LABOUR MARKET
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The Post-matriculation Enrolment Decision: Do Public Colleges Provide Students with a Viable Alternative?

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Evidence from the first four Waves of the National Income Dynamics Study

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ABBREVIATIONS AND ACRONYMS

ABET	Adult Basic Education and Training
DHET	Department of Higher Education and Training
EMIS	Educational Management Information System
GHS	General Household Survey
HSRC	Human Sciences Research Council
LMIP	Labour Market Intelligence Partnership
NCV	National Certificate (Vocational)
NIDS	National Income Dynamic Study
NSCE	National Senior Certificate Examinations
NSFAS	National Student Financial Aid Scheme
TVET	Technical and Vocational Education and Training

PREFACE

In 2009 the South African government administration, informed by a results-focused philosophy, identified 12 priority outcomes for the country. Outcome 5 refers to 'a skilled and capable workforce to support an inclusive growth path', and the delivery of this outcome is led by the Minister of Higher Education and Training. Delivery Agreement 5 consists of three parts, with Output 5.1 committing the Department of Higher Education and Training (DHET) to establish a credible mechanism for skills planning, in collaboration with 20 national and provincial ministries. The DHET commissioned the Human Sciences Research Council (HSRC) to support the DHET in establishing a credible institutional mechanism for skills planning (Memorandum of Agreement between the DHET and the HSRC, February 2012). Thus the Labour Market Intelligence Partnership (LMIP) project, with six themes of research, was established.

The objective of one of the research themes is to obtain a better understanding of the pathways and transitions undertaken by young people through the education and training system into the workplace. The key question underpinning this work is: What are the dynamics of access, progression, graduation and labour market destinations along various education, training and labour market trajectories, and how can this knowledge inform skills planning in South Africa? The research therefore collected and analysed data which then provides crucial information on the following:

- Understanding the extent to which **access** is conditioned by socio-economic factors, the quality of primary and secondary schooling, as well as spatial and demographic characteristics. In particular, it is important to know which barriers affect young people who successfully finish their schooling.
- **Pathways** or trajectories through the secondary school and post-school sector refer to the choices that students make in terms of institutions, subjects, degrees and specialisations.
- **Transitions** from and through education and training into the labour market are the final step in the progression sequence. Given the large investments (at both the household and government levels) made in training and higher education, the successful matching of available skills to the demands of the labour market is of significant interest in South Africa.

The post-school education and training landscape in South Africa consists of a diverse range of sectors and institutions. These include: Adult Basic Education and Training (ABET) centres; Technical and Vocational Education and Training (TVET) colleges; workplace training programmes (learnerships and apprenticeships); as well as traditional, comprehensive and universities of technology. All of these components of the post-schooling system are of vital importance to the supply of skills to the labour market and the broader

South African economy, and understanding the issues of access, pathways and transitions will provide valuable information for skills planning.

A number of research studies were conducted within this theme of research. The key questions that each of the studies attempted to answer is reflected in the following topics:

1. What is the progression, graduation and destination of secondary school students?
2. How matric results influence university access, field of study and progression through to university.
3. What are the school-to-work transitions in the National Income Dynamic Study?
4. What are the university graduate destination outcomes: The Eastern Cape study on transitions to the labour market
5. Assessing the usability of graduate destination surveys for the analysis of labour market outcomes.
6. Scoping for a tracer study of the education and training and labour market outcomes of workplace training programmes.
7. What are the pathways of TVET college learners through the TVET colleges and beyond?
8. Who accesses adult education programmes and where do they progress to: An exploratory tracer study on community education and training centres.

ABSTRACT

This paper uses National Income Dynamics Study (NIDS) data for the period 2008 to 2015, together with administrative data on South African schools and post-secondary institutions, to estimate the relationship between enrolment in post-secondary education and home background, school quality and scholastic ability during a learner's final years of schooling. We analyse enrolment patterns across for each of three institution types separately, namely public universities, public technical and vocational education and training (TVET) colleges, and private colleges. In the light of government's current policy to expand TVET colleges over the next two decades, we focus specifically on this institutional category. In particular, we investigate the role of financial constraints in the enrolment decision in order to assess the viability of the plan to expand post-secondary education via the TVET sector. Through a series of multinomial logit regressions, we find that household income during the matric year is highly significant in determining enrolment in all types of post-secondary institutions, including TVETs. Individual ability (as measured by numeracy-test scores) is also important in explaining enrolment in both universities and TVETs, even after controlling for socio-economic background and school-quality variables. These findings suggest that increasing the number of places available at TVET colleges without expanding funding opportunities and assessing the level of course content is unlikely to result in the target of 2.5 million learners in TVETs by 2030 being met.

1. INTRODUCTION

More than 20 years after the end of apartheid, South Africa remains one of the most unequal countries in the world. It has been argued that South Africa is caught in an inequality trap that operates in part via access to post-schooling education: Low post-schooling enrolment leads to skill scarcities that ensure high rewards for the skilled and low rewards for the unskilled (Pellicer & Ranchod 2012). The unskilled thus remain poor and enrolment in post-schooling education remains limited. In this way, the cycle of inequality and poverty is perpetuated.

Conventional wisdom on the chief reason for limited enrolment in post-secondary education in South Africa holds that the main barrier is eligibility. Owing to differences in the quality of education received at earlier levels of schooling, as well as home environments characterised by limited resources and a lack of academic support, matric outcomes are generally poor. Only around half of 25- to 29-year-olds have passed matric[1] (NIDS 2016; General Household Survey [GHS] 2014). Even among those who do pass matric, a substantial number (70%) do not pursue any form of post-secondary education or training, despite the very large rewards attaching to these qualifications in the labour market (see Table 1 and Appendix Table 1). The high cost of post-secondary education, especially university education, could be a reasonable explanation for this anomaly.

Given the high returns to post-secondary education in South Africa, an increase in access to post-secondary education could help break this cycle of inequality and poverty. In its 2013 White Paper, the Department of Higher Education and Training (DHET) presents plans to expand the capacity of the post-secondary sector over the next two decades in order to address these low levels of enrolment, attainment, and associated inequalities. A particular focus is a rapid expansion of the number of public technical and vocational education and training (TVET) colleges. The South African government has also increased funds available for students attending TVET colleges, primarily through the National Student Financial Aid Scheme (NSFAS). Students whose parents earn below a certain level of income do not have to pay any fees, and they are assisted with accommodation and transport costs (DHET 2013).

For this expansion to have an impact on the structure and reach of the current post-secondary education and training (PSET) system, it needs to be accompanied by an increase in enrolment and a broadening of access. Thus, we need to understand the current challenges these institutions face. These are reputed to include: poor management and functioning; a disconnect between course content and the skills demanded in the labour market; confusing course structures and application processes; a lack of student support; and funding constraints. In addition, such institutions have a reputation for being inferior institutions that provide a fallback option for learners who are unable to attend university, while, at the same time, the course content of the National Certificate (Vocational) (NCV) has been portrayed as too academically challenging (see Branson et al., 2015 for a recent summary). Empirical research into these challenges, particularly at a national level, is growing, but remains fairly limited. We aim to contribute to this literature by assessing the viability of the DHET's policy objective in terms of individual barriers to entry. In particular, we ask: To what extent is entry dependent on prior socio-economic status, financial means and/or academic merit?

1 See Table 2 and Appendix Table 2.

The decision to enrol in post-secondary education is largely determined by tuition costs and the ability to fund these costs. A large body of international literature shows that family income, home background, and ability all impact on post-secondary enrolment levels, and their relative importance has implications for the effectiveness of funding policies in the higher education arena. Family income can be largely indicative of short-run credit constraints, while home background, or long-term family income (often measured by parental education), is associated with quality of school attended and home-environment factors. These will have affected learners throughout their lives and impacted on their schooling outcomes, ability, and desire to continue their education. A number of studies have demonstrated that long-term family background is more important in explaining college attendance than short-term credit constraints (Carnerio & Heckman 2002; Cameron & Heckman 2001; Keane & Wolpin, 2001). However, others have used more recent data to show that the effects of family income on college attendance and achievement rates have become more important over time. This may be a result of increasing tuition costs, rising returns to education, and insufficient public funding. Net family wealth, or housing wealth, and the associated availability of credit/collateral, has also been shown to have significant effects on college enrolment, especially amongst poorer households (Belley & Lochner 2008; Lovenheim 2011; Lochner & Monge-Naranjo 2011).

In a study of urban Cape Town in South Africa, Lam et al. (2013) use longitudinal data to show that large racial gaps in post-secondary enrolment are explained mainly by differences in parental education and high school outcomes, rather than credit constraints (measured by household income during high school years). However, there is still evidence of income effects at the top end of the income distribution, as well as on enrolment levels in non-university programmes.

Using the National Income Dynamic Study (NIDS) data for the period 2008 to 2015, this paper takes a similar focus and investigates the relative importance of home background, school quality, ability, and other socio-economic factors for post-secondary enrolment, in particular TVET enrolment. The NIDS data set provides us with a rich set of socio-economic variables which, when combined with administrative data, allows us to analyse the characteristics of enrolees by institution type. The longitudinal nature of the NIDS means that we can control for characteristics at a point when the enrolment decision is being made, that is, prior to actual enrolment. Thus, the study enables an in-depth examination of enrolment patterns at the national level, providing important insights into the factors that influence the enrolment decision and which may have relevant policy implications.

In our descriptive analysis, we compare the characteristics of those who have enrolled in universities, TVETs, or private institutions with those who do not enrol at all within two years of matric, in order to identify which sectors of society are currently being served by TVETs and which sectors are being excluded. We see that, while university enrolees tend to come from wealthier households and schools, and have higher academic performance by the end of matric, TVET enrolees do not look so dissimilar in terms of socio-economic characteristics from those who do not enrol in any post-secondary education. However, when we consider the enrolment decision in a multivariate framework, we find that household income is important in determining enrolment in all institution types, even after controlling for socio-economic factors. In addition, academic merit, as measured by numeracy-test scores, appears to be highly significant in determining enrolment in both universities and TVETs. Thus, our results suggest that increasing capacity through expanding the number of TVET colleges will be insufficient to overcome the barriers students face in enrolling in post-secondary education. Alongside this expansion, an even further increase in funding and a re-examination of what level of academic ability is necessary to succeed in TVET courses would be required.

The remainder of this paper is structured as follows: We first provide a brief description of returns to education in South Africa and the current composition of the post-secondary education

system. We then move on to our main analysis, where we describe the data and sample, provide a descriptive comparison of the sample according to enrolment in the different post-secondary institution types, and present the results of a multinomial logit regression model by means of which we estimate the impact of income, socio-economic factors and ability on enrolment. Finally, we discuss our findings and conclusions, and provide recommendations for further research.

2. THE SOUTH AFRICAN POST-SECONDARY EDUCATION LANDSCAPE

Returns to education in South Africa

Employment rates and earnings levels vary substantially by educational attainment and indicate that the returns to education in South Africa are high. Van der Berg and Van Broekhuizen (2012) show that the demand for university graduates in the South African labour market is high, and that the probability of employment for degree-holders has in fact grown over time. They challenge existing research (e.g. Bhorat 2004) that argues that the South African graduate unemployment rate is cause for major concern (Van der Berg & Van Broekhuizen 2012). Using a variety of survey data across multiple time points, they show that unemployment among those with a certificate or diploma (without a degree) is persistently much higher than among graduates with university degrees, and that unemployment is low by international standards for university degree-holders. In addition, their results show that graduates have higher labour force participation rates (as they are less likely to be discouraged work-seekers), and are less affected by economic conditions, than non-graduates.

Table 1 provides the income returns to different levels of education for 25- to 59-year-olds using the National Income Dynamics Study (NIDS) as a cross section in Waves 1 to 4.[2] The coefficients indicate the income returns to completing a given level of education compared with the next-lower level. While returns to a matric are high, completing any post-schooling education substantially improves labour market prospects. Thus, low enrolment levels in universities, as well as technical and vocational studies, cannot be explained by low returns in the labour market.

2 Appendix Table 1 presents similar regressions using data from South Africa's General Household Surveys for 2009 to 2014.

Educational attainment in South Africa

The South African education system is characterised by high enrolment until late secondary school, but relatively low levels of attainment on the critical margins that improve labour market outcomes, with considerable variation across population groups, which is a strong indicator of wealth in South Africa. Table 2 provides educational attainment rates for 25- to 29-year-olds for each wave of the NIDS.[3] We see that the percentage of individuals in this age group who have obtained a post-matric diploma or certificate is 19% or lower, while the percentage who have obtained a university degree is even smaller, ranging from 2 to 3%. If we look solely at those with a matric, more than half do not go on to complete some form of post-secondary education, and only around 4 to 6% of matriculants go on to complete a university degree.

The post-school educational system

Analyses of the South African post-secondary education system have focused on qualification type, namely degrees, diplomas or certificates. There is variability, however, in the level and quality of these qualifications across and within institution type. For example, a technical and vocational education and training (TVET) diploma is unlikely to provide the same signal to the labour market that a university diploma provides. Similarly, a two-week certificate for on-the-job training is unlikely to be equivalent to an N certificate obtained from a TVET. Data constraints have largely prohibited the examination of differences within and across

3 Appendix Table 2 presents a similar table using General Household Survey (GHS) data for the period 2009 to 2014. It also includes the percentage of Grade 12s who do not go further, but have an exemption.

institution types.[4] The NIDS collects information on the institution attended, and therefore allows us to examine differences between TVETs, universities and other institution types.

The post-school educational system in South Africa consists of public universities, public TVET colleges, adult education and training centres, private post-school institutions (including colleges, adult learning centres, and private TVETs), and work-based training institutions (both private and public). Although private institutions are important for filling niche areas not covered by public education (such as design and fashion), there is currently no reliable, centralised database for this sector and, as a result, there is a lack of research on its functioning and structure. Private institutions also vary largely in terms of size, structure, and quality, making it difficult to analyse them as a homogeneous group. In this paper, we acknowledge that private institutions currently constitute a part of the post-secondary sector, but we do not focus on them specifically, nor do we attempt to assess their viability as an alternative to universities or TVETs.

South Africa has 26 public universities[5] – these include traditional universities, universities of technology (which focus primarily on technical and vocational skills), and 'comprehensive' universities, which are a mix between traditional universities and universities of technology. Learners can acquire the full range of qualifications at universities, including degrees, diplomas, and certificates (Branson et al. 2015). Entrance requirements at universities are high compared with other types of institutions: Learners require at least a National Senior Certificate (NSC) with a bachelor's pass to apply to traditional universities, and at least an NSC with a diploma to apply to universities of technology.

Public TVET colleges, on the other hand, focus on the provision of vocational or mid-level skills, mainly in the areas of engineering, construction, tourism, hospitality, and general business and management. Qualifications include the National Certificate (Vocational) (NCV) programme, which was originally introduced to replace the N programme (Nated programmes). This is intended to equip learners with a mixture of vocational and academic skills, as well as provide a bridge for learners wanting to advance into universities. There are 50 public TVET colleges in South Africa, with more than 264 campuses around the country.[6] Learners can obtain diplomas and certificates at TVETs but not degrees, which may be a reason why TVETs are less highly regarded academically than universities. They are also far more accessible than universities in terms of entrance requirements: There is no minimum NSC pass requirement, and learners with a completed Grade 9 can enrol in TVET colleges. Nevertheless, we see lower levels of enrolment in these institutions compared with universities (Tables 3 and 4).

Participation in post-secondary education

Table 3 presents the participation rates of 15- to 24-year-olds with at least Grade 9 who were not enrolled in school, by institution type, based on data from the General Household Survey (GHS) for 2009 to 2014. Participation rates remained remarkably stable between 2009 and 2014, at around 16%. By restricting the sample to matriculants only in Table 4, participation increases to 25%. Of note is the proportion enrolled in a public university or university of technology, which is consistently higher than the proportion enrolled in a public college, although the gap has decreased over time.

Given that only 50% of South Africans complete matric (see Table 2) and, of those who do, very few are eligible to go to university, TVETs would appear to be the logical alternative. However, with only around 26% of post-secondary enrolment in TVETs (see Table 3), the current enrolment composition suggests that this is not the case. In its 2013 White

4 Graduate destination studies aim to examine the life trajectories of graduates but have, to date, been plagued by low response rates (Branson et al. 2016). These studies also have limited information on student entry characteristics. Besides localised studies, such as the Cape Area Panel Study, that focus specifically on the transitions of the youth, no South African household surveys have sufficient focus or size to examine post-secondary enrolment by institution type.

5 http://www.universitiessa.ac.za/public-universities-south-africa.

6 http://www.fetcolleges.co.za/Site_Public_FET.aspx.

Paper, the Department of Higher Education and Training (DHET) states its main focus as being on an expansion of TVET enrolment levels, well beyond the enrolment levels at public universities. Its goal is to have 2.5 million enrolments in TVETs by 2030, an almost fourfold increase from 2012 levels, while only expanding 2012 public university enrolment by 70% to 1.6 million in 2030 (DHET, 2013). Tables 3 and 4 do show an increase in the proportion enrolled in TVETs over time, which may already be reflecting the DHET's efforts to expand this sector thus far. However, this expansion appears to be due to enrolment shifts away from both universities and private institutions, rather than a decrease in the proportion not enrolled in any post-secondary education. To increase post-secondary enrolment levels overall, a change in the enrolment composition will not be enough; attention will need to be focused on the group which is currently not participating in any post-secondary education at all. In this paper, we look specifically at a subset of this group, matriculants, and how their characteristics differ from those who enrol in either a university or TVET. We attempt to understand why these matriculants are not participating in post-secondary education, particularly at TVET colleges, which are far more accessible than universities in terms of entrance requirements and tuition fees and offer skills sets that are in high demand in the labour market.

3. UNDERSTANDING THE POST-SECONDARY ENROLMENT DECISION

Description of data

We use the first four waves of the National Income Dynamics Study (NIDS) data in our analysis. Wave 1 data was collected in 2008, Wave 2 in 2010/2011, Wave 3 in 2012, and Wave 4 in 2014/2015. In each wave, all adults then residing in the household were administered an adult questionnaire, and a child questionnaire was administered to the main caregiver(s) of all resident children (aged 15 years and younger). Both of these individual-level questionnaires collected information on education for the current interview year as well as the previous year, and, in Wave 1, a numeracy test was administered to 12- to 59-year-olds (who agreed to write the test). In addition, in each wave, a household-level questionnaire was administered to the household head.

The focus of the analysis is understanding the factors that help or hinder enrolment in post-secondary education. We face the same small-sample-data challenges experienced by others interested in post-secondary enrolment at the national level: Only 50% of Grade 1 entrants completed Grade 12, and only 25% of matriculants enrolled in post-secondary education (see Table 4). Answering this question using a national data set that is not focused on the youth is therefore not optimal. In addition, an analysis of this type requires socio-economic information prior to the post-secondary enrolment event. With four waves of data spanning eight years, and rich socio-economic data, the NIDS provides some good building blocks. We construct the analysis sample to maximise our pool of matriculants and focus on NIDS respondents who had survey information for their matric year and subsequent information within two years of matric.[7] The analysis sample therefore includes individuals younger than 30 years of age who were in matric at some point during the four waves of the survey, and were seen again during the survey within the two years following their matric. Individuals who matriculated in 2007 (but were only interviewed in 2008) were also included.

Appendix Table 3 shows the proportion of individuals by matric year who were seen within the two years following their matric. Attrition was fairly low overall, with a follow-up rate of 82%. Over the years 2007 to 2014, a total of 2 909 individuals were in Grade 12, and 2 390 were seen in the two-year period after their matric. Out of these 2 390 individuals, 72% were seen two years after their matric year, and the remaining 28% were seen one year after their matric year. Those who matriculated in 2014 could only be seen one year later during the Wave 4 2015 interviews. The table presents a breakdown of the sample by income tercile. It is evident that individuals from the middle-income and richest group were more likely to be seen only one year after their matric year, compared with their poorest counterparts. Appendix Table 7 compares the characteristics of those in the sample with those who were not seen within two years. The differences in characteristics reflect the pattern of attrition seen throughout the first four waves of the NIDS, whereby individuals from the richer income groups were more likely to drop out of the survey.

Socio-economic indicators at the time individuals are leaving school are expected to have an

7 Again, we restrict the sample to those who enrolled within two years in order to maximise the sample without allowing differences in the time to enrolment. Note that this analysis therefore addresses a particular question – factors related to enrolment within two years. It is possible that those who enrol three or more years after matric face different constraints. This is, however, beyond the scope of this paper.

impact on whether they enrol in post-secondary education or not. Parental education is usually used as a proxy of long-term socio-economic status, given that it can be assumed to be time-invariant. Household-income constraints at the point of exiting school, as well as other characteristics of the matriculant's household, can play a vital part in this decision. The NIDS, owing to its longitudinal nature, allows us to observe socio-economic information at this critical point in a young person's life. We therefore construct baseline socio-economic information for individuals based on their matric year, or a year prior to the matric year when the survey year did not align with the respondent's matric year.[8] Appendix Table 5 provides a summary of the gap between individuals' matric year and their 'base' year, which is the year in which their household-income data were collected. For 38% of individuals, we use household-income data from their matric year, with an additional 30% of individuals assigned the income data from the year prior to matric. The remaining 12% have income data two to five years prior to matric, and 20% have income data one year after the matric year.

The NIDS collects information on the name and location of educational institutions (both school and post-secondary) that respondents attend, as well as the geographical location of households in each wave. We supplement these data with administration data from the National Senior Certificate Examinations (NSCE) and a list of South African tertiary campuses. The NSCE data include information on matric results by subject and gender for all government schools for the years 2010 to 2013 and, for the purposes of this analysis, are used as an indicator of school quality. This school-level data was linked to the NIDS data using national Educational Management Information System (EMIS) number and matriculation year. The national EMIS numbers are school-level identifiers assigned by the government and are included in the NIDS secure data by matching the individual's school name and location. As the NSCE data only include results for 2010 to 2013, individuals who matriculated in the years 2007 to 2009 were assigned the matric results of their school in 2010 and, similarly, individuals who matriculated in 2014 were assigned the results of their school in 2013. This was done under the assumption that matric results would not vary substantially within three years for a particular school. Approximately 16% of our sample could not be matched to the NSCE data using their school information.

The list of South African tertiary campuses contains all public post-school institutions in South Africa. The data include campus-level location and contact information, including GPS coordinates. In addition, each institution is categorised under one of three college types: technical and vocational education and training (TVET) college, university, or university of technology. Merging NIDS post-secondary institution data with these data therefore allows us to look at the different types of post-secondary institutions that individuals enrol in, as well as distance between these institutions and individuals' residences in matric. Merging the NIDS data with the South African tertiary campuses data was done using a string matching method. The unmatched records were then matched manually to the list of South African tertiary campuses. The institutions that were matched to this data were classified as either a public university (including both universities and universities of technology) or a public TVET college. Based on online searches, the remaining records were categorised as private colleges, private TVETs, adult education and training centres, or secondary schools. The adult training centres and secondary schools were reclassified as missing for the purposes of our analysis, and the private colleges and TVETs were grouped together to form a third category, 'other'. However, some of these 'other' institutions (such as nursing colleges and social enterprises) were difficult to classify, as they did not always have official websites. Therefore, this category includes a fairly diverse range of non-public institutions – from wealthy private colleges to semi-formal training centres – which are likely to vary in size and quality.

8 For a subset of respondents (20%), we only have baseline information one year out of matric. For this group, we ensure that post-secondary enrolment is two years after matric to avoid using information affected by the post-secondary enrolment event.

Descriptive statistics

In our analysis, we look at the impact of individual, home-background and school-level characteristics at baseline (i.e. the closest year to the individual's matric year for which we have socio-economic data) on enrolment in our different post-secondary institution types. After restricting to matriculants seen within two years of matric in the panel, our sample consists of a total of 2 319 individuals. Of these, 226 were enrolled in university, 215 were enrolled in a public TVET, 208 were enrolled in another type of post-secondary institution (the 'other' category), and the remaining 1 670 were not enrolled in any form of post-secondary education within two years after matric. As discussed, the 'other' institution category consists of a fairly diverse range of private, post-secondary institutions. We therefore do not attempt to draw conclusions from the results for this category.

Table 4 provides a summary of means, standard deviations, and sample (N) values[9] for our sample's characteristics at baseline, by institution type. There is some variation in demographic make-up. The mean age at baseline is highest for the non-enrolled group, at almost 19 years. This suggests that people who repeat grades during their schooling, and therefore complete their matric later than expected, are less likely to enrol in any form of post-secondary institution. The TVET enrolees have a mean baseline age of 18.42 years, which is slightly lower than that of the non-enrolled group. However, it is also above the expected age in matric (which should be 17 to 18 years), suggesting that TVET enrolees also experience some grade repetition. University enrolees, in comparison, have a mean age of 17.71 years, which is far closer to the expected average age in matric, suggesting that this group of learners is unlikely to have repeated a grade by the time they finish secondary school. Looking at population group, we see that Africans have the highest representation in TVETs, while whites are most highly represented in universities. Overall, the racial composition of the non-enrolled group is not so dissimilar from the TVET group, especially when compared with the composition of the university group.

Next we look at home-environment variables at baseline, including household size, composition and income, and parental education. Once again, the TVET and non-enrolled groups look fairly similar in comparison with the university enrolees. TVET enrolees come from households that are slightly smaller in size and have only slightly higher income and parental-education levels than those of the non-enrolled group. University enrolees come from smaller households, have household incomes that are over three times higher, and parental-education levels over 2.5 years higher compared with those of both the TVET and non-enrolled groups.

The TVET enrolees and non-enrolled group also have fairly similar geographical origins, with fairly equal proportions coming from urban and traditional (rural) areas, respectively. University enrolees, on the other hand, are more likely to come from urban areas, with less than a third coming from rural areas. Looking at the median distance from baseline household to the learner's school, we see that TVET enrolees and those who do not enrol for post-secondary studies attend secondary schools relatively close to their homes compared with those who enrol at university.

The next section of the Table 4 summarises individual school outcomes and expenditure information. The numeracy-test scores come from Wave 1 (2008) of the NIDS data. In Wave 1, all 12- to 59-year-olds were given the option to write a short numeracy test. There were four versions of the test, ranging in difficulty from Level 1 (easiest) to Level 4 (hardest). Respondents were assigned a particular level based on the highest grade they had reached in mathematics. However, in some cases, respondents opted to write an easier or harder test than the test assigned to them. Note that only 875 individuals, or 38% of our sample, have a test score. This is because, firstly, many individuals refused to write the test and, secondly, part of our

9 Note that the sample sizes differ across variables because not all variables are in both the adult and proxy questionnaire (a proxy questionnaire is completed on behalf of adults who are unavailable or unable to answer their own adult questionnaire), due to item non-response, and because some information (e.g. educational expenditure) was only collected for the year prior to the survey year.

sample consists of individuals who were not part of Wave 1. The test scores are provided only as z-scores in the data.

As one would expect, the average numeracy z-scores are highest for the university enrolees (0.002), followed by the TVET enrolees (–0.133), and lowest for the non-enrolled group (–0.545). One is able to compare the scores of TVET enrolees with scores of the non-enrolled group more confidently, as they tended to take tests of a similar difficulty level (relative to the maths grade they had attained), and also had similar test-completion rates. The result that TVET enrolees score higher on their tests compared with the non-enrolled group is important, as it suggests that individual mathematical ability, as measured at the end of secondary school, plays a role in TVET enrolment. Note that, at this point, we do not claim that these scores are a reflection of either scholastic or innate ability (or both), and it is likely that they are influenced by a variety of individual, school-quality, and home-background factors. In our regression analysis below, we attempt to separate out these different effects in more detail.

The grade-repetition trends mirror those for average age, as discussed earlier. University attendees are least likely to have repeated a grade (only 21% have repeated a grade by their matric year), while those not enrolled are most likely to have repeated a grade (61% have repeated a grade at least once). Those who enrol in TVETs are slightly less likely to have repeated a grade, compared with the non-enrolled group, with 53% having ever repeated. The mathematics grade reached is highest for those with university qualifications, and is slightly higher for the non-enrolled group, compared with TVET enrolees. However, the variations are small. As one would expect, school fees and expenditure levels are notably higher for university enrolees, suggesting that learners who can afford to attend more expensive schools, and have more money invested in their education overall, are more likely to enrol in university. The average school fee for TVET enrolees is slightly lower than for those not enrolled, yet not dissimilar. However, total school expenditure for TVET enrolees is far higher (at almost twice the amount of the non-enrolled group), which could be a reflection of parental willingness to invest more in their children's education.

The final section of the table presents a summary of school-level characteristics for the different groups, based on the secondary school attended during the matric year. The results show that both TVET enrolees and those not enrolled are more likely to have attended schools of poor quality, compared with university enrolees. Pass rates and average mathematics and English scores are fairly similar for TVET enrolees and the non-enrolled group, in comparison with university enrolees, who have higher pass rates and scores on average. The distribution of schools across former education departments is also not so dissimilar for the TVET- enrolled group and the non-enrolled group. However, one should be wary of the small sample sizes here. The ex-department of education variables indicate the department which governed the school under apartheid.[10] Government resources were distributed highly unequally between departments, and many schools that fell under former non-white departments still suffer from these historical disadvantages. Thus, the ex-department of education variables can be used as indicators of school quality to some extent. As with geographical location of household, university enrolees are more likely to have attended a school in an urban area, while TVET enrolees and those not enrolled are more likely to have attended a rural school.

Table 6 summarises costs, funding and distances associated with the different institution types. Bearing the small sample sizes in mind, Table 6 shows that university tuition fees are more than double those of TVETs, while average total educational expenditure on university study is around three times the average for TVETs. Thus, TVET fees make up a greater proportion of total expenses, compared with university fees. Financial constraints are therefore likely to be important in explaining enrolment gaps between these two institution types. It is also worth noting that the

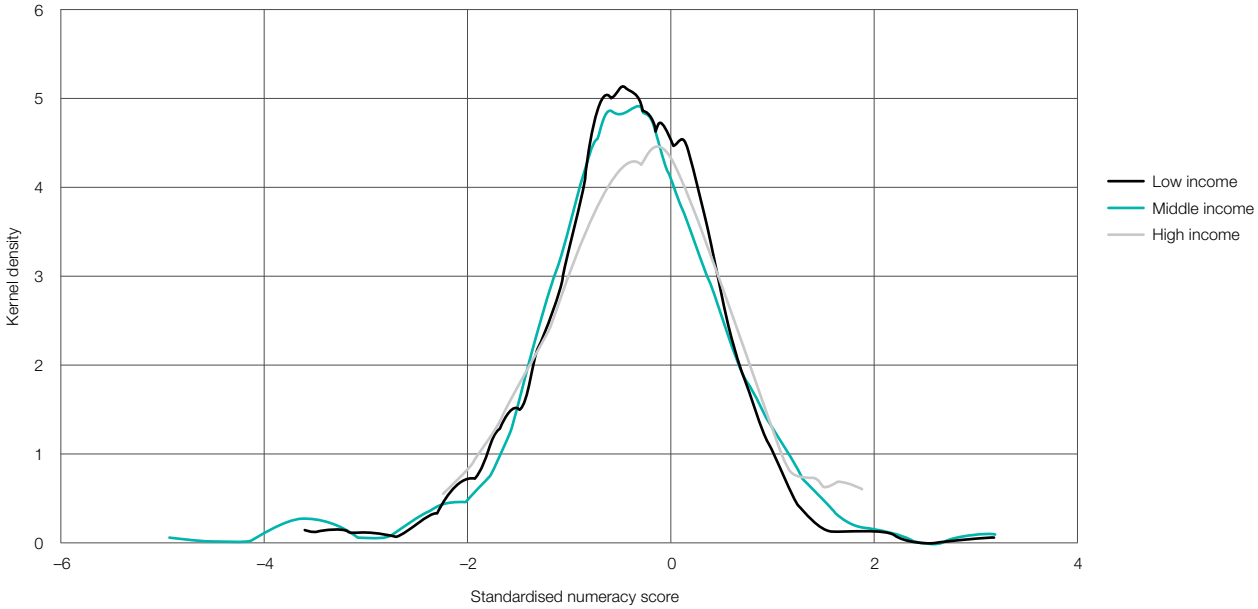
10 DET = Department of Education and Training (formerly black schools); HOR = House of Representatives (formerly Coloured schools); HOA = House of Assembly (formerly white schools); HOD = House of Delegates (formerly Indian schools); and New = new education department schools (established from 1994 onwards).

average TVET educational expenditure (almost R12 000 in total) is not insubstantial, even for households with average income levels. This is important, considering that full funding for TVETs is restricted to the poorest households. Around 32% of TVET enrolees have been awarded some form of bursary or scholarship, which is slightly less than awards to university enrolees. However, we cannot differentiate between merit- and means-based funding here. Finally, those who attend TVETs are, on average, further away from all institution types in the year they matriculate, making the cost of migrating to attend post-secondary education higher.

Our interest is in the relationship between income constraints, academic eligibility, and the post-secondary enrolment decision. Bearing in mind that only 38% of respondents (about 900) have test-score information, Figure 1 shows the distribution of standardised scores by household-income tercile. While the differences are not dramatic, the scores for the top income tercile (Tercile 3) are highest, followed by the middle tercile (Tercile 2) and the lower tercile (Tercile 1), respectively. In Figures 2a, 2b and 2c (one per institution type), we look at enrolment levels by test scores for each income tercile, and overall. University enrolment has a clear, positive relationship with the test scores overall. The relationship between score and university enrolment is fairly linear for the richest income group, with enrolment higher at each score level than for those in the middle- or lowest-income group. The relationship between enrolment and test score is most noteworthy in the low-income group. In this group, we see close to zero enrolment until two standard deviations below the mean and a gradual increase until about one standard deviation from the mean. Thereafter, enrolment increases rapidly, with scores reaching levels similar to those in the richest group by score levels 1.8 standard deviations above the mean. Interestingly, we see no relationship between enrolment and test scores in the middle-income group. These differences in patterns of enrolment for income groups could be explained by current funding policies. These dictate that those in the middle of the income distribution miss out on educational opportunities, as their incomes are not low enough to qualify for means-based government funding but, at the same time, are not high enough to qualify for private loans (the 'missing middle').

The graph for TVET enrolment by scores also shows a rise in enrolment with higher scores. However, the trends by tercile reflect different patterns. Unlike university enrolment, for the middle-income tercile, enrolment in TVETs

Figure 1: Kernel density graph of standardised numeracy score by income tercile

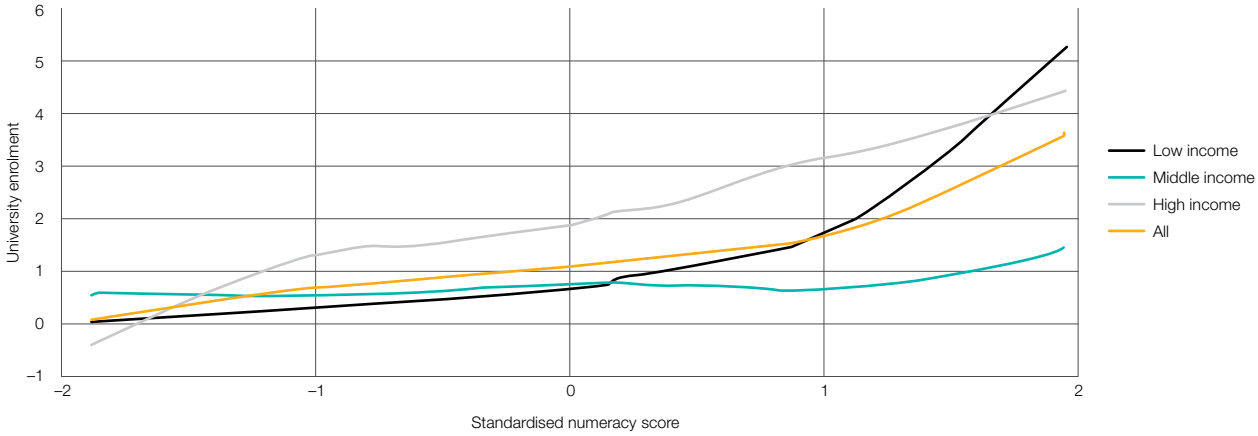


Data source: NIDS, Waves 1–4.

Notes: Graph includes individuals in our sample who wrote the numeracy test in Wave 1; post-stratification weights for the individual's baseline wave have been used.

Figures 2a-c: Proportion enrolling in each post-secondary institution type out of full sample, by standardised score, for each income tercile:

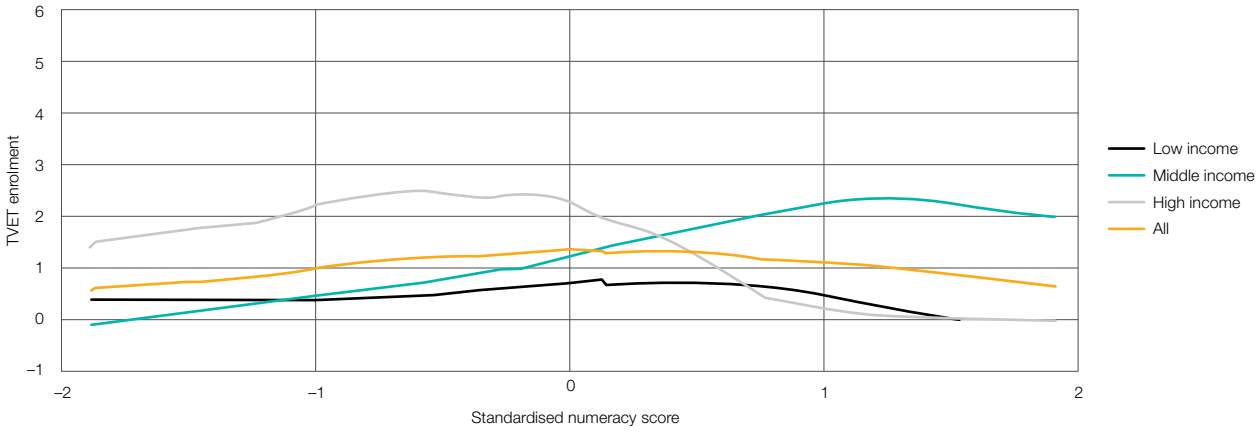
Figure 2a: University enrolment by numeracy-test score and income tercile



Data source: NIDS, Waves 1–4.

Notes: Graph includes individuals in our sample who wrote the numeracy test in Wave 1; individuals with scores more than two standard deviations above or below the mean have been excluded; post-stratification weights for the individual's baseline wave have been used.

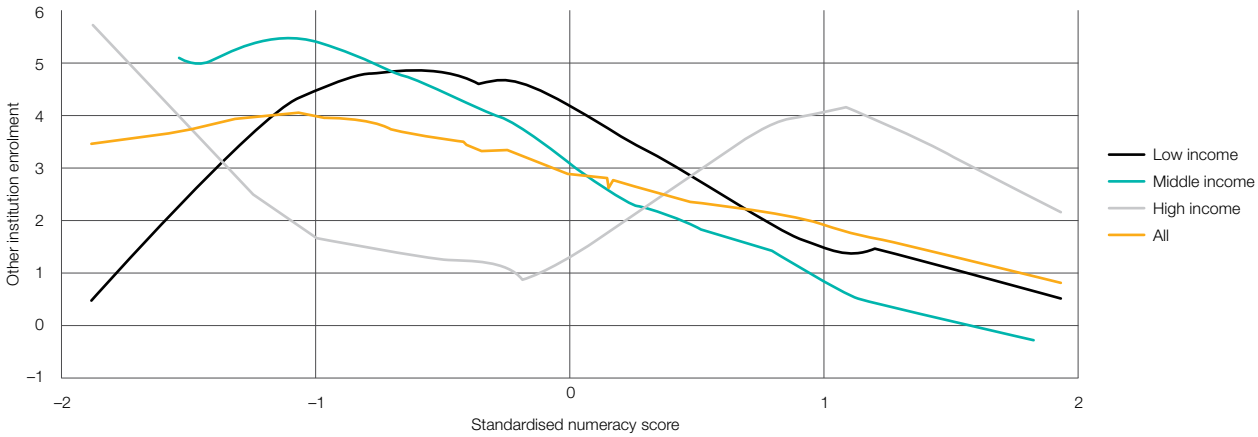
Figure 2b: TVET enrolment by numeracy-test score and income tercile



Data source: NIDS, Waves 1–4.

Notes: Graph includes individuals in our sample who wrote the numeracy test in Wave 1; individuals with scores more than 2 standard deviations above or below the mean have been excluded; post stratification weights for the individual's baseline wave have been used.

Figure 2c: Other institution enrolment by numeracy-test score and income tercile



Data source: NIDS, Waves 1–4.

Notes: Graph includes individuals in our sample who wrote the numeracy test in Wave 1; individuals with scores more than two standard deviations above or below the mean have been excluded; post-stratification weights for the individual's baseline wave have been used.

increases with higher scores, adding credence to the 'missing middle' university-enrolment theory. Enrolment levels for the richest tercile first increase and then decrease. This likely reflects that, when scores are above a certain level, learners choose to enrol in university instead of TVETs – a pattern also seen among high-scoring, lowest-tercile learners. Finally, enrolment levels in TVET are low across scores for the poorest income group, suggesting that credit constraints may be preventing capable individuals from enrolling in TVET colleges.

The third graph in this series shows enrolment in other institutional types by score. The spiky pattern likely reflects the heterogeneity of this group. However, overall, the proportion enrolled in other institutions does appear to fall as test scores rise.

Regression analysis

Table 7 presents the results for six multinomial logit regressions. The dependent variable is institution type (university, TVET, other, and not enrolled), and the explanatory variables consist of the individual, household, and school-level characteristics described in the section above. Our base category for the dependent variable in all regressions is the non-enrolled group. The coefficients thus indicate the relationship between the explanatory variables and enrolment in a particular institution type, compared with not enrolling in any form of post-secondary education. The first regression includes school outcome only, which is proxied by the grade-repetition dummy and highest mathematics grade reached. In the second regression, we add log per capita household income, and, in each subsequent regression, additional controls are added, including demographics and school- and household-level characteristics.

In the first two regressions, the dummy variable for 'ever repeated' is highly significant in explaining enrolment in all three institution types. The results indicate that having repeated at least one grade during school reduces the probability of enrolling in any kind of post-secondary education, and more so for university than other institution types. Grade repetition becomes insignificant for TVET and other enrolment when other socio-economic controls are added, suggesting that there is no direct relationship. In other words, grade repetition may be a by-product of coming from disadvantaged home backgrounds and attending poor schools. This finding is also consistent with evidence that shows that grade repetition is a noisy signal of educational ability in South Africa, in particular in poorly resourced schools (Lam et al. 2011).

Household income in the matric year is strongly related to enrolment in any institution type, even after controlling for other socio-economic and school-level characteristics. The coefficients are higher for university enrolment compared with TVET enrolment, suggesting that household income is a more important factor in determining university enrolment than TVET enrolment. This is not surprising, considering that universities have the highest tuition fees. Thus, the results suggest that short-term family income is important in the enrolment decision, over and above long-term family wealth (proxied by parental education) and school quality. Note that the income coefficient for explaining TVET enrolment generally decreases in magnitude as we add in the controls. This is likely due to the correlation between short-term income and the demographic, home background, as well as school-level variables. Nevertheless, the fact that short-term income remains significant throughout is of most relevance to our analysis, as it provides strong evidence that matriculants who come from families with low levels of family income will be less likely to enrol in TVETs.

In Table 8, we rerun the six regressions with the addition of the numeracy-test scores and an indicator for the absence of test-score information.[11] When controlling for demographic, home background, and school-level factors, one could argue that the scores reflect the impact of individual ability on enrolment to some extent. Interestingly, along with grade repetition, the test scores are highly significant in explaining enrolment in both university and TVET, as opposed

11 Appendix Table 7 replicates the results restricting the sample to those with test scores only. We find substantively similar results to those presented in Table 8.

to not enrolling in any post-secondary institution. Furthermore, they remain significant even when adding in income, socio-economic, and school-level controls. The scores, however, are not significant for the 'other' category, perhaps due to the heterogeneity in this group. These results suggest that individual ability, *independent of home-background and school-quality measures*, is important in post-secondary enrolment for both university and TVET.

When household income is added, the coefficient on the scores for university enrolees falls slightly, while, for TVET enrolees, it remains unchanged. In other words, some of the relationship between ability and enrolling in university is explained away by household income, but not for enrolling in TVETs. This continues as home background and school variables are added, such that the score coefficients for the university and TVET groups gradually converge.

4. DISCUSSION AND CONCLUSION

The following results from our analysis should be highlighted:

1. In terms of many of the average baseline socio-economic characteristics, TVET enrolees do not look substantially different from those who do not attend any form of post-secondary education within two years of finishing school. Their test scores are, however, higher, and household incomes marginally lower.

2. Household income during the matric year is highly significant in explaining enrolment in universities and TVETs, even after controlling for longer-run socio-economic background and school-quality variables.

3. Individual ability (as measured by the test scores) is also important in explaining enrolment in both universities and TVETs, even after controlling for socio-economic background and school-quality variables.

These are important results for a number of reasons. Firstly, the finding that short-term credit constraints are a significant factor in explaining enrolment in TVETs (and universities) could suggest that current funding opportunities are insufficient. Thus, increasing enrolment capacity at TVETs would not be enough to increase enrolment headcounts. Secondly, while a simultaneous increase in funding opportunities appears needed, it will not necessarily solve the problem of low TVET enrolment levels, given that learners who enrol in TVETs are currently of higher ability levels than those who do not enrol. Could this finding suggest that learners with lower levels of ability or school outcomes are currently being excluded from TVETs? If these institutions are being evaluated according to their students' success rates, it is possible that TVETs are purposefully selecting the highest-achieving learners from schools in order to improve overall outcomes. An alternate explanation could be that learners with lower levels of scholastic ability are not as motivated academically and are less likely to enrol in an education sector that is difficult to understand, is relatively unknown and is less highly regarded within the post-secondary system.

While our analysis does not focus directly on the current debate surrounding free university education, our findings do hold some relevance in relation to this issue. Our multivariate analysis shows that credit constraints do bind in the decision to enrol at university. However, two additional pieces of information in the descriptive tables suggest that directing funds towards free university education may have a more limited impact on total post-schooling enrolment numbers than expected. Firstly, in Table 5, we show that average household incomes in matric for those who enrol at university are over three times the incomes[12] of those who enrol in TVET or do not enrol in post-secondary education. Secondly, Appendix Table 2 shows that, of those 25- to 29-year-olds who have attained Grade 12 or higher, only around 8% have a matric exemption as their highest level of education, indicating that the vast majority of matriculants achieving exemptions – the requirement for entry into most university courses – go on to complete a college or university qualification. Therefore, alleviating the financial constraint may have a limited impact on expanding the number of students enrolled in post-secondary education and rather just shift the distribution between TVET and university and hence on national education-attainment levels. If this is the case, our findings suggest that it would be more effective in terms of equity to direct funds towards university and, in particular, TVET bursaries, as well as to improve the match between the skill

12 Note that the lower 95% confidence bound on the university estimate is twice the higher bound on the TVET estimate.

set of the school-leaving population and the level of academic preparedness required for college entry, both of which are critical for ensuring an effective and socially beneficial expansion of this sector. That said, we recognise that these findings abstract away from the supply-side challenges faced by the TVET sector, which, if not dealt with, would limit, if not eliminate, the effectiveness of these suggestions.

Recommendations for future research

1. In this paper, we look only at enrolment levels. With additional waves of data, we will also be able to look at success rates in both universities and TVET colleges.
2. As our panel of enrolees progresses through college, it will be important to monitor how TVET graduates are being absorbed into the labour market, via their employment rates and earnings. This will help to assess the degree to which there is a shortage of mid-level skills in the economy, as well as which particular skills categories are in high demand. Coding all post-school educational institutions in the NIDS will be invaluable to this process.
3. More detailed information on matric results will be valuable for analysing the impact of secondary school outcomes on post-secondary enrolment more accurately, particularly with regard to selection criteria.

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Table 1: Returns to education level for 25- to 59-year-olds

Educational level	NIDS W1	NIDS W2	NIDS W3	NIDS W4
Grade 10	0.361*** [0.079]	0.270*** [0.081]	0.0155 [0.065]	0.250*** [0.060]
Grade 11	–0.0768 [0.068]	0.112 [0.069]	0.271*** [0.056]	0.0556 [0.051]
Grade 12	0.660*** [0.059]	0.495*** [0.059]	0.410*** [0.049]	0.418*** [0.042]
Post-matric diploma/certificate	0.498*** [0.050]	0.332*** [0.047]	0.398*** [0.039]	0.442*** [0.034]
University degree	0.637*** [0.067]	0.738*** [0.063]	0.747*** [0.053]	0.843*** [0.047]
Observations	2 486	2 894	3 520	4 759
R-squared	0.588	0.526	0.530	0.508

Data source: NIDS, Waves 1-4.

*Notes: 'Post-matric diploma/certificate' includes a certificate or diploma that requires a Grade 12 qualification. 'University degree' includes a bachelor's degree, bachelor's degree and diploma, honours degree, and higher degree (masters, doctorate) from traditional universities, comprehensive universities, and universities of technology. Standard errors in brackets; significance levels: *** p<0.01, ** p<0.05, * p<0.1; regressions are restricted to individuals aged 25 to 59 for each wave; regressions also include race, age, age squared, gender, dummies for Grades 1 to 9, and province dummies; the coefficient is the return relative to the next-lower level – thus, the coefficient on university degree is the extra returns from this level of education relative to a post-matric diploma/certificate; post-stratification weights are used for each wave.*

Table 2: Educational attainment of 25- to 29-year-olds

	All			African			Coloured			Indian			White		
Educational enrolment	2009–2010	2011–2012	2013–2014	2009–2010	2011–2012	2013–2014	2009–2010	2011–2012	2013–2014	2009–2010	2011–2012	2013–2014	2009–2010	2011–2012	2013–2014
% currently enrolled in higher education	7%	7%	7%	7%	7%	8%	5%	6%	6%	7%	6%	6%	18%	15%	14%
% of those in higher education enrolled in University or University of Technology	62%	61%	58%	52%	55%	55%	54%	47%	45%	63%	59%	52%	80%	91%	82%
% of those in higher education who are enrolled in FET	22%	23%	31%	35%	35%	35%	29%	40%	45%	17%	31%	33%	10%	7%	11%
% of those in higher education who are enrolled in other college	16%	16%	11%	13%	10%	10%	17%	14%	11%	20%	10%	15%	10%	2%	7%
Observations	39 623	20 248	37 141	18 079	35 762	17 565	33 696	31 373	30 075	3 808	3 666	3 728	746	673	525

Data source: NIDS, Waves 1–4.

Notes: 'Post-matric diploma/certificate' includes a certificate or diploma that requires a Grade 12. 'University degree' includes a bachelor's degree, bachelor's degree and diploma, honours degree, and higher degree (masters, doctorate) from traditional universities, comprehensive universities, and universities of technology. Post-stratification weights are used for each wave.

Table 3: Enrolment in higher education for 15- to 24-year-olds with Grade 9, by year (2009–2014)

	ALL						African						Coloured						Indian						White					
Educational enrolment	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
% not enrolled	84%	85%	85%	84%	84%	83%	87%	87%	87%	86%	86%	85%	87%	87%	89%	87%	90%	89%	68%	76%	73%	78%	81%	76%	62%	67%	63%	63%	65%	55%
% enrolled in public university or university of technology	7%	6%	7%	6%	7%	7%	5%	5%	5%	4%	5%	5%	7%	6%	5%	6%	5%	5%	13%	16%	18%	13%	10%	12%	20%	18%	22%	23%	25%	28%
% enrolled in public college	3%	3%	3%	5%	5%	5%	3%	3%	4%	5%	6%	6%	3%	4%	3%	3%	3%	4%	1%	4%	0%	3%	1%	0%	0%	1%	1%	1%	2%	2%
% enrolled in private university or university of technology	4%	3%	3%	2%	2%	2%																								
% enrolled in private college	3%	2%	2%	3%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	1%	2%	2%	1%	4%	2%	0%	0%	3%	4%	7%	3%	4%	3%	3%	4%
Observations	7 645	8 677	7809	7 610	7 813	7 597	6 093	6 937	6 246	6 075	6 229	6 098	966	1 052	959	923	974	930	226	241	197	196	182	170	360	447	407	416	428	399

Data source: General Household Survey, 2009–2014.

Notes: All individuals aged 15 to 24 with at least a Grade 9 but who were not enrolled in school, adult education/training, literacy classes or home schooling in the relevant year, are included. Post-stratification weights are used for each year.

Table 4: Enrolment in higher education for 15- to 24-year-olds with a matric or above, by year (2009–2014)

	ALL						African						Coloured						Indian						White					
Educational enrolment	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
% not enrolled	75%	77%	76%	76%	77%	75%	78%	80%	79%	78%	78%	78%	78%	80%	80%	78%	83%	81%	65%	74%	70%	76%	80%	72%	58%	63%	59%	61%	62%	53%
% enrolled in public university or university of technology	12%	10%	11%	10%	12%	12%	9%	8%	9%	7%	9%	9%	13%	10%	9%	10%	8%	8%	15%	18%	20%	15%	11%	14%	23%	21%	25%	25%	28%	31%
% enrolled in public college	4%	4%	5%	6%	6%	6%	5%	5%	5%	7%	8%	8%	2%	5%	5%	5%	5%	6%	2%	4%	1%	2%	1%	0%	0%	1%	2%	1%	2%	2%
% enrolled in private university or university of technology	6%	5%	5%	4%	3%	3%																								
% enrolled in private college	4%	4%	3%	4%	3%	3%	4%	4%	3%	5%	3%	3%	3%	2%	2%	3%	2%	2%	5%	1%	1%	0%	3%	5%	8%	4%	4%	3%	3%	4%
Observations	4 317	5 018	4 476	4 297	4 481	4 509	3 315	3 853	3 470	3 259	3 397	3 466	516	566	479	495	547	536	186	211	174	176	157	149	300	388	353	367	380	*358*

Data source: General Household Survey, 2009–2014.

Notes: All individuals aged 15 to 24 with at least a Grade 12 are included. Post-stratification weights are used for each year.

Table 5: Entry characteristics by institution type

	University (N=226)			Public TVET (N=215)			Other (N=208)			No Post Schooling (N=1670)		
Entrance characteristics	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**
Demographics:												
Age in matric year	17.711	1.586	226	18.428	2.294	215	18.173	1.925	208	18.922	2.398	1 670
Female	0.581	0.494	226	0.575	0.495	215	0.678	0.468	208	0.546	0.498	1 670
African	0.726	0.447	226	0.949	0.220	215	0.920	0.272	208	0.884	0.321	1 670
Coloured	0.091	0.288	226	0.044	0.206	215	0.007	0.086	208	0.063	0.242	1 670
Indian	0.042	0.200	226	0.001	0.029	215	0.014	0.119	208	0.028	0.165	1 670
White	0.141	0.349	226	0.006	0.076	215	0.058	0.235	208	0.026	0.159	1 670
Home (in matric year):												
Household size	5.078	2.439	226	6.027	2.575	215	5.499	3.392	208	6.369	3.450	1 670
Number age 6–18	1.968	1.275	226	2.175	1.265	215	2.028	1.541	208	2.267	1.674	1 670
Number age 19–22	0.506	0.709	226	0.704	0.771	215	0.802	0.792	208	0.965	0.843	1 670
Grant income	0.387	0.488	226	0.662	0.474	214	0.478	0.501	206	0.647	0.478	1 662
Household income	3 786.32	5 310.23	226	1 140.49	2 060.40	215	2 198.18	3 644.32	208	972.43	1 752.73	1 670
Mother's education	10.410	4.207	222	7.824	3.864	209	9.414	3.901	201	7.149	4.308	1 609
Father's education	10.421	3.827	145	7.707	4.431	137	8.874	4.349	125	6.593	4.693	934
Geographical type:												
Traditional	0.306	0.462	226	0.478	0.501	215	0.304	0.461	207	0.507	0.500	1 670
Urban	0.679	0.468	226	0.506	0.501	215	0.692	0.463	207	0.466	0.499	1 670
Farm	0.014	0.120	226	0.016	0.126	215	0.004	0.064	207	0.027	0.163	1 670
Proximity to school in matric:												
Distance to school attended (Median)	4.598	200.84	194	2.179	1 060.70	182	3.662	641.85	166	2.865	414.47	1 445

**The median rather than the mean has been reported for this variable, for all categories.*

Table 5: Entry characteristics by institution type (continued)

	University (N=226)			Public TVET (N=215)			Other (N=208)			No Post Schooling (N=1670)		
Entrance characteristics	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**
Individual educational outcome and expenditure												
Numeracy Z-score	0.002	0.990	93	-0.133	0.825	81	-0.358	0.859	70	-0.545	0.926	631
Test difficulty level relative to required	0.127	0.512	93	-0.110	0.757	81	-0.211	0.842	70	-0.110	0.886	631
No test completed	0.538	0.500	226	0.527	0.500	215	0.561	0.497	208	0.506	0.500	1 670
Ever repeated	0.213	0.411	222	0.527	0.500	212	0.532	0.500	203	0.606	0.489	1 644
Highest grade took maths	9.985	2.930	222	9.414	3.274	210	10.190	2.306	206	9.662	2.842	1 633
School fees	3 696.05	6 516.29	201	568.19	1 482.16	187	2 264.64	4 430.71	183	610.76	2307.44	1 402
No school fees paid	0.343	0.476	143	0.688	0.465	151	0.487	0.502	119	0.599	0.490	1 027
Total school expenditure	5 095.43	8 442.25	146	2 806.59	5 992.23	147	3 819.89	6 110.07	135	1 489.96	3 389.77	1 107
Matric school charactatistics												
% of matriculants that wrote the exam	0.975	0.036	187	0.955	0.131	183	0.974	0.041	168	0.965	0.067	1 408
% who passed of those who wrote	0.813	0.200	187	0.679	0.194	182	0.705	0.197	168	0.656	0.219	1 407
% of entrants who pass	0.796	0.205	187	0.650	0.209	183	0.688	0.199	168	0.636	0.221	1 408
% who wrote maths of total wrote matric	0.414	0.229	187	0.340	0.205	181	0.338	0.230	165	0.295	0.210	1 394
% who wrote maths rather than maths literacy	0.463	0.231	186	0.407	0.234	183	0.429	0.262	168	0.371	0.235	1 406
Average maths score	45.457	11.720	185	37.383	8.986	177	40.405	10.482	166	37.977	10.342	1 372
Average English score (First additional)	55.014	9.515	160	49.978	5.402	174	50.505	8.677	160	49.408	6.605	1 348
Average English score (Home Language)	59.811	9.290	56	50.269	6.446	17	54.384	8.763	31	53.080	8.224	151
Independent homelands	0.120	0.325	189	0.110	0.313	180	0.203	0.403	163	0.123	0.329	1 423
Self-governing territories	0.196	0.398	189	0.390	0.489	180	0.206	0.406	163	0.373	0.484	1 423
DET	0.160	0.368	189	0.300	0.460	180	0.290	0.455	163	0.233	0.423	1 423
HOA	0.173	0.379	189	0.073	0.261	180	0.059	0.236	163	0.047	0.211	1 423
HOR	0.072	0.259	189	0.047	0.213	180	0.063	0.243	163	0.076	0.265	1 423
HOD	0.086	0.281	189	0.014	0.117	180	0.013	0.113	163	0.020	0.139	1 423
WCED, TED, CED, FED	0.074	0.263	189	0.005	0.071	180	0.036	0.187	163	0.022	0.148	1 423
New	0.110	0.313	189	0.053	0.225	180	0.131	0.339	163	0.105	0.307	1 423
INDEP	0.010	0.100	189	0.007	0.085	180	0.000	0.000	163	0.000	0.013	1 423
Urban school	0.596	0.492	145	0.375	0.486	147	0.561	0.498	125	0.404	0.491	1 167

Data source: NIDS, Waves 1–4.

Notes: The table includes all matriculants seen within two years of their matric year in the panel; entrance characteristics are taken from the closest year to the individual's matric year for which we have socio-economic data; 'university' includes traditional universities, comprehensive universities, and universities of technology; 'TVET' refers to public technical and vocational education and training college; the 'other' category includes private colleges and TVETs; post-stratification weights for the individual's baseline wave have been used.

Table 6: Cost and funding by institution type

	University (N=226)			Public TVET (N=215)			Other (N=208)		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Cost (in rand)									
Tuition fees	17 678.29	16 987.96	114	7 462.86	19 419.27	88	12 343.49	17 860.13	104
Total educational expediture	35 497.66	82 787.83	91	11 989.63	2 2431.53	80	17 906.64	21 095.50	85
Funding									
Bursary/Scholarship	0.376	0.487	116	0.318	0.468	90	0.139	0.347	97
NGO pays fees	0.019	0.138	115	0.063	0.245	90	0.020	0.140	97
Bursary/scholarships or NGO pays fees	0.388	0.489	116	0.364	0.484	90	0.141	0.350	97
Physical access (in km) in matric									
Distance to Public TVET or University	11.240	14.720	218	15.723	16.999	203	12.324	14.774	199
Distance to Public University	39.405	44.801	218	51.079	43.174	203	42.290	45.543	199
Distance to Public TVET	12.900	15.511	218	17.053	17.990	203	13.430	15.591	199
Distance to Public UoT	98.763	106.646	218	115.159	97.829	203	119.185	113.521	199

Data source: NIDS, Waves 1–4.

Notes: The table includes all matriculants seen within two years of their matric year in the panel and who were enrolled in post-secondary education; physical access in matric is based on the location of their household in the closest year to the individual's matric year for which we have socio-economic data; 'university' includes traditional universities, comprehensive universities, and universities of technology; 'TVET' refers to public technical and vocational education and training college; the 'other' category includes private colleges and TVETs; post-stratification weights for the individual's baseline wave have been used.

Table 7: Multinomial logit regressions of the probability of enrolling, by institution type

Variables	Uni	TVET	Other	Uni	TVET	Other	Uni	TVET	Other
Ever repeated	–1.591***	–0.525***	–0.515***	–1.427***	–0.464***	–0.425***	–1.223***	–0.203	–0.270
	(0.169)	(0.148)	(0.150)	(0.172)	(0.150)	(0.153)	(0.192)	(0.171)	(0.176)
Log income – mean 0				0.663***	0.295***	0.442***	0.734***	0.395***	0.551***
				(0.0716)	(0.0731)	(0.0726)	(0.0806)	(0.0795)	(0.0799)
Controls									
Age, sex, race	No	No	No	No	No	No	Yes	Yes	Yes
Matric school characteristics	No	No	No	No	No	No	No	No	No
Parental education & household size	No	No	No	No	No	No	No	No	No
Distance to PSET in matric	No	No	No	No	No	No	No	No	No
Constant	–1.885***	–1.591***	–2.187***	–1.786***	–1.514***	–2.090***	0.657	0.928	–0.583
	(0.294)	(0.247)	(0.291)	(0.299)	(0.248)	(0.294)	(0.777)	(0.718)	(0.747)
Observations	2 265	2 265	2 265	2 264	2 264	2 264	2 264	2 264	2 264
Pseudo R–squared	0.0301	0.0301	0.0301	0.0584	0.0584	0.0584	0.0748	0.0748	0.0748

Variables	Uni	TVET	Other	Uni	TVET	Other	Uni	TVET	Other
Ever repeated	–1.168***	–0.210	–0.275	–1.161***	–0.212	–0.254	–1.159***	–0.181	–0.232
	(0.194)	(0.172)	(0.177)	(0.196)	(0.174)	(0.178)	(0.197)	(0.175)	(0.179)
Log income – mean 0	0674***	0.384***	0.530***	0.493***	0.334***	0.366***	0.469***	0.298***	0.329***
	(0.0831)	(0.0822)	(0.0822)	(0.0917)	(0.0889)	(0.0892)	(0.0892)	(0.0899)	(0.0904)
Controls									
Age, sex, race	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matric school characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental education & household size	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Distance to PSET in matric	No	No	No	No	No	No	Yes	Yes	Yes
Constant	1.038	0.723	–0.587	0.193	0.0391	–1.712**	0.634	0.788	–0.991
	(0.793)	(0.741)	(0.760)	(0.874)	(0.799)	(0.842)	(0.903)	(0.831)	(0.864)
Observations	2 264	2 264	2 264	2 264	2 264	2 264	2 264	2 264	2 264
Pseudo R–squared	0.0879	0.0879	0.0879	0.101	0.101	0.101	0.108	0.108	0.108

Data source: NIDS, Waves 1-4.

*Notes: Standard errors in brackets; significance levels: *** p<0.01, ** p<0.05, * p<0.1; the regressions include all matriculants seen within two years of their matric year in the panel; the base category for the dependent variable in all regressions is the non-enrolled group – therefore, the coefficients indicate the relationship between the explanatory variables and enrolment in a particular institution type, compared with not enrolling in any form of post-secondary education; controls are taken from the closest year to the individual's matric year for which we have socio-economic data; matric school characteristics include: dummy for unmatched schools; dummies for ex-department of education in respect of secondary school, and matric pass rate at secondary school; additional controls in all regressions include: highest grade taken in maths; 'university' includes traditional universities, comprehensive universities, and universities of technology; 'TVET' refers to public technical and vocational education and training college; the 'other' category includes private colleges and TVETs.*

Table 8: Multinomial logit regressions of the probability of enrolling, by institution type (including numeracy score)

Variables	Uni	TVET	Other	Uni	TVET	Other	Uni	TVET	Other
Numeracy z-score	0.471***	0.330**	0.0150	0.426***	0.330**	0.0192	0.457***	0.339**	0.0483
	(0.141)	(0.142)	(0.145)	(0.143)	(0.142)	(0.145)	(0.144)	(0.143)	(0.146)
Ever repeated	–1.561***	–0.508***	–0.519***	–1.400***	–0.448***	–0.429***	–1.200***	–0.183	–0.262
	(0.169)	(0.149)	(0.150)	(0.173)	(0.150)	(0.153)	(0.193)	(0.172)	(0.176)
Log income – mean 0				0.670***	0.294***	0.434***	0.740***	0.392***	0.543***
				(0.0724)	(0.0734)	(0.0729)	(0.0811)	(0.0797)	(0.0802)
Controls									
Age, sex, race	No	No	No	No	No	No	Yes	Yes	Yes
Matric school characteristics	No	No	No	No	No	No	No	No	No
Parental education & household size	No	No	No	No	No	No	No	No	No
Distance to PSET in matric	No	No	No	No	No	No	No	No	No
Constant	–1.730***	–1.537***	–2.397***	–1.555***	–1.434***	–2.242***	0.817	0.965	–0.684
	(0.313)	(0.272)	(0.324)	(0.319)	(0.274)	(0.326)	(0.788)	(0.721)	(0.747)
Observations	2 265	2 265	2 265	2 264	2 264	2 264	2 264	2 264	2 264
Pseudo R–squared	0.0357	0.0357	0.0357	0.0638	0.0638	0.0638	0.0805	0.0805	0.0805

Variables	Uni	TVET	Other	Uni	TVET	Other	Uni	TVET	Other
Numeracy z-score	0.422***	0.336**	0.0468	0.392***	0.327**	0.0305	0.383***	0.317**	0.0177
	(0.146)	(0.143)	(0.144)	(0.146)	(0.143)	(0.143)	(0.146)	(0.143)	(0.143)
Ever repeated	–1.143***	–0.192	–0.271	–1.136***	–0.189	–0.250	–1.133***	–0.160	–0.230
	(0.196)	(0.173)	(0.177)	(0.197)	(0.174)	(0.179)	(0.198)	(0.175)	(0.180)
Log income – mean 0	0.684***	0.381***	0.523***	0.510***	0.333***	0.358***	0.486***	0.298***	0.322***
	(0.0836)	(0.0825)	(0.0826)	(0.0918)	(0.0890)	(0.0897)	(0.0924)	(0.0900)	(0.0908)
Controls									
Age, sex, race	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matric school characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental education & household size	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Distance to PSET in matric	No	No	No	No	No	No	Yes	Yes	Yes
Constant	1.201	0.753	–0.688	0.366	0.0429	–1.844**	0.812	0.801	–1.140
	(0.805)	(0.745)	(0.762)	(0.887)	(0.803)	(0.844)	(0.916)	(0.837)	(0.867)
Observations	2 264	2 264	2 264	2 264	2 264	2 264	2 264	2 264	2 264
Pseudo R–squared	0.0933	0.0933	0.0933	0.106	0.106	0.106	0.112	0.112	0.112

Data source: NIDS, Waves 1–4.

*Notes: Standard errors in brackets; significance levels: *** p<0.01, ** p<0.05, * p<0.1; the regressions include all matriculants seen within two years of their matric year in the panel; the base category for the dependent variable in all regressions is the non-enrolled group – therefore, the coefficients indicate the relationship between the explanatory variables and enrolment in a particular institution type, compared with not enrolling in any form of post-secondary education; controls are taken from the closest year to the individual's matric year for which we have socio-economic data; matric school characteristics include: dummies for ex-department of education in respect of secondary school, and matric pass rate at secondary school; additional controls in all regressions include: missing dummies; highest grade taken in maths, a dummy for no test score, and the difference between numeracy-test level taken and recommended level; 'university' includes traditional universities, comprehensive universities, and universities of technology; 'TVET' refers to public technical and vocational education and training college; the 'other' category includes private colleges and TVETs.*

APPENDIX

Appendix Table 1: Returns to education level, South Africa men and women aged 25 to 59 (2009–2014)

Educational level	2009	2010	2011	2012	2013	2014
Grade 10	0.204*** [0.034]	0.152*** [0.037]	0.145*** [0.039]	0.149*** [0.038]	0.183*** [0.039]	0.232*** [0.040]
Grade 11	0.0482 [0.030]	0.0640** [0.032]	0.131*** [0.034]	0.0847*** [0.032]	0.0772** [0.034]	0.0545* [0.033]
Grade 12	0.448*** [0.025]	0.447*** [0.027]	0.412*** [0.028]	0.385*** [0.027]	0.470*** [0.028]	0.399*** [0.027]
Post-matric diploma/certificate	0.759*** [0.027]	0.769*** [0.030]	0.753*** [0.031]	0.752*** [0.032]	0.696*** [0.033]	0.658*** [0.032]
University degree	0.400*** [0.042]	0.392*** [0.047]	0.432*** [0.046]	0.272*** [0.049]	0.404*** [0.049]	0.539*** [0.048]
Observations	12 056	11 550	11 624	11 543	11 683	11 444
R-squared	0.481	0.438	0.431	0.379	0.388	0.367

Data source: South Africa General Household Survey 2009–2014.

*Notes: 'Post-matric diploma/certificate' includes N4/NTC 4, N5/NTC 5, N6/NTC 6, certificate or diploma with Grade 12, higher diploma (technikon/university of technology), and post higher diploma (technikon/university of technology masters, doctorate); 'University degree' includes bachelor's degree, bachelor's degree and postgraduate diploma, honours degree, and higher degree (masters, doctorate) from traditional universities, comprehensive universities, and universities of technology; standard errors in brackets; significance levels: *** p<0.01, ** p<0.05, * p<0.1; regressions are restricted to individuals aged 25 to 59 for each year; regressions also include race, age, age squared, gender, dummies for Grades 1 to 9, and province dummies; the coefficient is the return relative to next-lower level – thus, the coefficient on university degree is the extra returns from this level of education relative to a post-matric diploma/certificate; post-stratification weights for each year are used.*

Appendix Table 2: Educational attainment of 25- to 29-year-olds, by year (2009–2014)

Educational attainment	2009	2010	2011	2012	2013	2014
Less than Grade 9	17%	16%	14%	15%	14%	12%
Grade 9	9%	8%	9%	8%	7%	7%
Grade 10	13%	13%	13%	12%	13%	12%
Grade 11	16%	17%	16%	17%	16%	17%
Grade 12	35%	34%	37%	36%	37%	37%
Post-matric diploma/certificate	8%	9%	8%	9%	8%	10%
University degree	2%	4%	3%	3%	4%	5%
At least Grade 12	45%	46%	49%	48%	49%	51%
Beyond Grade 12	11%	12%	12%	13%	13%	15%
% of Grade 12s going further	23%	27%	24%	26%	26%	29%
% of Grade 12s completing university degree	5%	8%	7%	7%	9%	9%
% of Grade 12s who do not go further but have an exemption	13%	8%	7%	5%	6%	7%
Observation	7 498	7 780	7 728	7 653	7 655	7 515

Data source: South Africa General Household Survey 2009–2014.

Notes: 'Post-matric diploma/certificate includes N4/NTC 4, N5/NTC 5, N6/NTC 6, certificate or diploma with Grade 12, higher diploma (technikon/ university of technology), and post higher diploma (technikon/university of technology masters, doctorate); 'University degree' includes bachelor's degree, bachelor's degree and postgraduate diploma, honours degree, and higher degree (masters, doctorate) from traditional universities, comprehensive universities, and universities of technology. Post-stratification weights for each year are used. Note that the NIDS does not distinguish between a matric with or without exemption; therefore, the NIDS equivalent of '% of Grade 12s who do not go further but have an exemption' could not be calculated for Table 2.

The GHS and NIDS educational-attainment data show somewhat different trends, particularly with regard to the proportion of individuals who have obtained a post-matric diploma or certificate. According to the GHS, 8 to 10% of 25- to 29-year-olds have completed a post-matric diploma or certificate, while, in the NIDS, this proportion is higher, at 10 to 19% (using the waves as cross sections over time), with a lower proportion having completed matric only. This is due to the way the education questions are asked in the two surveys; hence the construction of the two variables. The GHS variable comes directly from the survey and is collected with one question: 'What is the highest level of education that ... has been successfully completed?' In addition, only diplomas and certificates that are of six months plus study duration full-time (or equivalent) are counted (GHS, 2009-2014). The NIDS educational-attainment variable, on the other hand, has been constructed using two separate questions: (1) the individual's highest level of schooling, and (2) the individual's highest level of education completed outside of school (including diplomas, certificates, or degrees), with no specification of duration or whether it is full-time or part-time. If an individual in the NIDS has specified that he or she attained any post-matric diploma or certificate that requires a matric, this is counted as an additional level of education. Thus, in the GHS, individuals are less likely to report post-matric diploma/certificate qualifications (particularly those with short study duration).The NIDS educational-attainment variable, however, includes all of these qualifications as an additional level above matric, regardless of their study length. We therefore see higher proportions of matric-only attainment and lower proportions of diplomas/certificates in the GHS compared with the NIDS.

This classification difference is also evident in the comparison of the post-matric diploma/certificate coefficient in the returns to education regressions presented in Table 1 (NIDS) and Appendix Table 1 (GHS). The NIDS coefficient is just over half the size of the GHS coefficient. In the NIDS, individuals with a post-matric diploma/certificate have wages about 40% higher than matriculants. In the GHS, this differential is about 70%.

Appendix Table 3: Proportion of individuals seen within two years following their matric, by matric year

	Respondents by matric year	Sample-respondents seen within 2 year of matric		Respondents seen 2 years after matric		Respondents seen 1 years after matric	
	#	#	%	#	%	#	%
Matric year							
2007	258	253	98%	159	63%	94	37%
2008	413	315	76%	315	100%	0	0%
2009	267	249	93%	184	74%	65	26%
2010	373	310	83%	310	100%	0	0%
2011	290	289	100%	213	74%	76	26%
2012	414	286	69%	286	100%	0	0%
2013	421	362	86%	259	72%	103	28%
2014	473	326	69%	0	0%	326	100%
All years	**2 909**	**2 390**	**82%**	**1 726**	**72%**	**664**	**28%**
Poorest income group		1 173		912	78%	261	22%
Middle-income group		837		574	69%	263	31%
Richest income group		380		240	63%	140	37%
All income groups		**2 390**		**1 726**	**72%**	**664**	**28%**

Data source: NIDS, Waves 1–4.

Notes: Sample is restricted to individuals seen in matric before age 30 and who were interviewed as adults in their base wave; post-stratification weights for baseline wave have been used.

Appendix Table 4: Comparison of characteristics between those in the sample and those not in the sample

	Not in sample		In sample	
Age	19.82	455	18.64	2 390
Female	0.58	455	0.57	2 390
African	0.80	455	0.88	2 390
Coloured	0.09	455	0.06	2 390
Indian	0.01	455	0.03	2 390
White	0.10	455	0.04	2 390
Mother's education	9.49	429	7.91	2 308
Father's education	8.72	227	7.49	1 379
Matric-year information:				
Income	3 016.00	455	1 463.45	2 390
School fees	1 932.64	241	1 183.49	2 038
Household size	5.28	455	6.08	2 390
Geo type:				
Urban	0.69	454	0.52	2 389
Traditional	0.30	454	0.45	2 389
Farms	0.01	454	0.02	2 389
Highest grade took maths	10.15	445	9.75	2 342
Ever repeated	0.42	440	0.54	2 351
Number of repeats by 2008	0.81	175	0.91	1 356
# repeats–- Grades 1–7	0.32	192	0.40	1 273
# repeats – Grades 8–12	2.20	197	1.54	1 272

Data source: NIDS, Waves 1–4.

Notes: Sample is restricted to individuals seen in matric before age 30 and who were interviewed as adults in their base wave. Post-stratification weights for baseline wave have been used.

Appendix Table 5: Income-source year relative to year in matric

Difference in years between base year and matric year	Freq.	Percent	Cum.
–5	4	0.17	0.17
–4	15	0.63	0.79
–3	50	2.09	2.89
–2	230	9.62	12.51
–1	696	29.12	41.63
0	905	37.87	79.5
1	490	20.5	100
Total	**2 390**	**100**	

Data source: NIDS, Waves 1–4.

Notes: Sample is restricted to individuals seen in matric before age 30 and who were interviewed as adults in their base wave. Post-stratification weights for baseline wave have been used.

Ideally, we would want to use the home-background conditions experienced by the individual during his or her matric year as his or her baseline socio-economic status. However, this is not always possible, as a household-level interview did not always take place during the individual's matric year. Firstly, the survey was not in field in every possible matric year that we are including in our analysis. Secondly, there may have been a household non-response in the year that the individual was in matric. Thirdly, we are including individuals who were in matric in 2007 (i.e. before the survey began). Lastly, because we are including 'temporary sample members'[13] in our analysis, the individual may not yet have been in the survey at the time of his or her matric. Thus, per capita household income data from the household interview conducted in the year closest to the individual's matric year are used, while the first-mentioned parental-education data available across all waves are used to construct baseline socio-economic status.

13 The NIDS is a panel of individuals rather than households. An individual's household composition may change over time in that he or she may join another household, or individuals may join their existing household. Any 'new' household member will also be interviewed but will not be tracked in subsequent waves. These individuals are referred to as 'temporary sample members' or TSMs. We include both CSMs and TSMs in our analysis primarily to increase sample size.

Appendix Table 6: Comparison of mean characteristics of those in the sample with score vs no score

	No Score (1487)	Score (903)	
Age in matric	18.73	18.51	**
Female	0.55	0.60	
African	0.84	0.93	***
Coloured	0.06	0.06	
Indian	0.04	0.00	***
White	0.06	0.01	***
Traditional	0.45	0.47	
Urban	0.53	0.52	
Farm	0.02	0.02	
Household size	5.93	6.30	
Number age 6–18	2.12	2.33	
Number age 19–22	0.83	0.92	
Grant income	0.56	0.66	**
Household income	1 757.08	1 022.69	**
Mother's highest education	8.10	7.63	
Father's highest education	8.09	6.68	**
Ever repeated	0.53	0.56	
Number of repeats by 2008	0.94	0.88	
# repeats – grades 1–7	0.35	0.46	***
# repeats – grade 8–12	1.60	1.47	
Highest grade took maths	9.72	9.80	
% of matriculants that wrote the exam	0.97	0.97	
% who passed of those who wrote	0.70	0.65	**
% of entrants who pass	0.68	0.63	**
% who wrote maths of all maths writers	0.42	0.35	**
% who wrote maths of total wrote matric	0.35	0.27	***
Average maths score	38.84	39.30	**
Average English score (First additional)	50.81	49.17	***
Average English score (Home Language)	55.85	52.65	
School fees	1 532.64	666.84	***
No fee school	0.55	0.58	
Total educational expediture matric	**2 777.46**	**1 557.08**	***

Data source: NIDS, Waves 1-4.

Notes: The table includes all matriculants seen within two years of their matric year in the panel; characteristics are taken from the closest year to the individual's matric year for which we have socio-economic data; post-stratification weights for baseline wave have been used.

Appendix Table 7: Multinomial Logit 2 – sample with score

Variables	Uni	TVET	Other	Uni	TVET	Other	Uni	TVET	Other
Numeracy z-score	0.474***	0.329**	–0.000446	0.446***	0.319**	8.96e-05	0.462***	0.323**	0.0203
	(0.141)	(0.142)	(0.146)	(0.141)	(0.142)	(0.146)	(0.144)	(0.143)	(0.148)
Ever repeated	–1.218***	–0.504**	–0.719***	–1.156***	–0.453*	–0.683***	–0.884***	–0.351	–0.464
	(0.255)	(0.241)	(0.259)	(0.258)	(0.244)	(0.261)	(0.311)	(0.295)	(0.318)
Log income – mean 0				0.450***	0.389***	0.303**	0.514***	0.449***	0.403***
				(0.118)	(0.112)	(0.131)	(0.127)	(0.129)	(0.140)
Controls									
Age, sex, race	No	No	No	No	No	No	Yes	Yes	Yes
Matric school characteristics	No	No	No	No	No	No	No	No	No
Parental education & household size	No	No	No	No	No	No	No	No	No
Distance to PSET in matric	No	No	No	No	No	No	No	No	No
Constant	–1.554***	–1.500***	–2.565***	–1.420***	–1.355***	–2.429***	1.285	0.0732	–0.786
	(0.464)	(0.426)	(0.560)	(0.472)	(0.431)	(0.564)	(1.541)	(1.396)	(1.541)
Observations	852	852	852	852	852	852	852	852	852
Pseudo R–squared	0.0421	0.0421	0.0421	0.0574	0.0574	0.0574	0.0708	0.0708	0.0708

Variables	Uni	TVET	Other	Uni	TVET	Other	Uni	TVET	Other
Numeracy z-score	0.447***	0.310**	0.0112	0.416***	0.304**	0.0179	0.404***	0.288**	0.0177
	(0.148)	(0.144)	(0.147)	(0.149)	(0.143)	(0.147)	(0.149)	(0.143)	(0.149)
Ever repeated	–0.856***	–0.324	–0.496	–0.915***	–0.337	–0.522	–0.907***	–0.314	–0.408
	(0.312)	(0.299)	(0.326)	(0.315)	(0.304)	(0.333)	(0.316)	(0.306)	(0.337)
Log income – mean 0	0.488***	0.418***	0.390***	0.396***	0.410***	0.282*	0.363***	0.374***	0.285***
	(0.130)	(0.131)	(0.143)	(0.138)	(0.142)	(0.152)	(0.140)	(0.143)	(0.154)
Controls									
Age, sex, race	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matric school characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental education & household size	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Distance to PSET in matric	No	No	No	No	No	No	Yes	Yes	Yes
Constant	1.467	0.0215	0.835	1.602	–0.454	–1.772**	2.207	0.439	–1.105
	(1.536)	(1.431)	(1.587)	(1.658)	(1.547)	(1.717)	(1.685)	(1.583)	(1.765)
Observations	852	852	852	852	852	852	852	852	852
Pseudo R–squared	0.0922	0.0922	0.0922	0.111	0.111	0.111	0.124	0.124	0.124

Data source: NIDS, Waves 1-4.

*Notes: Standard errors in brackets; significance levels: *** p<0.01, ** p<0.05, * p<0.1; the regressions include all matriculants seen within two years of their matric year in the panel and who wrote the numeracy test in Wave 1; the base category for the dependent variable in all regressions is the non-enrolled group – therefore, the coefficients indicate the relationship between the explanatory variables and enrolment in a particular institution type, compared with not enrolling in any form of post-secondary education; controls are taken from the closest year to the individual's matric year for which we have socio-economic data; matric school characteristics include: dummies for ex-department of education in respect of secondary school, and matric pass rate at secondary school; additional controls in all regressions include: missing dummies; highest grade taken in maths, and the difference between numeracy-test level taken and recommended level; 'University' includes traditional universities, comprehensive universities, and universities of technology; 'TVET' refers to public technical and vocational education and training college; the 'other' category includes private colleges and TVETs.*

Note on the test score:

A large portion of our sample does not have a test score. As mentioned above, some individuals in our sample were not in Wave 1 of the survey and therefore would not have had the opportunity to write the test. In addition, Wave 1 respondents may have refused to write the test. If refusing to write the test is correlated with certain socio-economic characteristics, then the scores will not be missing at random, and this may be biasing our results. Thus, we first compare the mean characteristics for those who do have a score with those who do not have a score. Appendix Table 6 provides a summary of means, p-values, standard deviations, and sample sizes (N). We see that there are some differences: Most notably, learners who had higher levels of school expenditure, household income and father's education are less likely to have a test score. Secondly, we rerun our six regressions using only the sample which has a test score. The results, provided in Appendix Table 7, show that, even within the sample of individuals whose test score is non-missing, the score has a positive and significant impact on enrolment in both university and TVETs, and, once again, remains significant even after the addition of demographic, home-background, and school-level characteristics. Household income also remains positive and significant in explaining enrolment in all institution types.

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The Post-matriculation Enrolment Decision: Do Public Colleges Provide Students with a Viable Alternative? Evidence from the First Four Waves of the National Income Dynamics Study

This report provides an analysis of enrolment patterns for public universities, public technical and vocational education and training (TVET) colleges, and private colleges. Considering government's policy is to expand TVET colleges over the next two decades, the role of financial constraints in the enrolment decision was investigated. The results showed that household income during the matric year is highly significant in determining enrolment in all types of post-secondary institutions, including TVETs. Individual ability (as measured by numeracy test scores) is also important in explaining enrolment in both universities and TVETs, even after controlling for socio-economic background and school-quality variables. These findings suggest that increasing the number of places available at TVET colleges without expanding funding opportunities and assessing the level of course content is unlikely to result in the target of 2.5 million learners in TVETs by 2030 being met. The research drew on the National Income Dynamics Study (NIDS) data for the period 2008 to 2015, together with administrative data on South African schools and post-secondary institutions.

About the LMIP

The Labour Market Intelligence Partnership (LMIP) is a collaboration between the Department of Higher Education and Training, and a Human Sciences Research Council-led national research consortium. It aims to provide research to support the development of a credible institutional mechanism for skills plannning in South Africa. For further information and resources on skills planning and the South African post-school sector and labour market, visit http://www.lmip.org.za.