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Progress through school and the determinants of school dropout in South Africa

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Progress through school and the determinants of school dropout in South Africa

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Abstract

The release of the National Income Dynamics Study Wave 2 provides the first nationally representative longitudinal data collected in South Africa. This makes it possible to study transitions in and out of school, across grades and into work in ways not previously possible. We illustrate the high levels of grade repetition evident in South African schools and show how school completion presents a significant hurdle with very few youth successfully completing matric. Exit from school does not offer any advantages as most youth find themselves idle once they have left school. Our regression analysis investigates correlates of school dropout and shows that not keeping pace is a key determinant of school dropout, even after controlling for school quality and socioeconomic status. Those behind but attending higher quality schools are partially protected from dropping out. Some evidence that credit constraints may be related to dropout is found, especially among males.

Key words: education, dropout, school completion, credit constraints in educational attainment
JEL codes: I24 I20

Introduction

Education is a major focus in the National Income Dynamics Study (NIDS). With the release of Wave 2, NIDS provides the first longitudinal data ever collected on education in a national household survey in South Africa. This makes it possible to study transitions between grades as well as transitions in and out of school in ways that have not before been possible in South Africa[1]. NIDS collects schooling information at each wave and for intermediate years. As such, by Wave 2 there is information on the respondent's grade and enrolment status for each of the years 2007 through 2010, as well as the outcome of grades taken in 2007 through 2009. Many of the education questions in NIDS are similar to questions in other national surveys, but the combination of tracking the same individuals across time and the wealth of additional information in the NIDS questionnaire allows us to identify changes over time while controlling for individual, household and school characteristics. Added to this, questions around employment and other post schooling transitions are well covered in NIDS, enabling us to complete this discussion with transitions between school and work.

In this paper we illustrate that progress through school is slow in South Africa, with high rates of grade repetition. School completion presents a large hurdle with very few youth completing matric. Exit from the schooling system does not offer a better alternative as most are idle once they have left school. Our regression analysis investigates some of the correlates of school dropout and shows, as is commonly found in the international literature, that not keeping pace at school is a strong determinant of school dropout, even after controlling for school quality and socioeconomic status. Those who are behind in school for their age but are attending higher quality schools are however partially protected from dropping out. Some evidence is found that credit constraints may be related to dropout, especially among males.

In section 2 we describe the data and sample, before descriptively mapping out patterns of enrolment, repetition and dropout within school and into post school options in Section 3. Section 4 investigates school dropout in a multivariate framework. Section 5 concludes.

Data and Sample

The data for this study come from Waves 1 and 2 of NIDS. The first wave was conducted in 2008, with a sample of around 30000 individuals living in 7300 households. Wave 2 was conducted in 2010/2011. Data are collected for each household member. Respondents over the age of 14 complete an adult questionnaire. Data for children 14 and younger are collected from the child's primary caregiver. A proxy questionnaire is completed for all household members not available at the time of the survey. Household information pertaining to income, expenditure, social grant access and asset ownership is collected via the household questionnaire.

[1] For example, Lam et al. (2011) analyse progress through secondary school but their sample is restricted to youth in the Cape Town metropolitan area.

The NIDS education module has detailed information about respondents' progress through school, post schooling choices, educational expenditures and reasons for dropping out of school. NIDS also collected retrospective information on the age the respondent started school and which grades they repeated and how many times. Information on the name and location of the school the respondent currently and last attended has been matched to Department of Basic Education information on school-level characteristics. Besides the education module, the NIDS questionnaires include detailed information on household living arrangements, including both resident and non-resident household members, information about resident, non-resident and deceased parents of all household members and indepth sections on expenditure, labour market, health and social assistance.

We are interested in observing patterns of progress through school for respondents who were in grade 1 through 12 in 2008. Table 1 presents the number of respondents who were in grade 1 through 12 in 2008 and the number and percentage who were successfully interviewed in Wave 2. Overall 86% of the sample was interviewed in Wave 2, with a slightly lower response rate among those who were in secondary school (84%) compared to those in primary school (87%).

Table 1: Sample sizes and response rates, NIDS Waves 1 and 2

	Grade 1-12 in 2008		Grade 1-7 in 2008		Grade 8-12 in 2008	
	Obs	%	Obs	%	Obs	%
Wave 1	8274		5154		3120	
Wave 2	7101	86%	4467	87%	2634	84%
Sample can be classified as passed, repeated, dropped out:	6925	98%	4349	97%	2576	98%
without transition errors 1, 2, 4	5670	82%	3436	79%	2234	87%
without any transition errors	4634	67%	2764	64%	1870	73%

Notes to table 1: Presents sample sizes and response rate between Wave 1 and 2 of respondents in grade 1-12 in 2008. See text for details on transition errors.

Our key variables of interest are whether an individual progressed through school at the desired rate, failed a grade or dropped out of school without completing matric. We classify people who were enrolled in 2008 into three categories: 1) passed two grades between 2008 and 2010 (normal academic progress); 2) repeated at least one grade and were still enrolled in 2010 (repeaters); 3) not enrolled in 2010 and had not completed grade 12 (dropouts). We construct these indicators using the enrolment, education level and result of schooling by year variables. A subsample of respondents was not asked the complete education module in Wave 2 either because their information was collected from a proxy respondent or because they were part of the second phase of fieldwork (NIDS user document, 2012). Others have item non-response on some or all of these variables. In these cases, highest level of education attained coupled with the year in which this education level was attained were used, where possible, to fill in the gaps. Table 1 shows that 98% of the sample successfully interviewed in Wave 2 can be classified as having passed, repeated or dropped out. This sample forms the basis of our analyses.

The benefit of a panel is the ability to track individuals over time and to assess the impact of life events on choices and progress through school. That being said, this is only beneficial if

the data are accurately collected at each wave, such that the transitions across time are plausible. While measurement error in survey data is generally difficult to identify, the structured nature of educational progress enables us to identify individuals who have implausible transitions. We classify school transitions as implausible if respondents 1) progressed more than one grade per year, 2) progressed a grade without successfully completing the previous one, 3) stayed in the same grade if they passed or 4) regressed a grade. The most common error is respondents reporting the same grade for two or more years (error type 3) although they stated that they successfully completed the grade in a prior attempt. Skipping grades is also common among child questionnaire respondents. Table 1 shows that 82% of our analysis sample is without errors of type 1, 2 and 4. Including type 3 errors (reported passing a grade but did not advance to the next grade) reduces this percentage to 67%[2]. In the analysis we include all respondents irrespective of their errors. We then test whether our results are sensitive to excluding respondents who have implausible transitions and find no significant change in the results.

Progress through school and into work

The NIDS panel data allow us to describe a complete picture of progress through school and into work. Wave 1 information forms a baseline from which changes can be measured.

Figure 1 shows whether students advanced two grades by 2010. Students who were enrolled in 2008 are divided into one of four possible states in 2010: 1) passed two grades and enrolled in 2010 (pass); 2) repeated at least one grade but still enrolled in 2010 (repeat); 3) not enrolled by 2010 (dropout); unable to classify (unknown). Separate figures are presented for males and females.

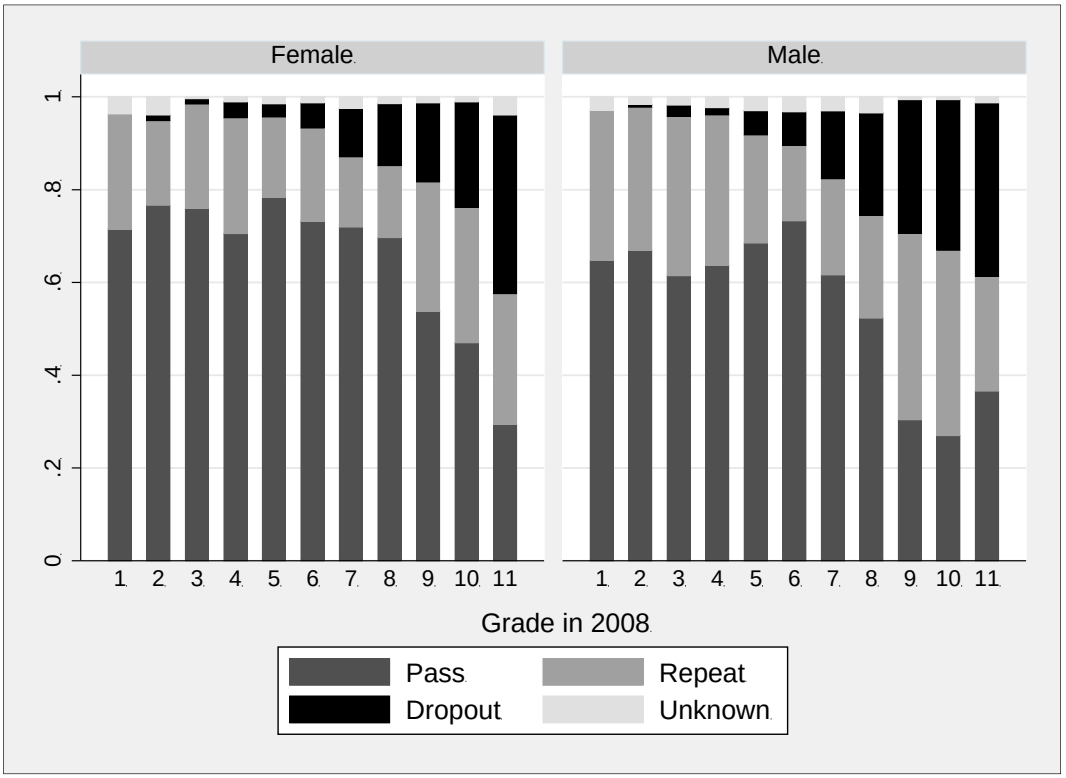
The figure depicts much of what is already known about the South African schooling system[3]: although enrolment rates are high until late secondary school, grade repetition is common in all grades, with higher repetition in secondary grades. Looking at males who were in grade 9 in 2008, for example, only about 30% had advanced to grade 11 in 2010, with close to 40% still in school but having repeated at least one grade. These patterns of repetition are consistent with a process called 'weeding' whereby provincial education departments encourage schools to hold back learners in grade 10, 11 and 12 who are performing poorly and are therefore likely to fail the grade 12 exams (Crouch and Vinjevold,

[2] Hertz (2003) found similarly high levels of error in measured education. He showed that the correlation between educational attainment in 1993 and 1998 for South African respondents who had completed their education was only 0.77. Given that our classification of error is far more fine-grained, the levels of error reported are not too surprising. It is possible that 'successful completion of a grade', the phrasing used in the questionnaire, is ambiguous. This could explain the high frequency of type 3 errors. For more information about the completeness and accuracy of the NIDS education module, refer to Branson et al. (2012).

[3] For example, the estimates of progression through school are broadly aligned with those reported in the Grade Retention report (Department of Education, 2007) and by Lam et al. (2011), who look secondary school progress in the Western Cape.

2006). This is done in an attempt to meet national pass rate targets set by the Minister of Education in 2001. If we examine the percentage of grade 11s in 2008 who have completed grade 12 by 2010, we see very low levels of grade 12 completion. Only about 35% (30%) of male (female) grade 11s in 2008 had completed matric by 2010.

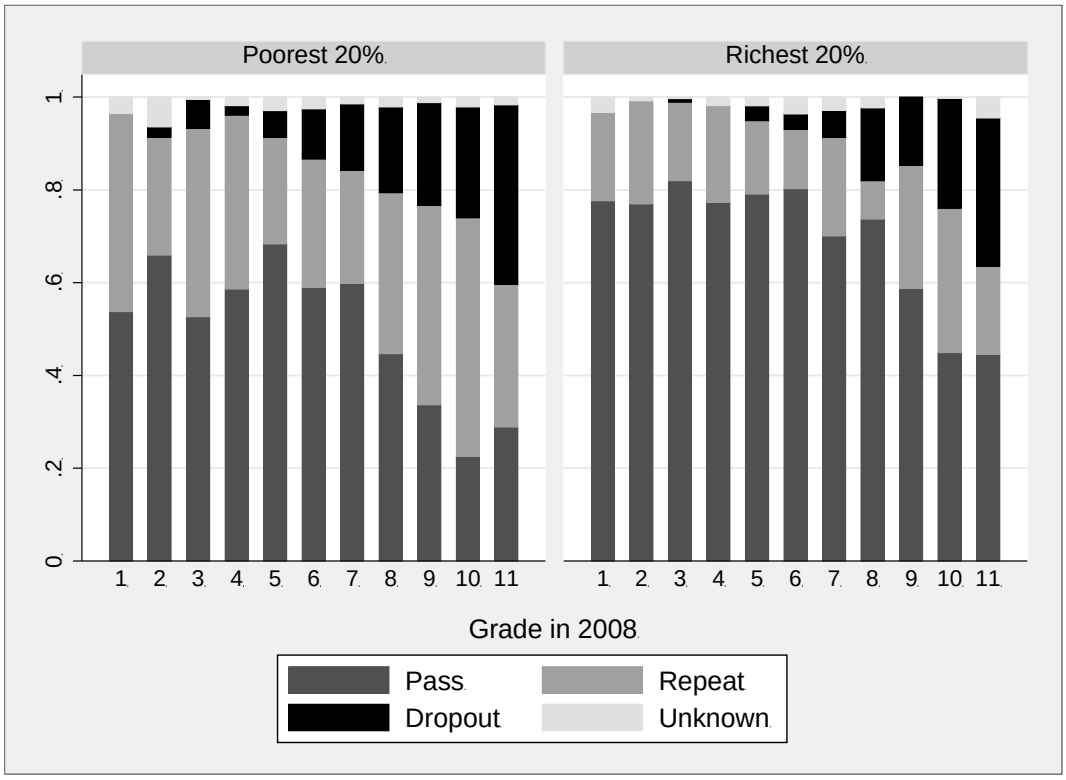
Figure 1: Schooling transitions between 2008 and 2010, males versus females



Notes to figure 1: Sample restricted to respondents who were in grade 1-11 in 2008 and successfully interviewed in Wave 2. Sensitivity to the exclusion of respondents with errors identified in table 1 were assessed and found not to be significant. Point estimates weighted using the panel weight.

The figure adds an additional dimension not often documented in the South African literature - levels of dropout by grade. The figure shows that dropout is negligible in primary school (grades 1-7), but increases year-on-year thereafter. Dropout rates are higher for males than for females beginning in grade 6. For both males and females who were in grade 11 in 2008, close to 40% had dropped out of the schooling system without completing matric by 2010.

Figure 2: Schooling transitions between 2008 and 2010, poorest versus richest learners



Notes to figure 2: Sample restricted to respondents who were in grade 1-11 in 2008 and successfully interviewed in Wave 2. Sensitivity to the exclusion of respondents with errors identified in table 1 were assessed and found not to be significant. Point estimates weighted using the panel weight.

Figure 2 presents comparative information to Figure 1 for the poorest and richest 20% of our analysis sample[4]. Before turning to the inequality in educational progress evident in the figure, it is worth noting that even the richest 20% of learners have low pass rates in later secondary school, especially in grades 10 and 11. This is in line with the idea of weeding mentioned above. Comparing the left and right panels, the figure shows the dramatic difference in rates of progress through school and school dropout between poor and richer learners. Around 80% of the richest quintile of primary school learners progressed at the desired rate, while the comparative figure in the poorest quintile is about 60%. The distinction continues to widen into secondary school where only about 20% of grade 10 learners from the poorest quintile progress successfully compared to 50% of the richest grade 10 learners. While rates of dropout are slightly higher in all grades in the poorest quintile than the richest quintile, most of the difference in school progress between richer and poor learners is a result of higher repetition rates among poor learners. By 2010, 30%

[4] Note that we did not use the household quintile variable available in NIDS as the richest households have fewer children and thus resulted in small sample sizes in quintile 5. Instead, we divided our analysis sample of respondents in grade 1-12 into household income quintiles, with the poorest 20% of the sample assigned quintile 1 and the richest 20%, quintile 5.

of the poorest grade 11 learners had repeated at least one grade, compared to only 8% of the richest grade 11 learners. For dropout the percentages were more similar, at around 40% of the poorest and 30% of the richest grade 11s.

Table 2 provides additional detail on the transitions between grades between 2008 and 2010. The blocked 'diagonal' elements are the percentage of respondents progressing at the desired rate of two grades over the two-year period. For example, the first row shows that 73% of learners who were in grade 1 in 2008 had advanced to grade 3 by 2010. The percentages below the diagonal show the percentage repeating one or two grades. In the first row, for example, 3% of those who were in grade 1 in 2008 were still in grade 1 in 2010 and 25% were in grade 2. The dropout column shows the percentage of learners by grade in 2008 who have left school without completing matric, and the matric column shows the percentage that have left the schooling system after completing matric. As such, each row sums to 100.

Table 2: Schooling transitions between 2008 and 2010

Grade in 2008		1	2	3	4	5	6	7	8	9	10	11	12	NTC	Dropped out	Matric	n
Grade 1	Phase 1	2.7	24.4	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	522
Grade 2		0.0	0.2	25.0	73.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	492
Grade 3		0.0	0.0	0.7	28.1	69.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	463
Grade 4		0.0	0.0	0.0	2.9	25.5	68.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	471
Grade 5	Phase 2	0.0	0.0	0.0	0.0	0.5	16.0	78.7	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	516
Grade 6		0.0	0.0	0.0	0.0	0.0	0.5	16.5	78.4	0.0	0.0	0.0	0.0	0.0	4.7	0.0	479
Grade 7		0.0	0.0	0.0	0.0	0.0	0.0	0.6	15.4	70.4	0.0	0.0	0.0	0.0	13.6	0.0	468
Grade 8	Phase 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	15.2	65.0	0.0	0.0	0.0	17.8	0.0	449
Grade 9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	28.0	43.3	0.0	0.0	24.8	0.0	418
Grade 10		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	25.1	39.8	0.0	29.9	0.0	478
Grade 11	Phase 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	17.3	1.7	40.1	35.7	469
Grade 12		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	3.8	15.3	76.6	395

Notes to Table 2: The table presents an education transition matrix between 2008 and 2010. The blocked 'diagonal' elements are the percentage of respondents progressing at the desired rate of two grades over the two-year period, with percentages below the diagonal presenting the percentage repeating one or two grades. The dropout column shows the percentage of learners by grade in 2008 who have left school without completing matric, and the matric column shows the percentage that have left the schooling system after completing matric. Each row sums to 100. Excludes errors of type 1, 2 and 4. Point estimates weighted using the panel weight.

We see in Table 2 that successful progression rates hover between 65% and 80% until grade 9, the point where compulsory education ends. As seen above, in grade 9 there is a large increase in both the proportion repeating and the proportion not enrolled. For those who were in grade 9 in 2008, only 43% had progressed two grades by 2010, around 30% repeated at least one grade and the rest dropped out. Interestingly, none had chosen a vocational route to complete their education. Progress continues to deteriorate for those in grade 10 and 11. Only 36% of respondents who were in grade 11 in 2008 had passed matric by 2010, with around 24% still attempting to complete their schooling. The remaining 40% had left school completely. These patterns of repetition and dropout are consistent with the story described in Lam et al. (2011). While Lam et al. (2011) found that enrolment rates, particularly among coloureds, drop once learners pass the age of 15, they also remark on

the large proportion of learners, especially in poor African schools, who failed repeatedly but stayed in school. They attribute this persistence in enrolment to the poor link between grade progression and actual ability in low quality schools (Lam et al. 2011). Note that given the high dropout rates from grade 9 onwards, each additional grade contains a more select group of individuals who have gotten to this point without dropping out. Even given this selectivity, the rate of repetition and dropout does not decrease.

Table 2 includes grade 12s for completeness but the interpretation of this row is different. By 2010 over 77% of individuals in grade 12 in 2008 report that they have completed matric; this is substantially higher than the 36% of grade 11s who have completed matric. There are three reasons this group is not directly comparable to individuals in the previous grade. First, the matriculation column for grade 12s represents the percentage of grade 12s in 2008 who passed matric on either their first or second attempt. We would therefore expect this percentage to be higher. Second, this is a select sample of individuals who had already reached grade 12 by 2008. The second last row of the table shows a high dropout rate of 40% for those in grade 11 in 2008, far higher than observed for those in grade 12 in 2008. Further investigation of the grade 11 dropouts shows that 60% had already dropped out in 2009. Of the remaining grade 11 dropouts, 28% were repeating grade 11 and 12% were in grade 12 in 2009 before dropping out in 2010. Thus reaching grade 12 is a large hurdle, and the chances of passing matric improve dramatically once an individual reaches grade 12. This needs to be kept in mind when assessing the matric pass rate reported annually by the Department of Basic Education. It is based only on those who write the matriculation examination and therefore ignores the fact that 50% of the cohort who started school twelve years previously are not included in the denominator (Spaull, 2013).

The last reason why the interpretation of the grade 12 row may differ from other grades is potential reporting error. The calculated matric pass rates by year in NIDS are higher than those from the Department of Basic Education in 2008. For example, in 2008 the national matric pass rate was 58% if one includes all full time matric enrolments (not only those candidates who wrote). The equivalent matric pass rate for 2008 using NIDS is 64%. It is possible that respondents interpret 'successful completion' of grade 12 differently from that required by the DBE[5].

Figure 2 and Table 2 show large increases in school dropout in late secondary school. Figure 3 explores the reasons[6] respondents, or their main caregiver in the case of children, gave for not being enrolled even though they had not completed school[7], separately for males and females. The most common reason given by females is pregnancy or childbirth. Over 24% of girls who had dropped out reported that this was due to being pregnant or having a baby. This is lower than the estimate by Gustaffson (2011) who found that 42 percent of female dropouts reported teenage pregnancy as their reason for dropping out. The most common

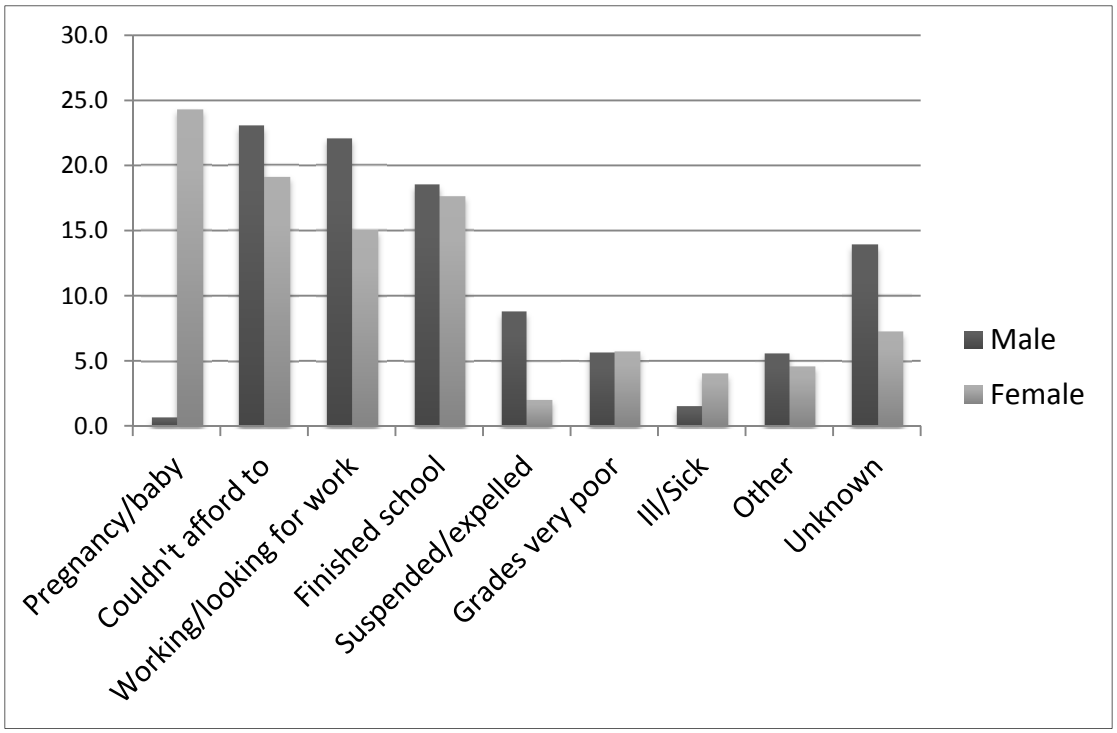
[5] This would be consistent with the high level of type 3 errors reported.

[6] Other includes those who responded that they were needed at home, got married or gave a specific other reason.

[7] Some respondents who are classified as dropouts in 2010, first dropped out in 2009. In this case we use the reason when the respondent first dropped out.

reason given by males (23%) is that they could not afford to stay in school. This is also the second most common reason given by females (18%). Data from the General Household Survey paints a similar picture; of young adults under the age of 21 who are not enrolled in any form of education, almost 30% cited financial constraints (Gustafsson, 2011). Comparing the household and school characteristics of those who report having dropped out due to financial constraints versus other reasons, we find that this group of learners is more socioeconomically disadvantaged. The average annual school fees paid for them in 2007 was R154 compared to R330 among other dropouts. They are also more likely to have attended no fee schools in rural areas in 2008 and live in households were the average per capita household income is R450 per month compared to R600 among other dropouts.

Figure 3: Reasons given for dropping out of school without completing matric



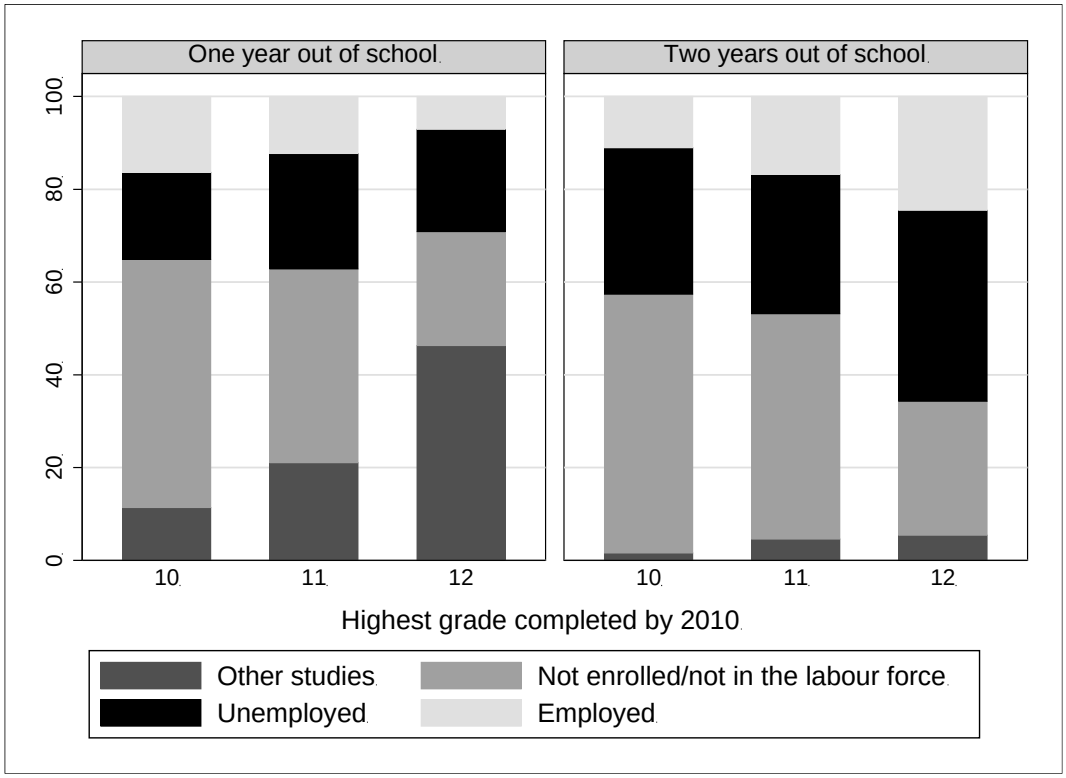
Notes to Figure 3: Reasons given for dropping out of school by 2010 without completing matric. Sample restricted to respondents who were in grade 1-12 in 2008. Point estimates weighted using the panel weight.

Working or looking for work is another common reason given, especially by males (22%). Both males and females also frequently report that they had 'finished' their schooling (males – 19%, females – 18%). This is interesting given the large labour market returns to completing matric (Keswell and Poswell, 2004). Over 85% of learners who reported that they dropped out because they had finished their schooling had completed grade 9 (compulsory education) or more. In the South African schooling environment of high grade repetition and low school completion, there are surprisingly few learners who report poor grades as the reason for dropping out., It is possible that respondents who report 'finished school' as the reason for dropout have evaluated their odds of completing matric and have

chosen to classify school completion as grade 9[8]. Few males and females reported suspension/expulsion, poor grades or illness as the primary reason for dropping out. However, it may be the case that while factors such as poor grades and illness have limited cumulative learning, it is another factor, such as limited finances or pregnancy, which acts as the catalyst for dropout and is given as the reason.

In Figure 4 we examine, by highest completed grade in 2010, what respondents are doing one and two years after leaving school.[9] It is clear from the figure that the most likely state a respondent who has not completed school (highest grade 10 or 11) will end up in is not economically active. The percentage in employment is low across all groups both one and two years out of school. While economic inactivity is in line with the high frequency of female respondents who report leaving due to pregnancy, it is disturbing that economic activity is not higher given the large percentage who report leaving as a result of credit constraints or the need to work/search for work.

Figure 4: Transitions out of school



Notes to Figure 4: Sample restricted to respondents in grades 8-12 in 2008 who had completed grades 10-12 by 2010 and were not enrolled in grade school. This figures uses the highest-grade completed variables in wave 2. Thus some respondents would have completed some post schooling education in the two years out of school sample. Point estimates weighted using the panel weight.

[8] These respondents are not, however, further behind in their schooling in 2008 than those giving other dropout reasons. In fact, they are less likely to be more than two years older than the expected age for their grade in 2008 than all other reason groups except those who are expelled.

[9] Note the one year out of school and two year out of school samples are mutually exclusive as this figure shows the status in 2010 of those who were enrolled in grade school in 2008 and no longer in grade school in 2010.

The distribution across activity states is very different between the samples one and two years after successfully matriculating. Importantly, a far larger percentage of respondents are in some other form of education one year out of school compared to two years after. In fact, at first the percentage in education one year out of school appears high. We checked this using the General Household Survey 2010 data. The percentage of respondents with grade 12 as their highest education who were enrolled in tertiary education depended strongly on the age restriction. For example, 20% of respondents under 25 with matric were enrolled. However, among 19 year olds with matric, 35% were enrolled in an educational institution. The NIDS sample finds that 45% of grade 12s in 2008 are enrolled in post schooling options one year out of school. However, the percentage of those two years out of school enrolled in post schooling education is very low, even among matriculants. Investigating this further, the majority (75%) of matriculants who enrolled in education one year after matriculating are studying towards diplomas and certificates, some of which could plausibly be one-year qualifications. The dramatic drop in the percentage enrolled two years out of matric is, however, also likely to reflect high dropout rates among post secondary school students.

Turning to the proportion not enrolled and not economically active, we see, if anything, an increase in this percentage between the one-year post school and two-year post school samples. Some noticeable differences are also apparent across highest grade completed. Those who have completed matric are less likely to be not enrolled and not economically active both one and two years after completing school than those who dropped out.

Figure 1-4 and Table 2 present the harsh reality of transitions through school and into work for youth in South Africa. Progress is slow with high rates of grade repetition throughout school and dropout increasing systematically from grade 7 onwards. Very few youth successfully complete matric and even fewer attempt the vocational route. Exit from the schooling system does not offer a better alternative – even for those who have completed matric, the majority remain without employment two years after completing grade 12.

Given these dire outcomes, in the next section we investigate the correlates of dropout in a multivariate framework. We choose to look at dropout only, as opposed to dropout and repetition, because of the relative paucity of dropout analyses available in the literature regarding South Africa. For a similar analysis using NIDS data of the correlates of repetition see Branson and Lam (2010).

Determinants of school dropout

There is a substantial international literature on the correlates of grade repetition and school dropout (e.g. Ministerial Report on School Retention (2007)). Multiple factors are suggested as precursors to dropout. It is also recognised that dropout is a result of a long cumulative process. A key conclusion that emerges is that grade repetition is ineffective in addressing underachievement and is usually a prelude to school dropout (Jimerson et al., 2002). To date, South African research into the reasons for school dropout has been qualitative or has used cross sectional data asking retrospectively why an individual dropped out of school (for example, Gustafsson, 2011). While this type of question provides some

information, it is well established that the choice to leave school without completing matric is complex and multidimensional and usually a result of a set of events reaching as far back as birth and accumulating over time (Hunt, 2008, Strassburg et al., 2010). Thus the reason given for dropout may only reflect the event or constraint that prompted the decision as opposed to the root cause of a longer-term problem. In addition, the 'reason for dropping out' question asked in some household questionnaires is answered by the household respondent and not the individual who dropped out of school, limiting its applicability.

The South African literature discusses a number of different determinants of dropout but as yet does not decisively indicate which plays the most important role nor provide the sequencing of these factors. Out-of-school factors such as family structure, financial constraints, shocks including loss of employment, death and pregnancy, attitudes regarding the value of matric and lack of information are all posited as causes of dropout. From the supply-side, few studies have investigated the effect in-school factors in South Africa.

Using data from the 2007 Community Survey, Fleisch et al. (2012) look at the characteristics of learners of compulsory school-going age (7-15 years old) who are not attending school. They find that while participation in compulsory schooling in South Africa is high even by international standards (95%), approximately 390 000 children aged 7-15 years are not attending school, due either to late enrolment or dropout. The advantage of this study is the large sample size. While their socioeconomic controls are limited and only observed when the child is no longer enrolled in school, the data paint a clear picture of the racial pattern evident in dropout statistics. The authors find that coloureds have the highest rate of non-attendance followed by Africans. The estimates for whites and Indians are substantially lower at approximately 1%. Strassburg et al. (2010) find similar figures using the nationally representative 2007 Access to Education household survey.

Analysing qualitative data from the Barriers to Education Project, Dieltiens and Meny-Gibert argue that absolute poverty is unlikely to be a major cause of dropout in South Africa given the concurrent high levels of poverty and school enrolment (South African Child Gauge, 2008/2009). Even though 70% of children lived in households with per capita monthly incomes below R350, the gross enrolment rate was about 95% for grades R – 9 and 85% for grades 10-12. This argument is supported by Fleisch et al. (2012), who find no meaningful relationship between measures of poverty such as piped water, household income or the presence of an employed person in the household, and learners not attending compulsory schooling. These findings are in contradiction to those of Gustafsson (2011) and Strassburg et al. (2010) who report that financial constraints and costs involved in attending school were given as reasons for absence from school in three different sets of data.

Part of the reason for this apparent contradiction is that high levels of enrolment during compulsory schooling do not negate a relationship between poverty and dropout. Schools provide food[10] and shelter which act as substantial incentives to attend, especially for poor learners. Yet, the quality of many schools and teachers in South Africa is low; Spaull (2012) shows that 75% of South African schools perform well below national and international

[10] The National School Nutrition Programme provides children at quintile 1-3 schools with a lunch meal.

benchmarks. Most learners attend schools in their neighbourhood (Branson et al., 2012) implying that learners from relatively poor homes will attend poor quality schools. Thus poverty plays a part in determining the opportunities to learn available to learners. Educational disadvantages accumulate over the school life-cycle such that by the end of compulsory schooling, the road to successful school completion is too difficult to navigate and learners drop out (Spaull, 2013). In fact, unlike our findings in Figure 3, Gustafsson (2011) and Strassburg et al. (2010) indicate that failing or being behind in schoolwork are common reasons given for dropout.

Family structure is also found to be important: children of compulsory school-going age who are living in homes where the head of the household is a parent or grandparent are much more likely to attend school than those living in other types of homes (Fleisch et al. 2012). Surprisingly, parental death or absence is insignificant in their regressions, implying that it is living with a close relative that is important as opposed to living with one's parents specifically. However, parental residency and vital status are captured at a point after the decision to leave school, making the sequencing of events unclear. Grant and Hallman's (2006) research contradicts the finding that parental presence, specifically, is irrelevant as they find that children living with mothers were significantly less likely to drop out when compared to children with absent or deceased mothers. Hunter and May (2003) argue that children who reside in single parent households, poor households and relatively uneducated households all face a greater likelihood of dropout. While the exact factors and their relative importance remain unclear, it is apparent that family background plays an important role in dropout.

Finally, Gustafsson (2011), Grant and Hallman (2006) and Strassburg et al. (2010) indicate that pregnancy for female students is a common reason given for dropout. While Grant and Hallman (2006) find that teens who dropout due to pregnancy are already behind at school, Ranchhod et al. (2011) show that childbearing also has a direct effect on the decision to drop out. They construct a counterfactual group of teens who have similar pre-childbearing characteristics to teen mothers but who did not give birth and show that even after controlling for selection into teenage childbearing, teen mothers are 16 percentage points more likely to be dropouts at age 20 than girls who did not give birth.

The NIDS panel allows us to take the analysis of school dropout in South Africa a step further. Restricting the sample to individuals who were in school in 2008 allows us to assess characteristics in 2008 that are associated with dropout by 2010. The wealth of information in NIDS allows us to assess long run socioeconomic disadvantage measured using parental education, prior progress through school, school fees before dropout, financial position of the household prior to the respondent dropping out, household income in Wave 1, living arrangements prior to the point of dropout as well as the quality of school attended. As there are different distributions of reasons given for dropout illustrated in Figure 3, regressions are run for the aggregate sample and separately for males and females. We have restricted the sample in the dropout analysis to Africans and coloureds. Very few white and Indian learners (only 7 respondents) in our sample are observed dropping out of school. Furthermore, whites and Indians differ substantially from Africans and coloureds on a number of socio-economic dimensions that are important for this analysis. In particular, the average white and Indian learner attends better quality schools, repeats fewer grades, and

has higher per capita income and more educated parents. Including whites and Indians as potential counterfactual observations in our analysis would likely confound our results.

Table 3: Comparison of mean wave 1 characteristics by whether they dropout by wave 2, Africans and Coloureds only

	All	Dropout		Did not dropout		Dropout/not dropout significantly different
Demographic characteristics:		Mean	Sample	Mean	Sample	
Age	12.32	16.87	842	11.69	5939	***
Male	0.51	0.56	842	0.50	5942	***
Schooling:						
Grade in 2008	6.25	9.22	842	5.83	5942	***
More than 2 years older than standard age for grade	0.08	0.28	842	0.06	5939	***
Age started school	5.83	6.18	495	5.80	4858	***
Ever repeated by 2008	0.36	0.60	787	0.33	5728	***
Attended grade R	0.69	0.51	197	0.70	4377	***
No school fees paid in 2007	0.25	0.23	691	0.26	4796	*
School fees in 2007 (in Rands)	373.05	298.64	691	383.54	4796	
Total school expenditure in 2007	908.83	787.97	467	926.00	3220	
School characteristics						
School quintile	2.57	2.59	670	2.57	5078	
Number of learners	741.85	808.17	683	733.14	5187	***
No fee school	0.46	0.44	686	0.46	5205	
Pupil teacher ratio	33.91	33.07	676	34.02	5140	***
School in an urban area	0.47	0.46	570	0.47	4398	
Distance to school (km)	17.22	19.96	679	16.86	5171	
School matric pass rate	73.55	71.84	468	74.10	1422	*
Went to a fee paying school but did not pay fees	0.06	0.06	580	0.05	4283	
Matric expectations and English proficiency:						
In 2008 expect will complete matric	0.99	0.98	526	0.99	1269	*
Read English fair or very well	0.60	0.51	594	0.63	1389	***
Write English fair or very well	0.59	0.49	595	0.62	1390	***
Parental information:						
Mother's educational attainment	7.67	6.53	756	7.82	5503	***
Father's educational attainment	6.47	5.42	587	6.60	4544	***
Live with mother in 2008	0.71	0.62	839	0.72	5932	***
Live with father in 2008	0.37	0.35	836	0.38	5898	
Parents are in a relationship in 2008	0.43	0.39	201	0.44	4440	
Mother deceased	0.11	0.16	798	0.11	5839	***
Father deceased	0.24	0.31	782	0.23	5705	***
Household characteristics in 2008:						
Urban	0.45	0.45	842	0.46	5942	
Per capita monthly household income (in Rands)	689.30	565.60	842	706.52	5942	***
Monthly household income (in Rands)	3702.65	3112.75	842	3784.73	5942	***

*** p<0.01, ** p<0.05, * p<0.1

Notes to Table 3: The table presents the means, sample sizes and level of significant between dropout mean characteristics and non-dropout mean characteristics of a list of variables for dropout, non-dropouts and the full sample. Point estimates weighted using the panel weight. School fees range from R0 to R38000 per annum. The matric pass rate ranges from 0-100% and reflects the percentage of students that passed matric with or without an exemption. South African schools are divided into quintiles based on the income, employment rate and education level of their surrounding neighbourhood. Quintile 1 represents the 20% of schools in the poorest neighbourhoods and quintile 5, the 20% of schools in the richest neighbourhoods. Learners are not required to pay school fees in no fee schools. Educational attainment ranges from 0-17; 1-12 represents grades in school and 13-17 represents different levels of tertiary education.

Table 3 compares the mean characteristics of dropouts to those who do not drop out for our sample of interest. 12.4% of the sample drops out of school between 2008 and 2010, with dropout rates higher within the coloured (13.8%) versus African (12%) population

groups. Those who end up dropping out are already distinct in 2008. They are older, have slower progression rates and attend poorer schools with lower matric pass rates[11]. They report being less proficient in English reading and writing and are marginally less likely to expect to complete matric (although the percentage expecting to complete is surprisingly high for both groups). Living arrangements also differ between the two groups. Dropouts are less likely to live with both parents, who are more likely to be deceased. Dropouts also live in poorer households and their parents have less education. These findings correspond well with the determinants indicated in the literature.

Table 4 presents a sequence of linear probability models[12] describing the correlates of dropout. The first five regressions are for the pooled male and female sample with an indicator for gender, while the sixth and seventh regressions present results for males and females respectively.

Regression 1 includes only indicators of the grade in 2008, if they are male, coloured and whether they were more than two years older than the expected age for their grade in 2008 (thus female Africans are the reference category). As suggested by Figure 1, dropping out is less common in grades 1-7 than in grades 8-11. The highest dropout rates are in grades 10 and especially 11, where the probability of dropout is 16.6 percentage points higher than in grade 8. There are also differences in the probability of dropout across demographic groups. Males are 2.5 percentage points more likely to drop out than females and coloured students are 3.7 percentage points more likely to drop out than African students. These results concur with the literature discussed above, especially Lam et al (2011).

[11] The matric pass rate ranges from 0-100% and reflects the percentage of students that passed matric of any type. This information comes from the Department of Education, and was matched to the NIDS respondent based on the name and location of the school they attended in 2008.

[12] We ran similar models using a probit specification and found no significant differences in the substantive results.

Table 4: OLS regressions for the probability of dropping out of school by 2010 for NIDS respondents in grade 1-12 in 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Males and Females					Males	Females
VARIABLES							
Coloured	0.037*	0.038**	0.045**	0.048***	0.052***	0.090***	0.019
	(0.019)	(0.019)	(0.018)	(0.018)	(0.019)	(0.032)	(0.021)
male	0.025**	0.026**	0.026**	0.025**	0.025**		
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)		
Grade 1	-0.167***	-0.156***	-0.152***	-0.153***	-0.152***	-0.158***	-0.148***
	(0.033)	(0.036)	(0.037)	(0.037)	(0.037)	(0.048)	(0.038)
Grade 2	-0.163***	-0.153***	-0.149***	-0.149***	-0.146***	-0.148***	-0.147***
	(0.033)	(0.036)	(0.036)	(0.036)	(0.036)	(0.047)	(0.040)
Grade 3	-0.156***	-0.146***	-0.143***	-0.144***	-0.142***	-0.142***	-0.141***
	(0.034)	(0.037)	(0.037)	(0.037)	(0.037)	(0.049)	(0.039)
Grade 4	-0.157***	-0.147***	-0.146***	-0.147***	-0.145***	-0.144***	-0.146***
	(0.034)	(0.037)	(0.037)	(0.037)	(0.036)	(0.047)	(0.040)
Grade 5	-0.132***	-0.122***	-0.124***	-0.126***	-0.124***	-0.117**	-0.134***
	(0.034)	(0.037)	(0.037)	(0.037)	(0.037)	(0.049)	(0.038)
Grade 6	-0.109***	-0.101***	-0.099**	-0.100***	-0.100***	-0.099*	-0.101**
	(0.035)	(0.038)	(0.039)	(0.039)	(0.038)	(0.052)	(0.041)
Grade 7	-0.047	-0.038	-0.041	-0.042	-0.039	-0.027	-0.051
	(0.041)	(0.044)	(0.044)	(0.044)	(0.044)	(0.058)	(0.050)
Grade 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Grade 9	0.058	0.057	0.054	0.053	0.053	0.067	0.033
	(0.042)	(0.041)	(0.042)	(0.042)	(0.042)	(0.048)	(0.056)
Grade 10	0.083**	0.080**	0.081**	0.081**	0.080**	0.074*	0.081
	(0.040)	(0.039)	(0.039)	(0.039)	(0.039)	(0.045)	(0.051)
Grade 11	0.166***	0.164***	0.164***	0.163***	0.162***	0.126**	0.194***
	(0.040)	(0.039)	(0.039)	(0.039)	(0.040)	(0.054)	(0.050)
Grade 12	-0.067*	-0.069*	-0.065*	-0.067*	-0.071*	-0.089*	-0.057
	(0.038)	(0.037)	(0.037)	(0.037)	(0.037)	(0.051)	(0.049)
>2 years old for grade (lagging)	0.243***	0.285***	0.279***	0.278***	0.277***	0.264***	0.286***
	(0.033)	(0.032)	(0.032)	(0.032)	(0.031)	(0.038)	(0.053)
Matric Pass rate of 2008 school		-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Interaction - Lagging X matric pass		-0.001**	-0.001**	-0.001**	-0.001*	-0.001*	-0.002
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mother's highest educational attainment			-0.002	-0.001	-0.001	-0.004*	0.001
			(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Father's highest educational attainment			-0.003***	-0.003***	-0.003**	-0.003	-0.004**
			(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Live with mother in 2008				-0.026**	-0.026**	-0.020	-0.032*
				(0.012)	(0.012)	(0.016)	(0.017)
Live with father in 2008				0.003	0.004	0.019	-0.010
				(0.011)	(0.011)	(0.015)	(0.014)
Log of school fees in 2007					0.005**	0.009***	0.002
					(0.002)	(0.003)	(0.003)
No school fees paid in 2007					0.017	0.036*	-0.004
					(0.015)	(0.022)	(0.020)
Log of household income in 2008					-0.012*	-0.018**	-0.006
					(0.007)	(0.008)	(0.009)
Constant	0.150***	0.194***	0.212***	0.233***	0.307***	0.426***	0.232***
	(0.033)	(0.063)	(0.061)	(0.063)	(0.069)	(0.094)	(0.078)
Observations	6,781	6,781	6,781	6,781	6,776	3,447	3,329
R-squared	0.174	0.177	0.180	0.181	0.184	0.199	0.183

Notes to Table 4: OLS regressions of the probability of not being enrolled and not having completed matric by 2010. Sample restricted to respondents in grade 1-12. Regressions that include matric score, parental education and residency status and school fees also include dummy variables for missing information on these variables. Regression accounts for the survey design and use the panel weight. Significance *** p<0.01, ** p<0.05, * p<0.1

Being behind at school in 2008 has a strong and significant relationship with dropout. Students who are more than two years older than the recommended age for their grade are 24.3 percentage points more likely to have dropped out by 2010. Progress through school is strongly correlated with socioeconomic status and, in South Africa, large inequalities in schooling quality reinforce the slower progress of poor learners (Lam et al., 2011; Spaull, 2012). In Regression 2 we therefore interact our measure of lagging behind with the matric pass rate of the school the respondent attended in 2008. This is a measure of school quality that captures a range of characteristics of the school. The coefficient on lagging behind for one's grade is 0.28 which, interpreted directly, means learners in schools with matric pass rates of zero who are behind in 2008 are 28 percentage points more likely to dropout than those on track. The interaction term is significant at the 5% level and shows that for learners lagging behind for their grade, a 10% increase in the matric score decreases the probability of the learner dropping out by one percentage point. There is no significant direct effect between matric pass rate and dropout, conditional on being on track.

In Regression 3 we include parental education as a measure of the long run socioeconomic characteristics of the child. Somewhat surprisingly, parental education does not appear to play a large role in predicting dropout; the coefficients are small and only father's education is significant. Controlling for parental education also has no significant effect on the size or significance of the school progression variables as might be expected. It may be that the role of parental education is already largely captured by the type of school an individual attends, as more highly educated parents will have higher socioeconomic status and are more likely to send their children to better quality schools.

Regression 4 includes indicators of whether the mother and/or father lived with the learner in 2008. The presence of the mother lowers the probability of dropout by three percentage points while the presence of the father appears to be statistically insignificant. Note that the addition of these controls has not altered the size or significance of the lagging in school variables.

Attending school incurs both direct and indirect costs including fees, books, stationery, uniforms, transport and the foregone wage due to the inability to hold full time employment. In Regression 5 we include the log of school fees in 2007, an indicator that no school fees were paid in 2007 and household income in 2008 as measures of financial resources available in the household. The estimates indicate that, holding all else equal, a 10% increase in school fees would raise the probability of dropout by five percentage points. Those learners who did not pay school fees in 2007 were not significantly more likely to drop out than those who paid fees, although the coefficient is positive. Household income has an even stronger relationship than school fees with the probability of dropout. Increasing household income by 10% is associated with a fall in dropout of 12 percentage points. Thus for a given level of household income, higher fees are correlated with a greater chance of dropping out, suggesting that credit constraints could be a reality for African and coloured students.

Next we run the final specification (Regression 5) separately for males and females. There are a number of interesting differences by gender. First, while coloured males are nine percentage points more likely to dropout than African males, there is no difference between coloured and African females. Second, the interaction between lagging in school and the

matric score, although similar in size, is not statistically significant for females. Third, paternal education has a small but significant relationship with dropout for females while no relationship is evident with dropout among boys. The opposite is true of maternal education; there is a small but significant relationship for males but not females. That being said, it appears that living with one's mother plays a role in mitigating dropout among females.

Another interesting difference is that the probability of dropout among females is not significantly related to either school fees or household income, while the male regression mimics more strongly the pattern evident in the pooled sample. The male coefficients are also larger than in the pooled regression. A 10% increase in fees is correlated with an eight percentage point increase in the dropout rate of males. Male learners who did not pay school fees in 2007 are also 3.6 percentage points more likely to drop out than those who did. With regards to household income, a 10% increase is associated with a decreased probability of dropout of 19 percentage points. This may suggest that male children feel the effects of household credit constraints to a greater degree than female children and are the first to leave school and seek work when income is limited or costs rise.

Conclusion

NIDS provides the first national longitudinal data on education collected in a South African household survey. This makes it possible to study transitions across grades, in and out of school and between school and work in ways that have not previously been possible. In addition, the wealth of information collected in NIDS and the panel aspect of the data allow us to further unpack the determinants of school dropout.

The paper starts with a description of progress through school and into work, reflecting on much that is already known about the South African schooling system. Progress through school is shown to be slow with high rates of repetition throughout grades and dropout increasing systematically from grade 7 onwards. Very few youth successfully complete matric and even fewer attempt the alternative vocational route. Exit from the schooling system does not offer a better alternative as most respondents one and two years out of secondary school are not studying or working.

Our regressions go some way towards better understanding the relationship between progress through school, cumulative socioeconomic disadvantage, household income and parental support by controlling for these characteristics at the point just before the respondent dropped out. In addition, we investigate the correlation between a supply-side factor, school quality as measured by the matric score, and dropout in a multivariate framework.

We show that not keeping pace at school is a fundamental determinant of who drops out. The coefficient on our measure of falling behind i.e. being more than two years older than the expected age for your grade, is large and significant and remains so when all socioeconomic controls are included. This finding aligns with those in the international literature (Jimerson et al., 2002). Interestingly, this is hardly ever given as the main reason

for dropping out in the NIDS data. This is not necessarily inconsistent, however, as falling behind is cumulative and may not stand out as the primary catalyst for dropping out.

Falling behind at school is strongly correlated with socioeconomic status and school quality in South Africa. Including the school matric pass rate variable increases the coefficient on the lagging in school variable and the interaction is significant, suggesting that those behind for their age are partially protected from dropping out when they attend higher quality schools. Controlling for measures of long run socioeconomic status and current household financial resources does not diminish the strength of this relationship.

These findings add to the discussion of school inequality in South Africa and the benefits, or lack thereof, of grade retention in schools of low quality. The large coefficient on falling behind suggests that repetition is not remedial if completion of grade 12 is the outcome of interest; learners who are behind for their age are 25 percentage points more likely to dropout of school without completing grade 12 than learners on track. This finding is especially troubling if repetition is not targeted to the weakest learners (Lam et al., 2011). In addition, the finding that better quality schools can partially protect struggling learners from dropping out suggests that improvement in supply-side school factors could play a role in reducing dropout, particularly among learners who have repeated grades. A more disheartening conclusion from this finding is that for the majority of learners who are behind in school, their schools are ill-equipped to help them negotiate a pathway to school completion.

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southern africa labour and development research unit

The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.

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