Does Reducing the Length of Study Boost University Enrollment? Evidence from the 2001 Italian Reform

Giorgio Di Pietro*

In 2001 the Italian university system embarked on a process of reform where the traditional four to five year program was replaced by a '3+2' model. Students initially enroll on a three-year course and, upon successful completion, those eager to continue their education can attend an additional two-year course. Using a difference-in-differences approach, this paper investigates whether the reduced duration of the degree program and other measures introduced by this reform have had any impact on university enrollment. The empirical findings support the hypothesis that the 2001 university reform has widened participation in higher education in Italy.

* University of Westminster, Westminster Business School, 35 Marylebone Road, London NW1 5LS. Phone 0044 (0) 2079115000 ext 3350, E-mail G.D.I.Pietro@westminster.ac.uk

1. Introduction

Following the Bologna Declaration, which aims at the development of a coherent and cohesive European Higher Education Area by 2010, university education in Italy has recently embarked on a process of reform. This reform, introduced by the ministerial decree No. 509/99, has changed the structure and the duration of the university program. The traditional four to five year program has been replaced by a '3+2' model consisting of a First Degree (*Laurea di primo livello*) that lasts three years, followed by a Second Degree (*Laurea specialistica*) of two years length. This division meant a reduction in the length of the university program as it offers the possibility to obtain a first-level degree to those students who wish to study for a shorter period of time[1].

This paper attempts to evaluate the effect of this reform on university enrollment. The reform was applied uniformly to all the individuals who enrolled at Italian universities from 2001 onwards. To investigate the impact of the reform, we employ a difference-in-differences (DiD) approach. The first difference is along the time dimension: before versus after the implementation of the reform. Thus we compare the university enrollment decision of individuals who successfully completed high school in the post-reform period with that of their peers who successfully completed high school in the pre-reform period. As regards the second difference, we exploit the idea that the reform is likely to provide an incentive to enroll at university especially for those individuals on the margin of continuing their education. The shorter duration of the university program may

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[1] In the beginning of the 1990s three-year university courses (*diplomi di laurea*) were introduced. However, enrolment on these courses never picked up, possibly due to the lack of connection with the main four to five year program.

make tertiary education more attractive to those who would not otherwise attend university for financial or academic reasons. This hypothesis is supported by the experience of the US where two-year colleges (or community colleges) have significantly contributed to widening participation in higher education, as shown by Rouse (1998). We therefore use individuals from richer backgrounds as a control group, and compare how enrollment behavior of individuals from poorer backgrounds changed after the reform relative to the control group.

This paper is related to the vast literature on university enrollment, but more specifically to those studies examining how institutional changes in the university system have affected enrollment. Some studies emphasize the key role played by lowering admission criteria in boosting university participation. For instance, in Italy since 1969 participation in higher education has increased considerably as a result of a reform that extends the automatic right to enroll at university also to those students who have successfully completed five years at vocational high schools. Similarly, policies aimed at increasing the number of towns with a university are also expected to have a positive impact on enrollment in higher education. The presence of a nearby university allows students to reduce their living expenses as they can continue staying at home with their parents while attending university. A number of empirical studies, including those by Rouse (1994) and Di Pietro and Cutillo (2006), assume the importance of proximity in university access. Finally, a number of studies examine the effect of changes in the student aid scheme on university enrollment. Rijken et al. (2003) argue that in 1986 the introduction a more transparent scholarship system in the Netherlands led to a wider participation in higher

education especially for lower-income individuals. On the other hand, Baumgartner and Steiner (2005) find that in Germany increased student financial assistance was ineffective in raising university enrollment rates during the 1990s.

The remainder of the paper is as follows. Section 2 provides additional information on the 2001 university reform and outlines the channels through which this is likely to increase enrollment rates especially among individuals from poorer backgrounds. Section 3 sets up the model used in this study. While Section 4 describes the data, Section 5 presents and discusses the empirical results. Section 6 concludes.

2. The 2001 Reform and University Enrollment

The major innovation introduced by the 2001 reform regards the division of the undergraduate university program into two separate degrees. All individuals wishing to start university enroll on a three-year course and, upon successful completion, those who want to continue their education can attend an additional two-year course. This provision may provide an important incentive to attend university particularly for children from more disadvantaged backgrounds. Since the shorter duration of the university program implies a drop in the direct and indirect costs of university education, the reform is expected to reduce liquidity constraints that may prevent low-income students from participating in higher education[2]. Although in Italy the direct cost of university education is lower than in many other countries (e.g. the US), several studies (see, for

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[2] This is the so called "democratization effect" (Brint and Karabel, 1989). As argued by Rouse (1994), the democratization effect is often used as a rationale for the expansion of community colleges in the US.

instance, Di Pietro, 2003) suggest that in the first half of the 1990s a number of factors, including higher poverty rates and a rise in tuition fees which has not been accompanied by a corresponding increase in student aid, could have made university less affordable for low-income families.

The 2001 reform includes two additional measures that might have induced more people from poorer backgrounds to enroll at university. First, the reform has strongly encouraged universities to devote more resources to improve their marketing strategy. For instance, it is now compulsory for all Italian universities to organize student orientation sessions. The increased marketing efforts of universities may benefit especially children from less advantaged backgrounds given their inability to gain the relevant information within their family environment. The lack of information suffered by these individuals may have significant detrimental effects on their probability of enrolling at university. Orfield (1992) suggests that many low-income families are often unaware of eligibility rules and procedures of student aid programs. Similarly, as reported in Carneiro and Heckman (2003), it is also possible that many eligible persons feel that even with a grant, returns to university education for them would still be too low to afford the forgone earnings associated with university attendance.

Second, several studies (Bratti et al., 2006; Cappellari and Lucifora, 2007) suggest that the 2001 reform has been accompanied by a reduction in student workload coupled with a simplification of the content in several subject areas. Additionally, Bratti et al. (2007) observe that most complex subject areas have been moved to Second Degree programs.

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Lower academic standards are likely to make tertiary education more attractive especially to those high school leavers who, not only don't have much confidence in their academic abilities, but also come from poorer backgrounds. These individuals were unlikely to attend university before the reform because of the combination of the uncertainty about their chances of graduating and the perception that they could not afford such a risk given their poor financial situation.

3. Empirical Methodology

In this study we compare the university enrollment behavior of one cohort of high school leavers in the post-reform period (i.e. 2001) with the university enrollment behavior of two cohorts of high school leavers in the pre-reform period (i.e. 1995 and 1998). We first estimate the following equation:

(1) $\quad E_i = \alpha + \beta_0 X_i + \beta_1 D_{2001} + \varepsilon_i$

where E is a dichotomous variable that is equal to 1 if the high school leaver enrolls at university, and 0 otherwise; X is a vector of control variables that are thought to influence the university enrollment decision; D_{2001} is a cohort dummy variable (1995,1998=0, 2001=1); and ε is the usual error term.

The coefficient β_1 measures the difference in university enrollment behavior in the post-reform period relative to the pre-reform period. However, β_1 may not be a good estimator of the effect of the reform as there is the possibility that it picks up the effect of other changes that had an impact on the enrollment behavior before and after the reform.

To account for this problem, we adopt a DiD approach. Our intuition is that, since the 2001 reform is likely to have a bigger impact on the enrollment behavior of individuals from less advantaged backgrounds relative to those from more advantaged backgrounds, the latter individuals can be used as a control group while the former ones can be employed as a treated group. Although the DiD approach traditionally assumes that the treatment affects only the treated group and not the control group, this technique is also used (see, for instance, Belot et al., 2007) when there are reasons to believe that the treatment influences both groups to a significantly different extent.

In line with the approach followed by several studies, including those by Evans and Schwab (1995) and Averett and Burton (1996), parental education is used here as a proxy for family background. Thus, whilst individuals from less advantaged backgrounds are defined as those who have none of their parents with a university degree, individuals from more advantaged backgrounds are identified as those who have at least one of their parents with a university degree. The DiD estimate can therefore be computed in a regression of stacked micro data for family background groups and years. The following model is estimated:

(2) $E_i = \alpha + \beta_0 X_i + \beta_1 D_{2001} + \beta_2 D_i + \delta D_i D_{2001} + \varepsilon_i$

where D is a dummy variable that takes the value 1 if the individual has none of his/her parents with a university degree, and 0 otherwise; and the DiD coefficient δ estimates the effect of the reform. More precisely, δ provides an estimate of the difference in the

change in university enrollment between high school leavers from poorer backgrounds and those from richer backgrounds after the reform, conditioning on control variables.

Equations (1) and (2) can be estimated by OLS as this allows us to directly estimate the parameter of interest[3]. As pointed out by Angrist (2001), the problem of casual inference does not significantly differ between limited dependent variables and continuous outcomes. This means that if there are no covariates or the covariates are sparse and discrete, then linear models can be used to estimate models with limited dependent variables as well as models with other types of dependent variables. Berlinski and Galiani (2007) argue that institutional reform and policy experiments clearly fall within this framework since control variables are primarily added in an attempt to improve the efficiency of the estimates, but their omission is unlikely to significantly bias the estimates of the parameter of interest

Our DiD approach relies on the assumption that any secular trend in enrollment is common to individuals from both richer and poorer family backgrounds. Since we have data on two cohorts of high school leavers in the pre-reform period (i.e. 1995 and 1998), we are able to test the plausibility of this assumption. Pre-program tests pioneered by Heckman and Hotz (1989) can thus be used to investigate whether there were significant differences in the enrollment trend across these two groups in the pre-reform period. If pre-program tests reveal the existence of a differential trend, then the use of DiD to assess

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[3] As shown by Chunrong and Norton (2003), while in linear models the interpretation of the coefficient of the interaction between two variables is straightforward, this does not hold in non-linear models.

the impact of the reform would result in biased estimates. One way to account for this differential temporal effect is to employ the random growth model. The random growth model is designed in attempt to subtract the bias revealed through the pre-program tests from the effect of the reform estimated using the DiD estimator.

We can now sketch more formally the methodology used in this paper to estimate the random growth model. First, we need to test whether the time trend in university enrollment was similar across high school leavers from both poorer and richer family backgrounds in the pre-reform period. Thus, the following equation is estimated using only pooled data on the 1995-1998 cohorts.

(3) $\quad E_i = \alpha + \beta_0 X_i + \beta_2 D_i + \beta_3 D_{1998} + \beta_4 D_i D_{1998} + \varepsilon_i$

where D_{1998} is a dummy variable that takes the value 1 for those high school leavers included in the 1998 cohort, and 0 otherwise. While β_4 measures the differential time trend for high school leavers from less advantaged backgrounds in the absence of the reform, β_3 is instead intended to capture a common time trend across both groups in the absence of the reform.

Second, if the estimated coefficient β_4 turns out to be statistically different from zero, one would need to account for this differential trend in the post-reform period. This implies that the model represented in Equation (2) should be reformulated in an attempt to control for the effect of the difference in enrollment profiles across family backgrounds during

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the pre-reform period. Thus, in line with the approach of Dorsett (2005), the following equation is estimated:

(4) $E_i = \alpha + \beta_0 X_i + \beta_2 D_i + \beta_5 (D_{1998} + 2D_{2001}) + \beta_6 (D_i D_{1998} + 2D_i D_{2001}) + \delta D_i D_{2001} + \varepsilon_i$

Our primary coefficient of interest is still δ which is expected to capture the effect of the reform. Note that, as $(D_{1998} + 2D_{2001})$ is equivalent to a continuous cohort variable while $(D_i D_{1998} + 2D_i D_{2001})$ is basically an interaction term between the latter and the dummy for high school leavers from poorer backgrounds, our approach is also similar to that of Oosterbeek and Webbink (2007).

Although Equation (4) allows for the possibility that people from richer and poorer backgrounds have differential trends, it assumes that the rate of growth is constant over time. One may, however, relax this assumption using the random growth model with no constant growth.

(5) $E_i = \alpha + \beta_0 X_i + \beta_2 D_i + \beta_7 (D_{1998} + D_{2001}) + \beta_1 D_{2001} + \beta_6 (D_i D_{1998} + 2D_i D_{2001}) + \delta D_i D_{2001} + \varepsilon_i$

Statistically significant values for the coefficients β_1 and β_7 would imply that the differential trends in the post-reform and pre-reform periods are not constant over time. Hence the random growth model, which imposes this restriction, is not appropriate.

4. Data

The data for this study come from three waves (i.e. 1998, 2001 and 2004) of a national cross-sectional survey (*Percorsi di Studio e di Lavoro dei Diplomati*) carried out by the Italian National Statistical Institute (ISTAT). Each wave consists of a representative sample of high school leavers who are surveyed three years after their completing their studies. Thus these data enable us to examine the post-high school decisions made by three different cohorts of individuals who completed their studies in 1995, 1998 and 2001. Although one of the possible destinations of these individuals is university enrollment, there are other possible trajectories. Some people may start to work immediately while others may become job seekers, and they can all change their mind after the initial choice. The survey contains individual information on previous educational attainment, degree results and parents' socio-economic status, as well as a range of personal attributes.

In this study we consider people to have gained access to university if they have enrolled within three years after successfully completing high school. Although in Italy the majority of people enroll at university immediately after finishing high school (more than 80 per cent), there are still a number of them that decide to do it at a later stage. It is important to take this into account in an attempt to account for the possibility that, as argued by Sjögren and Sae-Marti (2004), people from different family backgrounds may choose a different timing for university enrollment.

Our empirical analysis considers three different sets of individual characteristics that are likely to affect the decision to enroll at university. The first group consists of two proxies

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for the individual's observed ability. These indicators are: the high school final grade and a dummy variable recording whether the individual has failed and had to repeat at least one year at high school. The second set of factors includes school-related variables. We include indicators for the type of high school attended by the individual and a dummy variable recording whether this high school was public or private. The third group of variables comprises individual personal attributes such as gender and age.

Although individual characteristics are likely to affect the decision to attend university, the human capital model predicts that other factors have an important role too. Labour market conditions influence the choice to continue with further education through their impact on the opportunity cost of university education and the expected returns to university education. Controlling for these factors is crucial in our study given that, over time, individuals face different incentives and opportunities when deciding whether to continue with further education. Thus in our specification we include the unemployment rate by geographical area[4] and sex for individuals aged between 20 and 24[5] as well as the average hourly wage gap between university and high school graduates by sex and geographical area[6].

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[4] Three geographical areas are considered: North, South and Centre.

[5] This particular age group is chosen in order to control for the effect of working experience on employment prospects. The datasets on 1995, 1998 and 2001 cohorts of high school leavers are matched with information on the average unemployment rate for the 1995-1997, 1998-2000 and 2001-2003 periods respectively. These data are taken from the ISTAT Labour Force Survey.

[6] We use information on earnings of employees from several cross-sections of the Survey of the Household Income and Wealth (SHIW). Following the approach of several researchers, including Freeman, (1976) and Card and Lemieux

Our empirical analysis is accompanied by two main drawbacks. The first concerns the relationship between family background and unobservable children and family characteristics. Family background may be endogenous as it could be associated with unobservables exerting a positive influence on children's choice to attend university. The second problem regards the possible endogeneity of earlier individuals' educational decisions. Not only is selection into high school tracks unlikely to be random, but it is also likely to be associated with unobservables which could influence later educational choices and outcomes. Unfortunately, as in many other empirical studies, we are unable to address any of these issues due to the lack of identifying information in our datasets.

We remove from the datasets those individuals who have only spent four years at vocational high schools and have decided not to continue studying for one additional year, which would have allowed them to gain the right to have access to university education. After deleting observations with missing variables of interest, we are left with a final sample which includes 57,226 observations, 17,969 from the 1995 cohort, 19,558 from the 1998 cohort and 19,699 from the 2001 cohort[7]. Table 1 provides some descriptive statistics on the variables used in this study. It is interesting to observe that, especially during the 1998-2001 period, while enrollment for individuals from more advantaged family backgrounds is pretty stable over time, enrollment for those from less advantaged family backgrounds is subjected to quite significant variations. This provides some support for our choices of the control and treated groups.

(2000), it is assumed that people have myopic expectations and use the current wage difference between university and high school graduates to evaluate the magnitude of the returns to university education.

[7] The original sample sizes are: 18,443 (1995 cohort), 23,261 (1998 cohort) and 20,407 (2001 cohort).

Insert TABLE 1 about here

5. Empirical Results

Table 2 presents our first set of empirical results. Columns (1) and (2) show the estimates of the before-after comparison (i.e. Equation 1) for high school leavers from more and less advantaged family backgrounds, respectively. Columns (3), (4) and (5) report the DiD estimates (i.e. Equation 2) for three different specifications. Column (3) depicts the estimates for our basic specification where we only use gender and age as controls. In the second specification, whose results are shown in Column (4), we add indicators for school characteristics and ability. Finally, for the estimates presented in Column (5) we use the full set of control variables including measures of labour market conditions.

Insert TABLE 2 about here

The estimates of Columns (1) and (2) show that the reform is associated with an increase in university enrollment for individuals from both groups under examination. However, in line with our expectations, this effect appears to be larger for high school leavers from poorer family backgrounds than for those from richer family backgrounds. Whilst the latter show a 3.8% higher probability of attending university in the post-reform period relative to the pre-reform period, the corresponding figure for the former is 9.4%.

However, one needs to be cautious about interpreting the before-after estimates as evidence of the effectiveness of the reform in raising university enrollment. This is because these estimates may capture the effects of other factors that have also affected the enrollment behavior before and after the reform. In an attempt to account for the potential bias associated with these other factors, we employ a DiD approach. Estimates reported in Column (3) show that the DiD coefficient is statistically significant at all conventional levels and has the expected positive sign. Our empirical results show that after the reform enrollment grew faster among high school leavers from poorer backgrounds than among their peers from richer backgrounds. More precisely, the DiD estimate is approximately 5.8%.

Although the results shown in Column (4) still suggest that the reform is likely to have exerted a stronger incentive to enroll at university among individuals from less advantaged backgrounds relative to those from more advantaged backgrounds, the value of the DiD coefficient is lower than the one reported in Column (3). Finally, estimates depicted in Column (5) indicate that results do not change significantly in the least parsimonious specification.

The DiD approach assumes that individuals from both more and less advantaged family backgrounds had a similar enrollment trend before the reform was implemented. We test this assumption by estimating Equation 3. The results of this pre-program test reject the hypothesis of a similar trend in enrollment across these two groups. Columns (1), (2) and (3) of Table 3 show that the coefficient β_4 is statistically significant and has a negative

sign across all the three specifications previously used. This implies that in the pre-reform period university enrollment increased more rapidly among high school leavers from more advantaged backgrounds than among those from less advantaged backgrounds. More precisely, depending on the specification, this growth difference varies between 4.1% and 5.5%.

Insert TABLE 3 about here

In light of these results, we need to adjust the DiD estimates reported in Columns (3), (4) and (5) of Table 2 in order to consider the differential trend in enrollment in the pre-reform period. Columns (1), (2) and (3) of Table 4 report the results from the random growth model (i.e. Equation 4) for our three different specifications. These results show that the DiD estimates are likely to consistently and significantly underestimate the effects of the reform. In the post-reform period enrollment growth among high school leavers from poorer family backgrounds was between 14.5% and 20.7% higher than that among their peers from richer family backgrounds[8].

Insert TABLE 4 about here

Finally, we need to test whether a more flexible version of the random growth model is here more appropriate. Thus we estimate a model allowing not only for the possibility

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[8] The results presented in Table 4 are quite robust to the removal from the sample of those university students who dropped out before the end of their third year of study. In such as case, the DiD coefficients are all statistically different from zero and their values are 0.205, 0.133 and 0.131 in the first, second and third specifications, respectively.

that people from richer and poorer backgrounds have differential trends, but also that the rate of growth is not constant over time (i.e. Equation 5). The estimates of the random growth model with no constant growth are depicted in Columns (4), (5) and (6) of Table 4. As the coefficients β_1 and β_7 are both found to be statistically different from zero, our results indicate that estimates from the random growth model with no constant growth should be preferred to those from the random growth model. The DiD estimates from the former model range between 6.8% and 13.8% and are consistently smaller than the corresponding ones from the latter model.

6. Conclusions and Discussion

In 2001 university education in Italy underwent a process of reform. The major innovation introduced by this reform lies in the division of the undergraduate program into two separate degrees. Thus the traditional four to five year program was replaced by a '3+2' model consisting of a First Degree that lasts three years, followed by a Second Degree of two years length.

This paper has attempted to investigate the effect of this reform on university enrollment using a difference-in-differences approach. It is here assumed that, whilst a number of measures introduced by the reform (most notably the shorter duration of the university program but also lower academic standards and reduced informational constraints) are likely to considerably boost enrolment among people from poorer backgrounds, their effects on the participation of individuals from richer backgrounds is much less

significant. Our empirical findings provide consistent support for the proposition that the 2001 reform has yielded higher university enrollment rates.

Given that Italy displays the highest university drop-out rate of all OECD countries (OECD, 2004), an important question is whether the increase in enrollment rates triggered by the reform has actually been accompanied by a similar increase in graduation rates. Unfortunately, we are unable to test this hypothesis as our data keep track of students only in the first three years of their studies. Data from another source, however, do not lend support to this hypothesis. Specifically, Leonardi and Bratti, (2006), using data from a survey conducted by Almalaurea[9], find that while in the pre-reform period the proportion of graduating students who have none of their parents with a university degree is 72.5% , the corresponding figure in the post-reform period is 72.8%. Additionally, data on students from more advantaged backgrounds suggest that the 2001 reform is actually associated with a slight decline in graduation rates. While in the pre-reform period the proportion of graduating students who have at least one of their parents with a university degree is 25.1%, the corresponding figure in the post-reform period is 25.0%.

Another issue concerns the long-term effect of the reform. Two sets of reasons suggest that our analysis may underestimate the extent to which the reform impacts on university

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[9] Almalaurea is an Italian inter-university consortium comprising 38 universities. It accounts for approximately 61% of the Italian university system.

enrollment. First, one should bear in mind that it may take several years before the reform is fully implemented and hence there is the possibility that, especially in the initial period, it may be conducted at a different pace and with differing degrees of conviction across universities. Second, in the long-term the reform may be associated with relevant indirect effects. For instance, as it may be perceived to cause a significant expansion of university education, a larger number of high school leavers may feel obliged to attend university as a way to secure a job.

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TABLE 1: Mean of dependent and explanatory variables (standard deviations are in parentheses)

	High school leavers with at least one parent with a university degree			High school leavers without parents with a university degree		
	1995 cohort	1998 cohort	2001 cohort	1995 cohort	1998 cohort	2001 cohort
Enrolled at university	0.879(0.327)	0.837(0.370)	0.858(0.349)	0.461(0.498)	0.365(0.482)	0.481(0.500)
Individual personal attributes						
Female	0.510(0.500)	0.528(0.499)	0.532(0.499)	0.554(0.497)	0.548(0.498)	0.535(0.499)
Age						
21 years old or less	0.195(0.375)	0.138(0.345)	0.109(0.311)	0.080(0.271)	0.037(0.189)	0.032(0.176)
22 years old	0.635(0.482)	0.692(0.462)	0.685(0.465)	0.587(0.492)	0.637(0.481)	0.652(0.476)
23 years old or more	0.170(0.397)	0.170(0.375)	0.207(0.405)	0.334(0.472)	0.326(0.469)	0.316(0.465)
School-characteristics						
General high school	0.685(0.465)	0.639(0.480)	0.548(0.498)	0.197(0.398)	0.133(0.339)	0.144(0.351)
Private school	0.147(0.354)	0.152(0.359)	0.131(0.337)	0.108(0.310)	0.057(0.232)	0.066(0.248)
Individual ability						
High school final grade						
60-69	0.248(0.432)	0.249(0.432)	0.249(0.433)	0.347(0.476)	0.368(0.482)	0.373(0.484)
70-79	0.187(0.390)	0.261(0.439)	0.258(0.438)	0.223(0.416)	0.306(0.461)	0.276(0.447)
80-89	0.167(0.373)	0.228(0.419)	0.201(0.401)	0.131(0.3370)	0.188(0.391)	0.176(0.380)
90-100	0.211(0.408)	0.262(0.440)	0.291(0.455)	0.108(0.310)	0.138(0.345)	0.175(0.380)
Repeted high school year	0.160(0.367)	0.138(0.345)	0.200(0.400)	0.256(0.247)	0.222(0.416)	0.251(0.434)
Labour market conditions						
Unemployment rate (%)	0.361(0.181)	0.333(0.197)	0.252(0.178)	0.364(0.185)	0.349(0.200)	0.272(0.184)
Wage diff between university and high school graduates	1.523(0.081)	1.468(0.120)	1.450(0.086)	1.526(0.079)	1.469(0.119)	1.456(0.084)
Number of observations	1,935	1,722	2,285	16,034	17,836	17,414

TABLE 2: Effect of the 2001 reform on university enrolment

	Before-after estimates		Difference-in-differences estimates		
	High school leavers with at least one parent with a university degree (1)	High school leavers without parents with a university degree (2)	DiD1 (3)	DiD2 (4)	DiD3 (5)
	0.038*	0.094*	0.058*	0.020**	0.019**
	(0.009)	(0.004)	(0.010)	(0.010)	(0.010)
Controls					
Individual personal attributes	Yes	Yes	Yes	Yes	Yes
School-characteristics	Yes	Yes	No	Yes	Yes
Individual ability	Yes	Yes	No	Yes	Yes
Labour market conditions	Yes	Yes	No	No	Yes
Number of observations	5,942	51,284	57,226	57,226	57,226

Robust standard errors are given in parentheses
* denotes statistical significance at 1%
** denotes statistical significance at 5%

TABLE 3: Difference in university enrolment in the pre-reform period. Pre-program test

	(1)	(2)	(3)
	-0.055*	-0.041*	-0.042*
	(0.012)	(0.012)	(0.012)
Controls			
Individual personal attributes	Yes	Yes	Yes
School-characteristics	No	Yes	Yes
Individual ability	No	Yes	Yes
Labour market conditions	No	No	Yes
Number of observations	37,527	37,527	37,527

Robust standard errors are given in parentheses
* denotes statistical significance at 1%

TABLE 4: Effect of the 2001 reform on university enrolment. Random growth model and Random growth model with no constant growth

	Random growth model			Random growth model with no constant growth		
	(1)	(2)	(3)	(4)	(5)	(6)
	0.207*	0.147*	0.145*	0.138*	0.080*	0.068*
	(0.009)	(0.008)	(0.008)	(0.022)	(0.020)	(0.011)
Controls						
Individual personal attributes	Yes	Yes	Yes	Yes	Yes	Yes
School-characteristics	No	Yes	Yes	No	Yes	Yes
Individual ability	No	Yes	Yes	No	Yes	Yes
Labour market conditions	No	No	Yes	No	No	Yes
Number of observations	57,226	57,226	57,226	57,226	57,226	57,226

Robust standard errors are given in parentheses
* denotes statistical significance at 1%