

FEDERAL FINANCIAL AID POLICY AND COLLEGE BEHAVIOR

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Do federal tuition grants and subsidized loans help students afford college, or do they simply encourage colleges and universities to raise tuition? This seemingly simple question has spawned a long, often heated, and highly politicized debate. In his 1987 *New York Times* op-ed, titled “Our Greedy Colleges,” William Bennett’s oft-cited answer is, “If anything, increases in financial aid in recent years have enabled colleges and universities blithely to raise their tuitions, confident that Federal loan subsidies would cushion the increase.”¹ This “Bennett Hypothesis” is often justified as simple economics. Federal aid is a subsidy. Subsidies raise demand, and that pushes up price. This claim continues to exert a powerful effect on the national conversation about financial aid policy. Appeals to simple supply and demand, however, are misleading at best. The right way to understand the claims and counterclaims about the Bennett Hypothesis begins by laying out an accurate framework of how tuition is set at colleges and universities.²

We believe that the attention focused on the Bennett Hypothesis largely misses a much broader question. How do changes in aid policy affect the well-being of students who receive grant and loan assistance from the government, given that students often receive various forms of aid from the institutions they attend? As the Congressional Research Service highlighted in a recent report, there are two important questions in this debate:

1. Is the full value of an increase in aid likely to be realized by aid recipients?
2. Will increases in aid have the unintended effect of raising list price tuition (Stoll, Bradley, and Mahan 2014)?

Bennett’s claim is that federal aid does enable institutions to push up tuition. By extension, this means that students also do not receive the full benefit of the grants and loans the government provides. But the two questions actually are very distinct. Students may not receive 100 percent of the intended benefit of government financial aid even if there is absolutely no link between that aid and college tuition-setting behavior. The first question is about how much, if any, of the federal aid institutions can siphon off for other purposes. If colleges and universities do not pass all of the aid on to their students, we will say that they are “taxing” the federal aid. The second question is about how much, if any, of that “taxation” happens through tuition increases.

In the next few pages we will build a simple framework of college tuition-setting behavior that will help us to think clearly about both of these questions. We will first show how some institutions have the capacity to siphon off a portion of any federal subsidy without changing their list price tuition. They can do this because the aid system allows institutions to decide their own aid allocations after they know a student’s federal support package. Colleges and universities that give need-based grants can allow federal grant aid to displace some portion of their own internal funding. This displacement is more likely at nonprofit institutions that offer substantial amounts of need-based grant aid.

Our tuition-setting framework also allows us to explore Bennett’s contention that increased aid

¹ William Bennett, “Our Greedy Colleges,” *The New York Times*, February 19, 1987, p. A31.

² We will tackle the shortcomings of textbook appeals to supply and demand in the appendix.

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may enable tuition hikes. We show that many campuses have no incentive at all to change their list price tuition in response to changes in the supply of federal aid. We see little scope for a Bennett effect at colleges and universities that give out a substantial amount of need-based assistance of their own and who serve a student population that includes some upper-income families. For these institutions, list price is determined by the willingness of

families who are largely unaffected by changes in federal aid policy to pay. By contrast, any links between list price tuition and federal aid policy are more likely at colleges and universities that give very little institutional aid, which is mainly the for-profit sector, or at nonprofit institutions that serve very few upper-income families.

We will also evaluate the existing evidence on both questions. The amount of federal aid colleges and universities siphon off or “tax” tends to vary by the type of institution. The tax rate is higher at for-profit institutions whose tuition does seem related to aid availability, and at selective private institutions that give out large need-based grants. The tax rate is lower (often zero) at state universities. Perhaps surprisingly, the higher education system as a whole siphons off a rather small fraction of the federal aid. Most of the aid reaches its intended target. Lastly, the evidence for an unintended aid-tuition link at the nation’s nonprofit universities is very weak. This is consistent with our tuition-setting framework.

I. How Do Colleges and Universities Set Tuition?

Let's look within the decision-making processes of a college or university to see how it might behave in response to a change in federal student aid policy. Can an institution capture federal aid dollars, and are there incentives to raise list price tuition? The answer to the first question is a clear yes. It's much harder to see a rationale for most institutions to raise their list price tuition.

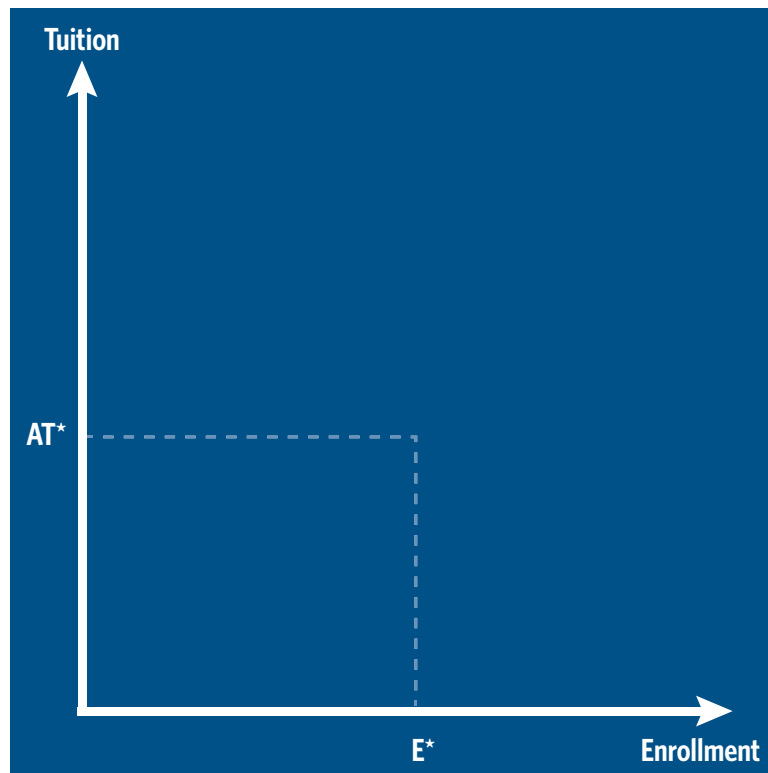
Imagine a hypothetical institution that we'll call St. Bridget's.³ It's a small Roman Catholic college of 1,200 students in the town of Kildare. St. Bridget's is selective, but not very selective. Its acceptance rate is 80 percent. St. Bridget's yield is a fairly low 25 percent. That means roughly three out of four accepted students decline its admissions offer and enroll somewhere else instead. For most of the students who do matriculate, St. Bridget's was their backup. This is especially true of their full-price-paying students. The list price tuition and fees at St. Bridget's is \$32,000. This is well below more elite brethren like the College of the Holy Cross (MA) or the University of Notre Dame (IN), both of which charge a list price tuition of over \$46,000. Only 5 percent of St. Bridget's students, however, actually pay the full list price. The average discount rate is 50 percent, which means that the institution's average *net price* is "only" \$16,000. This is quite a bit higher than the local branch campus of the state university system, but quite a bit lower than the average net price at the more selective private institutions that also tend to pull students away from St. Bridget's. Rounding out the costs at this residential college, the total for room and board averages \$9,000 per year.

One quarter of St. Bridget's students qualify for Pell Grants, and 10 percent get this year's maximum Pell Grant of \$5,775. The average Pell recipient's family has an expected family contribution (EFC) of \$2,500, so the average Pell recipient gets a federal grant of \$3,275. St. Bridget's gives this average Pell recipient an internal tuition discount of \$25,000. These large need-based discounts are called Kells Scholarships to give them some advertising cachet. People like to say that their child got a Kells Scholarship. Fewer would brag about getting a mere discount. This average student also is "awarded" a \$5,500 Stafford loan as part of the package. Federal Direct PLUS loans and Work-Study make up the difference to equal the \$41,000 cost of attendance.

To start the discussion we will sketch how an institution like St. Bridget's goes about determining its tuition for the next academic year. In the short run we will take the size of the institution as fixed. Its buildings, faculty, and staff determine that size. The institution knows how many students it would like to enroll, how much revenue it needs in order to maintain its quality, and how much of that revenue it needs to extract from its students in the form of tuition. Figure 1 shows the tuition revenue requirement for the college to make ends meet. St. Bridget's wants to enroll E^* students, and to meet its budget it needs to receive an average tuition per student of AT^* . The box represents the revenue St. Bridget's needs in order to balance its books in the short run.

³ We claim no originality in choosing the St. Bridget's name. Aden Hayes has written a number of articles about this tough little fictitious institution for *Inside Higher Ed*.

Figure 1. The Tuition Requirement of the Institution



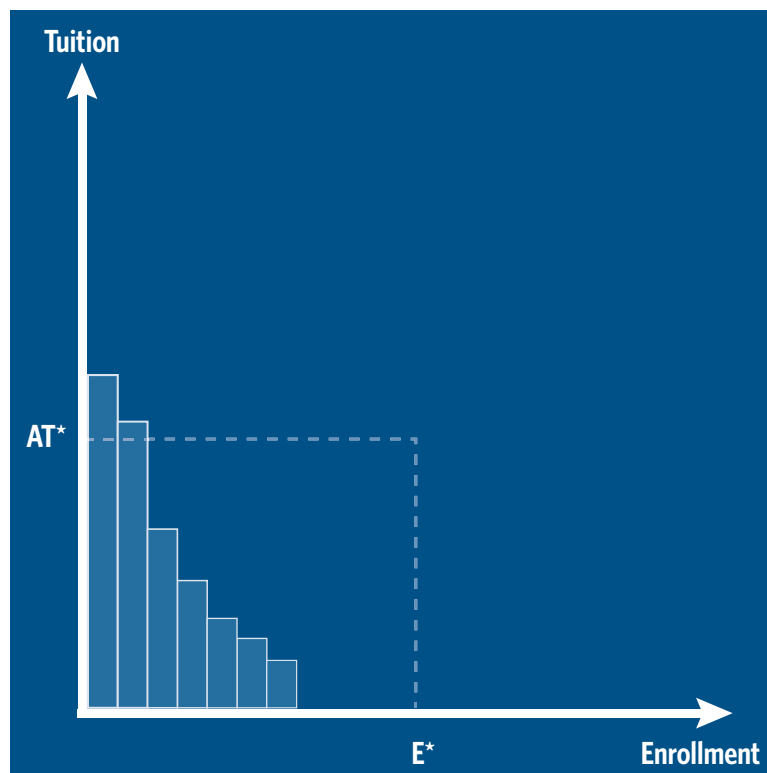
St. Bridget's tries to enroll the highest-quality group of students it can get while also collecting the needed amount of tuition revenue. The college is somewhat selective, so its applicant pool is larger than E^* . Highly selective institutions' applicant pools are much larger than E^* . All selective colleges and universities have some mechanism to rank potential students. For example, St. Bridget's might

employ a 10-point scale. Students rated 10 are the highest-quality applicants from the institution's perspective. Amherst College's (MA) 10s and St. Bridget's 10s aren't the same group. Amherst's 10s will have rarified test scores and very impressive high school records. Nonetheless, St. Bridget's 10s will have the highest test scores and the best high school transcripts of their applicant pool. In addition, many of these applicants will bring something special to the first-year class. They may be accomplished athletes or musicians, or they may offer geographic, economic, or racial diversity. The college would love to fill the incoming class with 10s, but it may not be able to come even remotely close to hitting its revenue needs or its enrollment goals with just that group.

The first step is to estimate the willingness to pay among this most select group. Most institutions have information they can use to make this determination. Some applicants have had siblings or parents who attended. Some may have applied using "early decision," or actively pursued the institution in ways that suggest real interest. They may have filled out financial aid forms, which reveal a lot of information about their parent's income and assets. The institutions may also have a track record with applicants from particular high schools and from particular locations. On the other hand, the college will also know that these 10s are very attractive to other institutions. Competing campuses may offer them large scholarships, and this may affect their willingness to pay at St. Bridget's. Also, the "yield" from this group may not be particularly high. This is not as large a problem for Harvard University (MA), Stanford University (CA), and Amherst, though even they must compete for the 10s in their own pool.

The next step is to determine the tuition revenue the group of students with an admission rating of 10 may yield. Figure 2 below gives an example. The height of the bars represents the willingness to pay of the students the institution believes will actually enroll after the dust settles on the admissions game. The diagram is constructed by placing students from left to right in declining order of willingness to pay. The shaded area under the bars gives the total willingness to pay among the portion of the 10s group the college reasonably expects to matriculate. If we suppose that St. Bridget's can design its financial aid offers adroitly, it will charge each student his or her full willingness to pay. The shaded area is the revenue the college can get from this group. A quick look shows that St. Bridget's does not think it can meet its revenue requirement or its enrollment goal with just the group of students with the highest admission rating. Given the fact that these 10s have many other options, there simply aren't enough of them with a high willingness to pay who will choose to attend the college. The area on the willingness-to-pay bars above AT^* is not as large as the part of the required revenue box not covered by the most desirable group's willingness to pay. In addition, the number of students from this group who would accept an offer of admission is well short of E^* .

Figure 2. Top-Rated Students' Willingness to Pay



In order to meet revenue and enrollment goals, all selective programs admit and enroll students with lower admission ratings. Knowing the odds of enrolling students with successively lower admission ratings, colleges and universities can eventually craft a class with the highest possible average admission rating that satisfies the tuition revenue requirement while filling the

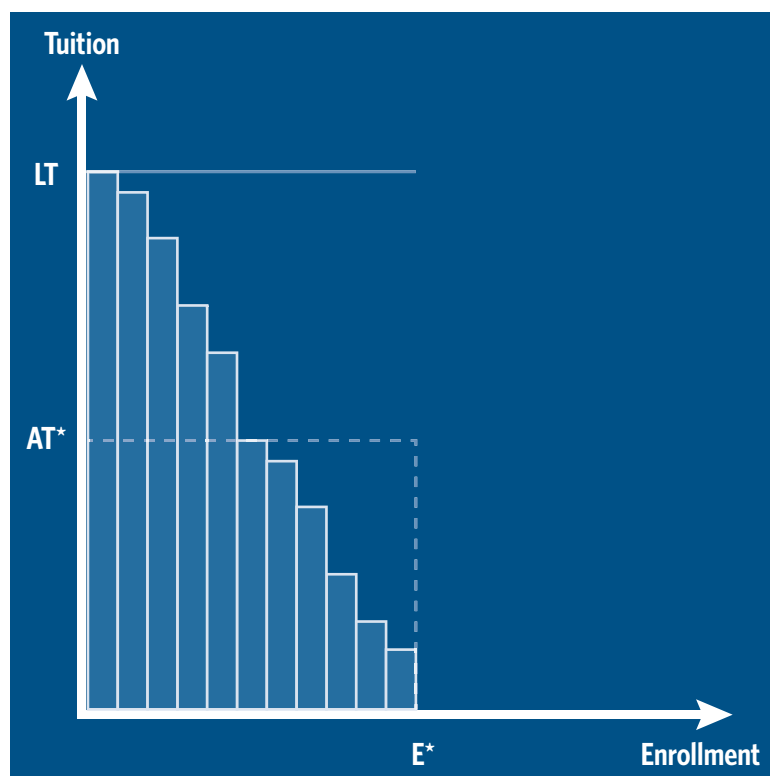
entering class. In its enrollment decisions, St. Bridget's may find that many of its 6s and 7s have a higher willingness to pay than many or most of its 10s. These are students with fewer opportunities to earn merit money at more selective institutions, and many come from high-income families. For some institutions—and St. Bridget's is among them—this means that a student

from the 6s with a very high willingness to pay may get preference over a student from the 8s with a very low willingness to pay. If so, St. Bridget’s practices “need aware” admissions.

The next figure illustrates the full outcome of the enrollment management process after institutions have accepted students as far down the list as they think they need to go. In Figure 3 the area covered by the willingness-to-pay bars above AT^* is exactly equal to the area below AT^* not covered by student willingness to pay. If each student is charged exactly what the family is willing to pay, the average tuition will be AT^* and the institution will sell all of its seats. Institutions accomplish this by setting the list-price tuition at LT , the height of the highest willingness-to-pay bar, and giving the remaining students tuition discounts like the Kells Scholarships we invented for St. Bridget’s.

This framework is clearly a simplification. The real tuition-setting process is more uncertain and more haphazard. For example, we assumed that the college knows each family’s willingness to pay, and we also assumed it could accurately forecast the yield for each group of students. Some students do reveal their willingness to pay by presenting colleges and universities with competing offers as part of a bargaining process. But for the most part institutions make guesses about willingness to pay using rules of thumb or with some type of forecasting model. Also, the yield on offers of admission can vary unexpectedly from year to year, and between the 10s, 9s, 8s, and so on down the list.

Figure 3. Pricing and Enrollment



Nonetheless, we think this simple idea captures the essence of how tuition is set in much of the nonprofit sector. An even minimally selective institution has two goals: The first is generating sufficient revenue to cover its short-run costs and the second is meeting or exceeding a target level of student quality. Our framework presumes the revenue needs are set first, based on the existing size and cost structure of the

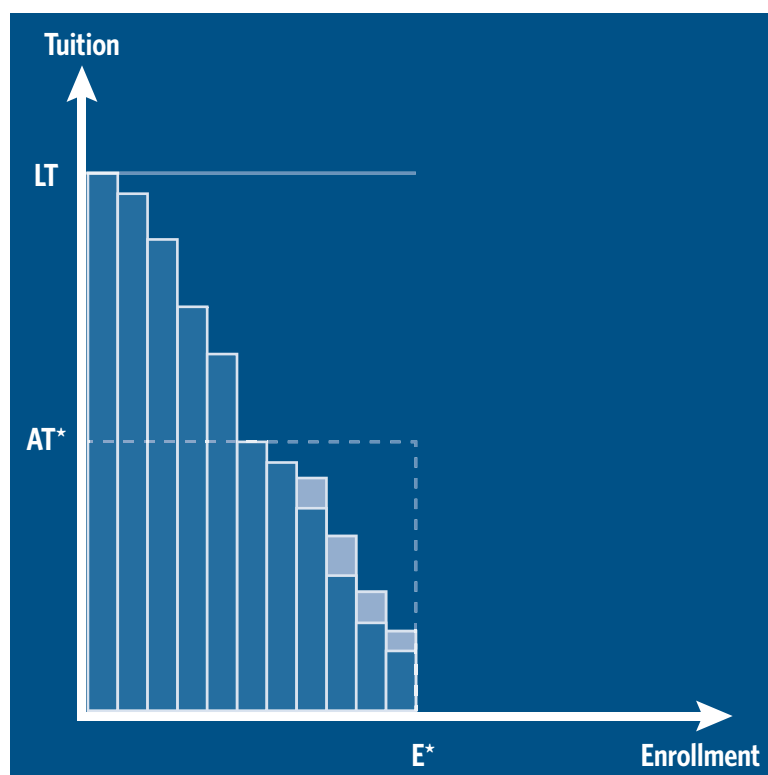
institution, and the tuition setting and admission decisions are made together afterward.⁴ This is essentially a model of enrollment management, easily recognized by any vice president for enrollment. It is the process by which a college or university sculpts its incoming class to meet multiple goals. Some public institutions don't follow this approach. In many states, for instance, the legislature or a state board sets tuition. In these cases, there are fewer levers the campus can pull to craft a class in the manner just described. Yet many public institutions are selective and use discounting to craft the incoming class. This applies to most public flagships.

This enrollment management approach is not a good description of how for-profit institutions operate. These colleges and universities maximize revenue in the short run and profits in the long run. For-profit institutions do face some constraints on their selection of students. To keep their access to Title IV programs such as Pell Grants and federally backed student loans, they need to ensure—like all institutions—that their three-year cohort default rates on student loans remain within federal limits. However, unlike public and independent colleges, they need to get at least 10 percent of their revenues from non-Title IV sources (i.e., money from students and their families). But this only sets a bare minimum quality standard for students. For-profit colleges and universities do not sculpt their classes to improve the learning environment for everyone, and they have no particular incentive to offer scholarships to attract particularly talented students to the residential mix. A quick look at the “net price calculators” for several for-profit institutions shows that most students pay a set price with no internal discount. Some proprietary institutions offer grants to applicants who have recently completed high school and who have met a high school grade point average threshold. This can be seen as a form of marketing, not class sculpting with a social or educational objective. The financial aid that is available to students at for-profit institutions is almost wholly made up of federal Pell Grants and loans.

With this background we can ask how an institution like St. Bridget's might change its behavior when the federal government makes financial aid more generous. Will the college or university have an incentive to raise the list price as the Bennett Hypothesis suggests? Let's consider an increase in the maximum Pell Grant first. Pell Grants go to the students with the lowest ability to pay. Because they are income-constrained, these students also have the lowest willingness to pay. With a higher Pell Grant maximum, many of these lower-income students will be willing to pay more for a chance at a degree. Figure 4 illustrates this situation. The lighter-shaded portion of the willingness-to-pay bars shows the increased willingness to pay among students whose maximum Pell Grant has grown.

⁴ In the long run, colleges and universities can adjust everything, so size and revenue target are no longer fixed. Rethinking those basic attributes of the institution is what strategic planning is designed to manage.

Figure 4. The Effect of Increasing the Maximum Pell Grant



After an increase in the Pell maximum, St. Bridget's has many options, and they're all good. Some of them are less good for the average student who relies on Pell Grant support to pay the bill. The best thing St. Bridget's could do for its average Pell Grant recipient is to subtract the full increase in the Pell Grant from the amount the student needs to borrow. If they do this, the extra Pell Grant money would reduce

the cost of attendance. At the other extreme, St. Bridget's could cut the Kells Scholarship of each Pell recipient dollar for dollar with the increased federal support. The increase in the Pell Grant from the federal government just displaces the institution's own grants to the student. St. Bridget's would get a tuition windfall. In this case, the lighter-shaded bars will be extra revenue above what St. Bridget's needs to cover all its immediate costs of producing a given level of educational quality.

In the first case, St. Bridget's has not taxed the extra federal support at all. Every dollar of added Pell support goes directly to the student in the form of a lower net price. In the second example, the institution has effectively imposed a 100 percent tax rate on the added Pell money. The average Pell recipient's net price is unchanged, so a 100 percent tax rate is not 100 percent bad news for students; it depends on what the institution does with the found money. That extra revenue could be used to improve programming that benefits all students, Pell recipients and full paying students alike. It could be targeted to student support services that are of disproportionate benefit to students from a disadvantaged background and to students who are the first in their family to experience the college world. The federal government might prefer a zero internal tax rate. But it's actually up to St. Bridget's to set the tax rate since it knows the Pell Grant award students are getting before it makes its own decisions about financial aid awards. The Pell program is an example of a "first dollar" award. St. Bridget's gives the last dollar, and the giver of the last dollar has more choice.

St. Bridget's isn't forced to choose either of these extremes. The college's most pressing needs will have a strong effect on the tax rate it sets. A lower tax rate maximizes the amount the average student's net price falls, and this will help the institution in a number of ways. A lower net price should enlarge the applicant pool, and this could help St. Bridget's to attract a few more 10s and 9s compared to institutions that don't pass all of the extra Pell money directly to students as a lower net price. The institution could become a bit more selective. This would improve the

quality of the incoming class and boost the graduation rate a few years later. As a better financial deal, St. Bridget's might also see a higher yield on its offers of admission. All of this looks good in the college rankings. In fact, for students who are near the threshold of Pell eligibility, the desirability of getting students tagged as Pell recipients may encourage some colleges and universities to add more institutional aid to those students' packages to boost the yield in that group, and there is very good evidence that many colleges and universities do in fact behave this way.⁵

On the other hand, if a campus has a greater need for immediate revenue, it would likely opt for a higher tax rate. This would shore up its financial position and allow it to enrich programming options for students. Lastly, the institution could allocate some of the extra resources not to programming, but to cutting the list price or slowing the list-price increases. This is the exact opposite of the Bennett forecast of extra aid causing a rise in tuition. Cutting the list price would perversely transfer some of the federal aid that is given to lower-income families to a higher-income student population that does not need it in order to attend.

Whatever the tax rate on additional federal student aid, St. Bridget's has no incentive to raise list-price tuition. The average student at St. Bridget's gets a hefty discount. And students receiving Pell support tend to be the most heavily subsidized. Since institutions tailor aid packages to each student, it's easy to adjust that package individually as students bring in more federal support. Since incremental changes in federal support are much smaller than the average aid package given out to these students, all of this internal taxation of the federal support can be done within each student's aid package. Moreover, institutions cannot increase a student's Pell Grant by raising the list price tuition. The size of the Pell Grant is determined by the difference between the Pell maximum and the EFC. Congress controls the Pell maximum, and the EFC is a formula based on family income, family assets, and the number of children the family is supporting in college. High-income families aren't the ones on the borderline between getting some Pell support and getting none. The Pell program is irrelevant for the list price, and it has

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⁵ See Lesley Turner (2012). We will discuss her evidence in greater depth later.

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We can look at changes to the federal loan program or tuition tax credits in the same way. The difference is that a more generous loan program or increased tuition tax credits are likely to affect more students. Broader availability of loans does not change the net price that students pay to the institution. However, if students had been financing college expenses with unsubsidized federal loans or private loans, then the full costs of going to college will decrease. Other things being

equal, this will increase some students' willingness to pay. Tuition tax credits do affect the net price students have to pay, so increases in tuition tax credits will clearly increase the willingness to pay among students from families eligible to use them. There is no need to show a separate diagram of these increases in the willingness to pay. It would look just like Figure 4 except the lighter-shaded bars showing an increase in the willingness to pay would spread further to the left. The increased height of the bars (the extra willingness to pay) is probably small since extra loan availability isn't as large a direct subsidy as a hike in the Pell Grant. The tuition tax credit mainly affects families in the middle and upper middle of the income distribution since it begins to phase out for incomes above \$80,000.⁶ There is no reason to repeat the discussion of the tax rate the institution might choose in response to these federal policies. In any instance in which the family's willingness to pay increases, the institution has the options described above.

Whether we are examining more generous subsidized loans, more generous tuition tax credits, or an increase in the Pell maximum, the result on list price is the same. Unless the policy change affects students with the highest willingness to pay, there is no reason for St. Bridget's to increase its list price. At our hypothetical college, these students come from families with the highest incomes, and these families will not qualify for Pell Grants, for subsidized loan programs, or tuition tax credits. However, there are other institutions whose students with the highest willingness to pay do qualify for subsidized student loans and tuition tax credits. Institutions serving fairly homogeneous working-class communities or institutions serving primarily nontraditional-age students who are financially independent are likely to be in this position. This first group includes some of the nation's small and minimally selective colleges and universities. The latter includes most for-profit institutions. These institutions may have an incentive to raise list prices in response to more generous loan limits. But there is no general support in this enrollment management process for the idea that federal aid automatically pushes up list price tuition.

⁶ The tuition tax credit is partially refundable, so it has a small effect on the willingness to pay of some lower-income families. The tax credit is a complicated policy, and it "pays off" as a tax refund that is not clearly connected to paying the college bill. Most families may see it primarily as a one-time boost in family income instead of as a decrease in the price of college. Therefore its effect on willingness to pay is complex and possibly quite small.

II. What Does the Evidence Tell Us?

There is a long and growing body of empirical work on possible links between federal aid policy and the list price (or net price) tuition that colleges and universities charge. Instead of offering another exhaustive review of this increasingly complex econometric work, we will focus on two aspects of it. First, we want to summarize the main contributions and identify what we see as some fundamental weaknesses. These weaknesses should cause analysts and policymakers alike to shy away from overarching or hard-edged claims about the impact of U.S. policy toward higher education. The evidence is nuanced, not conclusive. Secondly, we think recent evidence from a number of papers fits nicely into the enrollment management framework we outlined in the first section.⁷

The first question we posed asked if students get the full benefit of any increase in federal programs or if institutions siphon off (tax) some fraction for other purposes. Our enrollment management approach suggests that colleges and universities can indeed get their hands on some federal aid money by adjusting their own internal discounts and scholarships. Only evidence can tell us how much of the federal aid is taxed overall, or whether there are significant differences in tax rates between different parts of the higher education industry. Our framework offers no firm prediction, but it does highlight the role of competition. Institutions that are not very selective have to work harder to enroll a student of a given “quality” than do more selective institutions. Other things being equal, this suggests that less-selective programs are likely to pass more of the subsidy through to applicants as a lower net price. Other things, however, are rarely equal. Institutions that need extra revenue more than they need the benefits of higher yield on acceptances might choose to tax at a higher rate. On this margin, less selective institutions may be the ones with a stronger need for extra revenue. These two incentives may push a college or university in opposite directions in deciding how to tax an extra dollar of federal aid, which is why we offer no clear prediction about the tax rate set by these institutions.

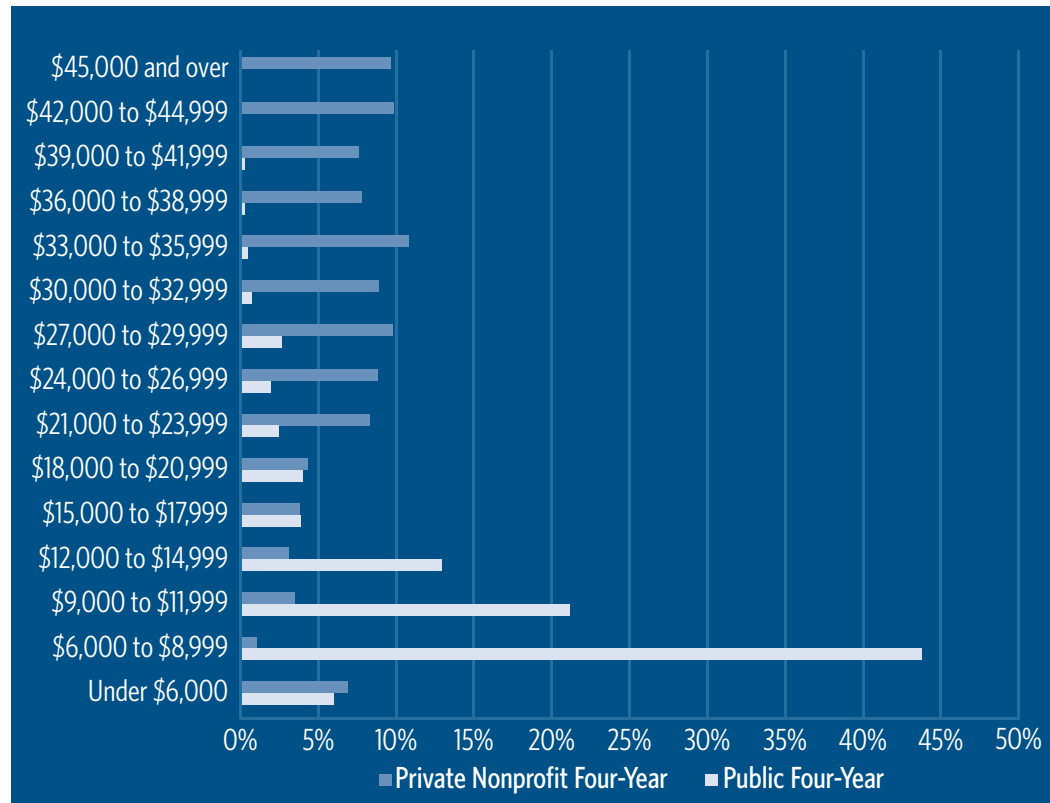
The second question asks if a more generous federal aid policy causes list-price tuition inflation. This is the Bennett Hypothesis. On this question our framework offers more guidance and our answer is: not very often, and not in the way that most people assume. At an institution with selective admissions, the tuition-setting policy is designed to obtain a certain amount of revenue from the most well-qualified students the institution can attract. To meet these dual objectives, the institution sets its list-price tuition to capture the high willingness to pay among students from well-to-do families that do not qualify for any federal financial aid. High income families are unaffected by small changes to federal aid programs, so any institution that has a meaningful fraction of its student population drawn from this group is unlikely to change its sticker price in response to an increase in a federal subsidy. According to the National Postsecondary Student Aid Study, for the 2011–12 academic year, 38 percent of students at private four-year

⁷ We encourage readers who want a thorough overview of this work to read the Congressional Research Service’s 2014 report, *Overview of the Relationship Between Federal Student Aid and Increases in College Prices*, or Donald Heller’s 2013 survey titled *Does Federal Aid Drive Up College Prices?*, published by the American Council on Education.

campuses did not borrow and 14 percent received no financial aid at all. This tells us that many of these colleges and universities can indeed find a way to repurpose some of the federal aid by adjusting their own aid packages without fiddling with the list price. As we noted earlier, only two types of private institution offer fertile grounds for a Bennett effect. The first is the set of relatively non-selective institutions that pull very few students from high-income families. These high-income families are immune to direct federal (or state) subsidy policies. The second are the for-profit institutions that discount tuition very little to begin with.

Public universities occupy a middle ground. There are reasons to think that state-supported universities might have an incentive to raise list price if federal subsidies become more generous, yet their traditional tuition-setting practices suggest that they don't. For in-state students, these universities do not set list price based on the willingness to pay among the highest income families. All students, even those from the wealthiest families, receive a generous indirect state subsidy in the form of low in-state tuition. A quick look at national data (Figure 5) drives home this difference in tuition setting between public and private campuses.⁸ The vast majority (over 85 percent) of students enrolled at public four-year universities see a listed tuition of less than \$15,000. By contrast, fewer than 15 percent of the students at private four-year institutions see a list price under \$15,000. As a result, public universities could take advantage of increases in federal support to push up list prices.

Figure 5. Published Tuition and Fees



⁸ Figure 5 is based on data in the College Board's *Trends in College Pricing*, 2014.

But would they? The actual process of tuition setting at state universities is very complex. Tuition setting in some states is done by the state legislature with little input at the campus level. In other states, in-state tuition is set by a state university system or a Board of Regents, and not by individual campuses in response to local market conditions. If there is a Bennett effect in this situation, it is driven by state politics and state finances, not institutional need.⁹ Even at institutions that have some local control over tuition, institutions essentially pass their state appropriation back to students in the form of an untargeted reduction of the list price. Colleges and universities that do this are likely to see additional federal support as a means to reduce the net price faced by their students and not as a revenue source.

What does the empirical literature actually tell us about our two questions? On the Bennett Hypothesis, the evidence isn't remotely conclusive. In an early work on Pell Grants, McPherson and Schapiro (1991) used institution-level data from the Department of Education's Integrated Postsecondary Education Data System (IPEDS) and found a positive relationship between gross tuition revenue and federal aid revenue at public universities but not at private institutions.

By contrast, an exhaustive congressionally mandated study (2001) conducted by Cunningham, Wellman, Clinedinst, Merisotis, and Carroll found no relationship between federal and state grant aid or loans and institution-level tuition increases. Singell and Stone (2007) looked at the relationship between the total amount of tuition revenue collected at public and private nonprofit institutions and the size of the *average* Pell Grant award per Pell recipient. They found no relationship at public universities but a positive relationship at private institutions. One of the most recent studies in this vein is a 2015 working paper from the Federal Reserve Bank of New York (Lucca, Nadauld, and Shen). In examining a possible relationship between federal aid and published tuition price (instead of net tuition), they argue that an additional Pell dollar to an institution leads to a 55 cent rise in sticker price, while an extra unsubsidized loan dollar has a 30 cent effect. While the paper is not yet final, the loan effects appear to be statistically robust while the Pell effect is less so. This study recognizes that tuition and loans/grants are bi-directionally linked—i.e., easier loan availability could cause tuition to go up or rising tuition could cause loan demand to rise, but it lacks a causal story for why tuition might be linked with federal policy and omits many controls that in theory could have generated their observed correlation.

This review tells us a number of things. First, there is no clear answer that has emerged. If you look around, you can find any result you want. One reason is that there is no consensus on what

If there is a Bennett effect in this situation, it is driven by state politics and state finances, not institutional need.

⁹ The possibility that states may tax federal programs is very important as Congress thinks about ways to give states the incentive to recapitalize their higher education systems.

relationship should be tested. What is the right measure of federal policy, for instance? Is it the maximum Pell Grant or loan a student can get (as in the New York Fed study), the average level of Pell support per student at affected institutions (Single and Stone), or the total amount of federal funding an institution takes in (McPherson and Schapiro)? Different studies use different measures and there is no common agreement about the appropriate relationship to test. There is also no common understanding of the right set of control variables to use. One reason is that all of this work is at best only lightly related to any rigorous story of how colleges and universities actually behave, such as the enrollment management process we have laid out here.

Building an analytic framework to understand university behavior is certainly not the only path to wisdom, but the absence of one makes interpreting these very contradictory results quite difficult. A positive link between aid and tuition could be simple spurious correlation, while the absence of a link might reflect a failure to include an important control variable that is positively correlated with aid but negatively correlated with tuition. Our enrollment management “model” of tuition setting tells us how to use control variables. For instance, one should clearly control for different types of institution if your theory tells you that they behave differently. One should control for-profit institutions separately because their pricing mechanism is quite different from nonprofits. Within nonprofits, public universities operate quite differently. Studies of public university behavior should control for difference in the pattern of state level higher education spending per student (the state business cycle) and in how they set their public university tuition (at the institution level or by state board). The private nonprofit sector is also not monolithic. Our model tells us that institutions without a meaningful cadre of wealthy families may set list prices differently than campuses that have a sizeable contingent of wealthy families. Studies that do not control for these predictable effects—and this includes a lot of the existing work—are unlikely to offer good tests of institutional behavior. Any correlations that emerge may very well be spurious.

As one example, we know of no study of the Bennett Hypothesis that has attempted to control for the tuition-setting mechanism at the state level, or for the interaction of state policy making with federal aid policy. Studies often don’t control for institution type, and the groups of colleges and universities that are often lumped together may contain subgroups that behave in opposite ways. We realize that charges of omitted variable bias bother many people. After all, anyone can dismiss evidence they dislike by claiming that the study in question has not controlled for every possible influencing factor. But when the literature in question has coughed up clearly contradictory findings, and many of the papers have left out seemingly crucial correlates (sometimes for lack of data), the case for worrying about omitted variables is quite strong. Omitted variable problems seem endemic in this literature. This is one reason why our enrollment management approach to tuition setting is helpful.

There are a number of recent studies that bear on the two questions we have posed, and some of them do capture important features of the simple framework of tuition setting that we have outlined. The first is a study of the for-profit sector by Cellini and Goldin (2014). A Bennett effect

is quite plausible in the for-profit sector, and that is exactly what Cellini and Goldin observe. They identify a set of for-profit institutions in five states that offer very similar services to very similar students. The major difference is that some of the institutions are eligible to participate in Title IV programs. This means that their students are eligible to receive federal grants and loans. Other for-profit colleges and universities in the study are not Title IV eligible. The Title IV eligible institutions charge a higher tuition than those not eligible for Title IV programs across all states, samples and specifications, controlling for program length, enrollment, how long the college or university has operated, and a set of other institution, location, and year effects. The tuition premium over non-Title IV programs is 78 percent. They also show that within Title IV institutions, particular programs that are too short to qualify for federal aid have tuition about the same as what is charged for similar programs at non-Title IV institutions. This suggests that college and university quality differences are not driving the result.

In a recent working paper, Lau (2014) confirms this finding about for-profit institutions, whose students use a surprisingly large fraction of federal aid. In the 2008–09 academic year, students at for-profit institutions comprised only 11 percent of the total population of postsecondary students, but they received 24 percent of Pell allocations, 28 percent of unsubsidized Stafford loans, and a quarter of the subsidized Stafford loans. Lau estimates a differentiated product oligopoly model in the for-profit sector and shows that for-profit colleges and universities absorbed 57 percent of Pell Grants and 51 percent of extra loan amounts as profit, passing through the remainder to students as consumer surplus (a lower net price).¹⁰

Turner (2012, 2014) directly addresses the tax rate question that we pose by estimating the economic incidence of the Pell program, taking into consideration how colleges and universities can adjust their own aid packages for individual students. She exploits two features of the aid system to separately identify the effects of federal aid programs with respect to institutional aid. The Pell program has discontinuities in both the level of aid and the slope (rate of change) that lead similar students to get differing amounts of total support.¹¹ Overall, she finds the tax rate is a modest 12 percent to 16 percent. Things are more interesting when she breaks the higher education industry down into specific sub-sectors. Selective nonprofits tax at a much higher rate (79 percent), presumably because of their market power. Public universities' net tax rate is close to zero. Turner shows that public universities actually exhibit a willingness to enroll students categorized as Pell recipients, though some of the increased aid that they give to students who are near the Pell threshold comes from other Pell recipients who are even more needy. She also finds that the for-profit colleges' and universities' tax rate is a low 18 percent, which is similar to

¹⁰ In a product differentiation model each firm (or institution in this case) offers a somewhat different product (or product quality) and faces a separate demand for its program. In an oligopoly, the number of competitors is low, so each one considers how its rivals will respond when making pricing decisions. Coca-Cola and Pepsi offer a good analogy in a product market.

¹¹ A student who qualifies for \$199 of Pell support actually gets \$0, while a student who qualifies for \$200 gets \$400 of Pell support. This is a significant discontinuity. Likewise, as family income falls below a threshold level so that the EFC is below the maximum Pell Grant, Pell support begins to rise. This is a slope change in the relationship between family income and grant aid. Turner exploits this discontinuity and this slope change to help identify the effects of policy changes.

the amount appropriated by most of the non-selective institutions.

The fact that for-profit institutions assess a modest *internal* tax rate is perfectly consistent with the finding that they take their pound of flesh by raising list prices in response to federal subsidization. A strong Bennett effect coupled with a low tax rate may seem odd at first, but this sector does not use institutional aid to craft the class like its more selective nonprofit brethren, so there is little institutional aid to displace. That does not mean that for-profits pass federal aid through to students. As Lau and Cellini and Goldin have shown, the for-profit sector takes its cut of federal support primarily through list-price increases.

III. Conclusions and Some Thoughts About Policy Debates

We have argued that federal financial aid to students and their families is something higher education institutions can potentially tax. We say it's a "tax" because institutions give out grant aid of their own, and they can allow increases in federal grant support to displace some of the assistance the colleges and universities would otherwise have given on their own. We have also reviewed some of the evidence about the size of this displacement effect nationally, and at different types of institution within the complex U.S. higher education system. The tax rate seems quite low overall. A small fraction of the value of government aid programs winds up serving other university purposes. The tax rate is roughly zero at four-year public universities that educate the bulk of the nation's students in bachelor's degree programs. It is substantially higher at highly selective private universities. Selective private universities tend to give more grant aid of their own, so their aid recipients may be less needy than students at other, less selective institutions. Highly selective programs also serve a small portion of the market for higher education, which is why their higher tax rate doesn't significantly drive the overall national rate.

By contrast, we have argued that the supposed link between federal aid policy and rising *list price* tuition is not obvious at all. Our enrollment management framework of pricing behavior tells us that the Bennett Hypothesis is probably confined to two kinds of institution: non-selective private institutions serving primarily low- and middle-income students, and the burgeoning for-profit sector that largely educates older nontraditional students who rely extensively on federal aid to finance their schooling. For-profit institutions don't offer very much internal grant aid, so there is very little of it for extra federal assistance to displace. So far, there is little evidence about non-selective private institutions pushing up tuition in response to rising federal assistance, but the evidence for a Bennett effect at for-profits seems quite strong.

Any discussion of federal higher education policy should be set in some context about how other federal programs affect behavior. When the federal government subsidizes any private activity, the subsidy changes some peoples' (or firms') incentives at the margin. But the subsidy also pays other people (or firms) for doing what they were already doing. As a concrete example, suppose the government pays a \$1 subsidy to buyers of solar cells for each one they purchase. If a buyer had intended to acquire 1,000 but now decides to buy 1,100, we see the incentive effect. The government pays \$1,100 in subsidy to that buyer and has achieved a 100-unit increase in solar cell usage.

If there were some way to pay the subsidy only on additional (marginal) purchases, the subsidy would only have cost \$100, but there is no easy way to separate the marginal effect from the total.¹² In this example, only 9 percent of the subsidy ($100/1,100$) has an incentive effect. The other 91 percent ($1,000/1,100$) is extra compensation for buying solar cells that people would

¹² Trying to distinguish between new purchases and old purchases punishes firms that were behaving wisely or with foresight initially, and with a homogeneous good it would set up truly perverse incentives to game the policy over time.

have purchased anyway (the infra-marginal effect). And the extra demand for solar cells might also push up the price of cells by 5 percent in the marketplace. That would be the Bennett Hypothesis of solar cell policy.

The debate about the Bennett Hypothesis is part of an ideological tussle that currently dominates public discussion about higher education. On one side we hear impassioned claims that the magic of unfettered and unsubsidized markets can solve the college cost problem. On the other side we have those who believe that free is the right price for everything of social value. And from both sides we are regularly treated to finger wagging about costly and wasteful amenities. When Louisiana State University included a “lazy river” in its new athletic center, the public image of the entire higher education industry suffered a damaging blow, even though improving the amenities on campuses often meets real demands and is an insignificant driver of college cost or price.

Relying on the magic of the market is not a sufficient response to fundamental questions of affordability and access in an industry as complex as U.S. higher education. As we have pointed out, the most market-responsive sector has benefited greatly from aid programs designed to open doors for financially constrained students. The spectacular growth in the size and reach of the for-profit sector is due in large part to the federal programs that have made postsecondary programming, and especially short-term certificate and two-year programs, more affordable to lower-income students and to older nontraditional students who seek a marketable credential. The fact that for-profit market-driven institutions seem particularly subject to the Bennett Hypothesis is ironic, though predictable, but that is not evidence the sector is guilty of high crimes and misdemeanors. The for-profit sector itself is a complex mix of high-quality programs and more questionable ones. There is mileage in thinking about ways to reduce high loan default rates and low completion rates at many for-profit institutions without condemning all for-profit institutions because there may be a positive linkage between federal aid and list price tuition within this sector.

In our view, the most important questions we face are about program design and achieving targeted results. If the social goal of federal financial aid policy is to make higher education more affordable to many low-income families there is ample evidence that it does so, despite the fact that some of this aid displaces grant aid the institutions might otherwise have given. There is also good evidence that federal aid programs can help persistence (reduce drop-out rates).¹³ Yet defects in the design of our aid programs are also well established. For instance, our aid programs are largely one-size-fits-all. But the best program for an 18-year-old full-time degree-seeking student from a lower-income family may be quite different than the optimal program for a 32-year-old who seeks a short-term certificate to boost her wage and who has to juggle family responsibilities in the process.

¹³ Eric P. Bettinger (2004), for instance, works carefully through the statistical issues involved in identifying the relationship between changes in Pell support and persistence. He shows that increases in aid do not reduce persistence, as they might if eliminating “skin-in-the-game” caused lower-income students to reduce their work effort. And under many specifications, he shows that extra aid significantly improved persistence.

Likewise, we have good evidence that the complexity and lack of transparency of the current aid system is a real barrier that limits the effectiveness of the Pell program. In a recent controlled experiment (Bettinger et al. 2012), high school seniors who received clear information about available aid and real assistance in completing the FAFSA were 8 percentage points more likely to finish two years of college.

We do need to know how much of the higher education funding provided by the federal government reaches its target. Most studies conclude that the vast bulk of it actually improves access. The amount of the federal support that winds up diverted, or taxed, by nonprofit colleges and universities seems quite low. But this is only a small part of a much broader set of questions about the best ways to overcome the real financing constraints that stand between so many people and achieving important educational goals that are privately and socially productive.

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Appendix

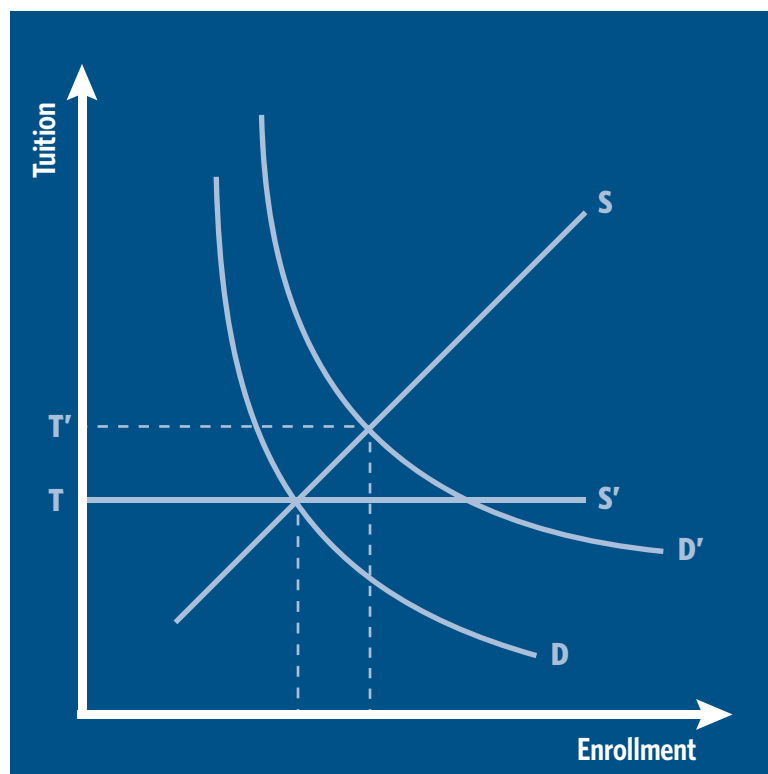
“Experience by itself teaches nothing . . . Without theory, experience has no meaning. Without theory, one has no questions to ask. Hence without theory there is no learning.”

—W. Edwards Deming

What Does Supply and Demand Tell Us About the Bennett Hypothesis?

We start by laying out the simple rationale for an aid-tuition linkage. The theory behind the Bennett Hypothesis is quite recognizable to anyone who has taken, or suffered through, a class in the principles of microeconomics. Figure 1A shows a traditional supply/demand model of the market for higher education.¹⁴ The demand curve (D) shows that enrollment is inversely related to the cost of attendance. There is a voluminous literature on the demand for higher education. Higher tuition does indeed reduce enrollment, other things being equal, but the response to a price change often is not very large. A 1 percent rise in tuition does not lead to a 1 percent falloff in enrollment. The whole demand curve (D') will shift to the right if people's incomes rise, if the return to higher education goes up, or if demographic changes increase the pool of potential students.

Figure 1A. Supply and Demand Model



This standard model is a workhorse in studies of the effects of government subsidies in product markets for homogeneous commodities or manufactured goods. The initiation of a government subsidy or an increase in an existing subsidy will shift the demand curve out to the right. For higher education the increase in the subsidy could be an increase in the maximum Pell Grant or a change in policy that

¹⁴ This framework is used quite often in higher education discussions. See, for instance, chapter one of Richard Vedder's *Going Broke by Degree* (2004).

expands the availability of subsidized student loans. In Figure 1A, the extra federal subsidization creates an excess demand for places at the current tuition T , and this naturally leads to higher tuition T' . Case closed.

This simple Economics 101 story suffers from two distinct problems. First, it presumes that the supply curve is upward sloping (S). There is considerable evidence to suggest that the supply curve is flat, like S' in the figure. In this case shifts in demand have no effect on price. Increasing subsidies will increase enrollment, not tuition. Second, the supply and demand model may not be the appropriate model for many institutions. Unlike many businesses, colleges and universities are concerned about who their customers are, and they often have considerable market power. This makes them very different from the kinds of firms that inhabit markets that can be accurately described in the supply and demand model. Hence the enrollment management model we develop in the body of the paper.

Slope of the Supply Curve

In Economics 101, we learn that a short-run supply curve is based on the marginal cost of producing the next unit of the industry's output. If it's upward sloping, educating one more student costs more than educating the previous one. But does it really cost more for a college or university to enroll the 655th student in the entering class than the 654th? The evidence about how college cost is related to enrollment points in the opposite direction. Cost per student doesn't seem to go up as institutions expand.

The reasons why cost per student does not go up, and in some cases may decline, are well known. A library that is sufficient for a college or university of 1,000 doesn't necessarily need to be expanded if in the following year the campus grows to 1,100. The number of full-time professors needed to run an institution of 2,000 doesn't necessarily need to expand if there are 50 extra first-year students. An institution has to maintain a reasonably complete set of departments and programs to be a true higher education institution. In some cases, many of those programs are inefficiently small, as are many of the classes taught. A class of six students can grow to 10 with no loss in instructional quality and no extra costs for the students. Alternatively, the institution may hire a couple of adjunct professors. These extra faculty members will be relatively inexpensive, so cost per student will not rise. Likewise, the minimum sized administrative and support staff necessary to operate a college or university of 1,500 can handle 150 more students without needing to grow in proportion to the rise in the student population.

What about supply in the long run? The slope of the long-run supply curve depends on what economists call returns to scale. In the long run a business firm can change all inputs. It can change its scale of operations. The evidence for returns to scale in higher education suggests that small colleges and universities—institutions with roughly 5,000 or fewer students—experience increasing returns to scale, and larger institutions have roughly constant returns to scale.¹⁵ With

¹⁵ See Darrell R. Lewis and Halil Dunder (2001).

increasing returns to scale, outputs (students taught) expand more rapidly than inputs (professors, rooms, laboratory equipment, etc.). As a result, cost per student declines as the scale expands. With constant returns to scale, outputs expand at the same rate as inputs, so cost per student is constant. The S' supply curve in the figure shows the result for constant returns to scale.

With a flat supply curve, the market responds to increases in demand with increases in enrollment. Examples abound of institutions getting larger over time, and sometimes much larger. When a young Sen. Joe Biden (D-DE) gave the commencement address at what is now called the University of Central Florida (UCF), the campus served 11,000 students. Today's enrollment exceeds 60,000. UCF is sometimes jokingly called "Under Construction Forever." The number of institutions has expanded as well. Since 1980 the number of four-year colleges and universities has grown from 1,957 to almost 3,000. A lot of this expansion has been in the for-profit sector, but even the stodgy nonprofit sector of public and private institutions has grown from 1,387 to almost 1,500.

The notion of a flat long-run supply curve may strike many people as quite unusual. Everyone knows that college tuition almost always rises more rapidly than the inflation rate. The result in Figure 1A with supply curve S' seems to suggest that tuition will be constant. With the flat long-run supply curve, rising demand does not push up tuition. How can we square our assumption of a flat long-run supply curve with the evidence that tuition has increased dramatically? The answer is that there is no reason to expect that the flat "constant cost" supply curve stays in the same place. The flat supply curve has moved upward over time. For much of the last 70 years, the cost of producing a year of college has gone up more rapidly than the inflation rate. Our book, *Why Does College Cost So Much?*, contains a detailed explanation of the factors that we believe have caused the real cost of a year in college to increase over long stretches of time.¹⁶ We identify three main causal factors, and they are all related to technological change. The first is the tendency for all artisanal services to experience low productivity growth compared to the rest of the economy. The second is the fact that colleges and universities must adopt new technology to meet an educational standard of care set in the labor market that employs our graduates, even if that raises cost. The third causal force is the rising wage gap in favor of college graduates. This pushes up cost in any industry whose employee base is highly educated. Rising demand, however, is not responsible for tuition growth.

¹⁶ See Robert B. Archibald and David H. Feldman, *Why Does College Cost So Much?* (2011).

