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## Tax benefits for graduate education: Incentives for whom?

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## ABSTRACT

Numerous studies have examined the enrollment responses of traditional undergraduate students to the introduction of government-provided tuition subsidies, but far less attention has been devoted to the elasticity of demand for graduate education. This paper examines how the tax code and government education policies affect graduate enrollment and persistence rates along with the ways in which students fund their graduate education. Our empirical methodology is based on exogenous variations in the availability of an income tax exemption for employer-provided tuition assistance for graduate courses. We find that graduate attendance among full-time workers age 24–30 is higher when the tax exemption is available, mostly due to higher persistence in public universities and vocational course work. The use of employer aid for individuals enrolled in full-time and public part-time graduate programs also increases. We present some evidence that universities may adjust tuition to capture part of the incidence.

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## 1. Introduction

There are several reasons why it is important to understand the degree to which different groups of students respond to government-provided financial incentives for education, in particular ones available through the tax code. In the 2011–2012 academic year alone, over \$18 billion of student aid was in the form of federal education tax credits and deductions; about 10% of this amount was used by graduate students (College Board, 2012). In addition, in 2010, the government lost an estimated \$690 million in revenue due to tax exemptions for employer-provided educational assistance (Office of Management & Budget, 2010). Understanding how such benefits are likely to affect the recipients who are targeted, as well as those who may not be, can help in the

cost-benefit analysis of government spending on education. Responses to changes in the tax treatment of employer-provided tuition assistance can also provide a better understanding of firm-provided general training. Additionally, there is still a lot to be learned about the price elasticity of demand for graduate education.

This paper examines how the tax code and government education policies affect graduate enrollment and persistence rates as well as the ways in which students fund their graduate education. The tax code may provide an incentive for someone to enroll in graduate school who would not do so without tax incentives, and it could change how students pay for graduate school conditional on the fact that they would attend without any tax benefits. Over the past two decades, the United States government has enacted several federal policies with the goal of increasing graduate education enrollment. One important policy has been the allowance of an income tax exemption for employer-provided tuition assistance up to \$5250. This tax exemption can affect enrollment decisions if the student ultimately receives the benefit, which amounts to a tuition subsidy. Firms can alter the availability of tuition

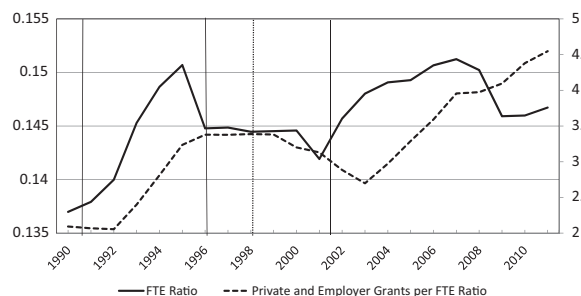
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assistance and universities can change tuition or grant amounts to capture the incidence. The tax exemption has been in place for undergraduate courses during the whole period we study (1989–2009), but employer assistance for graduate education was not exempt prior to 1991 and between 1996 and 2002. This allows us to test for responses to the tax policy in a difference-in-difference framework.

Descriptive evidence consistent with an impact of the tax exemption based on data from the [College Board \(2012\)](#) is presented in [Fig. 1](#). The solid line shows the ratio of the number of full-time equivalent (FTE) graduate students to FTE undergraduate students in the United States between the 1990–1991 and 2011–2012 academic years. This ratio varies between 0.137 and 0.151 and tends to be higher during periods when the tuition assistance exemption is available for graduate course work. Further, the dashed line represents the ratio of employer and other private-source grants<sup>2</sup> per FTE graduate student to employer and other private grants per FTE undergraduate student during the same time period. This ratio is increasing between the 1992–1993 and 1996–1997 academic years, then remains relatively flat or decreases slightly up to the 2003–2004 year, after which it exhibits a steady growth. It appears that employer aid responds to changes in Section 127 eligibility with a slight lag but in the expected direction.

While numerous studies have examined the enrollment responses of traditional undergraduate students to the introduction of government-provided tuition subsidies<sup>3</sup> or to exogenous variations in the grant aid policy within specific institutions,<sup>4</sup> far less attention has been devoted to graduate students and “nontraditional” undergraduate students.<sup>5</sup> There is more room for increase in enrollment among older students because their attendance rates are considerably lower than the attendance rates of recent high school graduates. The incentives that older students face are likely to be very different from the driving forces



**Fig. 1.** Number of FTE students and employer/private grants per FTE student. The data are from the [College Board \(2012\)](#). The “FTE ratio” graph shows the ratio of full-time equivalent (FTE) graduate to FTE undergraduate students. The “private and employer grants per FTE ratio” represents grants from employers and other private sources per FTE graduate student divided by employer and other private grants per FTE undergraduate student. The years on the horizontal axis correspond to academic years, where 1990 stands for the 1990–1991 school year. The solid vertical lines show changes in Section 127 eligibility; the dotted vertical line shows the implementation of the Tax Relief Act.

behind the postsecondary enrollment of more typical college students. For example, two-thirds of undergraduate students between the ages of 18 and 23 are listed as dependents in our data while none of the individuals aged 24–30 are dependents. Older students are more likely to pay for the education themselves, rather than rely on parental transfers, so it is important to focus on personal, rather than parental income. In addition, individuals in the older age group have to balance work, family, and potentially school, both financially and in terms of time. For the reasons mentioned above, one’s own employment status, among other factors, should have a strong impact on schooling decisions. In our study, employment status is given even more importance, as our identifying variation is linked to employer-provided education subsidies.

There are fewer studies that examine the role of financial aid for college persistence beyond the first year and completion, rather than first-year enrollment. Several of the papers that focus on the effects of education benefits for veterans find a positive effect of veteran benefits on the number of years of completed schooling or the fraction of college graduates in the affected population ([Angrist, 1993](#); [Bound & Turner, 2002](#); [Stanley, 2003](#)). Similarly, [Dynarski \(2003\)](#) shows some evidence that Social Security education benefits may have a positive impact on college persistence in addition to college enrollment. [Kane \(2007\)](#) finds that the D.C. tuition assistance program affected both the probability of applying to and the probability of attending college, along with the type of college attended (public or private). [Gicheva, Ionescu, and Simpson \(2012\)](#) show that the availability of education financing can have different implications for the extensive and intensive margins of postsecondary education. [Turner \(2004\)](#) also points out that it is important to distinguish between college enrollment and completion when analyzing the impacts of aid policies. In the analysis here of graduate attendance rates, we consider both individuals who were enrolled in school a year before their interview date and those who were not, so we measure overall attainment, including enrollment and persistence. We further use

<sup>2</sup> The [College Board \(2012\)](#) reports these grants jointly so we are unable to show data on employer aid only.

<sup>3</sup> Programs whose effects on enrollment have been studied recently include the Georgia Hope Scholarship ([Cornwell, Mustard, & Sridhar, 2006](#); [Dynarski, 2000](#)), the CalGrant program in California ([Kane, 2003](#)), the Washington, D.C. Tuition Assistance Grant Program ([Abraham & Clark, 2006](#); [Kane, 2007](#)) and, most notably, the Tax Relief Act of 1997 ([Chenevert, 2010](#); [Long, 2004](#); [Turner, 2011](#)). [Nielsen, Sørensen, and Taber \(2010\)](#) study the college enrollment effects of an increase of the generosity of student aid in Denmark. [Dynarski \(2003\)](#) is among the few studies who focus on the enrollment effects of the elimination of a program (the Social Security Student Benefit Program in 1982). See the overview in [Dynarski \(2002\)](#) for a list of other papers that use the quasi-experimental approach to estimate the elasticity of demand for college education.

<sup>4</sup> See [van der Klaauw \(2002\)](#) and [Linsenmeier, Rosen, and Rouse \(2006\)](#) for example.

<sup>5</sup> Two exceptions are [Seftor and Turner \(2002\)](#), who examine how changes in the Pell Grant Program impact the college enrollment rates of individuals in their twenties and thirties, and [LaLumia \(2012\)](#), who studies the impact of the Tax Relief Act of 1997 on older college students. [Long \(2004\)](#) shows estimates of her college enrollment specifications for a sample of older CPS respondents (age 25–40) but similarly to her results for traditional college students, finds no enrollment effect of the Tax Relief Act.

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