THE HAMILTON PROJECT

Advancing Opportunity, Prosperity and Growth

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Sima J. Gandhi

Viewing Education Loans Through A Myopic Lens

The Brookings Institution

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Viewing Education Loans Through A Myopic Lens:

A Revenue-Neutral Proposal For Accelerating Student Loan Subsidies

Sima J. Gandhi

Graduate-Level Winner of the 2007 Hamilton Project Economic Policy Innovation Prize

This discussion paper is a proposal from the authors. As emphasized in The Hamilton Project's original strategy paper, the Project is designed in part to provide a forum for leading thinkers from across the nation to put forward innovative and potentially important economic policy ideas that share the Project's broad goals of promoting economic growth, broad-based participation in growth, and economic security. The authors are invited to express their own ideas in discussion papers, whether or not the Project's staff or advisory council agree with the specific proposals. This discussion paper is offered in that spirit.

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Abstract

Although the federal government dedicated nearly $40 billion to funding student loans in 2006, only 60 percent of potential students from low-income families attend college, compared with 90 percent from high-income families. This paper argues that enrollment rates are lower than they could be because potential students undervalue loan subsidies, which are delivered after graduation instead of up front when a student enrolls and incurs costs. The behavioral economics concept of myopic loss aversion suggests that accelerating loan subsidies to the time of enrollment would increase their effectiveness as an incentive to enroll. Empirical studies also find a larger response to up-front subsidies such as grants than to delayed subsidies delivered after graduation such as loan forgiveness. Eliminating interest rate subsidies from student loans, which cost 12 cents on the dollar for loans issued in 2006 and works out to approximately $950 per borrower, is a revenue-neutral means of funding up-front subsidies. Accelerating the subsidy would make higher education spending more efficient by encouraging more students on the financial margin to enroll. Allocating the subsidy on a need-only basis would deliver, on average, a $4,800 up-front lump-sum subsidy to students from low-income families, increasing the enrollment rate among low-income students from 60 percent to almost 70 percent.

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1. Introduction

Viewing Education Loans through a Myopic Lens: A Revenue-Neutral Proposal for Accelerating Student Loan Subsidies

From the direct subsidies for college education provided by the 1944 G.I. Bill, to the subsidized student loans authorized under the Higher Education Act of 1965, to the individual income tax credits and deductions for college outlays in the 2001 tax bill, federal funding has long played a leading role in expanding access to higher education. During the 2006-07 school year, college undergraduates received $40 billion in federal loans, equivalent to almost 2 percent of the 2007 federal budget (College Board 2007a). But higher education in America remains skewed toward the well off: 90 percent of high school graduates from families earning more than $80,000 a year are attending college by the time they are 24, compared with only 60 percent from families earning less than $33,000 (Gladieux 2004; see also Kane 2001). Widening national income inequality and an increasingly skills-dependent economy together raise a pressing question: How can the federal government most efficiently structure its aid to higher education to influence the decisions of students on the financial margin toward entering college?

This paper applies insights from behavioral economics to show that the effectiveness of subsidies for higher education depends on *when* they are delivered. Delivering the subsidy up front at enrollment, rather than later and over time, strengthens the incentive to enroll for students close to the decision threshold—those who, but for the aid, would not seek higher education. These students value the costs and benefits of attending college equally or nearly so; a marginal increase or decrease in their cost valuation can tip the decision one way or the other. It is certainly true that other factors also influence the decision to attend college. However, to the extent that the decision rests on financial grounds, delivering subsidies at the time of enrollment reduces the *perceived* cost of matriculation, and so makes a given amount of subsidy (at net present value) more efficient at inducing enrollment.

This paper proposes accelerating the delivery of federal loan subsidies in order to increase their effectiveness in raising college enrollment rates. Such acceleration would not change the present value of the subsidy, but the behavioral economics theory of myopia posits that students would perceive the accelerated subsidy as larger simply because it is delivered at the time costs are incurred. Myopic individuals respond more strongly to a money incentive now than to the equivalent future value tomorrow; hence back-loaded aid, delivered years after the student first incurs higher education costs, makes for an inefficient incentive. Front-loading the aid strengthens the incentive and so induces more potential students to enroll.

Of the three main forms of federal financial aid, two (grants and tax benefits) deliver aid up front at the time students enroll; only loan subsidies back-load aid. The subsidy component of a loan is delivered after graduation, through below-market interest rates, deductions from federal income tax liability for interest payments on the loan principal, and in some cases, forgiveness of interest payments. Restructuring these subsidies as up-front grants would maximize efficiency by countering students' myopia. The savings from elimination of the interest rate subsidies could be transferred to students in the form of up-front lump-sum payments, without requiring new revenue. Loan subsidy acceleration could thus be made revenue-neutral, because students would receive subsidies with the same present value as they do today. This paper finds that the

resulting improvement in incentives could be large: a revenue-neutral accelerated subsidy would effect a 9.5-percentage-point increase in the enrollment rate of low-income students.

How Existing Higher Education Subsidies Inefficiently Back-Load Aid

Of the nearly $100 billion in financial aid that undergraduates received in 2006-07, federal subsidies funded more than $60 billion, through a combination of grants, tax benefits, and loans (figure 1).

Grants

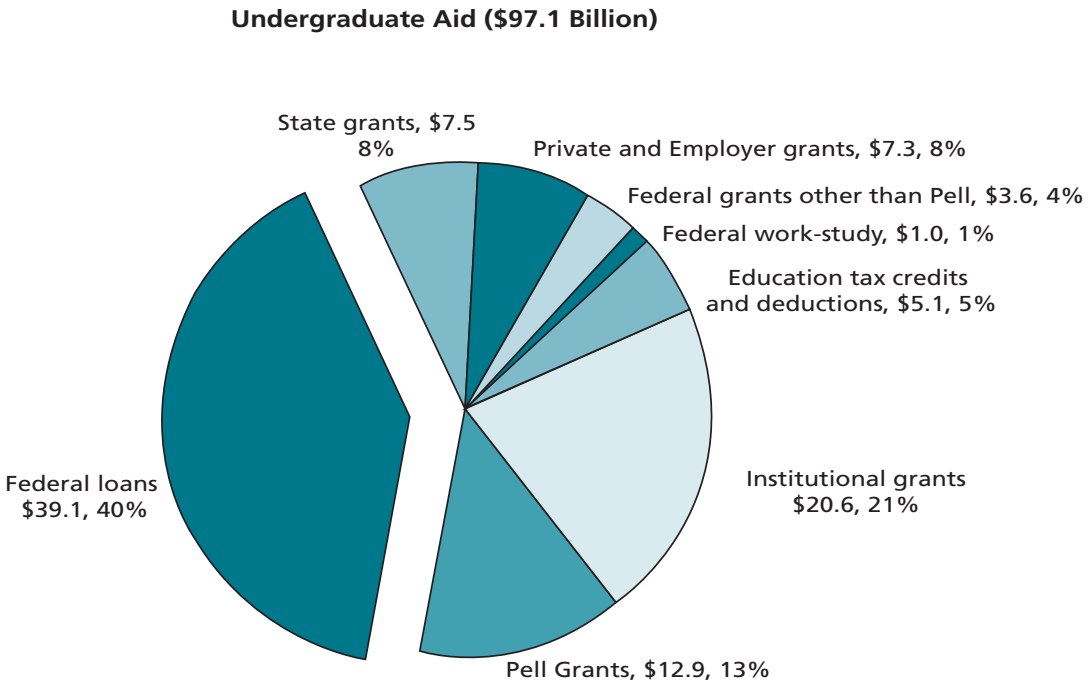
Grants, unlike loans, do not need to be repaid and are generally provided at the time of enrollment. The Pell Grant program, the federal government's largest in the area of higher education, makes awards according to a financial need formula set by Congress using information submitted by students or their parents on the Free Application for Federal Student Aid (FAFSA). As a result, Pell Grants are extremely redistributive: 62 percent of undergraduates from families with annual income below $32,000, but only 1 percent of students from families with incomes exceeding $92,000, received Pell Grants in 2003-04 (National Center for Education Statistics 2005, table 2; see also College Board 2006).

With the expansion of the Stafford loan program (see below) in 1992 and the drop in relative value of Pell Grants over time, Stafford loans are an increasingly important funding alternative. Although the real value of a Pell Grant in 2005 remained relatively similar to that in 1975 (figure 2), increasing tuition costs mean that the maximum Pell Grant today covers a smaller share of those costs (figure 3; note that the average Pell Grant is considerably less

FIGURE 1.

Total Financial Aid to Undergraduates, by Type, 2006-07

Billions of dollars

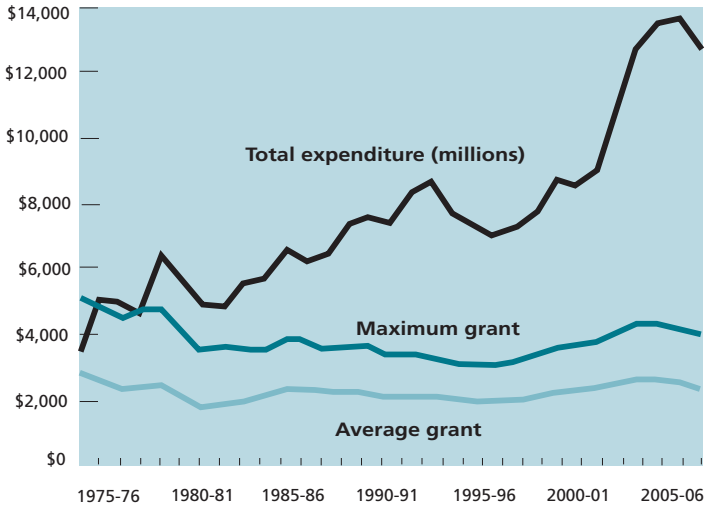


Source: Adapted from College Board (2007a, p. 8).

FIGURE 2.

Total Pell Grant Expenditure and Maximum and Average Pell Grant, 1975-76 to 2005-06

Constant (2005) dollars

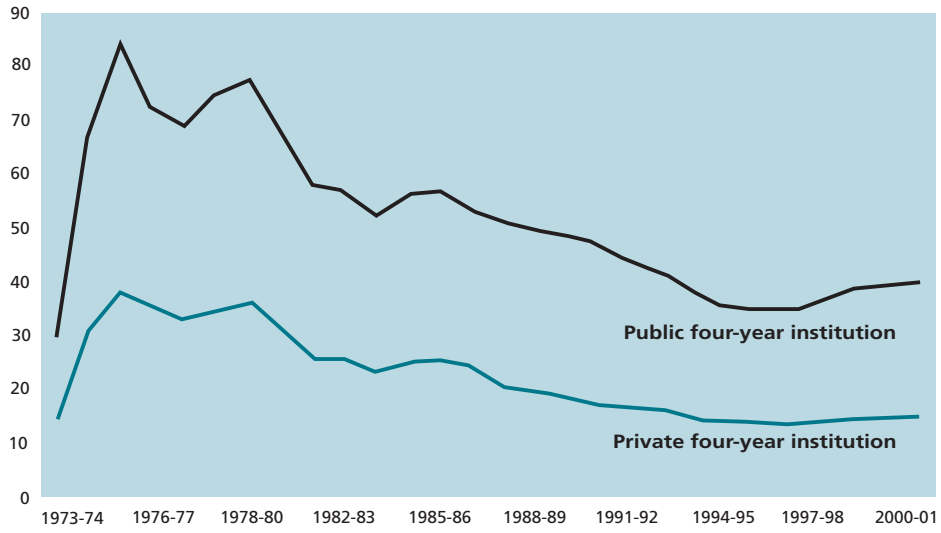


Source: College Board (2006, 10).

FIGURE 3.

Maximum Pell Grant as a Share of Cost of College Attendance, 1973-74 to 2000-01

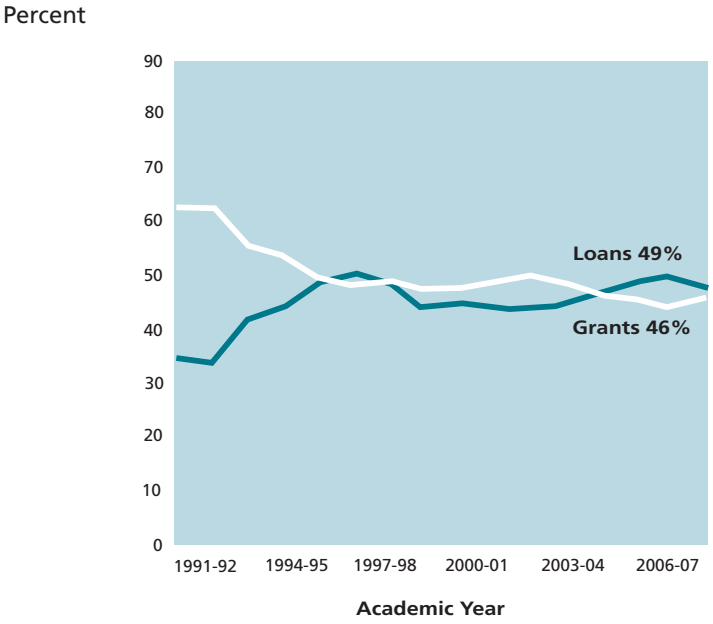
Percent



Source: Gladieux (2000, figure 9).

FIGURE 4.

Grants and Loans as Shares of Total Aid to Undergraduates, 1991-92 to 2006-07



Source: College Board (2007a, 15).

than the maximum). To make up the difference, students are borrowing more. As figure 4 shows, over 1991-2006, grants as a share of total financial aid funding fell by 15 percentage points, while the share for loans increased by 14 percentage points (College Board 2006).

As loan aid increasingly replaces grant aid, federal aid becomes less redistributive. Figure 5 shows that, in the 1999-2000 academic year, 49 percent of students in the lowest quarter of the income distribution took out loans, up modestly from 46 percent ten years earlier. But the share of students in the highest quartile who took out loans nearly tripled, from 13 percent to 36 percent. Thus, with the expansion of non-need-based loans starting in 1993, families in the highest quartile (and in the two middle quartiles) now receive a larger proportion of federal higher education subsidies. This trend is troubling, because it shifts funds away from those students for whom the need is greatest. Furthermore, the very characteristics that make grants such effective incentives—they do not need to be repaid and are delivered up front at the time of enrollment—are lacking in loan subsidies.

Tax Credits and Deductions

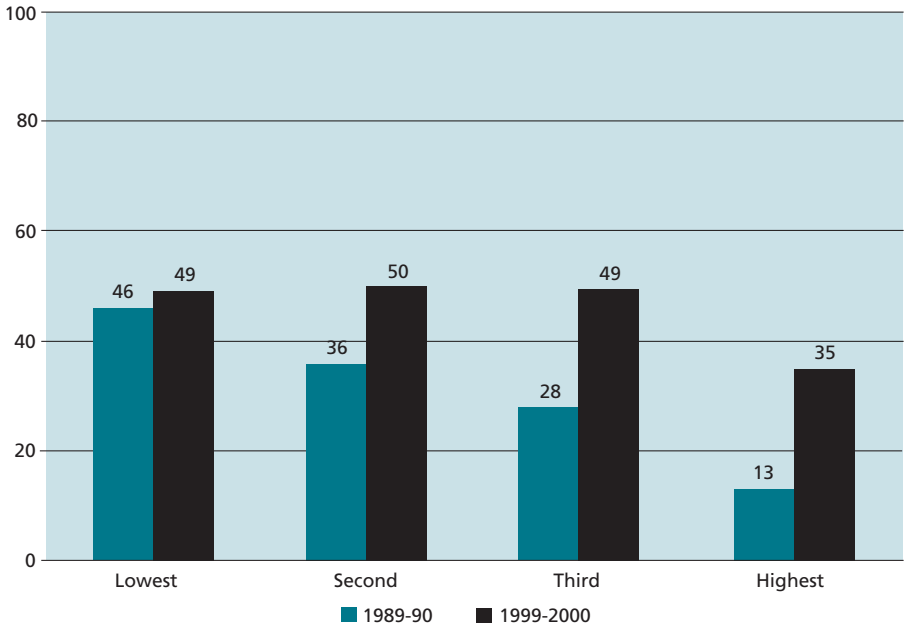
Like grants, financial aid in the form of tax credits and deductions for education expenses subsidize the costs at the time of enrollment. After a modest start in 1986 under President Ronald Reagan (with education savings bonds), tax subsidies more recently gained prominence in the administration of President Bill Clinton. A leading champion of using the tax code to fund education, President Clinton explained, "I have long believed that the tax system should better encourage investment in college education and job training."[1] In 1997, Title II of the Taxpayer Relief Act created a set of new education incentives that included an income tax deduction for interest paid on student loans, the HOPE and Lifetime Learning nonrefundable cred-

1. "Statement by the President," White House press release, August 5, 1997, available at www.ed.gov/offices/OPE/PPI/HOPE/august5.html (last visited April 26, 2008).

FIGURE 5.

Shares of Full-Time, Full-Year Dependent Undergraduates Receiving Loans, by Family Income Quartile, 1980-90 and 1999-2000

Percent



Source: Adapted from Wei, Li, and Berkner (2004, table 7).

its, and education individual retirement accounts (later renamed Coverdell Education Savings Accounts). Congress rationalized these incentives as necessary for "a better educated population, a more competitive economy, and a society in which the rewards are more equally shared" because "education is the key to higher wages and a better standard of living" (Albus 1998, 601).

Because both grants and tax benefits are delivered up front, the important distinction between them lies not principally in their timing but rather in their form. (There is a modest difference in timing: a grant can in principle be provided at the time costs are actually incurred, whereas receipt of a tax subsidy is inevitably delayed while the Internal Revenue Service processes the tax return claiming the subsidy and issues a refund.) The difference in form between *nonrefundable* tax benefits and grants affects the value taxpayers recognize from the subsidy. A grant provides a subsidy equal to its nominal value, irrespective of the recipient's tax liability, whereas the value of a nonrefundable tax credit hinges on the recipient's tax liability. A nonrefundable tax credit is limited in value to the taxpayer's income tax liability. For example, if a taxpayer owes income tax of $1,000 and is eligible for a tax credit of $200, the credit reduces her liability to $800. But if the same taxpayer is eligible for a credit of $1,200, the credit reduces the $1,000 tax liability to zero; the taxpayer may not claim the remaining $200 as a refund or as a credit against other taxes.

Like nonrefundable tax credits, deductions such as the higher education tuition deduction are worth less to households in lower tax brackets than to those in higher brackets, and they are of no value at all to households with no income tax liability. Different households realize different benefits because the value of any deduction depends on the taxpayer's marginal income tax rate. A taxpayer whose marginal tax rate is 35 percent will value a $1,000 deduction at $350, because the deduction reduces her tax liability by $350. But a taxpayer whose marginal rate is 25 percent will value the same $1,000 deduction at only

$250, because his tax liability decreases by that lesser amount.

The inverse relationship between a taxpayer's marginal tax rate and the value of a deduction to that taxpayer means low-income families generally realize less value from a given deduction than do families with higher incomes. The implications are severe. In any given year almost half of all children, and 80 percent of children in single-parent households, are part of tax units with no income tax liability (Batchelder, Goldberg, and Orszag 2006). For these children, deductions, exclusions, and nonrefundable credits are worthless. Out of an estimated 136 million federal tax filers for fiscal 2006, roughly 43.4 million will value the higher education tuition deduction and the nonrefundable HOPE and Lifetime Learning credits at zero (Hodge 2006).

Loan Subsidies

Making up almost half of the total federal aid portfolio directed toward undergraduates, the Stafford loan program reaches more than 6 million students, who borrowed almost $40 billion in the 2006-07 academic year (College Board 2007a, figure 2a and table 4). These loans subsidize the costs of higher education in three ways: a below-market interest rate, interest rate deductions of up to $2,500 a year, and (in the case of "subsidized" Stafford loans)[2] forgiveness of interest due while the student remains at university.

The interest rate subsidy on Stafford loans lowers the accrual rate of interest on the loan. However, the benefit from this below-interest loan is realized only when the loan is repaid, as explained below. The cost of subsidizing the interest rate is significant. From 1994 to 2004 the government spent $40 billion to subsidize the below-market interest rates on Stafford loans (Government Accountability Office 2005).
Like the interest rate subsidy, the $2,500 deduction for interest payments is also realized after graduation, when the student starts to repay the loan. The Office of Management and Budget has projected the cost to the government of the interest rate deduction at $4 billion over the 2007-11 fiscal years (OMB 2007). Ironically, the subsidized interest rate cannibalizes the value of the interest rate deduction: because the interest rate subsidy reduces the student's interest payment, it also reduces the value of the interest deduction. Unless a student opts to pay more than the required payment (the average annual loan payment of $1,800 is less than the $2,500 maximum for interest payments), the student will not fully realize the benefits of the deduction (Choy and others 2006).

The most costly to the government of the three Stafford loan subsidies, the forgiveness of interest accrued on "subsidized" loans, is likewise not realized until graduation. The Congressional Budget Office projects that, in 2008, the cost of this subsidy will be $16.89 for every $100 lent (CBO 2007, table 5). With approximately 5 million "subsidized" Stafford borrowers in 2006-07 borrowing an average of $5,000 a year, the government spent over $4 billion on this subsidy in that academic year (College Board 2007a, table 4).

In the aggregate, the three price subsidies in the Stafford loan program account for more than half the federal government's budget for higher education aid (College Board 2006). As table 1 shows, the CBO has estimated the volume of all Stafford loans (excluding consolidation lending; see below) in 2007 at $56 billion. At a subsidy rate (ratio of subsidy to total loan value) of just over 8 percent, the federal outlay for these loans is about $4.5 billion. When the $800 million cost of student interest rate deductions is added to this figure, the total subsidy cost for Stafford loans disbursed in 2007 comes to over $5 billion.

Although the below-market interest rates, interest rate deductions, and forgiveness of interest on "subsidized" Stafford loans present students with a significant subsidy to higher education, these loan subsidies, unlike grants and tax benefits, are doled out over time. Unless students pay off the interest

2. All Stafford loans are subsidized; throughout this paper, the term "subsidized" refers to those loans that forgive interest due while the student is attending college.

TABLE 1.

Calculation of Accelerated Loan Subsidies as Applied to Actual 2007 Lending[a]

	Stafford loans					Consolidation loans		Total Stafford and Consolidation loans
	FFEL loans		FDLP loans					
Item	"Subsidized"	"Unsubsidized"	"Subsidized"	"Unsubsidized"	Total	FFEL	FDLP	
Loan volume	$21.87 billion	$22.67 billion	$6.17 billion	$5.32 billion	$56.03 billion	$26.98 billion	$4.53 billion	$87.54 billion
No. of loans	5.73 million	4.69 million	1.81 million	1.32 million	13.55 million			7.54 million[c]
Average loan value	$3,815	$4,833	$3,407	$4,019	$4,315			
Subsidy rate[b]	19.59%	2.77%	5.65%	-14.11%	8.05%	5.22%	7.04%	
Aggregate subsidy	$4.28 billion	$628 million	$348 million	-$751 million	$4.51 billion	$1.41 billion	$319 million	$7.05 billion[d]
Pro rata subsidy rate								8.05%
Pro rata subsidy per borrower								$934
Distributionally neutral subsidy[e]								25.14%

Sources: Congressional Budget Office (2007); Office of Management and Budget (2007, tables 1 and 2); and author's calculations.
a. Numbers may not sum to totals because of rounding.
b. Ratio of loan subsidy value to total loan volume. The federal government realizes a net inflow on "unsubsidized" FDLP loans because of the interest it charges to students.
c. "Subsidized" borrowers may also receive "unsubsidized" loans. To account for overlap of "subsidized" and "unsubsidized" borrowers, it is assumed that all the former take out an "unsubsidized" loan, but not vice versa, so that the number of borrowers equals the number of "subsidized" loans.
d. Includes the cost to the federal government of the higher education tuition tax deduction ($810 million), which, under the loan subsidy acceleration proposal, would also be delivered at the time of enrollment.
e. Total subsidy amount is allocated across "subsidized" Stafford borrowers only, for a subsidy of 25.14 cents on the dollar.

while in college so as to take advantage of the tuition deduction for higher education, they do not realize the benefits of loan subsidies until after graduation.

For students with limited resources who must decide whether the immediate costs of education outweigh the long-term returns, a deferred tax benefit in the form of lower interest payments and interest deductions is probably not enough to render higher education a viable option (Dodge 1993). And insofar as such loan subsidies are delivered in the future, hyperbolic discounting by myopic students (discussed in the next section) means that these higher education cost breaks are valued at less than their nominal value. Although the ultimate subsidy is quite substantial, the delay in providing the subsidy leaves students with significant up-front costs yet minimal up-front assistance.

2. Students' Misvaluation of the Returns to Higher Education Results in Underenrollment

Higher Education Generates Positive Returns and a Positive Cost-Benefit Ratio

The private internal rate of return on college education, even before grants and subsidies, is close to or even exceeds rates of return on conventional investments (Dodge 1993). Even so, potential college students do not always choose to invest in higher education. A confluence of factors, including societal pressure and, in many cases, simple lack of desire, may affect the decision to attend college. However, to the extent that the decision is based on financial concerns, behavioral economics theory suggests that students' failure to invest is irrational and that up-front subsidies best combat such irrationality.

Adopting the standard neoclassical assumption that people are rational utility maximizers, economists of the Chicago School put forth the human capital hypothesis (HCH), which led them to argue that the costs of higher education should not be subsidized, since the high returns more than compensate for the initial costs. According to proponents of the HCH, all education subsidies—whether loans, grants, or tax benefits—essentially pay a student to make money.

Research does strongly suggest that college graduates enjoy high financial returns to their education. In 2003 the average full-time, year-round worker with a four-year college degree earned $49,900, 62 percent more than the $30,800 earned by the equivalent worker with only a high school diploma (College Board 2004). More generally, the typical bachelor's degree recipient can expect to earn 61 percent more over a forty-year working life than the typical high school graduate (figure 6). The returns to education are even higher for holders of master's and doctoral degrees, whose respective average lifetime earnings are almost two and three times that of the average high school graduate. The College Board (2004) estimated that a college graduate will earn an average of about $2.5 million (in today's dollars) over his or her working life, or about $1 million more than the average high school graduate. Accounting for the fact that earnings usually grow over time, the College Board estimated the discounted present value of these additional earnings at $450,000 in today's dollars. Another benefit to a college degree is stability. Over a working lifetime, a college graduate faces a 40 percent lower risk of unemployment than a high school graduate (Sharkey 2005).

Of course, these differences in earnings potential are not solely attributable to level of education; educational credentials are often correlated with a variety of other factors, including parents' socioeconomic status and one's own personal aptitudes. However, research suggests that the financial returns to higher education are not overstated (Card 2001; Ashenfelter, Harmon, and Oosterbeek 1999). Even when differences in gender and race are accounted for, the earnings potential of college graduates ranks higher across the board than that of high school graduates (College Board 2007b).

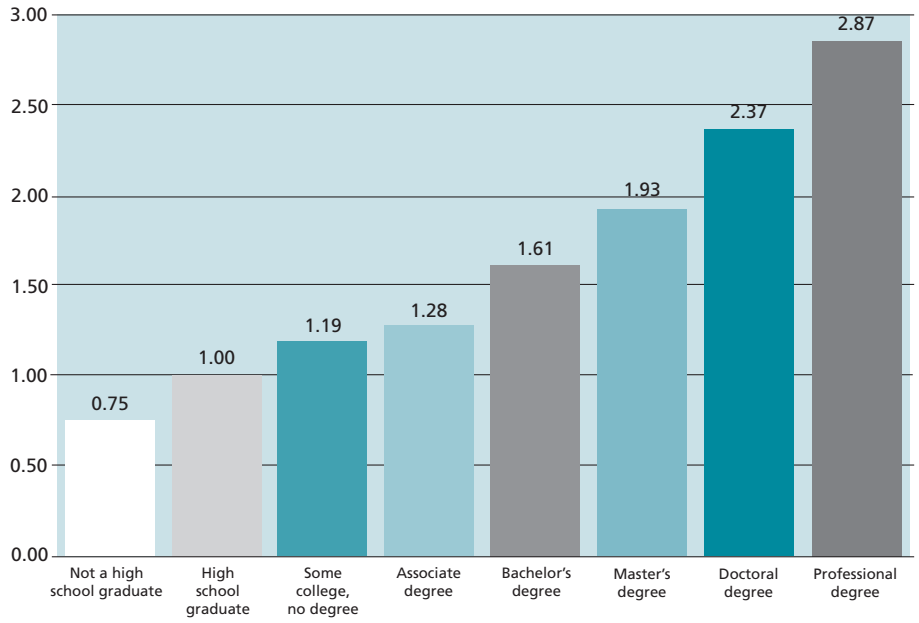
Not only are the returns to higher education positive; they are also more than sufficient to repay the loans incurred to finance that education (Card 1999, 2001; Ashenfelter, Harmon, and Oosterbeek 1999). As figure 7 shows, within ten years after earning a college degree, graduates' estimated cumulative net earnings (earnings minus college costs) on average surpass those of high school graduates. During the course of those ten years, the monthly average payment on student loans is a mere $150, or 6.7 percent of the median recent graduate's monthly salary; this figure declines to 4.8 percent after five years of working (Choy and others 2006).

Given the overwhelming data on the benefits to

FIGURE 6.

Expected Lifetime Earnings by Education Level

High school graduate = 1.00

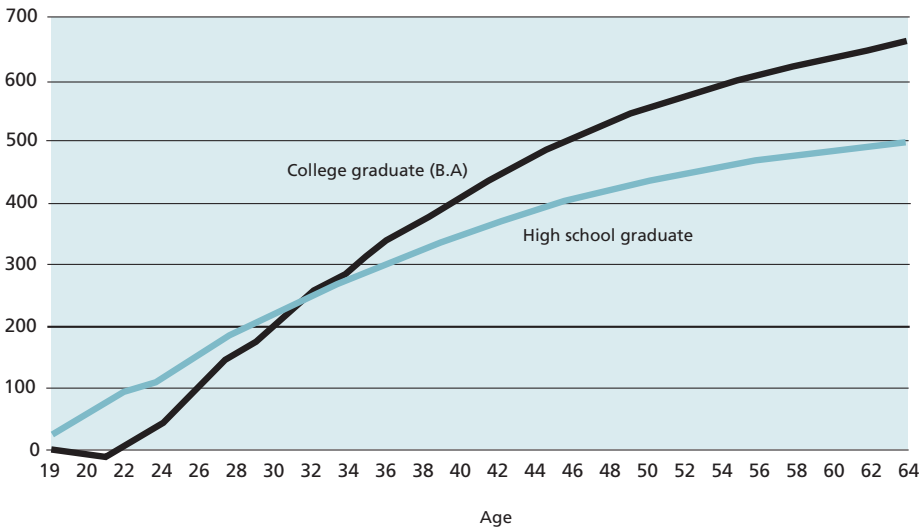


Source: College Board (2007b, 10).

FIGURE 7.

Estimated Cumulative Net Earnings of High School and College Graduates

Thousands of dollars



Source: College Board (2004, 11).

Note: High school graduate earnings are those of the average graduate entering the workforce at age 18; college graduate earnings are those of the average B.A. recipient entering the workforce at age 22 and not pursuing an advanced degree, after subtracting average tuition and fees paid over four years at a public college or university. Earnings are based on median earnings in 2003 for high school and college graduates at each indicated age, discounted at 5 percent annually.

higher education, the HCH fails to explain why disparities in enrollment rates between high-income and low-income students exist. If students are rational, utility-maximizing investors who recognize the returns to education, they should matriculate even without subsidies. Yet disturbingly, college enrollment rates show stark disparities by family income level. In 2001, 80 percent of high-income high school graduates aged 16-24 were enrolled in college by the October after graduation, compared with only 44 percent of graduates from low-income families (Sharkey 2005).

Granted, part of this difference in enrollment rates is due to generally better educational preparation among high-income students. Data indicate that low-income and minority students are less likely to complete high school or take college preparation courses. However, even when preparation is held constant across income classes, enrollment continues to vary by income. A breakdown of the top quartile of student performers by income indicates that 22 percent of high-achieving students from low-income families, but only 3 percent of those from high-income families, do not enroll in college. The discrepancy in enrollment rates is even greater among the bottom quartile of student performers: 77 percent of students in this quartile who come from high-income families enroll in college, but only 36 percent of low-income students do so (U.S. Department of Education 1997).

Despite the minimal burden of loan repayments on recent college graduates and the strong evidence on the positive returns to a college education, 71 percent of Americans believe that a four-year college education is not affordable, and 65 percent list the cost of a college education as a top concern (Weinstein 2003). And for students from low-income families, as discussed below, behavioral economics suggests that the costs appear even more formidable. Clearly, students do not operate within a neoclassical paradigm in which choices are based strictly on financial considerations.

Students Fail to Invest in Higher Education Because They Exhibit Myopic Loss Aversion

Federal subsidies for education are far-reaching: 40 percent of undergraduates receive some type of federal financial aid (Sharkey 2005, 6; Choy and others 2006, vi). Over the past decade the composition of that aid has changed. By the time they graduated, nearly two-thirds of students at four-year colleges and universities in 2006 had student loan debt; in 1993 fewer than half of such students had loans (Project on Student Debt 2007a). From a behavioral economics perspective, this shift is troublesome because it is inefficient. Behavioral economics theory suggests that because students are loss averse and myopic, they will value front-loaded subsidies more than the delayed subsidies provided through loans.

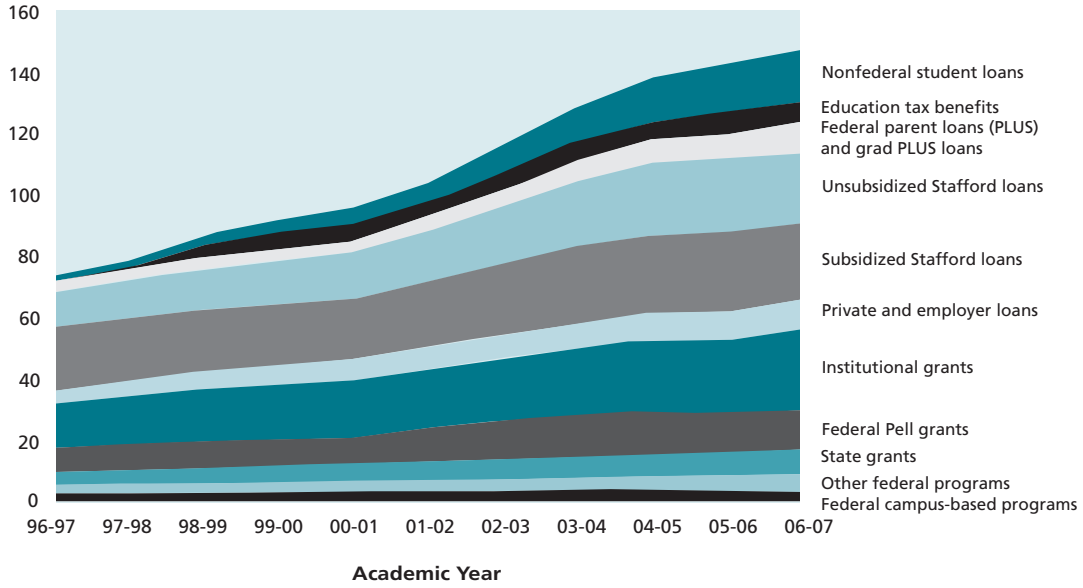
Loss aversion means that a loss generates more disutility than an equivalent gain generates utility—simply put, that the displeasure that a loss-averse person experiences from, say, a $100 loss exceeds the pleasure he or she enjoys from a $100 gain. Studies have shown that, roughly speaking, people are twice as displeased with losses as they are pleased with the equivalent gains (Field 2006; Sunstein 1997; see also Thaler 1992). One implication of loss aversion is that loss-averse people will exhibit a bias against out-of-pocket expenses and debt. Such individuals are not utility maximizers: their bias leads them to forgo spending and avoid incurring debt even when the resulting gains would increase their utility.

In the context of education financing, loss aversion manifests itself as debt aversion (Field 2006, 1; see also Burman 2005). The contemplation of taking on debt triggers the anticipation of the eventual repayment, a constructive out-of-pocket expense. For the loss-averse, loans come with hefty strings attached. Because debt and repayment are valued concurrently, debt triggers the same loss aversion associated with actual out-of-pocket expenses (Field 2006).

FIGURE 8.

Aid to Postsecondary Education, by Type, 1996-97 to 2006-07

Billions of constant (2006) dollars



Source: College Board (2007a, 3).

Individuals who must choose between attending college and giving up current or proximate income from work will feel even greater loss aversion than those who lack such income or expectations of proximate income. Many will accept the opportunity cost of forgoing college, because the aversion to immediate debt outweighs the utility generated from the receipt of potentially higher income in the future.

Another common form of irrational economic behavior is hyperbolic discounting (Thaler and Benartzi 2004; Laibson 1997). Since R. H. Stroz's 1955 paper, economists have known that intertemporal choices are consistent across time only if people discount future gains and losses exponentially, using a constant discount rate—in other words, only if they weigh the future equally, in present value terms, with the present. But substantial empirical evidence indicates that people's preferences are in fact dynamically inconsistent. People discount hyperbolically rather than exponentially, myopically weighing current and near-term consumption more heavily than future consumption. Their preference for one alternative over another may thus be due to its proximity in time, not its magnitude (Ainslie and Monterosso 2003).

Hyperbolic discount functions are characterized by a relatively high discount rate over short horizons and a relatively low discount rate over long horizons. For example, consider a choice between two rewards: a small reward in year t, St, and a big one in year $t + 1$, $Bt+1$. When t is large (that is, the reward is far in the future), people will prefer $Bt+1$, because the difference in the value of the prizes exceeds the perceived costs of waiting. But as t approaches zero, the discounted value of the first reward increases relative to that of the second, causing people to switch their preferences. Such present-biased preferences can be captured with models that employ hyperbolic discounting (see Thaler and Benartzi 2004; see also Laibson 1997).

Myopic individuals contemplating college enrollment will both underestimate the growth rate of their future earnings and hyperbolically discount the earnings themselves, resulting in a massive

tendency toward undervaluing the returns to education. Milton Friedman's classic paradigm, the permanent-income hypothesis, posits that rational actors make decisions about future earnings and consumption today taking into account earnings over their lifetime. But because myopic individuals underestimate the growth rate of their future earnings, they will value the returns to education mainly in terms of starting salaries, without taking into account the increase in earnings that a college degree will bring them over their lifetime. Recall that although figure 6 showed that a higher education results in higher lifetime earnings, figure 7 showed that the divergence in earnings between college graduates and nongraduates occurs not immediately upon graduation but over a lifetime; a higher education does not necessarily generate immediate returns. As a result, even though the present value of the average college graduate's additional lifetime earnings amounts to $450,000—well over twice the cost of even the most expensive four-year college—myopic students will consider only their expected salary immediately upon graduation in estimating that present value.

Thus, in addition to severely underestimating the returns to education, potential college students significantly undervalue the present value of those returns because they come in the distant future. For a student weighing the immediate costs of education (including opportunity costs) against future earnings, hyperbolic discounting means that future benefits are undervalued and present costs overvalued. Generally, a full-time college student does not start realizing income until year $t + 4$ (assuming a four-year degree program), and the higher rate of return is realized even further out in time. As discussed above, myopic students fail to consider the full value of their lifetime earning stream, but, compounding this misvaluation, they also underestimate the present value of that stream because delivery does not occur until $t + 4$. This undervaluation of future income deviates from the behavior predicted by the permanent-income hypothesis. The decision likely to result—to forgo higher education—is myopic, based not on faulty information but on a psychological preference for present consumption.

Potential students who exhibit myopic, loss-averse behavior will improperly value the returns to education. As a result, they will find the risks involved in incurring college debt exorbitantly greater than the distant returns to a college education. Every dollar in loans they might receive, representing an out-of-pocket expense, creates a twofold disutility over every dollar to be gained through higher education. And future tax benefits (such as the interest rate deduction), which are also hyperbolically discounted, do little to offset the overwhelmingly high front-loaded costs. Such aversion to loss, in conjunction with the myopic preference for money now over money later, means that the irrational exhibition of myopic loss aversion disproportionately manifests itself in working students who must forgo current income, and in students relying on proximate earnings from a paying job upon high school graduation (Choy and others 2006). Working students who are dependent on their self-generated income tend to be concentrated among lower-income families. For students whose parents lack the financial resources to help them repay the loans, the risk associated with the loan can compound the underlying behavior initiated by loss aversion. In contrast, students who do not need to take out loans face no loss associated with repayment, and hence operate outside the behavioral patterns predicted by myopic loss aversion.

3. The Policy Proposal and an Illustration

> The logic of choice does not provide an adequate… theory for decision making.
>
> Tversky and Kahneman (1986, S252)

If students act irrationally, exhibiting myopic, loss-averse behavior, then up-front subsidies to higher education, such as grants and the HOPE, Lifetime Learning, and tuition tax credits, will be more effective in raising college enrollment than loan subsidies that are doled out over time. As explained above, student loans today are subsidized through below-market interest rates, deductions upon repayment, and in some cases forgiveness of interest after graduation. Although the subsidy component of student loans amounted to approximately $5 billion for loans disbursed in 2006, students do not realize these subsidies until after graduation, when they start repaying their loans.

This paper proposes accelerating the loan subsidy: instead of being delivered after graduation, the subsidy would be offered as a lump-sum payment at the time of enrollment. This would effectively restructure the loan subsidy so that it operates like a grant. Even proponents of pay-as-you-go budgeting should find the proposal to accelerate subsidy delivery appealing: it would increase the efficiency of government spending for higher education at no additional cost. The front-loading of education subsidies to correspond with when students actually incur enrollment costs, by addressing the problem of myopic loss aversion, has great potential to influence the behavior of potential college enrollees at the margin.

Determining Eligibility and Delivering the Subsidy

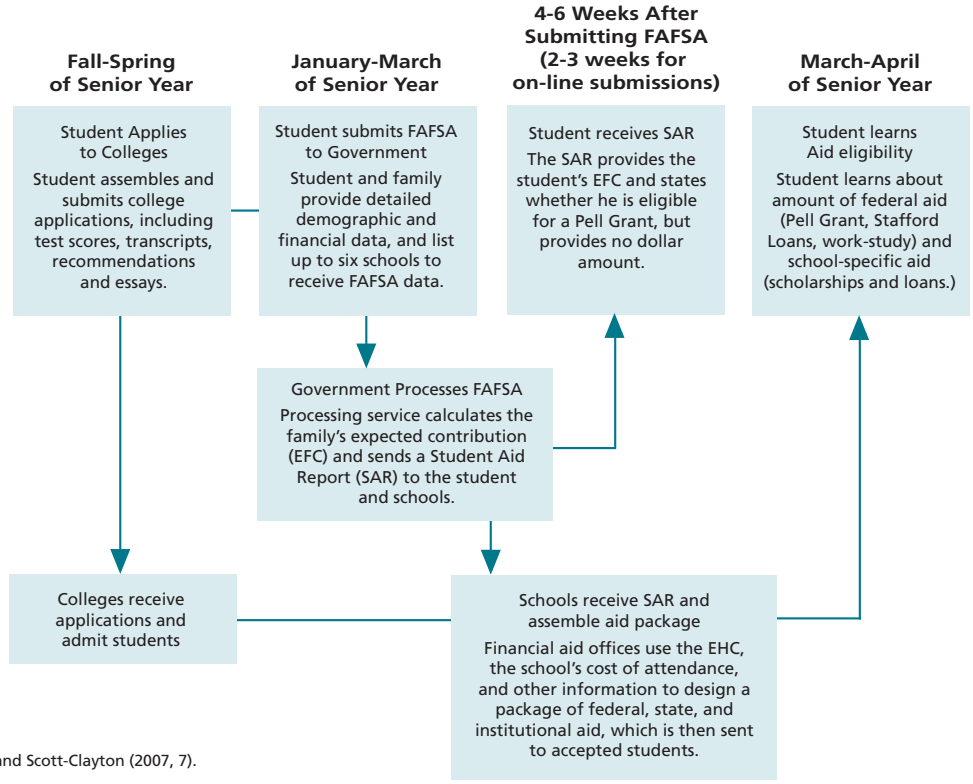
The information needed to assess a student's eligibility for the up-front subsidy could come either from the FAFSA or from income tax returns. Loan eligibility is currently determined on the basis of the FAFSA, which is filed by all college students seeking aid or by their parents. A Hamilton Project paper by Susan Dynarski and Judith Scott-Clayton (2007) proposes simplifying the loan application process by replacing the FAFSA with income information from tax returns. In the year a student applies for aid, the Internal Revenue Service (IRS) would forward information from the preceding year's return (or an average of several preceding years) to the Department of Education, which would then process and forward it to the college. The college in turn would determine the student's eligibility for aid, based on federally issued guidelines. Under the proposal presented in this paper, the aid would come in the form of up-front subsidies, which would directly reduce the student's tuition by a predetermined amount.

Whether information from the FAFSA or from tax returns is used to determine eligibility, delivering the up-front subsidy through the transfer system would look almost identical to the process under the current Federal Direct Loan Program (FDLP; figure 9). Currently, educational institutions exclusively select either the FDLP or the Federal Family Education Loan Program (FFEL) through which to offer their students federal loans. FFEL loans are funded by private lenders who direct funds to the university, whereas FDLP loans are funded with public capital that is channeled to the Department of Education and then to the university. In both cases, upon receipt of funds, the institution withholds a predetermined portion for tuition costs and refunds any amount left over to the student. Like the FDLP loans, up-front subsidies would be delivered directly to universities without going through a private intermediary.

From an economic point of view, whether the up-front subsidy is delivered through the tax system as a credit or through the transfer system does not

FIGURE 9.

The Student Aid Application Process



Source: Dynarski and Scott-Clayton (2007, 7).

matter so long as the former is refundable.[3] As discussed earlier, the value of a nonrefundable credit is limited to the taxpayer's tax liability, and thus the 32 percent of the nation's 136 million households who have no tax liability (Hodge 2006) would receive no credit at all under a nonrefundable credit. Without a refundable credit, many potential students would fail to receive the funds that could make the difference in their enrollment decision, thus rendering null the incentive and redistributive potential of the subsidy (see Batchelder, Goldberg, and Orszag 2006; see also Brody 2004, Albus 1998, and Kalafat 2005).

Delivery of up-front subsidies through either the tax system or the transfer system offers students aid at the time of enrollment. If the accelerated subsidy were delivered through the tax system as a refundable credit, the IRS could issue refunds directly to the family or, like FDLP and FFEL lenders, to the college, which would then refund any amount in excess of tuition back to the student. Because of the lag between payment of tuition (typically in the fall) and delivery of tax refunds (typically in April of the following year), families strapped for cash may find delivery through the transfer system more appealing. Alternatively, the tax system could be utilized if colleges, with their larger operating budgets, are willing to absorb the cost and inconvenience of the refund delay. They could provide the reduction in tuition up front when tuition is due, and apply the following year for a refundable credit equivalent to the student's up-front subsidy. Using the college itself as an intermediary has the added advantages of

3. On the efficiency differences between enacting programs through the tax system and enacting them as grants through the transfer system, see Weisbach and Nussim (2004, p. 957).

increasing accountability and simplifying the process for families, who generally lack the financial sophistication of a college's financial aid department.

A revenue-neutral acceleration of loan subsidies would fund a lump-sum subsidy of $934 to every Stafford loan borrower, or $8.05 for every $100 borrowed (table 1). Note that although deductions are technically realized through the tax system, the loan subsidy calculation includes the cost of interest payment deductions. This is done for two reasons. First, the subsidy generated by interest repayment deductions is closely related to the size of the loan principal and to the interest rate charged. Second, in keeping with the purpose of loan subsidy acceleration, front-loading the interest deductions increases their efficiency as price subsidies. In other words, replacing subsidized interest rates with market interest rates generates savings that would fund a $934 pro rata subsidy for every student taking on a Stafford loan.

What impact would a subsidy of that size have on enrollment? An experimental study by Erica Field (2006) suggests that students with low-debt financial aid packages are 50 percent more likely to enroll than those with high-debt financial aid packages of equivalent subsidy value. And Susan Dynarski's (2003) point-to-point study strongly suggests that enrollment increases by 4 percent for every $1,000 in grant aid. A back-of-the-envelope calculation based on these two sets of findings indicates that a $934 up-front grant would result in an increase in the share of potential students enrolling in college by 1.9 percentage points, increasing the enrollment rate of low-income students from 60 percent to 62 percent.[4]

Although the $934 represents the pro rata subsidy that the average student borrower receives based on total loans disbursed in 2007, in reality the amount that students may borrow changes over their college career in accordance with the maximum annual Stafford loan limits (table 2). Since the $934 represents an 8.05 percent subsidy rate, the nominal value of the accelerated subsidy equals the product of the subsidy rate and the amount of Stafford loan incurred. As a result, a student eligible for the maximum Stafford loan amount would receive $603.75 at the beginning of her first year, $684.25 at the beginning of her second year, and $845.25 in her third and fourth years, for a total of $2,978.50 in acceler-

TABLE 2.
Annual Limits on Stafford Loans for Undergraduates

	Independent students[a]		Dependent students	
Year in college	Total	Of which: "Subsidized"	Total	Of which: "Subsidized"
First	$7,500	$3,500	$3,500	$3,500
Second	$8,500	$4,500	$4,500	$4,500
Third and fourth	$10,500	$5,500	$5,500	$5,500
Total	$37,000	$19,000	$19,000	$19,000

Source: U.S. Department of Education (2005).
a. Students who are not claimed by their parents as dependents for income tax purposes.

4. The increase in enrollment is calculated as the change in aid times the estimated elasticity of enrollment with respect to aid. Dynarski (2000) finds that a $1000-dolar increase in grant aid can increase college enrollment by up to 4 percentage points. For a more comprehensive and recent review see Dynarski 2003. Both Field (2006) and Linsenmeier, Rosen, and Rouse (2002) estimate that students value loans at half their face value. Thus, converting a current loan subsidy of $934 to a grant is estimated to result in a 1.9-percentage-point increase in enrollment, calculated as ($934 – [$934 × 0.5])/$1,000 × 4. The enrollment rate among low-income students is estimated at 60 percent (Gladieux 2004, 20).

ated subsidies. Just as the annual Stafford loan limit increases as the student progresses through college, the accelerated subsidy also would start low and increase, to limit the downside from front-loading the full $2,978.50 should the student fail to complete her degree. Note, however, that if the government truly wanted to maximize the subsidy's efficiency, the full $2,978.50 would be delivered in year one, to solicit the greatest behavioral response from students on the cusp. Should the student then fail to obtain her degree, the government could require repayment of the accelerated subsidy.

The estimated 3.2-percentage-point change in enrollment for low-income students is conservative, because the pro rata $934 subsidy fails to maintain distributional neutrality. Limiting the loan subsidies to "subsidized" Stafford loan holders would be more distributionally consistent with the current subsidy distribution than a pro rata acceleration that goes to all holders of Stafford loans. Currently, loan subsidies are more heavily concentrated in the "subsidized" Stafford loans, which, again, in addition to the interest rate deduction and below-market interest rates, forgive interest accrued while the student is in college. Unlike other Stafford loans, the "subsidized" loans are awarded on a need basis. Recipients tend to be low-income, with about half of borrowers in 2003 coming from families with annual incomes less than $45,000.[5] Spreading a greater proportion of the accelerated subsidy among current holders of "subsidized" Stafford loans would generate an accelerated subsidy worth 25.14 cents on the dollar – an amount that stands to increase when taking into account the additional costs generated by the recent decrease in interest rates charged to students under the College Cost Reduction and Access Act (see below). (Lowering the interest rate on a loan widens the spread between the subsidized rate and the market interest rate; the government must compensate private sector lenders for the difference.) The product of the subsidy rate and the maximum subsidized loan amount results in an acceleration of $879.90 in year one, $1,131.30 in year two, and $1,382.70 in years three and four, for a total of $4,776.60.

Both the redistribution and the pro rata acceleration are revenue-neutral, but a redistribution to "subsidized" Stafford loan holders would generate more potent effects than the pro rata subsidy. Concentrating the accelerated subsidy among these recipients would maximize the efficiency of every dollar delivered, not only because it would elicit stronger behavioral responses than back-loaded loan subsidies, but also because students on the financial margin have a higher enrollment elasticity to grant aid than high-income students (Cronin 1997). Delivery of $4,776.60 would result in a 9.5-percentage-point increase in enrollment among low-income students, raising the rate of enrollment among low-income students to 69.5 percent. Delivery of the $4,776.60 year by year contingent on continuation in school would dilute the enrollment response in year one to the extent that students hyperbolically discount the amounts delivered in years two through four. However, students would then be discounting over just four years (compared with fourteen years with standard Stafford loans), and they would value the total accelerated subsidy as a grant totaling $4,776.60 (rather than as a subsidy in the form of a lower interest rate). Together these considerations should mitigate the dilution arising from contingent delivery over four years.

Applying Up-Front Subsidies in 2007: An Illustration

As an illustration of the acceleration in loan subsidies proposed here, consider the case of three hypothetical students attending college in 2007: Annie, Sara, and Noosh. Annie's family is in the lowest income quintile, with annual income of $19,000. Sara's family earns the median income of $46,326, but she files her income tax returns independently. Noosh's family is in the top 5 percent of income earners, with annual income of $300,000. To receive her loan, each student has to either fill out a FAFSA or

5. Anne Marie Chaker, "House Approves Cuts in Student Loans," *The Wall Street Journal Online*, January 19, 2007.

TABLE 3.

Accelerated Loan Subsidies in Three Hypothetical Cases, 2006

Student	Year 1	Year 2	Year 3	Year 4	Total
Annie					
(Family income = $19,000)					
"Subsidized" loan	$3,500	$4,500	$5,500	$5,500	$19,000
"Unsubsidized" loan	0	0	0	0	0
Total debt	$3,500	$4,500	$5,500	$5,500	$19,000
Accelerated subsidy	$879.90	$1,131.30	$1,382.70	$1,382.70	$4,776.60
Debt less accelerated subsidy	$2,620.10	$3,368.70	$4,117.30	$4,117.30	$14,223.40
Debt reduction (percent)	25	25	25	25	25
Sara					
(Family income = $46,326)					
"Subsidized" loan	$3,500	$4,500	$5,500	$5,500	$19,000
"Unsubsidized" loan	$4,000	$4,000	$5,000	$5,000	$18,000
Total debt	$7,500	$8,500	$10,500	$10,500	$37,000
Accelerated subsidy	$879.90	$1,131.30	$1,382.70	$1,382.70	$4,776.60
Debt less accelerated subsidy	$6,620.10	$7,368.70	$9,117.30	$9,117.30	$32,222.40
Debt reduction (percent)	11.7	13.3	13.2	13.2	12.9
Noosh					
(Family income = $300,000)					
"Subsidized" loan	0	0	0	0	0
"Unsubsidized" loan	$4,000	$4,000	$5,000	$5,000	$18,000
Total debt	$4,000	$4,000	$5,000	$5,000	$18,000
Accelerated subsidy	0	0	0	0	0
Debt less accelerated subsidy	$4,000	$4,000	$5,000	$5,000	$18,000
Debt reduction (percent)	0	0	0	0	0

Source: Author's calculations based on assumptions described in the text.

have the IRS forward her or her parents' previous year's tax return to her college. Once the college has this information, it notifies the student of her loan eligibility and (under the proposal) accelerated subsidy, as indicated below. Annie and Sara each receive a total of $4,776 in accelerated subsidies, because they take out the maximum allowed "subsidized" Stafford loan amount. In addition, Sara taps into the guaranteed liquidity provided by "unsubsidized" Stafford loans, which do not generate accelerated subsidies. Noosh is ineligible for a "subsidized" loan because of her family's high income.

As table 3 shows, Annie's subsidy reduces her total debt principal by about 25 percent. Sara, who takes out loans of both types, receives the same nominal accelerated subsidy, but her total debt is reduced by only 13 percent. The lower debt reduction properly reflects the concentration of accelerated subsidies in the "subsidized" loans. If Sara had received a pro rata accelerated subsidy of 8 cents on the dollar, her accelerated subsidy would equal $2,960, which is less than the amount she actually receives with the concentrated subsidy. Because both Annie's and Sara's tuition costs exceed their subsidies, both must place 100 percent of the accelerated subsidy toward their loans. Again, Noosh receives no subsidy because she is not eligible for "subsidized" Stafford loans.

Shifting the loan subsidy forward in time from after graduation to an up-front lump sum upon enroll-

ment moves the subsidy one step closer to operating like a tax benefit or grant, both of which are known to increase college attendance by serving as a de facto price subsidy (Dynarski 2002a). As table 3 shows, the accelerated subsidies reduce Annie's debt costs by a quarter, and Sara's by 13 percent, while delivering nothing to Noosh, whereas under the current system Noosh enjoys a subsidy equivalent to 12 percent of her loan principal over the course of repayment ($2,160). As a result of their accelerated subsidies, estimates suggest that Annie will be almost 10 percent more likely to go to college, reflecting the estimated 16-percentage-point increase in enrollment among low-income potential students. If a simple change in the timing of a subsidy can create a stronger incentive with no change in the dollar amount, then the change makes the subsidy more efficient. And a more efficient subsidy means that some potential students close to the cusp, like Annie and Sara, will acquire the higher education they might otherwise have forgone.

In addition to revenue-neutral efficiency increases, up-front subsidies promote equitable redistribution by targeting those students most in need of the aid. As table 3 also shows, an accelerated subsidy that maintains distributional neutrality will deliver a greater overall subsidy to students even though it eliminates subsidies for the "unsubsidized" Stafford loan. Although Sara would no longer receive a lower interest rate or interest payment deductions on her "unsubsidized" Stafford loans, acceleration delivers to Sara an up-front subsidy worth about 12 cents on the dollar, instead of the 8 percent subsidy she currently receives on the combined principal of both her "subsidized" and "unsubsidized" loans. And Annie, who comes from a low-income family, will receive a subsidy worth 25 cents on the dollar. Concentrating the subsidy among "subsidized" Stafford loan recipients, although not distributionally neutral, is more consistent with the current allocation of subsidies, because these loans require a higher amount of subsidies than "unsubsidized" Stafford loans. Furthermore, "subsidized" Stafford loans are based on need only, so that a distributionally consistent loan acceleration has the added benefit of funding low-income students, who have a higher enrollment elasticity to such aid.

4. The Case for Up-Front Subsidies to Higher Education

Empirical Studies Strongly Suggest That Up-Front Subsidies Increase Enrollment

As shown above, behavioral economics theory can explain *why* up-front subsidies for higher education maximize efficiency. The results of empirical studies substantiate that theory by strongly suggesting that college enrollment is more sensitive to grant aid than to loan aid. A grant's strong incentive effect stems from its immediately tangible benefits (Maag and Fitzpatrick 2004; see also Dynarski 2003). Potential students perceive a grant as a price subsidy that lowers the costs of tuition, and in fact grants have been shown to yield a measurable increase in college attendance (Dynarksi 2002a; see also McPherson and Schapiro 1991). According to what has been called the Bennett hypothesis,[6] colleges might simply appropriate the value of Pell Grants by raising tuition, but studies on the effectiveness of these grants continue to show a strong correlation between the grant and the enrollment response (see Singell and Stone 2004).

Indeed, Charles Manski and David Wise estimated that enrollments would fall by 21 percent if the Pell Grant program ceased (McPherson and Schapiro 1991; Manski and Wise 1983). Another study found that a $1,000 increase in grant aid produced a 4-percentage-point increase in college attendance rates among recent high school graduates.[7] A review of twenty-five studies by Leslie and Brinkman (1988) suggests that price increases result in lower enrollment, but that student aid in the form of grants increases enrollment by effectively reducing tuition costs. They estimated that at least 20 percent of enrollment among lower-income students and 13 percent among middle-income students was due to the availability of grant aid. Although the funding provided by Pell Grants is a small fraction of the typical student's tuition, their redeeming characteristics are their delivery at the time of enrollment and the fact that they do not need to be repaid.

Whereas grants clearly increase matriculation, the effect of loans on enrollment is not as convincing. Field (2006) analyzed experimental data from a financial aid study at the New York University School of Law, in which two career-contingent financial aid packages were randomly assigned to participating admitted students. Students agreeing to accept public interest jobs upon graduation were eligible for an aid package with up-front tuition waivers or postgraduation debt forgiveness of equivalent present value. Because the packages differed only in the duration of indebtedness, any differences in career choices could be attributed to debt aversion. As discussed above, debt is associated with repayment, which requires out-of-pocket expenses. As a result, individuals experienced the same disutility from debt as from an immediate loss. Indeed, Field found that participants randomly assigned to the low-debt package were nearly twice as likely to enroll, and that for entering classes where lottery winners were announced after matriculation, students with the low-debt package had a 36 to 45 percent higher rate of accepting a job in public interest law upon graduation. Field concluded that debt aversion affects how students value otherwise equivalent monetary options.

In a related point-to-point study, David Linsenmeier, Harvey Rosen, and Cecilia Rouse (2002)

6. After William Bennett, secretary of education during the Reagan administration, who argued in a *New York Times* op-ed that "increases in financial aid in recent years have enabled colleges and universities blithely to raise their tuitions, confident that Federal loan subsidies would help cushion the increase" ("Our Greedy Colleges." *The New York Times*, p. A31).
7. Kane (1994, pp. 882-83); see also Dynarski (2003, p. 282), who found that an additional $1,000 in student benefits increased enrollment rates among those eligible by 3.6 percent and increased schooling by one year, and Kane (2003), who found that California's CalGrants increased college enrollment among those eligible by 3 to 4 percentage points. See also Leslie and Brinkman (1988).

examined financial aid packages at Northeastern University. When Northeastern replaced the loan portion of its aid packages with grants, matriculation by low-income students, and especially by low-income minority students, increased. Although only the composition and not the amount of aid was changed, the program increased the likelihood of enrollment among low-income students by about 3 percentage points, and among low-income minority students by 8 to 10 percentage points.

A more targeted study by Dynarski (2002a) focused on identifying the impact of loan subsidies on matriculation. She found that enrollment did not increase by a statistically significant amount when students were provided with subsidized loans.[8] Although the subsidy was substantial, students failed to recognize it as a subsidy because they significantly undervalued the benefit.

These empirical studies all strongly suggest that students react differently to loans than to grants, even if the economic value of each is the same. Because students perceive grant aid as a price subsidy, substituting grant aid with loan aid deters students on the financial margin of entering college (Dynarski 2002b, 293). If loan aid continues to replace grant funding as the latter declines, enrollment by those students most sensitive to changes in price will drop. Together, the behavioral and the empirical studies add a new dimension to the funding debate: rather than simply haggling over the dollar values of loans and subsidies, discussions must consider *when* such amounts are delivered.

Loan Subsidy Acceleration Is Free: A Revenue-Neutral Implementation

Savings generated from replacing the below-market interest-rate subsidy on Stafford loans with a market interest rate could finance loan subsidy acceleration. Because loans are accounted for on an accrual basis for budget purposes under the Federal Credit Reform Act of 1990 (FCRA), shifting the interest rate subsidies forward does not affect the federal budget balance (Government Accountability Office 2005, 4). Before the FCRA, the government calculated these costs on a cash basis: costs and revenue were recorded when money was paid or received. FCRA adopted an accrual method of cost accounting for direct loan and loan guarantee programs. With accrual accounting, the government measures the cost of federal loans and loan guarantees by the net present value of extending or guaranteeing the loan over its term. The result is that lifetime costs of loans are measured in a way that permits better cost comparisons between loans and grants. In terms of accelerating loan subsidies, the accrual method means that the federal budget already accounts for the disbursement of future subsidies. Simply accelerating payment does not alter the cost, and so does not alter the budgetary consequences.

The subsidy cost of loans includes the special allowance payments (SAP) to lenders that cover their loss when congressionally set interest rates paid by borrowers fall below the federally guaranteed yield as well as the cost of default insurance. Banks and other private lenders are willing to offer loans under the Stafford loan programs because the federal government guarantees them a statutorily specified minimum yield tied to market financial instruments. The Government Accountability Office (2005) estimates that, from 1994 to 2004, $546 billion in loans were disbursed with a total subsidy cost of $39 billion, or 7.1 percent of the amount lent. As the spread between the rates on student loans and the market interest rate widens, the cost of the federal subsidy to lenders increases. For example, when market interest rates rose in 2005, the cost of the SAP for loans issued that year increased by $3 billion, from $8 billion in 2004. By 2006 the cost of the SAP relative to loan volume was 8.5 percent (see also U.S. Department of Education, Federal Student Aid Office 2006). In addition to the guaranteed rate of return, the government also

8. Dynarski (2002a) found a 1.7-percentage-point increase in enrollment for every additional $1,000 of loan eligibility, but the results are inconclusive because the supporting data are weak.

insures lenders against default.[9] Loan acceleration eliminates the interest rate subsidy and default insurance program, which shifts subsidies up-front in time and directly into the hands of students.

On September 27, 2007, President George W. Bush signed the College Cost Reduction and Access Act (CCRA, P.L. 110-84), which cuts the interest rate on "subsidized" Stafford loans by half, from the current rate of 6.8 percent to 3.4 percent in 2011. Lowering the interest rate paid by students without decreasing the rate guaranteed to lenders increases the cost of the SAP, because the government must make up a greater difference between the two. To offset the increased cost, CCRA includes provisions that reduce the cost of the SAP; these provisions lower the lender-guaranteed rate and raise the fees that lenders must pay to the federal government. Nonetheless, the costs of the Stafford loan SAP remains high. The Congressional Budget Office's 2008 baseline projection (CBO 2008, table 3-3) estimates that over 2009-13 the federal student loan programs will disburse about $20 billion in loan subsidies.

That figure, moreover, excludes consolidation loans, which further amplify the costs of the SAP and the interest rate subsidy associated with Stafford loans. Upon leaving college, a student has the option of consolidating his or her Stafford loans into a single loan at an interest rate that remains fixed through the term of the loan. Besides presenting students with the opportunity to refinance their loans at lower rates, consolidation also extends the repayment timeline to thirty years. Thus consolidation amplifies the two main cost components of loan subsidies: the SAP paid to lenders, and the interest that the Department of Education must pay to finance its lending activities. This comes about because the net present value of cash flows decreases when students lock in interest at a lower rate and extend their repayment periods (CBO 2006). The rationale for allowing consolidation is that the reduction in monthly payments lowers the default risk and thus reduces the cost of guaranteeing lenders against default (General Accounting Office 2003; CBO 2006). Nonetheless, the costs of consolidation to the federal government are significant. By 2006 the cost of the SAP relative to loan volume had increased to 8.5 percent. When consolidation is taken into account, the subsidy rose to 12 percent of principal, with a net sum of almost $17 billion in subsidy costs as a result of consolidation alone (U.S. Department of Education 2007). Although these subsidies are substantial, students do not realize any of the savings until after they graduate and begin paying off their loans.

Even with the lower interest rates introduced under CCRA, interest deferral and the below-market interest rate on Stafford loans remain inefficient because they are back-loaded subsidies. At the current interest rate of 6.8 percent, a student with $20,000 in "unsubsidized" Stafford loans and a standard, ten-year repayment schedule pays $230.16 in interest and amortization a month. CCRA phases the interest rate down to 3.4 percent by 2011, resulting in monthly payments of $196.84, only about $30 less per month than under prevailing rates (Project on Student Debt 2007b), for a total of $3,600 over ten years. The back-loaded subsidies approximate the nominal value of accelerated subsidies. But because students are myopic and debt averse, they will value accelerated subsidies more highly. In addition, accelerated subsidies will induce a stronger enrollment response because they align with when students incur costs. Put simply, accelerated subsidies generate more bang for the buck.

Increasing Efficiency Also Promotes Equity

Although this paper concentrates on the efficiency arguments behind accelerating loan subsidies, an argument based on equity can also be made. Up-front subsidies more effectively support equality

9. "Federal Payments of Interest and Special Allowance," *Code of Federal Regulations*, Title 34, Vol. 2, §682.300 (edocket.access.gpo.gov/cfr_2005/julqtr/pdf/34cfr682.300.pdf, last visited March 24, 2007).

of opportunity by targeting lower-income persons who would otherwise find themselves excluded from higher education. Myopic loss aversion disproportionately affects low-income students like Annie, in the example above, who are more averse to current costs (debt, the cost of college itself, and current or proximate earnings forgone) than to the loss of future benefits (the returns from higher education), even though a rational evaluation would show that the benefits outweigh the costs (Sunstein 1997). Up-front subsidies directly combat this myopia by reducing the perceived cost of education, thereby reducing the potential loss. And because of loss aversion, students weigh losses disproportionately greater than gains, so that an immediate decrease in losses positively alters the cost-benefit calculation for students to whom changes in price matter most. Table 3 showed not only that Annie receives a substantial sum of $4,776.60, but because she receives it as she incurs costs, she will maximize its value, since up-front delivery directly combats myopic loss aversion.

For independent students like Sara, whose parents lack the financial resources to help her repay her loans, the risk associated with debt amplifies the underlying loss aversion (Choy and others 2006). Indeed, lower-income students considering college, faced with the prospect of significant debt, often forgo investing in education and instead enter the labor force or join the military upon leaving high school (Dodge 1993). Thus, up-front subsidies perceived as price subsidies reduce the risk incurred and tip the balance for students on the margin. It is not surprising that empirical data indicate that price reductions result in higher enrollment among low-income students (Cronin 1997).

In contrast, students like Noosh who do not need to borrow (but may choose to do so under current policy because of the low interest rate) face no losses and thus operate outside the behavioral patterns predicted by myopic loss aversion. Enrollment responses to higher subsidies are small or nonexistent for middle- and high-income students, indicating that price is not as significant a factor in their matriculation decisions (Cronin 1997). Short of a liquidity crisis, up-front subsidies eliminate the incentive for wealthy students like Noosh to drain the resources of the federal loan system. Instead, because students on the enrollment margin perceive up-front subsidies as positively revaluing their cost-benefit ratio, accelerated subsidies efficiently target those students for whom such a subsidy will make or break the decision to pursue higher education.

Recent Legislation Demonstrates Congressional Will to Implement Loan Subsidy Acceleration

A series of scandals involving lender kickbacks to universities and misrepresentations to students about interest rates, along with an impending credit crunch and rising tuition costs, were what spurred Congress to pass CCRA. Recognizing the importance of higher education, President George W. Bush said at the time, "Eighty percent of the fastest-growing jobs in America require some sort of education after high school…. More American citizens need skills that they can only get through a post-secondary education."[10]

Significantly, the CCRA not only increases subsidies to students but also reduces subsidies to lenders who make federally guaranteed loans to students. Despite lender opposition, the CCRA reduces the SAP by 55 basis points on Stafford and consolidation loans made by for-profit lenders, and by 40 basis points for such loans made by nonprofit lenders and state agencies. It also reduces repayments to lenders in cases of default from 97 percent to 95 percent of unpaid principal. As further proof of Congress' determination to recapture the subsidies paid to lenders, CCRA doubles the loan fee collected from the lender on each loan disbursed.

10. "Fact Sheet: College Cost Reduction and Access Act of 2007," White House press release, September 27, 2007 (www.whitehouse.gov/news/releases/2007/09/20070927-1.html, last visited February 16, 2008).

Although two types of federal student lending programs compete against each other, CCRA affects only the nongovernmental lenders participating in the Federal Family Education Loan Program (FFEL). Originally authorized in the Higher Education Act of 1965, the FFEL program was formerly known as the Guaranteed Student Loan (GSL) program. The GSL program empowered state and private nonprofit agencies to guarantee student loans and to establish loan insurance for lenders who lacked access to state or private nonprofit agencies. In return for lending to risky students, FFEL lenders collect considerable subsidies from the government through the SAP and default coverage. Though loan acceleration would end the SAP and default insurance program, private lenders would internalize the cost of losing these benefits through the interest rate charged to students.

Because FFEL lenders receive significant subsidies for lending to students, Congress in 1993 established the Federal Direct Loan Program (FDLP) to streamline the student loan delivery system and achieve cost savings by replacing private lenders with government lenders. Unlike the FFEL, the FDLP does not use private intermediaries who require subsidies in order to lend; as a result, the FDLP costs the federal government less money per dollar lent. In fact, the government often stands to profit on loans issued through the FDLP because direct lending to students cuts administrative costs and expenses associated with the extra benefits to FFEL lenders like default insurance.

Although the intent of the FDLP was to gradually expand direct lending and replace private lending to students, the 1998 amendments to the Higher Education Act removed the provisions that referred to a "phase-in" of the FDPL program (Stoll and Smole 2007). In 2006 the FFEL was still funding over 90 percent of all Stafford loans and 80 percent of "subsidized" Stafford lending (Government Accountability Office 2005). Although the FDLP thus ultimately failed to replace private lenders, its creation evidences Congress' ability to pass legislation contrary to the private lenders' narrow interests. More recently, the CCRA's reductions in lender subsidies indicate continued institutional will and ability to oppose the lending industry's lobbyists. Lenders, already under pressure from the credit crunch that began in late 2007, responded in different ways: some halted their student loan programs or made up for the decrease in federal subsidies by increasing fees to students.[11] The FDPL remains unaffected because the government itself is the lender. Currently, both the FDPL and FFEL programs are authorized and compete for the student loan business.

11. Liz Rappaport, "Student-Loan Issues Under Stress," *The Wall Street Journal*, February 11, 2008, p. C1; "MHESLA Continues Zero Percent Loan Program", State of Michigan press release, October 10, 2007 (www.michigan.gov/treasury, last visited February 11, 2008).

5. Conclusion

By countering loss aversion and myopia, a revenue-neutral acceleration of the student loan subsidy would help potential college students make optimal decisions. It would accomplish this in several ways. First, by reducing the amount a student needs to borrow, up-front subsidies decrease the disutility caused by debt. Second, by lowering what the student perceives as out-of-pocket expense (a loss), up-front subsidies narrow the gap between the perceived cost and the perceived benefits of a college education. Finally, by yielding an immediately tangible benefit in the form of a tuition reduction, up-front subsidies operate much like grants, which are known to yield measurable increases in college attendance. By charging market interest rates and shifting the subsidies inherent in Stafford loans to students as they incur costs, the government would create an up-front subsidy equivalent to the amount of the current subsidy without incurring any additional expense. This simple revenue-neutral shift in timing is institutionally possible and would profoundly affect student behavior, raising college enrollment among low-income students by 9.5 percent, from 60 percent to almost 70 percent.

Where a subsidy can be accelerated in a revenue-neutral manner, there is no excuse for not implementing a policy that combats tendencies toward loss aversion and more effectively targets potential college students close to the cusp of deciding whether to attend. Until policymakers realize that part of the subsidy problem is timing, too much of the federal government's limited resources will go toward those individuals who can comfortably foot the bill for college, while depriving others who need the boost now.

As this paper has shown, *when* subsidies are delivered makes a significant difference in how students perceive and react to them. If financial aid truly aims to create equality of opportunity, subsidies must be targeted so that students at the enrollment margin get the most bang for their buck. Recognizing that students, especially lower-income students, behave myopically and are loss averse is an important step to understanding that *when* subsidies are delivered matters.

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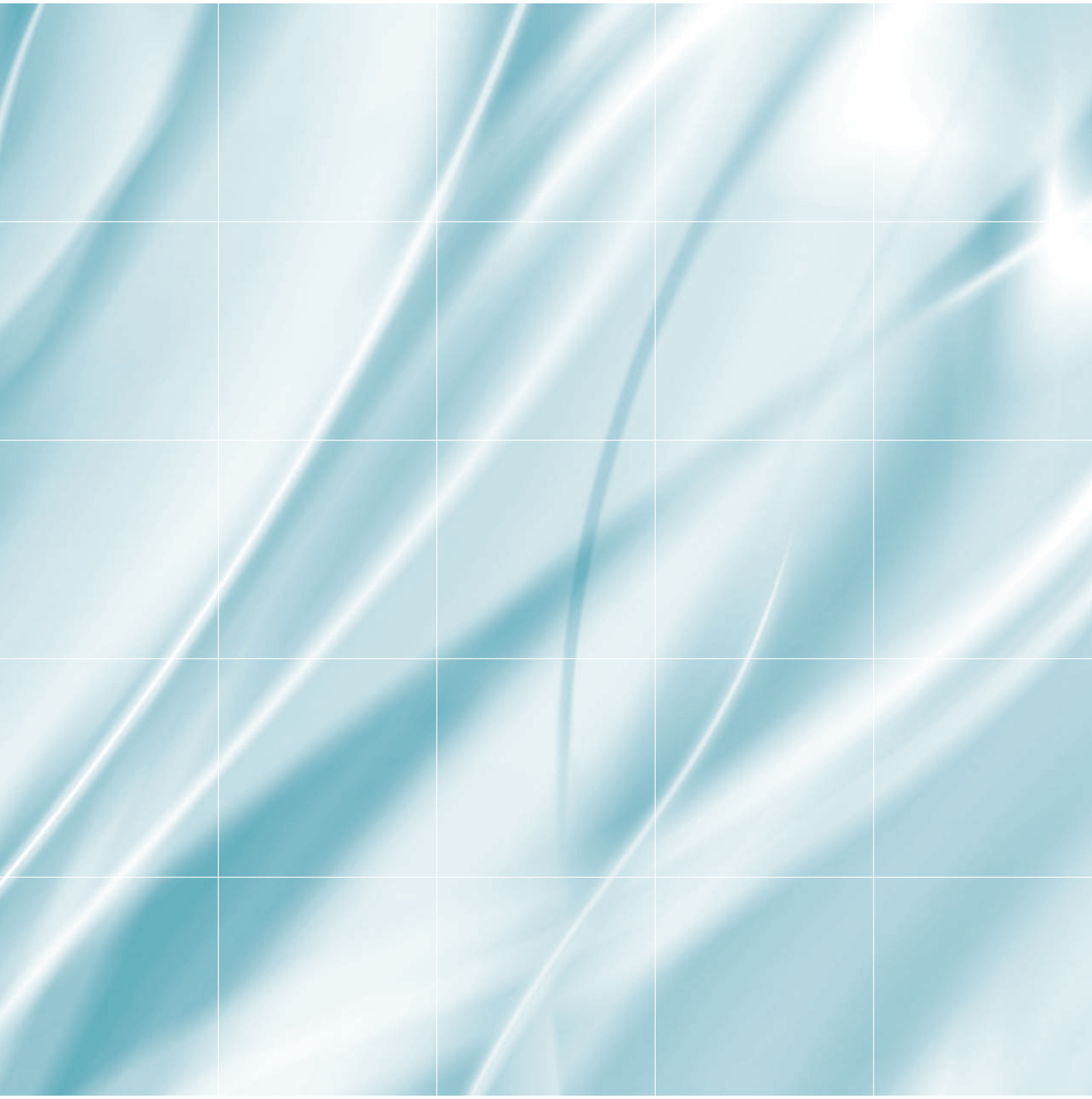

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