), employers that are increasingly concerned about education quality, and poor employment prospects for those labour market participants who do not have any form of tertiary education (Festus *et al.*, 2016).

4.2 The role of education quality in labour market outcomes

Although educational attainment among blacks has risen strongly and rapidly narrowed the racial gap in educational attainment, the equalising effect of this has been offset by rising returns to matric and post-school education, so that inequality has remained fairly constant (Branson *et al.*, 2012). Most sectors of the South African economy have become more skill-intensive, increasing the demand for skilled labour.



A large part of the
wage gap
between blacks
& whites can be
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differences
in the quality of
education
they receive

The low quality of education in much of the school system is partly to blame for the fact that the return to schooling below matric remains low and that the rise in educational attainment has not done much to decrease inequality or improve income mobility. Burger and Jafta (2006) show that differing returns to education by race, rather than racial discrimination, are increasingly responsible for the racial earnings and employment gap, suggesting that education quality has become a more prominent influence on labour market outcomes.

A large part of the wage gap between blacks and whites can be explained by differences in the quality of education they receive (Burger and Van der Berg, 2011), which remains highly unequal. While non-personnel spending is decidedly pro-poor, substantial differences in teacher qualifications and experience favour rich schools (Branson and Leibbrandt, 2013).

If poor children receive a low quality education, they are more likely to remain poor and socially immobile. However, because of the high labour market returns to quality education and to higher levels of education, for those poor children who manage to access better quality schools, education can indeed promote social mobility, acting as a route out of poverty. If the quality of schools could be improved for poor children, this would be likely to promote greater social mobility. Recent work by Burger and Teal (2016), discussed in Box 5 shows that once education quality is controlled for, the convex schooling-earnings profile becomes significantly more linear, suggesting that education quality is an important predictor of labour market earnings.

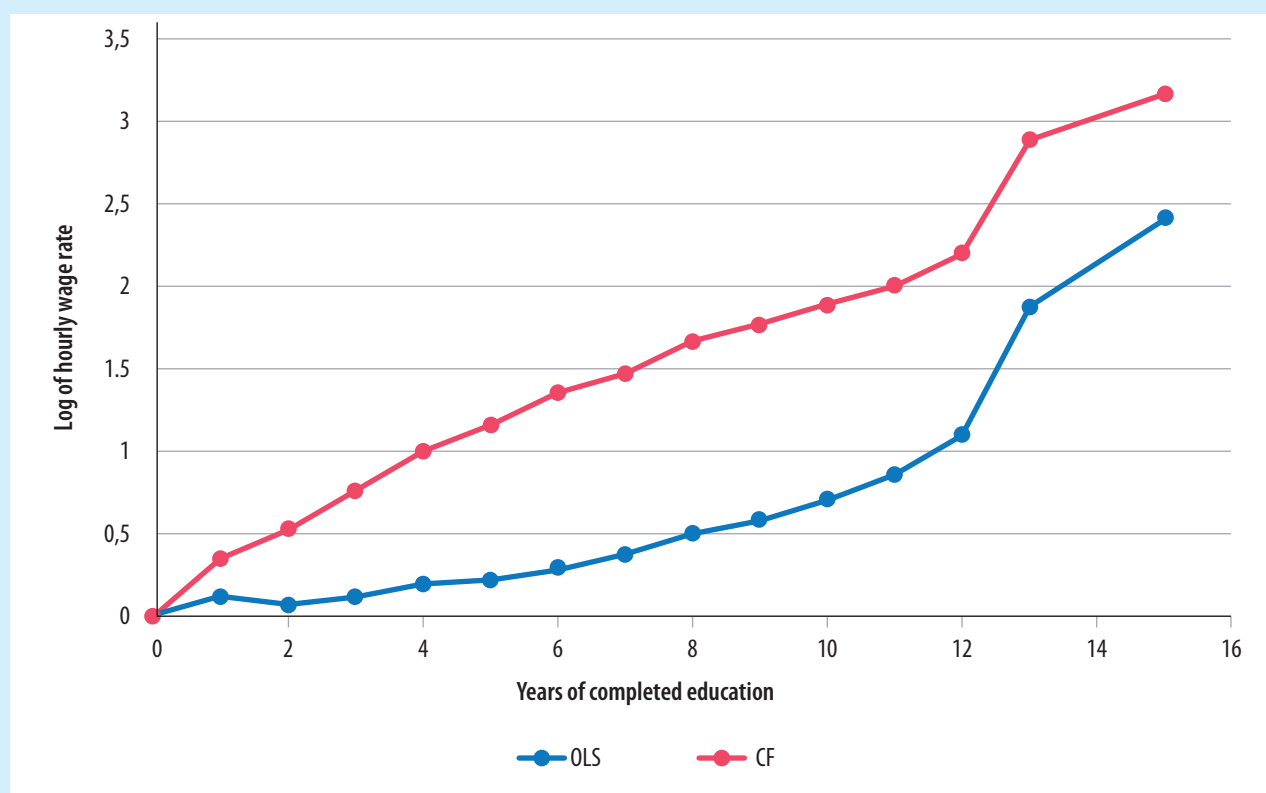
BOX 5: Convexity or Heterogeneity? Estimates of the shape of the earnings profile

The convex schooling-earnings profile observed in many African countries is generally interpreted as being reflective of labour markets where there is a low demand for workers with less than tertiary education and a high demand for tertiary graduates. The policy implications of a convex schooling-earnings function seem to be clear – in order to combat unemployment and wage inequality (and by extension, inequality in general), access to tertiary education must improve.

However, the conventional schoolings-earnings model does not account for heterogeneity in the costs and marginal benefits of schooling for different individuals. In a model first introduced by Becker (1964), individuals maximise their utility by choosing the amount of schooling that equalises the marginal costs and benefits of education. Individuals differ both in their opportunities to acquire education and their ability to transform educational attainment into earnings, resulting in heterogeneity in schooling and labour market outcomes.

Keeping in mind this possible heterogeneity in both the ability to attain education and the ability to transform that education attainment into productivity, Burger and Teal (2016) employ a control function (CF) approach to estimating the schooling-earnings function for black individuals aged 15 to 30. In Figure 4.6 the CF schooling-earning profile is compared to the results from the conventional OLS regression function. The CF profile suggests that the real South African schooling-earnings function is almost linear and slightly concave once ability differences are considered, suggesting that the convexity implied by conventional OLS approaches may be overestimated.

Figure 4.6: *Schooling-earnings profile for black males, 15 to 30 (1995 to 2012)*

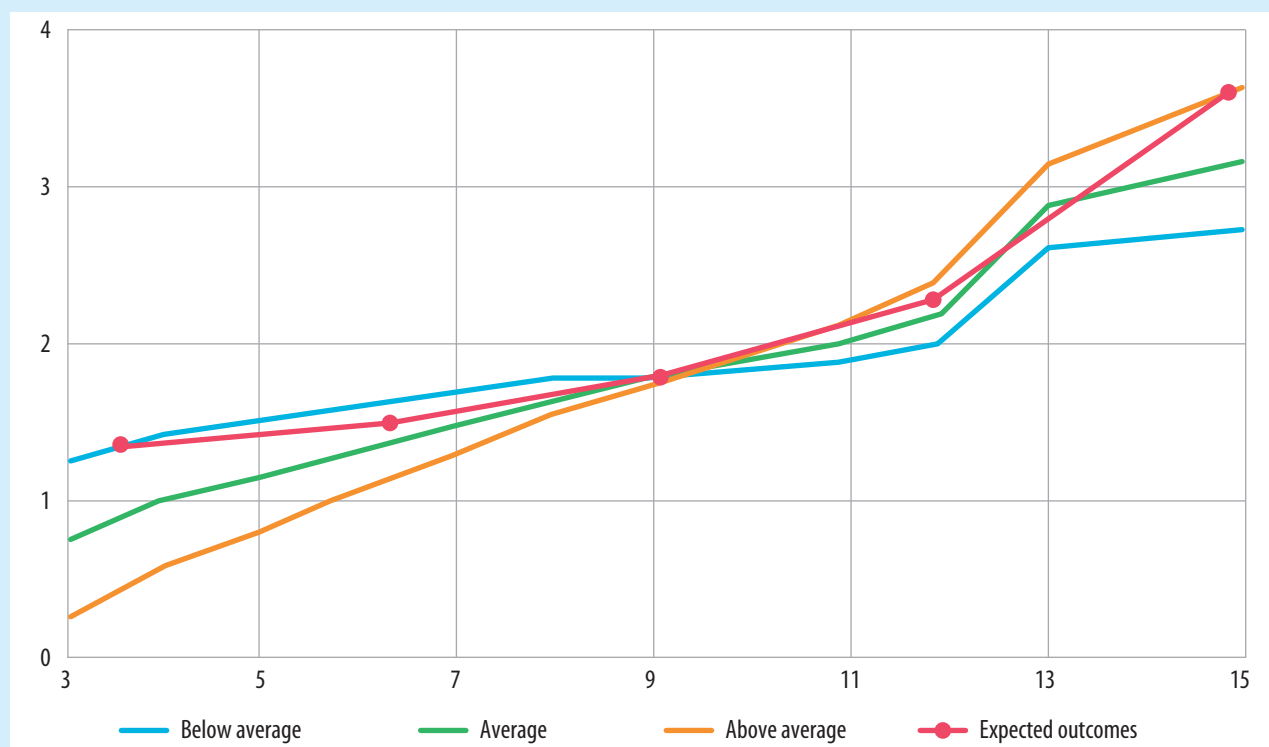


Source: Burger and Teal (2016).

Figure 4.7 decomposes the CF schooling-earnings function into separate earnings profiles which proxy the returns to schooling in below average, average and above average schools. The results reveal the expected relationship between education quality and earnings. Individuals attending school in the low quality part of the education system have flatter earnings profiles than those attending average or higher quality schools. In other words, individuals who attend high quality schools are more likely to stay in school longer to take advantage of the increasing returns associated with attaining more education. However, those individuals attending low quality schools face an almost flat profile, suggesting that learners in this part of the education system who remain at school longer are likely to be disappointed with labour market outcomes relative to those who drop out earlier.

This heterogeneity in the schooling-earnings profile between low quality and high quality schools suggests a policy response that goes far beyond improving access to higher levels of education. A more appropriate response would be to address the causes of the heterogeneity in returns to education, particularly education quality.

Figure 4.7: CF estimates of school-earnings profiles, for various individual schooling error terms*



* Schooling error terms: 2 standard deviations below the mean (below average returns profile), mean (average returns profile), 2 standard deviations above the mean (high returns profile)

Source: Burger and Teal (2016).

4.3 Conclusion

This chapter has shown that educational attainment is an important predictor of employment probabilities and earnings in South Africa. However, the returns to educational attainment are low for labour market participants with Grade 11 or less for a number of reasons, that include the low signalling power of educational attainment that has not been externally assessed and a rapidly changing structure of the labour market that rewards highly educated individuals and limits the earnings capacity of less educated individuals.

The earnings gap between races, often thought to be solely attributable to racial discrimination, can in part be explained by differences in education quality. The education quality disadvantage so pervasive in former black schools negatively affects labour market prospects not only for the current generation but also make it much more likely that future generations will suffer the same fate because of school choice being constrained by financial means.

Subjective perceptions that there has been little social mobility relative to previous generations because of poor labour market prospects are likely to persist unless there is decisive action to address the underlying causes of poor quality education in many schools. The consequences are likely to be more political instability in a labour market environment that is increasingly critical of low education levels and poor education quality.

5 Conclusion

This report has provided an empirical overview of the pivotal role that education plays in social mobility, with particular emphasis on the labour market. Chapter 1 introduced the notion of a dualistic education system that continues to serve an affluent minority well, despite massive public spending shifts in favour of learners in poor schools. The persistent education quality differential is a defining feature of the education system and compromises the prospect of sustainable, meaningful social mobility for the majority of South Africans.

The evidence presented in Chapters 2 and 3 suggests that while educational attainment for the black population has increased over time, education quality in most former black schools still lags far behind that produced by former white schools. Thus, the majority of learners essentially follow a learning trajectory that ultimately constrains opportunities of access to tertiary education and engenders poor labour market outcomes, which in turn perpetuate a cycle of poverty and desperation.

The most important findings in this report are:

1. **Education quality still poor** – International and national standardised tests show that while educational attainment has converged dramatically over time between races, poor schools still lag far behind their affluent counterparts in learning outcomes.
2. **Poor education quality for the poor** – Initial socioeconomic status is strongly associated with learning outcomes. Children from affluent homes are more likely to reside in homes that are conducive to learning through parents who are able to support learning, and to attend well-performing schools. In contrast, learners from poor homes are less likely to have access to good learning opportunities, either formally through the education system or at home.
3. **Large & early learning gaps** – Substantial learning gaps between learners in different schools are observable as early as the middle primary school years or even before, making a strong case for decisive interventions as early as possible in children's school careers.
4. **Importance of post-matric education** – Educational attainment is an important predictor of labour market outcomes, with years of education completed beyond Grade 12 offering extraordinarily high returns to educational investment, both in terms of employment probabilities and wages earned.

5. **Centrality of school quality** – New empirical evidence suggests that education quality, often omitted from earnings functions, is also positively associated with future earnings. Therefore, learners who attend poor quality schools generally earn substantially less than those who attend good quality schools, even when they have the same education levels. The underlying causes of heterogeneity in education-earnings profiles therefore need urgent attention.
6. **Unmet expectations** – The consequences of unequal education opportunities are particularly dire for South Africa's black youth, who despite having more education than previous generations and no longer facing discriminatory labour market legislation, have no better employment probabilities than older labour market participants. Thus, despite having achieved objective social mobility in terms of education, subjectively young black South Africans have not achieved as much as they would have liked to relative to older generations.

The continued dualism in the education system that produces distinctly different learning outcomes has far-reaching consequences for social mobility. Poor quality education for the majority of learners leads to poor labour market outcomes, which in turn beget poor quality education for the next generation. The persistence of deep inequality two decades after apartheid is a powerful indictment of the South African education system's failure to overcome past injustices, despite considerable shifts in government spending to poor schools.

In previous research for PSPPD, Resep has investigated the education system in more depth, with a focus inter alia on the binding constraints to educational improvement. A central finding in this regard, which is enhanced by the analysis in this report, is that early interventions are crucial, and that there is a clear need for a focus on getting reading right in the first years of primary school. Readers are referred to two of these studies for further analysis of policy recommendations: The reports on *Binding Constraints in Education* (Van der Berg *et al.*, 2016) and *Laying Firm Foundations* (Spaull *et al.*, 2016).

This report has shown social mobility, and thus also poverty and income distribution, is closely linked to the quality of education that South Africa society provides for its children. The imperative to improve on this cannot be clearer, and requires wider debate, more experimentation and improved implementation of policies in education to create a better future for the millions of children currently caught in a cycle of poverty.

6 References

- Almond, D. & Currie, J. 2010. Human capital development before age five. In *Handbook of Labor Economics*, Vol. 4b. O. Ashenfelter & D. Card, eds. Amsterdam: Elsevier. 1315–1486.
- Ardington, C. D. Lam, M. Leibbrandt & M. Welch. 2005. *The sensitivity of estimates of post-apartheid changes in South African poverty and inequality to key data imputations*. CSSR Working Paper No. 106. Cape Town: Southern Africa Labour and Development Research Unit, Centre for Social Science Research.
- Barro, R. 2001. Human Capital and Growth. *American Economic Review*, 91 (2): 12–17.
- Becker, G. 1964. *Human Capital*. New York: Columbia University Press.
- Becker, G. S. & Tomes, N. 1986. Human capital and the rise and fall of families. *Journal of Labor Economics*, 4(3): S1–S39.
- Behrman, J. R., Birdsall, N. and Szekely, M. 1998. *Intergenerational schooling mobility and macro conditions and schooling policies in Latin America*. IADB Working Paper No. 386. Washington, D.C.: Inter-American Development Bank.
- Blanden, J. 2009. *How much can we learn from international comparisons of intergenerational mobility?* Centre for the Economics of Education DP 111. London: London School of Economics.
- Branson, N., Garlick, J., Lam, D., Leibbrandt, M. (2012). *Education and Inequality: The South African Case*. A Southern Africa Labour and Development Research Unit Working Paper Number 75. Cape Town: SALDRU, University of Cape Town.
- Branson, N. and Leibbrandt, M. 2013. *Education and Labour Market Outcomes in South Africa*. OECD Economics Department Working Papers, No. 1021. Paris: Organisation for Economic Co-operation and Development Publishing.
- Burger, J. and Van der Berg, S. 2011. *Modelling cognitive skills, ability and school quality to explain labour market earnings*. Stellenbosch Economics Department Working Paper 08/2011. Stellenbosch: Stellenbosch University.
- Burger, J. & Zoch, A. 2016. *Modeling School Progression and Labour Market Outcomes*. Unpublished paper presented at ReSEP workshop, 21 November 2016.
- Burger, R. & von Fintel, D., 2014. Rising unemployment in a growing economy: a business cycle, generational and life cycle perspective of post-transition South Africa's labour market. *Studies in Economics and Econometrics*, 38(1).
- Burger, R. and Teal, F. 2016. Convexity or Heterogeneity? Estimates of the Shape of the Earnings Profile. Unpublished paper presented at ReSEP workshop, 21 November 2016.
- Burger, R., Jafta, R. and von Fintel, D. 2016. *Affirmative action policies and the evolution of post-apartheid South Africa's racial wage gap*. UNU-WIDER Working Paper wp2016-066. Helsinki: World Institute for Development Economic Research (UNU-WIDER).
- Case, A and Yogo, M. 1999. *Does School Quality Matter? Returns to Education and the characteristics of schools in South Africa*. Working Paper 7399. Massachusetts: National Bureau of Economic Research.
- Chevalier, A., Denny, K. & McMahon, D. 2009. Intergenerational mobility and education equality. In *Education and Inequality across Europe*. P. Dolton, R. Asplund & E. Barth, eds. Edward Elgar. 1–22.
- Coetzee, M. 2014. *School quality and the performance of disadvantaged learners in South Africa*. Stellenbosch University Economics Department Working Paper 22/14. Stellenbosch: Stellenbosch University.

- Cunha, F. & Heckman, J. 2007. The technology of skill formation. *AEA Papers and Proceedings*, 97(2): 31–47.
- DataFirst. 2016. South Africa – Post Apartheid Labour Market Series 1993-2015. (PALMS series.) ID zaf-datafirst-palms-1993-2015-v3.1. DataFirst: University of Cape Town.
- Easterly, W. 2001. The Lost Decades: Explaining Developing Countries' Stagnation in Spite of Policy Reform 1980-1998, *Journal of Economic Growth*, 6 (2): 135–157.
- Festus, L. Kasongo, A., Moses, M. & Yu, D. 2016. The South African labour market, 1995–2015. *Development Southern Africa*, 33 (5): 579–599.
- Fleisch, B. 2008: Primary Education in Crisis: Why South African schoolchildren underachieve in reading and mathematics. Juta: Cape Town.
- Cilliers, Jeanne & Fourie, Johan. 2017. Social mobility during South Africa's industrial take-off. Stellenbosch Economics Department Working Paper. Stellenbosch: Stellenbosch University.
- Gustafsson, M. 2016. *Understanding trends in high-level achievement in Grade 12 mathematics and physical science*. Pretoria: Department of Education.
- Gustafsson, M. & F.Patel. 2006. Undoing the apartheid legacy: Pro-poor spending shifts in the South African public school system. *Perspectives in Education* 24(2): 65–77
- Hanushek, E. 2003. The failure of input-based schooling policies. *The FwpEconomic Journal* 113(485): F64–F98.
- Hofmeyr, H. 2017. *Home background and educational outcomes: An analysis using NIDS*. Stellenbosch Economics Department Working Paper. Stellenbosch: Stellenbosch University.
- Howie, S., Hughes, C., 1998. Mathematics and science literacy of final-year school students in South Africa: a report of South African students in the Third International Mathematics and Science Study (TIMSS). Human Sciences Research Council, Pretoria.
- Ichino, A., Karabarbounis, L. & Moretti, E. 2011. The political economy of intergenerational income mobility. *Economic Inquiry*, 49(1): 47–69.
- International Labour Office. 2016. *World Employment and Social Outlook Trends 2016*. International Labour Office. Geneva: International Labour Office.
- Keswell, M., & Poswell, L. 2004. Returns to education in South Africa: A retrospective sensitivity analysis of the available evidence. *The South African Journal of Economics*, 72(4): 834–860.
- Kotzé, J. 2017. *Analysing schools performing above expectations using three constructed datasets*. Stellenbosch Economics Department Working Paper. Stellenbosch: Stellenbosch University.
- Lam, D. 1999. *Generating extreme inequality: Schooling, earnings, and intergenerational transmission of human capital in South Africa and Brazil*. Report No. 99-439. Ann Arbor, MI: Population Studies Center, University of Michigan.
- Louw, M., Van der Berg, S. & Yu, D. 2007. Convergence of a kind: Educational attainment and intergenerational social mobility in South Africa. *South African Journal of Economics*, 75(3): 548–571.
- Mankiw, G., Romer, D. & Weil, D. 1992. A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, 107 (2): 407–437.
- Mayer, S. E. & Lopoo, L. M. 2008. Government spending and intergenerational mobility. *Journal of Public Economics*, 92: 139–158.
- Mincer, J. 1974. *Schooling, Experience and Earnings*. New York: National Bureau of Economic Research.
- Moll, P. G. 1998. Primary schooling, cognitive skills and wages in South Africa. *Economica*, 65(258): 263–284.
- Moses, E. 2017. *Determinants of Internal Migration in South Africa: Evidence from Census 2011*. Stellenbosch Economics Department Working Paper. Stellenbosch: Stellenbosch University.

- Mullis, I., Martin, M.O., Foy, P., Arora, A., 2012. *TIMSS 2011 International Results in Mathematics*. TIMSS & PIRLS International Study Center and IEA, Chestnut Hill, USA.
- Mullis, I., Martin, M.O., Foy, P., Hooper, M., 2016. *TIMSS 2015 International Results in Mathematics*. TIMSS & PIRLS International Study Center and IEA, Chestnut Hill, USA.
- Psacharopoulos, G. 1973. *Returns to Education: An International Comparison*. Amsterdam: Elsevier.
- Psacharopoulos, G. 1985. Returns to Education: A Further International Update and Implications. *Journal of Human Resources*, 20(4): 583–604.
- Psacharopoulos, G. 1994. Returns to investment in education: A global update. *World Development*, 22(9), 1325–1343.
- Reddy, V., 2006. Mathematics and Science Achievement in South African Schools in TIMSS 2003. Human Sciences Research Council, Cape Town.
- Reddy, V., Visser, M., Winnaar, L., Arends, F., Juan, A and Prinsloo, C.H. (2016). *TIMSS 2015: Highlights of Mathematics and Science Achievement of Grade 9 South African Learners*. Human Sciences Research Council.
- Shepherd, D. 2016. *What is the limit? Performance ceilings at secondary school and their relation to socioeconomic status*. Unpublished paper presented at ReSEP workshop, 21 November 2016. Stellenbosch.
- Shepherd, D. & S. van der Berg. 2016. *Education and wage inequality: Prospects for income redistribution*. Unpublished paper submitted to REDI project on Inclusive Growth. University of Stellenbosch.
- Siphambe, H. K. 2000. Rates of return to education in Botswana. *Economics of Education Review*, 19(3): 291–300.
- Solon, G. 2004. A model of intergenerational mobility variation over time and place. In *Generational income mobility in North America and Europe*. M. Corak, ed. Cambridge University Press: Cambridge. 38–47.
- Spaull, N. 2013. *South Africa's Education Crisis: The quality of education in South Africa 1994 – 2011*. Report commissioned for the Centre for Development and Enterprise. Johannesburg: Centre for Development and Enterprise.
- Spaull, N. & Kotzé, J. 2015. Starting behind and staying behind in South Africa: The case of insurmountable learning deficits in mathematics. *International Journal of Educational Development*, 41:13–24.
- Spaull, N., S. van der Berg, G. Wills, M. Gustafsson & J. Kotzé. 2016. *Laying firm foundations: Getting reading right*. A study financed by the Zenex Foundation. Stellenbosch.
- Statistics South Africa. 2016. *Mid-year population estimates*. Pretoria: Statistics South Africa.
- Taylor, S. 2011. Uncovering indicators of effective school management in South Africa using the National School Effectiveness Study. Stellenbosch Economics Department Working Paper 10/11. Stellenbosch: Stellenbosch University.
- Taylor, S. & Yu, D. 2009. *The importance of socio-economic status in determining educational achievement in South Africa*. Stellenbosch Economic Working Paper 01/09. Stellenbosch: Stellenbosch University.
- Timaeus, I., Simelane, S. & Letsoalo, T. 2013. Poverty, race, and children's progress at school in South Africa. *The Journal of Development Studies*, 49(2):270–284.
- Van Broekhuizen, H. 2016. *Graduate unemployment and Higher Education Institutions in South Africa*. Stellenbosch University Economics Department Working Paper 08/16. Stellenbosch: Stellenbosch University.
- Van Broekhuizen, H. and Van der Berg, S. 2012. *Graduate unemployment in South Africa: A much exaggerated problem*. Stellenbosch Economics Department Working Paper 22/2012. Stellenbosch: Stellenbosch University.
- Van Broekhuizen, H., Van der Berg, S. & Hofmeyr, H. 2016. *Higher education access and outcomes for the 2008 national matric cohort*. Stellenbosch University Economics Department Working Papers: 16/16. Stellenbosch: Stellenbosch University.

- Van der Berg, S. 2007. Apartheid's enduring legacy: Inequalities in education. *Journal of African Economies*, 16(5):849–880.
- Van der Berg, S. 2008. How effective are poor schools? Poverty and educational outcomes in South Africa. *Studies in Educational Evaluation*, 34:145–154.
- Van der Berg, S. 2010. *Current poverty and Income distribution in the context of South African history*. Stellenbosch Economics Department Working Paper 22/10. Stellenbosch: Stellenbosch University.
- Van der Berg, S. & Moses, E. 2012. How better targeting of social spending affects social delivery in South Africa. *Development Southern Africa*, 28 (1): 127–139.
- Van der Berg, Servaas, Megan Louw & Derek Yu. 2008. Post-transition poverty trends based on an alternative data source. *South African Journal of Economics*, 76: 58–76.
- Van der Berg, S. 2015. What the Annual National Assessments can tell us about learning deficits over the education system and the school career. *South African Journal of Childhood Education*, 5(2): 28–43.
- Van der Berg, S. Girdwood, E., Shepherd, D. Van Wyk, C., Kruger, J., Viljoen, J., Ezeobi, O. and Ntaka, P. 2013. *The Impact of the Introduction of Grade R on Learning Outcomes*. Unpublished report. Accessed on the 15th January 2017 at <http://resep.sun.ac.za/wp-content/uploads/2014/06/Grade-R-Evaluation-1-3-25-Final-Unpublished-Report-13-06-17.pdf>.
- Van der Berg, S., N. Spaul, G. Wills, M. Gustafsson & J. Kotzé. 2016. *Identifying binding constraints in education*. A study financed by PSPPD (Project to Support Pro-Poor Policy Development). Stellenbosch.
- Visagie, J. 2015. Growth of the middle class: Two perspectives that matter for policy. *Development Southern Africa*, 32 (1): 3–24.
- Von Fintel, D. and Von Fintel, M. 2017. *Educational expansion, unfulfilled expectations and perceived lifetime social mobility in South Africa*. Stellenbosch Economics Department Working Paper. Stellenbosch: Stellenbosch University.
- World Bank, 2012. *South Africa Economic Update: Focus on Inequality of Opportunity*. Washington DC: World Bank.
- Yu, Derek. 2009. *The comparability of Census 1996, Census 2001 and Community Survey 2007*. Working Papers 21/09. Stellenbosch University, Department of Economics
- Zoch, A. 2013. *Life chances and class: Estimating inequality of opportunity in South Africa for various life stages*. Stellenbosch Economics Department Working Paper 08/13. Stellenbosch: Stellenbosch University.

Enquiries

Research on Socio-Economic Policy (ReSEP)
Department of Economics
Matieland, 7602
See more at: <http://resep.sun.ac.za/>