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Financial incentives and study duration in higher education ☆

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HIGHLIGHTS

- From 1990–1995 certain students in Norway received a reward for on-time completion.
- Mean delay was reduced by 0.23 semesters per year treated.
- Some indication that treatment should start before the final part of studies.
- Earnings while studying decreased slightly; no effects on longer-term earnings.
- On-time graduation increased from a low level, thus cost to treat relatively low.

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ABSTRACT

This paper investigates to what extent students in higher education respond to financial incentives by adjusting their study behavior. Students in Norway who completed certain graduate study programs between autumn 1990 and 1995 on stipulated time were entitled to a restitution of approximately 3000 USD from the Norwegian State Educational Loan Fund. Comparing treated and untreated (control) programs in a difference-in-differences framework, we find that the average delay in the treatment group decreased by 0.8 semester during the reform period, and by 1.5 semesters in the following two years. Number of years treated matters strongly, with delays reduced by 0.23 semesters per year treated. Furthermore, there is some indication that it is important that treatment starts before the final part of the educational programs. The share of on-time graduation increases by 3.8 percentage points per year treated, from a pre-reform level of about 20%. Thus, a large share of the restitutions given will be for students who would otherwise not have graduated on time. A series of robustness checks indicate that our estimated effects do not reflect differential trends or omitted variables.

1. Introduction

Because education is believed to have positive externalities, and as a way to promote equality of opportunity, higher education is subsidized in many countries. This is the case whereby students do not pay the full cost of their instruction through tuition, or when living expenses are partly covered either through scholarships, or through favorable student loans provided by government agencies.

From human capital theory, we would expect subsidies to increase the net return to education and help to offset credit constraints. However, the presence of subsidies to education may not only increase students' attainment level, but also influence the level of effort provided by students. As students are generally subsidized for each unit of time spent studying, and not for the degree attained, there may be incentives to spend too much time in the educational system. This may for instance be the case if the consumption value, i.e., the private, non-pecuniary return to education, is a dominant factor for the students' choice of study duration (Alstadsæter and Sivertsen, 2010; Zafar, 2009). Consequently, a higher level of student support may finance increased consumption of higher education, with few externalities.

It is indeed observed that many students enrolled in universities and college programs around the world do not complete their university or college degree on time. According to the U.S. Department of Education (2003), first-time recipients of bachelor's degrees between 1999 and 2000 spent on average 10 extra months finishing their degree beyond the estimated completion time. Similar patterns are documented for

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many European countries (Brunello and Winter-Ebmer, 2003). This result, together with the general belief that students do not exert sufficient study effort, has increased policy makers and researchers' interest in whether students respond to financial incentives.

This paper studies the effects of financial incentives on study duration using rich register data to investigate the effect of a reform that rewarded students who completed their higher education degree nominally on time. The reform entitled students in Norway who completed certain graduate study programs between the autumn semester of 1990 and the autumn semester of 1995 to a restitution from the Norwegian state educational loan fund of approximately 18,000 NOK (about 3000 USD) if they finished the program on nominal time. Thus, the reform created clear differences in the financial incentives that the autumn 1990 to 1995 graduation cohorts faced compared to previous and subsequent cohorts. These differences are exploited to estimate the impact of the financial reward on study duration. The fact that students enrolled in some education programs were not eligible for the restitution provides an additional comparison group that allows a difference-in-differences approach that can control for confounding time effects.

This reform was among the first to focus on the intensive margin, explicitly aiming at improving students' study effort and the efficiency in higher education. Earlier reforms had only been concerned with the design of students' support system (loans and grants) related to the extensive margin, such as increasing enrollment and access to higher education by providing a subsidy to all students independent of performance. A majority of the empirical literature on study duration in higher education focuses on the latter. Dynarski (2003, 2004) finds substantial effects of changes in student aid on college attendance in the US. Nielsen et al. (2010) and Baumgartner and Steiner (2005) find smaller effects, studying respectively Danish and German reforms. However, Denmark already had substantial student aid, and the German reform only targeted low-income families.

More in line with our study, the potential of financial incentives to increase students' study efficiency and performance has also attracted some attention. Leuven et al. (2010) implement a randomized experiment among first-year students at the University of Amsterdam where those who passed all of their courses on time could earn a cash reward. They find increased performance for higher-ability students, but a reduction for less able students. Garibaldi et al. (2012) study discontinuities in tuition at the Bocconi University in Italy, finding that higher tuition reduces the probability of late graduation. Hakkinen and Uusitalo (2003) evaluate a Finnish reform that was intended to shorten study duration by replacing loan-based student aid with a system of grants. The reform had only a modest effect, most of the decline in the time to degree can be explained by an increase in the unemployment rate that reduced student employment opportunities. Heineck et al. (2006) apply a duration analysis to examine the effects on study duration of an additional tuition fee for students enrolled in university programs (in Germany) beyond the regular completion time. Their findings are ambiguous.

This paper contributes to the literature by being one of the few papers addressing the causal effect of financial incentives on study duration among students in higher education. Moreover, it includes the whole student population in Norwegian higher education institutions. Previous papers with a credible research design have typically only focused on students from one particular field of study or university. It is also the first paper to directly address number of semesters delayed as dependent variable (previous papers have focused on graduation on time or student achievement). In addition, we look at the timing of the incentive to address the importance of late versus early treatment. Following other papers, such as Joensen (2011) and Humlum and Vejlin (2011), we also investigate whether earnings from part-time work while studying is affected.

The remainder of this paper is organized as follows: Section 2 provides some background on the higher education system in Norway, as well as the student support system and the incentive reform, i.e., the turbo reform. It also highlights some of the potential mechanisms for students to adjust their study duration. Section 3 presents the data, while Section 4 outlines the empirical strategy. Section 5 presents the findings and Section 6 offers some conclusions.

2. Institutional settings and the "turbo" reform

2.1. Higher education in Norway

The Norwegian higher education sector is almost completely dominated by public institutions, which have 85% of enrolled students. Tuition fees are virtually zero, making the direct costs of higher education very low.[1] There are three different types of higher education institutions: universities, specialized university colleges and regional university colleges. During the 1990s, most students at regional university colleges enrolled in two- or three-year professionally oriented programs (e.g., nursing, teaching, engineering and commerce), whereas students in specialized university colleges mostly enroll in four- to six-year programs in specialized fields, such as business, architecture and veterinary science. Universities offered two tracks: integrated five- or six-year programs leading to a graduate degree, or shorter programs in different fields that could be combined to eventually earn a Master's degree. This latter study program bears some resemblance to the American university system, although there was no "core curriculum" for undergraduates in Norway. Students in Norway who wished to begin a graduate program had to complete a related undergraduate program.

2.2. The Norwegian state educational loan fund

The Norwegian state educational loan fund offers favorable loans to students who enroll in higher education programs. The loan support, which is meant to cover the students' costs of living during the study period, is favorable in several respects. No interest is calculated and no repayment is required until the education is completed. Also, the loan may be fully or partially waived if insufficient income after completed education. In the case of death, the loan is waived.

The Norwegian Parliament decides every year how much money to assign to students during the subsequent school year, generally adjusting this amount to keep up with students' costs of living. This sum, which amounted to 54,000 NOK (about 9000 USD) for the 1991/1992 academic year (where about 42,000 NOK was given as loans, and 12,000 NOK as grants), is the same for all students and is not affected by parental income.[2] On the other hand, the financial support depends on students' own income and wealth.

The fraction of students in higher education who take up loans is close to 100% (Berg, 1997). In 1994 the average loan amount per student was approximately 155,000 NOK for students completing higher education (both shorter and higher degrees). The average loan is likely to be higher for the students we consider as they all have higher degrees.

The situation in Norway is in contrast to other countries. For instance, despite favorable conditions, the take-up rate of student loans in the Netherlands is low (Booij et al., 2012). One explanation for their findings may be debt aversion in addition to cognitive constraints.

2.3. The "turbo" reform

Students in Norway who completed certain graduate education programs between autumn 1990 and autumn 1995 were entitled to

[1] The single important exception to this rule is a private business school that accounts for about 10% of the students and charges significant tuition fees.

[2] Source: This figure and the following figures concerning loans and grants are taken from the website of the Norwegian State Educational Loan Fund, http://www.lanekassen.no/, unless stated otherwise.