



The effects of the tax deduction for postsecondary tuition: Implications for structuring tax-based aid



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ABSTRACT

The tax deduction for tuition potentially increases investments in education at minimal administrative cost. We assess whether it actually does this using regression discontinuity on the income cutoffs that govern eligibility. Although many eligible households take the maximum, we find no evidence that it affects attending college, attending full-time, attending four-year college, the resources experienced, the amount paid, or student loans. Our analysis suggests that the deduction's inefficacy may be due to salience, timing, and the method of receipt. We argue that the deduction might increase college-going if it were modified in simple ways that would not increase potential costs but would make it more likely to relax liquidity constraints and be perceived as a price change (which it is) as opposed to an income change. We find that households who would be just above a cut-off manage their incomes to fall slightly below it. Such income management generates bias due to reverse causality. We choose optimal "doughnut-holes" that trade-off bias and statistical power.

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1. Introduction

The U.S. federal government has a somewhat bewildering array of programs that help families pay for higher education. Some of these programs, such as the Pell grant for low-income students, receive significant media attention and appear to be salient to families. Others, especially those that

operate through the tax code, are less in the public eye. However, all of these programs have the goal of causing people to acquire additional higher education by reducing the price of college and relaxing liquidity constraints. They are usually justified with a return-on-investment argument: by causing people to attain more education than they otherwise would, society benefits because people earn more, pay sufficiently more taxes to finance the programs, and are better citizens in myriad ways. All these arguments depend, however, on the programs' having positive *causal* effects on college-going. In this paper, we investigate one of the key tax expenditures for higher education: the above-the-line deduction

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for tuition and fees (DTF). The DTF has features – sharp eligibility cut-offs based on household income – that make it highly susceptible to causal analysis. Since we find no evidence that the DTF has a causal effect on any measure of college-going, we apply economic logic to its structure to explain the likely reasons why it is inefficacious. For instance, we argue that the DTF may be perceived as a change in income rather than a change in the price of college (which it actually is). If it is perceived as a change in income, its effect would be negligible, consistent with our results. We suggest simple modifications to the DTF that would not change its cost but that would likely make it more efficacious. We outline how such modifications could be tested.

This study has independent applied econometrics interest because our data are so dense and precise that it is a near perfect application for exploring “doughnut-holes” as a remedy for manipulation of a forcing variable in regression discontinuity analysis. Because estimates of the DTF suffer from reverse causality bias if we do not account for households’ tendency to manage their incomes to get slightly below the cutoffs, we produce unbiased causal estimates by applying a statistically appropriate doughnut-hole to each cut-off.

It is reasonable to ask why the federal government has both grant-based and tax-based programs that support individuals’ spending on higher education. Programs that operate through the tax code, like the DTF, have the advantage of extremely low paperwork and administrative costs. Form 8917, which a family files for the DTF, has only 6 questions and could take at most a few minutes to complete. In contrast, the Free Application for Federal Student Aid (FAFSA), required for the grant programs, has 105 questions and is time-consuming to complete. To help the Internal Revenue Service (IRS) administer the tax expenditures for higher education, schools issue a 1098-T for every student. But, the cost of doing this plus the IRS’s costs of processing the extra lines in the tax code, even if very generously estimated, could not possibly represent more than 0.1 percent of the tax expenditures. In contrast, each college and the U.S. Department of Education maintain an office to administer federal grant aid, and cost of running these offices appears to amount to 10 percent of the total spent on grants. There are also concerns that schools commit fraud when administering grant-based aid.¹

The negligible cost of administering a tax-based aid program like the DTF is undoubtedly an advantage, but it may have disadvantages owing to its superficial aspects. If a family pays tuition and fees with typical timing, it receives its tax-based aid an average of 10.5 months later. This timing may make the tax-based aid less likely to relax liquidity constraints than grant-based aid which is timed to coordinate with tuition bills. In addition, because tax rules are complex, families may not understand that they are eligible for tax-based aid when they are making college-going decisions.

Such non-recognition may limit the causal impact of the programs on educational attainment. In particular, families may fail to perceive the aid as a change in the price of college (which it is) and may instead perceive it as income. If they perceive it as income, the effects of the aid are likely to be negligible. We show that a reasonable upper bound on the *income* effect of the DTF is an increase in college attendance of a tiny 0.25 percentage points (a quarter of 1 percentage point).

In short, understanding the causal effects of the DTF is both feasible and important. If tax-based aid causally increases college-going, its administrative costs are so low that it might be wise to substitute it for grant-based aid. If the DTF has little or no effect on college-going, economic logic may suggest how the DTF could be modified to increase its causal effects without increasing its potential costs. This is an unusual win-win situation.

We believe this paper contributes in four ways. First, the DTF is an important tax-based aid program that has received virtually no evaluation.² Second, because the DTF lends itself to regression discontinuity analysis and because we employ nearly ideal administrative data, our estimates are precise and bias-free under assumptions that we are able to validate well. Third, our analysis suggests that apparently superficial aspects of the program – its salience, timing, the way it is presented, the way it is received – may crucially change its effects. This is why we may be able to restructure the DTF to make it attain its intended effect without increasing its cost. Finally, our study is ideal for investigating manipulation of the forcing variable and the use of doughnut-holes in regression discontinuity analysis. Although we did not begin this study in an effort to learn about optimal doughnut-holes, our results could inform any such analysis.

The main limitation of this study is that our estimates of the effect of the DTF are local to households with income in the vicinity of one of the eligibility thresholds.³ Fortunately, there are several thresholds – as low as \$65,000 and as high as \$180,000 – so we do not rely on households in a narrow income range.

In [Section 2](#) of this paper, we explain how the DTF works. [Section 3](#) describes our data and the college-going context. [Section 4](#) reviews the regression discontinuity method. We discuss income management and statistically appropriate doughnut-holes in [Section 5](#). In [Section 6](#), we consider how households perceive the DTF and what this behavioral economics implies for analysis. In [Section 7](#), we estimate the DTF’s causal effect on numerous college-related outcomes including attendance, college choice, instructional resources, tuition paid, and student loans. In [Section 8](#), we summarize our findings and explain why we should not be surprised that DTF has negligible effects on college-going. In [Section 9](#), we

¹ The estimate of the cost of administering federal grant aid is based on authors’ calculations. The U.S. Department of Education’s budget indicates that the federal administrative cost amounts to about 4.3% of the total spent on grants. The budgets of higher education institutions suggest that their cost of administering financial aid amounts to about 5.4% of grants. For the concerns about fraud, see for instance [U.S. General Accountability Office \(2010\)](#).

² For analysis of the federal tax *credits* for higher education, see [Bulman and Hoxby \(2015\)](#), [Turner \(2011\)](#), [Long \(2004\)](#), [Hoxby \(1998\)](#), and [Maag and Rohaly \(2007\)](#).

³ The most credible studies that examine the effect of grant aid rely on randomization or regression discontinuity. They also produce effects that are local. For instance, most random assignment occurs only among students who are marginal to the program along some dimension such as achievement or family income.

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