

Renewing our Schools,
Securing our Future



**Affordability of Postsecondary Education: Equity and
Adequacy Across the 50 States**

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Report prepared for:
Renewing Our Schools, Securing Our Future
A National Task Force on Public Education

A joint initiative of the Center for American Progress and the Institute for America's Future.

January 2005



Funding for this report was provided by the Center for American Progress. The report builds on research developed originally for the Lumina Foundation for Education's financial indicators project. Derek V. Price (Director of Higher Education Research), Jerry S. Davis (Vice President for Research), and Robert C. Dickeson (Senior Vice President for Higher Education Policy) of Lumina Foundation provided reviews and guidance for the indicators project. The advisory panel for the Lumina Foundation project included: Derek V. Price, Jerry S. Davis, Jill Wohlford, and Deborah Bonnet (all four of the Lumina Foundation for Education), Cheryl Blanco (Western Interstate Commission for Higher Education), Brian Fitzgerald (Advisory Committee on Student Financial Assistance), Susan Kleeman (Illinois Student Assistance Commission), Donald Heller (Center for the Study of Higher Education at Pennsylvania State University), Paul Lingenfelter (State Higher Education Executive Officers), Tom Mortenson (Pell Center for the Study of Opportunity in Higher Education), Laura Perna (University of Maryland), Kenneth Redd (National Association of Student Financial Aid Administrators), Scott Thomas (Institute for Higher Education-University of Georgia), and Nick Vesper (State Student Assistance Commission of Indiana). Choong-Geung Chung, Ontario Wooden, Tina Tuttle, Glenda Musoba, Ada B. Simmons, and Jesse Mendez contributed to the analyses presented in this report. In addition, thanks to David Mundel for his review of an earlier version of this report. The opinions expressed in this report are those of the author and do not necessarily reflect the policies or positions of the Lumina Foundation for Education or members of the financial indicators project advisory panel.

Executive Summary

This report examines trends and research evidence related to two persistent patterns—inequality in financial access to postsecondary education for low-income students in the U.S. and disparities in financial access across states—and considers the implications for policy in higher education.

Inequality in Financial Access to Postsecondary Education among Income and Racial/Ethnic Groups

- Federal funding for Pell Grants, the nation’s major need-based grant program, increased in the late 1990s and early 2000s. However, as average college tuition costs have increased, the purchasing power of Pell Grants has declined.
- While high school graduates had similar college enrollment rates in the middle 1970s, regardless of racial/ethnic group, a substantial gap in enrollment rates opened in the 1980s for African-Americans and Hispanics compared to whites. This disparity narrowed modestly in the early twenty-first century after an increase in maximum Pell awards.
- Most forms of aid other than need-based grants—including loans and tax credits—make college more affordable for middle-income and high-achieving students, but they do not equalize opportunity for academically average, low-income students compared to their middle- and high-income peers. Institutional grants have eased the impact of the decline in the purchasing power of Pell Grants for some students. State need-based grants have the potential of reducing the burden of unmet need after grants for the average college-prepared, low-income student.
- The average annual net cost of attendance after grants (from all sources) for low-income students in 1999-2000 totaled \$9,100 in public four-year colleges, up \$1,000 from ten years earlier, even after accounting for inflation (in 1999 constant dollars). At public two-year colleges, the average annual net cost after grants was \$7,300 in 1999-2000 for low-income students, an increase of \$700 over the preceding decade.
- The average annual net cost of attendance minus grants for lower-middle-income students increased by \$1,600 (in 1999 constant dollars) between 1989-90 and 1999-2000 at public four-year colleges. Tax credits, implemented in 1997, covered up to \$1,500 of cost for middle-income students, and were almost sufficient to offset the growth in net cost. Low-income families, on the other hand, often lack the tax liability required to fully benefit from tax credits.
- It would be necessary to more than double the Pell maximum award to recover the losses in the purchasing power of Pell. Unless new eligibility guidelines were set

to increase the minimum Pell Grant award, this strategy would have a high cost to taxpayers in part because, in addition to providing larger grants for low-income students, it would substantially increase the number of small grants for middle-income students.

Disparities in College Affordability Across States

- Higher state funding levels for both need-based and non-need (merit) grants were associated with higher college enrollment rates in the 1990s, controlling for other state characteristics. However, funding for need-based grants had a stronger effect on enrollment rates than did non-need grants.
- Across states, there was substantial variability in the adequacy of state need-based grants in the 1990s and 2000. Over this period, on average, only four states met a proposed state funding equity standard, defined as per full-time equivalent (FTE) appropriations for grants equaling one-quarter of the average public sector tuition charge.
- Six of the ten states with the most substantial improvement in college enrollment rates between 1992 and 2000 increased investment in either need-based or non-need-based state grants.
- Five of the ten states with the largest declines in college enrollment rates between 1992 and 2000 also had substantial increases in tuition charges without sufficient improvement in need-based grants. The other five states were from the western U.S., where populations grew at a faster rate than opportunities in public colleges.
- State funding for need-based grants did not keep pace with tuition in the 1990s. Nationally, state funding for need-based grants fell short of the proposed equity standard by \$316 in 2000, up from a \$239 shortfall in 1990.

Benefits of Need-based Grants

- An estimated 1.2 million additional high school graduates would have had the opportunity to enroll in college in the 1990s had all states funded need-based grants at a level meeting the proposed equity standard.
- Had the federal government and states funded the state-federal grant partnership—the Leveraging Educational Assistance Partnership (LEAP) program—at a level equaling the equity standard, an estimated 2.5 million additional students would have had the opportunity to enroll in higher education.
- While a doubling of the maximum Pell Grant award would also address the now-evident inequalities in educational opportunity, the expansion of LEAP represents

a strategy that targets low-income students and distributes the cost of improved access to higher education between both the federal government and the states.

Definitions

Cost of Attendance (COA): Tuition and fees, room and board, and other allowable costs of college attendance. COA is an integral part of the funding formula for need-based grant programs.

Dependency Status: Students who are of traditional college age are *dependent*, according to federal need analysis, unless they have been financially emancipated. Older students and other nondependent students are considered financially *independent*. Aid award formulae differ for dependent and independent students, because need analysis for dependency status considers family income.

Equity Standard: A proposed standard for state funding of need-based grant programs: appropriations per full-time equivalent student (FTE) equaling at least one-quarter of the average public sector tuition charge.

Institutional Grant Aid: Grants made by colleges and universities to students from institutional revenue sources, such as endowments or tuition. While institutional aid can be merit-based or need-based, most institutions use merit as part of their award criteria even when need is considered, a practice known as “aid leveraging.”

Leveraging Educational Assistance Partnership (LEAP): A federal grant program, created under Title IV of the Higher Education Act, which helps states provide grants to financially needy students. Participating states must match every dollar of federal LEAP allocations they receive with one dollar of state funds. If the total federal appropriation is at least \$30 million, the state must match the amount in excess of \$30 million with \$2 for every federal dollar they receive. Federal funding for LEAP was modest historically and has not kept pace with increases in public sector tuition charges over the past two decades.

Need-Based Grants: Grant programs that use the generally accepted measure of financial need (i.e., family ability to pay) as the primary criterion for awarding aid.

Net Cost After Grants: The cost of attending college minus grants from all sources provides the best available indicator of the student’s price of attending college. Students’ work, borrowing, and family contributions pay this amount. Families with higher incomes have greater ability than low-income families to pay costs of attending after grants.

Non-Need Grants: Grant programs that use merit (i.e., test scores, grade point averages) or other criteria (e.g., type of employment [police, teachers], prior service, etc.) as the primary basis of awards.

Pell Grants: The primary federal need-based grant program. Students apply to a national processor that determines financial need based on cost of attendance, family income, and other indicators. Pell Grants are *portable*, meaning students receive their awards no matter where they enroll. *Funding* for Pell is influenced by the *award schedule* (an index of eligibility) and the *maximum award* (the amount received by students whose families cannot afford any payments for college).

Privatization: The shift in higher education funding strategies toward students and their parents bearing more of the burden of paying for college, rather than taxpayers at large funding the majority of the costs for educating state residents.

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Introduction

While several recent reports have created the impression that grants, loans and tax credits have made college affordable for all students (Cauchon, 2004; Choy, 2002), there are substantial and persistent inequalities in access to higher education attributable to the decline in the purchasing power of the Pell Grant program since 1980 (Advisory Committee on Student Financial Assistance [ACSFA], 2002; Fitzgerald, 2004). This paper examines trends in college costs and financial aid in the U.S. both nationally and at the state level as a means of documenting the inequalities that result from the failure of many states and the federal government to invest sufficiently in need-based grants. First, the national pattern is examined, focusing on inequalities across income and racial/ethnic groups. Next, state-level financial strategies are examined, focusing on inequalities for low-income students across states. Policy issues related to financial access are examined in relation to the evidence from these analyses.

Unequal Financial Access to Postsecondary Education

A substantial burden has mounted over the last quarter of a century for low-income students as tuition at colleges and universities has grown faster than federal and state need-based grants, the primary source of financial support for equalizing financial access across income groups (ACSFA, 2001, 2002, 2003). Alongside the tuition increases, new financing schemes have emerged—including expansion of loan programs using private capital, state merit-grant programs, tax credits, and savings programs—that reduce net cost for middle-income students or for high-achieving students of all income groups, but not for average college-prepared, low-income students.

Unfortunately, the role of financial aid in making postsecondary education affordable for academically prepared students—those who have completed college preparatory courses with grades and test scores that meet admissions standards at public four-year colleges—is not well understood. This paper aims to:

- Update the policy community on trends in the purchasing power of Pell Grants, the primary need-based grant program in the U.S.
- Examine trends in college enrollment and financial access to postsecondary education across racial/ethnic and income groups.
- Assess disparities in financial access to postsecondary education across states.
- Examine the roles of other forms of financial aid that could either increase or decrease inequalities in financial access in the U.S.
- Consider the net cost of attendance after grants for dependent students with low and lower-middle family incomes.

The gap in postsecondary opportunity is related to family income as well as race and ethnicity and is especially evident in students' choice of four-year colleges rather than two-year colleges (see Table 1). For the class of 1992, enrollment in two-year colleges was relatively similar across income groups, with 22 percent of those whose families ranked in the bottom income quartile and 19 percent of those in the top income group choosing to attend. Enrollment rates in four-year colleges, however, varied widely by income group. Approximately 66 percent of students in the class of 1992 whose families were in the top income quartile enrolled in four-year colleges, while only 28 percent of those in the bottom quartile did so. Furthermore, for students in the bottom income quartile, this represented a 1 percent decline in enrollment rates in four-year colleges as compared to a decade earlier. In contrast, students from upper-income families had substantially expanded opportunity to attend four-year colleges, with enrollment rates jumping 11 percentage points between the early 1980s and 1990s.

Unfortunately, no further longitudinal studies were initiated after the 1992 cohort, making it difficult to continue to track this trend to the present. However, the financial condition that best explains the disparities among income groups (i.e., the decline in the purchasing power of Pell) continued through the 1990s (St. John, 2003), making it reasonable to conclude that financial access to four-year colleges has worsened for low-income students as a consequence.

Parental Income Quartile	Total	Any Postsecondary Schooling			
		Vocational, Technical	2-Year College	4-Year College	
Bottom	0.57	0.12	0.16	0.29	Class of 1980/82
3 rd	0.63	0.11	0.19	0.33	
2 nd	0.71	0.10	0.22	0.39	
Top	0.80	0.06	0.19	0.55	
Total:	0.68	0.10	0.19	0.39	
Bottom	0.60	0.10	0.22	0.28	Class of 1992
3 rd	0.70	0.07	0.25	0.38	
2 nd	0.79	0.06	0.25	0.48	
Top	0.90	0.05	0.19	0.66	
Total:	0.75	0.07	0.23	0.45	

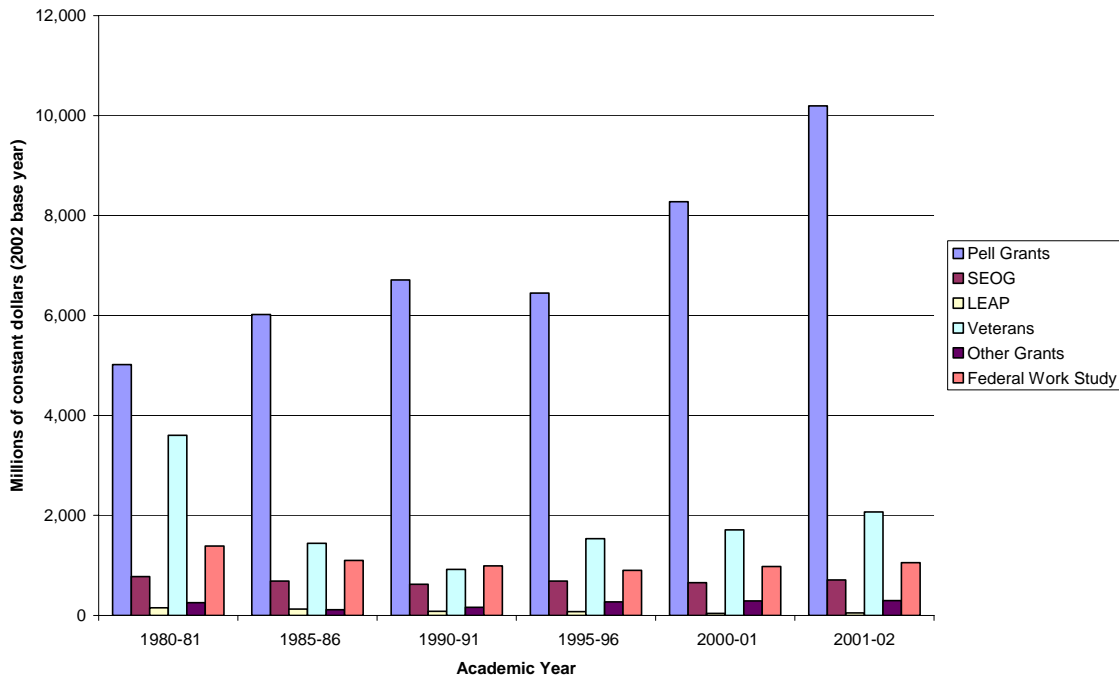
Note: Table from *Assessing the U.S. Financial Aid System: What We Know, What We Need to Know*, by T. J. Kane, 2001, Ford Policy Forum, Cambridge, MA: Forum on the Future of Higher Education; based on figures reported in "Who Is Getting a College Education: Family Background and the Growing Gaps in Enrollment," by D. Ellwood & T. J. Kane, 2000, in S. Danziger & J. Waldfogel (Eds.), *Securing the Future: Investing in Children from Birth to College*, New York: Russell Sage Foundation.

The Purchasing Power of Pell

The federal Pell Grant program, created in 1972 as Basic Educational Opportunity Grants (BEOG), was the first portable (voucher-like) need-based federal grant program and remains the primary federal program for equalizing financial opportunity for postsecondary education in the U.S. When first implemented, the program provided an amount of need-based grant aid sufficient to equalize the opportunity for low-income students to enroll in college if they were academically qualified. Over time, the eligibility criteria for the program have been extended to include middle-income students. The rising cost of university attendance has made it exceedingly difficult to restore the purchasing power of Pell Grants to a level sufficient to meet the original intent of the program.

The story of federal funding for Pell (Figure 1) is far from compelling. Funding rose slightly during the 1980s, from about \$5 billion in 1980 to nearly \$7 billion in 1990-91, as the Reagan administration retargeted the program on low-income students. The funding for Pell actually dropped during the early 1990s, as the federal government allowed inequalities in enrollment opportunities to grow (Ellwood & Kane, 2000; St. John, 2003). There has been some increase in recent years in Pell funding, which grew to more than \$10 billion in 2001-02. However, the increase in funding for Pell does not mean that college has become more affordable for low-income students, as noted below in the discussion of the purchasing power of Pell.

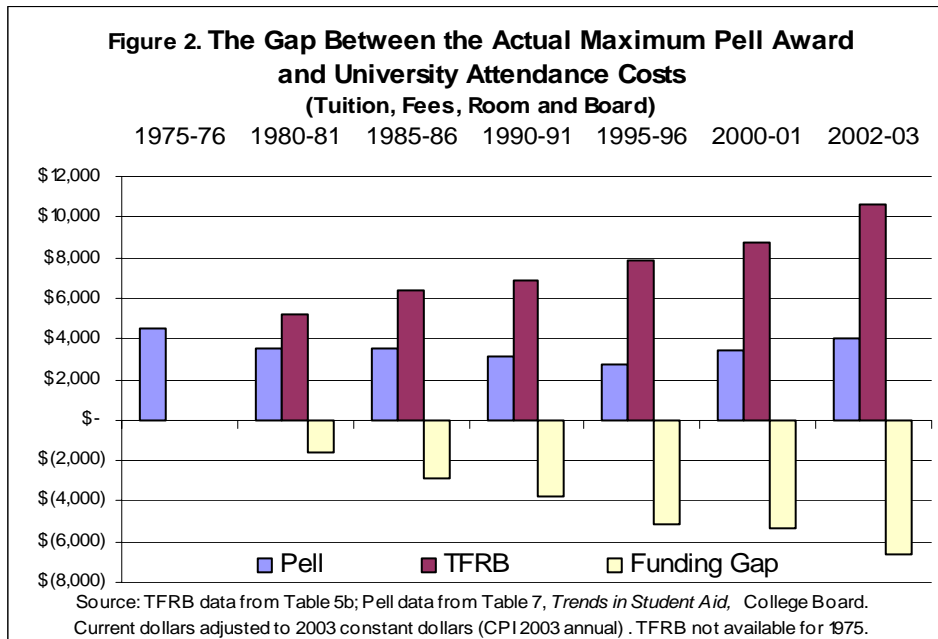
Figure 1: Federal Grant Aid for Postsecondary Education Expenses



Source: Data from *Trends in Student Aid 2003*, p. 7, Table 2, and p. 19, Appendix B, The College Board, 2003.

The fact that funding for other federal programs, with the exception of veterans' grant aid, also declined after 1980-81 should not be overlooked. Other forms of generally available, need-based aid dropped faster than Pell Grant aid relative to college costs. In particular, the funding for Leveraging Educational Assistance Partnership (LEAP), a federal grant program that requires states to match federal funding with two dollars for every federal dollar, actually declined during this period. LEAP is especially germane to this report because it provides a low-cost means for the federal government to reduce enrollment gaps and equalize enrollment opportunity across states.

While the rise in funding for the Pell Grant program in the early 2000s illustrates a pattern of reinvestment, the new spending has not substantially reduced the financial access problem for low-income students because of the rise in tuition. Trends in the purchasing power of Pell Grants (Figure 2) reveal a growing gap between the maximum Pell award and the average cost of attending a public four-year college in the U.S. In 1980, the maximum Pell award—the amount the lowest income students can receive—was about \$4,000, which was only modestly lower than the average cost of attending a public four-year college. However, at the time, low-income students in public four-year colleges did not receive the maximum Pell because of the half-cost limit: their Pell awards were capped at half the cost of attendance. By 1990-91, the half-cost provision had been removed, but the net cost of attending public four-year colleges was much higher. The maximum Pell award was less than \$3,000 in 1995-96, while the net cost after Pell was more than \$5,000. There were modest increases in the maximum Pell award after 1995, which rose to \$4,000 once again by 2002-03, but this did not keep pace with rising tuition rates. The funding gap after Pell was over \$6,000 in public four-year colleges in 2002-03.



The problem is that the annual cost of attending the average public four-year college nearly doubled, from approximately \$5,000 in 1980-81 to more than \$10,000 in 2002-03, even after adjusting for inflation. The rise in tuition charges in public colleges was also related to privatization (St. John, 2003). Privatization fundamentally shifted the pattern of public financing of higher education from using tax dollars to support opportunities across generations (i.e., funding colleges) and reduce inequality (i.e., federal need-based grants) to instead using private capital (i.e., loans) to mitigate the negative effects of rising costs on equal access. But the shift simply did not maintain equal opportunity.

Changes in the gap between maximum Pell awards and costs of attendance for low-income students provide a good indicator of trends in the purchasing power of need-based grants. Other forms of student financial aid should be examined relative to their role in reducing the burden after Pell for college-prepared, low-income students. The Pell maximum would need to reach a level over \$8,000 to attain the equivalent purchasing power it had in the 1980s. But raising the maximum without increasing overall federal funding for Pell would spread small grants across substantial numbers of middle-income students. A more sensible solution would be very costly. One option for containing cost would be to implement a higher minimum award as well as a higher maximum. Instead of receiving awards, students with less than \$1,500 eligibility should be encouraged to apply for tax credits. The minimum could be set at \$1,500, the tax credit maximum. Awards of \$1,500 or less would only offset the tax credit. Pell Grants of this amount would not help students. Since these tax credits are only available during the first two years of college, this practice would continue the front loading feature of tax credits.

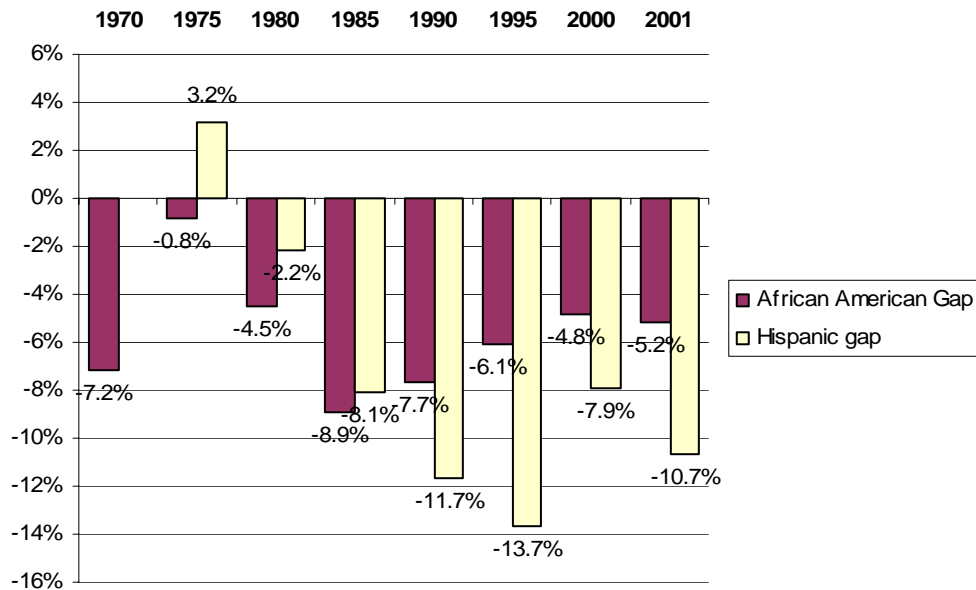
The Relationship Between Pell Grants and Financial Access to Postsecondary Education

Since Pell Grants are the primary need-based grant program in the U.S., it is appropriate to examine the relationship between trends in funding for the program and enrollment rates across racial/ethnic groups and income groups. It is important to note that trends alone do not indicate causality. However, there is substantial evidence that low-income students are more price responsive than high- and middle-income students (Heller, 1997; Leslie & Brinkman, 1988). Therefore, students' perceptions of college affordability may affect both their decision to pursue postsecondary education and their choice of what type of institution—two-year, four-year, or vocational—to attend.

First, the trends in college participation rates between 1970 and 2001 reveal a dramatic shift in equity across groups (Figure 3). In 1970, before Pell Grants, African-American high school graduates attended college at a rate that was 7.2 percentage points below the rate for whites; but Pell, along with other policies, helped remedy this differential in five short years. By 1975, there was near equality in college enrollment rates for high school graduates, with African-American and white high school graduates differing by less than one percentage point, while Hispanic high-school graduates actually had a higher rate than whites (by 3.2 percentage points).

In contrast, a substantial gap opened after the maximum Pell award for individuals began to decline. This gap persisted through the 1980s and 1990s. Compared to whites, the differential was 7.7 percentage points for African Americans and 11.7 for Hispanics in 1990. These differentials had lessened only slightly by 2000 (to 4.8 and 7.9 percentage points respectively). In short, there has been a slight reduction in the gap since 1985, the period of the most severe inequality, but the equality of the mid-1970s has not been restored.

Figure 3. Differentials in College Enrollment Rates for Hispanic and African American Compared to White 18- to 24-Year-Old High School Graduates



Note: Adapted from St. John, 2003; Data from *Digest of Education Statistics 2002*, p. 10, Table 4, Federal Support for Education, Fiscal Years 1980-2002, NCES, 2003a.

The Roles of Other Forms of Financial Aid

Recent reports have combined different forms of financial aid when making a general argument that grants, along with other forms of aid, have eased the effects of tuition increases. Before we untangle this question further, we need to examine the roles played by other types of student financial aid.

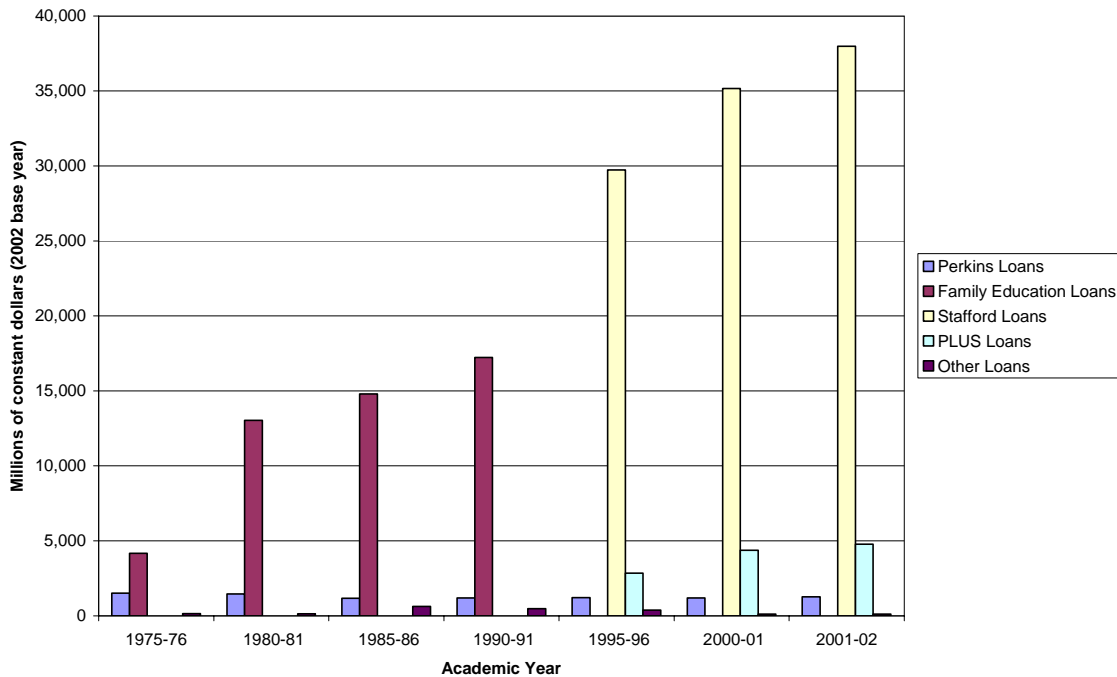
State grants are generally available based on financial, academic, or combined criteria. Therefore, state grants merit consideration as a factor in promoting equal opportunity for college enrollment by prepared students. However, there are differences in the roles of need-based and non-need (merit) grants (Heller, 2004a, 2004b) that should not be overlooked.

Other *federal grants*, including Supplemental Educational Opportunity Grants (SEOG), declined more substantially than Pell Grants after 1980. Further, most other grants are awarded based on institutional discretion (e.g., SEOG) or other award criteria

(e.g., Veterans' Benefits). The Leveraging Educational Assistance Partnership (LEAP) grant program, which provides matching funds for state grant programs, could play a role in reducing inequality if expanded (St. John, Chung, Musoba, Simmons, Wooden, & Mendez, 2004).

Loans for College Students. The growth in private capital for college students and parents (Figure 4) over the past two decades has been remarkable. The federal government guarantees loans for college students who borrow from private lenders. These guaranteed loan programs—called Federal Family Education Loan Programs (FFELP) in the 1980s and early 1990s and renamed Stafford Loans in the late 1990s—provided about \$13 billion in loan capital in 1980, and rose to about \$38 billion in 2001-02. In addition, the second biggest federal loan program, Parent Loans for Undergraduate Students (PLUS), uses the private capital market to provide loans for parents. Started by the 1992 reauthorization of the Higher Education Act, PLUS loans reached nearly \$5 billion in 2001-02.

Figure 4: Federal Loan Aid for Postsecondary Education Expenses



Source: Data from *Trends in Student Aid 2003*, Table 2, p. 7, and Appendix B, p. 19, The College Board.
 Note: Family Education Loans were renamed as Stafford Loans in the late 1990s.

The use of private capital for loans is the dominant way of funding higher education. The more than \$40 billion in private capital for loans from Stafford and PLUS overwhelms the direct investment in research in life sciences, a trifling \$14 billion in comparison. Guaranteeing private capital for students is the major federal contribution to higher education. There is also a relatively long history of direct federal loans as part of Title IV. Direct federal loans provide a less costly alternative than the use of private

capital. However, since the purpose of this paper is to address the topic of financial need after grants, the potential strategies for further reducing the costs of federal loans is not explicitly considered.

Loans are generally available but have maximum limits substantially below the total financial burden for low-income students after Pell and other grants. Low-income students must borrow more than the maximum in federally subsidized programs to pay for college if they do not receive sufficient aid from other sources. So loans play a role in promoting college access but are not a solution to inequalities in access, at least with current borrowing limits.

Tax credits are directed toward middle-income students and do not address the financial access challenge for low-income students (Kane, 1999). Because of their family income levels, many low-income Pell recipients do not exhibit the tax liability required to benefit from tax credits.

Institutional grants and scholarships have the potential of reducing financial inequities. However, most institutional grant aid is awarded on a mixture of merit and need criteria, as institutions use aid to leverage prestige (Hossler, 2004; McPherson & Schapiro, 1997). Aid leveraging involves giving higher awards for students with higher scores as a means of increasing average SAT scores. Since students must meet merit criteria to gain admission to elite colleges and get grant subsidies at most other public and private four-year colleges, institutional grant aid reduces inequalities in financial access for some students, but is not awarded to all academically qualified low-income students.

Institutional aid is a vital part of the student aid system. It has eased the effect of the rise in college costs on regular enrollment. However, college campuses cannot be expected to solve the inequalities created by the decline in the purchasing power of federal and state grants. As the analysis of net price after grants (below) reveals, institutional grant aid has not been sufficient to overcome the inequalities in educational opportunities that are now evident. While institutional aid helps promote enrollment—and played a role in increasing the enrollment rates for high school graduates in the 1990s—it does not equalize opportunity for all academically qualified low-income students because many institutions also consider merit as part of the award process.

Net Cost of Attendance After Grants

Even after the modest increases in Pell Grants and more substantial increases in institutional grants in the late 1990s, the average full-time dependent student from a low-income family faced a cost of \$9,100 after grants in public four-year colleges (Table 2) for the 1999-2000 school year, a \$1,000 inflation-adjusted increase over the preceding decade. For those low-income students attending two-year colleges, the average net cost after grants was \$7,300 for students in the lowest income quartile, up \$700 from ten years earlier. This is an extraordinary burden for families with income less than \$25,000. Throughout the decade, there was a high price to be paid through work, loans, and family contributions.

**Table 2. Average Net Cost of Attendance After Grants
(in 1999 constant dollars), by Type of Public College and Family Income Quartile**

Family Income	1989-90	1999-2000	Change
	Public 2-Year	Public 2-Year	Public 2-Year
Dependent Students			
Lowest quartile	\$6,600	\$7,300	\$700
Lower-middle quartile	\$7,300	\$8,100	\$800
Upper-middle quartile	\$7,200	\$8,300	\$1,100
Upper quartile	\$6,800	\$8,500	\$1,700
	Public 4-Year	Public 4-Year	Public 4-Year
Dependent Students			
Lowest quartile	\$8,100	\$9,100	\$1,000
Lower-middle quartile	\$8,900	\$10,500	\$1,600
Upper-middle quartile	\$9,400	\$11,700	\$2,300
Upper quartile	\$10,100	\$12,400	\$2,300

Note: Data from *A Decade of Undergraduate Student Aid: 1989-90 to 1999-2000*, by C. C. Wei, X. Li, and L. Berkner, 2004, NCES 2004-158, U.S. Department of Education, National Center for Education Statistics, Washington, DC: U.S. Government Printing Office. Average price of attendance after grants for public two-year colleges calculated from Table A-1.1, p. 42, and Table A-1.2, p. 43. Average price of attendance after grants for public four-year colleges calculated from Table A-2.1, p. 61, and Table A-2.2, p. 62.

Lower-middle-income students also faced a substantial burden after grants in the 1999-2000 school year: \$8,100 in public two-year colleges and \$10,500 in public four-year colleges. Over the decade, the cost after grants for lower-middle-income students had risen by \$1,600 at public four-year colleges, an amount slightly greater than the \$1,500 tax credit passed in 1997 for freshmen and sophomores. Thus, in spite of the efforts to improve affordability, the burden after grants was far more substantial than could be borrowed through federally guaranteed loan programs, even though these limits increased substantially after 1992.

In fact, students from all income groups, on average, faced higher net cost after all grants in 1999-2000 than in 1989-90 in constant dollar terms. Loans and tax credits helped ease this burden for middle-income students. However, low-income students could not borrow enough to pay this cost, nor were they eligible for tax credits.

Unequal Access Across States

During the past two decades, many states have fundamentally changed their approach to funding public higher education, shifting a substantial portion of the burden from taxpayers at large to students and their families. Because federal grants have not kept pace with the rising cost of attending public four-year colleges, it is crucial that states make a sufficient investment in need-based grants to ensure equal opportunity for all students who take the steps to academically prepare for college. Over the decade, most states that gained ground in enrollment rates made substantial new investments in grants. In contrast, states that lost ground had increases in net costs or failed to expand the

capacity in public and private colleges to keep up with population growth. These indicators, along with recent research on the impact of state grants, document the central role of state grants in this period of privatization of public higher education. This section summarizes recent research on the impact of state grants, examines how many states met a proposed standard for ensuring equity by committing to a proposed level of investment in aid, and considers the role of state grant programs in shaping college enrollment rates within states.

The Impact of State Grants

State financial strategies play an important role in equalizing access to higher education for diverse groups, especially for low-income students and people of color. In addition, the structural capacity of state systems (i.e., the number of seats available at public four-year, public two-year and private colleges as a percentage of the population) also influences access to postsecondary education, along with college enrollment levels, rates and persistence. That is, students cannot earn a postsecondary degree if sufficient openings do not exist at postsecondary institutions, regardless of financial aid levels. It is important to consider the role of state capacity in relation to state finance strategies when considering financial inequality in access.

Using this framework, the study of financial access (St. John, Chung, Musoba, & Simmons, 2004) examined the associations between state finance strategies and college enrollment rates in the 1990s. Two sets of findings merit attention (Table 3). First, the percentages of students enrolled in 1) private colleges and 2) public two-year colleges were positively associated with overall college enrollment rates, indicating that the capacity of the state system as a whole was crucial to expanding access to higher education.¹ Enrolling in private colleges had a particularly strong association. Second, funding for need-based and non-need grants was positively associated with enrollment rates, but need-based grants had a more substantial effect (the standardized coefficient was twice the size). Controlling for demographic variables, state tax rates, and student financial aid, tuition was not significantly associated with enrollment rates.

¹ The third capacity measure—the percentage of students in public four-year colleges—could not be entered into the equation at the same time as these two variables. The percentages of students in public two-year colleges and private colleges are measures relative to the capacity in public four-year colleges. In this sense, these measures provide indicators of the capacity of the entire state system to serve students in the state. The underlying assumption is that all three types of institutions—public two-year, public four-year, and private colleges—supply postsecondary opportunity in a state.

Table 3: Associations Between Public Finance Strategies and College Enrollment Rates in States for the 1990s: Standardized Coefficients for Variables from Fixed Effects Regression Analyses, Controlling for Population Characteristics

Variable	Coding	Standardized Coefficient
Public 2-year capacity	% of FTE enrolled in public 2-year college	0.328*
Private college capacity	% of FTE enrolled in private college	1.089***
Tax rate	State tax collection/personal income	-0.015
Per FTE need-based grant	Actual \$ divided by 1,000	0.426***
Per FTE non-need grant	Actual \$ divided by 1,000	0.204***
Undergraduate tuition and fees in public system, weighted per FTE	Actual \$ divided by 1,000	0.146

Note: *** p<0.01, **p<0.05, *p<0.1

Source: Financial Access: The Impact of State Financial Strategies, by E. P. St. John, C. G. Chung, G. D. Musoba, and A. B. Simmons, 2004, in E. P. St. John (Ed.), *Readings on Equal Education: Vol. 19. Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity*, New York: AMS Press, p. 121.

The Equity Standard

Historically, states developed publicly funded colleges as a means of expanding opportunity to higher education, and with that aim in mind most states maintained low tuition. Advocates used to argue that funding colleges was necessary to ensure that residents had access to higher education (e.g., Honeyman, Wattenbarger, & Westbrook, 1996; McKeown, 1996). With the advent of state need-based grant aid in the early 1970s, a more diverse pattern of public financing emerged. High tuition coupled with large grants was often considered more economical, and some states followed this strategy for expanding access. Minnesota has provided an excellent model for coordinating state subsidies to colleges, tuition, and student aid (Hearn & Anderson, 1989, 1995), but few states achieved this level of coordination. In spite of the great diversity in the financial strategies used by states, it is possible to consider a standard for state financing that promotes equal opportunity for high- and low-income students who are similarly qualified.

Given the role of tuition and grants in determining financial access to post-secondary education for low-income students, it is important to ask: What standard of equity should be maintained in states? It is proposed that setting funding for state need-based grants at a level equivalent to about one-quarter of revenue from public college tuition charges would significantly address the needs of low-income and lower-middle-income students (see Appendix A for a detailed explanation of the basis for determining the equity standard proposed here). The equity standard would apply to the state investment in need-based grants on top of Pell Grants, funded at current levels, adjusted for inflation. In addition, it would refer to the overall funding level for need-based grants and not the average award for a student. That is, states would fund need-based grants at a level of at least one-quarter of the average public college tuition charges, but any given student might receive need-based grants of more than that, depending on his or her financial need. The average award would equal about half the average tuition charge. The

total grants—Pell, state, and institutional grants—plus loans at the legal limit for the neediest students should equal total cost of attendance. The equity standard provides a basis for defining the state share of grants, given rising tuition charges in public colleges.

When this type of standard is met, states can fund grants equaling need for low- and lower-middle-income students. Since states essentially save a dollar of general funds for each tuition dollar charged at public colleges, it is more economical for states to invest one quarter of the “tax savings” from privatization into need-based aid rather than simply lowering tuition for all, as a means of ensuring equalized opportunity. This standard appears reasonable and logical, given the foundation provided by Pell Grants.

Most states currently fail to meet the equity standard proposed above. The trends in tuition and funding (Table 4) indicate that need-based grant aid has not kept pace with public secondary tuition charges. Nationwide, state-level funding for need-based grants averaged \$316 less than the proposed equity standard (one-quarter of tuition) in 2000-01, up from a \$239 gap in 1992-93. The average gap across all states over the period was \$264. When states were examined individually (See Appendix C, baseline estimate) only four states either met or nearly met this target: California, Minnesota, New Jersey, and New York. However, meeting this standard on average during the decade does not mean it was met throughout the decade, an issue discussed in the comparison of states below.² Three states had shortfalls in funding for state grants of more than \$800 per FTE—Delaware, New Hampshire, and Vermont—and had very substantial inequality in postsecondary opportunity.

Table 4. Trends in Tuition Charges and Need-Based Grants in the U.S. (in 2000 dollars)

	Tuition and Fees Weighted Per FTE	Actual Need-Based Grant /FTE	Need-Based Grant/FTE at the Proposed Equity Standard	Gap in State Need-Based Grants Relative to the Equity Standard
1992-93	\$2,332	\$344	\$583	(\$239)
1994-95	\$2,541	\$404	\$635	(\$232)
1996-97	\$2,661	\$396	\$665	(\$269)
1998-99	\$2,741	\$419	\$685	(\$266)
2000-01	\$2,728	\$366	\$682	(\$316)
Average	\$2,601	\$386	\$650	(\$264)

Source: *Expanding College Access: The Impact of State Finance Strategies*, by E. P. St. John, C. G. Chung, G. D. Musoba, A. B. Simmons, O. S. Wooden, and J. Mendez, 2004, Indianapolis: The Lumina Foundation for Education, p. 14.

² Specifically, as noted in the discussion of state comparisons below, there was a rise in net prices in New York during the decade that had an apparent influence on college enrollment rates. The state did not meet the equity standard by the end of the decade, due to the fact that grant funding did not keep up with tuition increases.

The failure of states to meet this equity standard entails potentially serious negative consequences in terms of college enrollment. The simulations of the impact of maintaining grant aid at a level equaling the equity standard (for method, see Box 1) show that had all states met the standard in the 1990s, an estimated 120,000 students nationwide (baseline estimate) would have qualified for college each year, for an estimated 1.2 million more enrolled over the decade (see Table 5). This would help equalize opportunity. This estimate seems within reasonable bounds, given that re-analyses of National Education Longitudinal Study (NELS) data confirm that an even larger number of college-prepared students from low- and middle-income families did not enroll in the 1990s (Fitzgerald, 2004; Lee, 2004). (The baseline, low-range, and high-range estimates of effects for each state are presented in Appendix C).

Table 5. Estimated Costs and Benefits of Meeting the Minimum Equity Standard in Funding for Need-Based Grants: Baseline, Low-Range, and High-Range Effect Estimates

	Baseline	Low-Range Effect	High-Range Effect
Estimate of Enrollment Effects			
High School Graduation			
Rate Increase	1.0% points	1.0% points	1.0% points
New Graduates	38,000	38,000	38,000
College Enrollment			
Rate Increase	3.8% points	1.1% points	6.5% points
New Enrollment	120,500	50,000	191,000
Estimate of Costs			
Cost per New Student	\$4,400	\$10,000	\$3,000
Additional Funding for Need-Based Grants (in million \$)	\$533	\$498	\$568

Source: *Expanding College Access: The Impact of State Finance Strategies*, by E. P. St. John, C. G. Chung, G. D. Musoba, A. B. Simmons, O. S. Wooden, and J. Mendez, 2004, Indianapolis: The Lumina Foundation for Education, p. 18.

Box 1. Simulation Methods—for estimating the impact of maintaining grant aid at a level equaling the equity standard (See Appendix C for State-Level Simulations.)

I. Baseline Estimation. Steps used in the baseline simulation:

- *Step 1:* Define a policy option for state grants (two options are examined below).
- *Step 2:* Calculate the change in the average amount of need-based grant aid for each state.
- *Step 3:* Use the regression coefficient for need-based state grants two years prior to graduation (Table 3) to calculate the change in *high school graduation rates*.
- *Step 4:* Multiply the percentage change in the *graduation rate* by the 9th grade enrollment to estimate the number of additional high school graduates.
- *Step 5:* Use the regression coefficient for need-based grants (Table 5) to calculate the change in the percentage of high school graduates *enrolling* in college.
- *Step 6:* Multiply the adjusted enrollment rate (original enrollment rate plus results of Step 5) by the adjusted number of high school graduates (original number of graduates plus results of Step 4) to calculate new *enrollment*.
- *Step 7:* Subtract actual enrollment numbers from new estimates to calculate the increase in enrollment.

II. Low- and High-Range Estimations.

The steps used in the low- and high-range simulations were exactly the same as for the baseline estimation except in Step 5. For the low- and high-range simulations, the low- and high-end values of the 95 percent confidence interval of the coefficient were applied.

III. National Figure Estimation.

The United States figures were estimated as follows:

- *Step 1:* The average weighted tuition for the United States in the 1990s (Column A) is multiplied by $\frac{1}{4}$ (Column B), setting the minimum average grant for the United States (i.e., national standard). This figure is a weighted average of all states.
- *Step 2:* The average need-based grant in the 1990s is subtracted from the standard (B-C), identifying the average shortfall by the nation (Column D).
- *Step 3:* The estimated increase in enrollment was then calculated by adding up all the states' enrollment increases (Column E).
- *Step 4:* The average number of total freshmen in the 1990s was obtained by adding up all the states' figures (Column F).
- *Step 5:* Program cost was calculated by adding up all the states' required costs (Column G).
- *Step 6:* Cost per new student enrolled (Column H) equals total costs divided by the number of new students ($H=G/E$).

An Expanded State-Federal Partnership

The estimated enrollment effects of funding the state-federal partnership program—the Leveraging Educational Assistance Partnership (LEAP)—at a level equaling the equity standard are presented in Table 6 (For simulation methods, see Box D.1 in Appendix D). The baseline estimates of enrollment effects indicate there would have been an annual enrollment increase of 255,300 students in the 1990s, for a gain of 2.56 million over the decade. The Advisory Committee on Student Financial Assistance (2002) and Lee (2001) indicate more than this number of qualified students might have attended with sufficient aid, so these estimates seem reasonable. These estimates assume stable K-12 education.

Table 6. Estimated Costs and Benefits of Prospective State-Federal Partnership for Need-Based Grants: Baseline, Low-Range, and High Range Effect Estimates

	Baseline	Low-Range Effect	High-Range Effect
Estimate of Enrollment Effects			
High School Graduate Rate Increase	2.1% points	2.1% points	2.1% points
New Graduates	77,000	77,000	77,000
College Enrollment Rate Increase	7.9% points	2.3% points	13.5% points
New Enrollment	255,300	106,100	404,500
Estimate of Costs			
Cost per New Student	\$4,800	\$10,400	\$3,300
Additional Funding for Need-Based Grants (in million \$)	\$1,226	\$1,107	\$1,344
State	\$817	\$738	\$896
Federal	\$409	\$369	\$448

Source: *Expanding College Access: The Impact of State Finance Strategies*, by E. P. St. John, C. G. Chung, G. D. Musoba, A. B. Simmons, O. S. Wooden, and J. Mendez, 2004, Indianapolis: The Lumina Foundation for Education, p. 20.

The high- and low-range estimates illustrate the range of effects the program might have had in the 1990s. The effect estimates of the proposed expansion of the state-federal partnership are presented in Appendix D.

Improving Financial Access to Postsecondary Education

It is also apparent that state financial strategies play an important role in improving college enrollment rates, but that is not the only factor that influences this outcome. An examination of trends in the states between 1992 and 2000 reveals substantial variation in the extent of improvement in state participation rates during this period (Table 7). Ten states improved enrollment rates by at least 9.5 percentage points

during the eight-year period: Florida, Indiana, Kansas, Kentucky, Massachusetts, Minnesota, North Carolina, South Carolina, South Dakota, and Tennessee.

Need-based state grants appear to have played an important role in improvement in access in three of the states. North Carolina was fourth among states in the total amount of increase in state need-based grants per FTE (\$196.79). Other changes in financial strategies in that state included a higher-than-average increase in merit grants (11th among states) and a lower-than-average tuition increase (29th). Massachusetts was fifth in the total amount of per FTE increase in grants (\$185.30) and actually substantially reduced tuition charges (by \$801.89), an exception among states (50th in tuition increase). Indiana was 11th in increased spending on need-based grant aid per FTE, but tightened the link between tuition and grants for low-income students through the Twenty-first Century Scholars program (St. John, Musoba, Simmons, & Chung, 2002) implemented in 2002.

Additionally, three of the states that improved enrollment rates were among those that substantially increased merit grant programs: Florida, Kentucky, and South Carolina. Minnesota is one of the few states that met the equity standard, but changes in the state's financial strategy do not reflect an ongoing commitment, given the increase in average tuition charges (\$566.42) and the slight drop in need-based grants (-\$73.94). Minnesota is one of the few states that estimates a total grant award and subtracts Pell from the total, so the increase in Pell may be a mitigating factor in this state.

However, in three of the states—Kansas, South Dakota, and Tennessee—the rise in college enrollment rates does not appear to be related to changes in financial strategies during the period. The role and influence of education reform merit attention in these states, as they do in other states.

Losing Ground

Ten states lost ground in college enrollment rates, with declines of more than 2 percentage points: California, Idaho, Illinois, Nebraska, New York, Oregon, Utah, Vermont, Washington, and Wisconsin. Two distinct patterns are evident among these states.

Five of the states—Illinois, Nebraska, New York, Vermont, and Wisconsin—had substantial increases in net costs. Two of the states (New York and Vermont) had reductions in funding of grants, and all five had relatively large tuition increases. While New York was a state that met the equity standard on average during the eight-year period, the state had a \$274.48 per FTE drop in grants, coupled with a substantial increase in tuition. Thus, while New York met the equity standard, on average, the rise in net price during the decade apparently caused problems. A tighter link was needed between tuition charges and funding for state need-based grants to mitigate this type of erosion in the purchasing power of state grants. Specifically, the annual funding for need-based grants should be based on expected tuition charges and the award maximum should be based on tuition charges.

The other five states—California, Idaho, Oregon, Utah, and Washington—were among the western states facing increases in student demand due to population growth. In particular, the growth of demand was problematic in California and Washington, states that made efforts to improve grants. These states had substantial population growth. Rather than expanding the number and size of campuses, however, they sought alternatives, including Western Governors University, an electronic campus. Both California and Washington maintained a focus on equity (i.e., funding for need-based grants) but were not able to maintain the capacity in the higher education system to keep pace with population growth. The plight of the western U.S. illustrates the capacity challenge facing this region.

Given the increase in the size of the traditional college-age cohort expected over the next 15 years (NCES, 2003b), the structural access problem could become more widespread. Alternatives such as higher public tuition and increased state investment in need-based grants could stimulate growth in both public and private colleges. If costs are shared with students (i.e., through higher tuition), then states can afford to expand capacity in public colleges. Higher public tuition also can stimulate competition from private colleges. However, adequate funding for need-based grants is crucial.

Table 7. State Reports: College Enrollment Rates, State Grant Funding, and Public Institution Tuition and Funding

State	College Enrollment Rate, 1992-2000		Change in Per FTE Need-Based Undergrad State Grant Funding, in 2000 Dollars		Change in Per FTE Non-Need Undergrad State Grant Funding, in 2000 Dollars		Change in Undergrad In-State Tuition and Fees for Public System, in 2000 Dollars		Change in 1992-2000 Per FTE State and Local Appropriation for Public System, in 2000 Dollars	
	% point change	Rank	\$ amount change	Rank	\$ amount change	Rank	\$ amount change	Rank	\$ amount change	Rank
South Carolina	22.9%	1	\$96.05	14	\$456.66	3	\$904.89	6	\$989.59	22
Tennessee	15.5%	2	\$41.60	21	-\$2.96	43	\$694.33	17	\$620.09	37
North Carolina	15.4%	3	\$196.79	4	\$83.33	11	\$500.19	29	\$1,290.75	15
South Dakota	12.7%	4	-\$31.11	40	-\$4.77	46	\$977.84	5	\$547.91	39
Florida	12.1%	5	-\$7.45	33	\$282.85	5	\$445.89	31	\$1,399.04	13
Minnesota	10.3%	6	-\$73.94	47	\$0.04	26	\$566.42	25	\$741.81	31
Kansas	10.2%	7	\$12.04	25	\$0.25	25	\$435.72	32	\$1,222.43	16
Massachusetts	10.0%	8	\$185.30	5	\$9.58	18	-\$801.89	50	\$3,528.74	1
Kentucky	9.8%	9	\$94.73	15	\$159.51	7	\$623.71	21	\$1,179.20	17
Indiana	9.5%	10	\$107.09	11	\$4.12	20	\$651.32	20	\$657.60	34
New Mexico	8.8%	11	\$16.97	23	\$306.47	4	\$368.04	39	\$1,490.55	10
Pennsylvania	7.7%	12	\$137.62	6	-\$0.57	40	\$865.48	7	\$497.76	40
Nevada	7.5%	13	\$117.68	9	\$149.16	8	\$425.54	35	\$589.68	38
Arkansas	7.2%	14	\$263.29	1	\$88.14	10	\$753.10	12	\$1,049.32	20
Wyoming	6.0%	15	-\$16.48	36	\$0.00	34	\$612.63	23	\$943.34	23
Ohio	5.8%	16	-\$3.18	30	\$91.05	9	\$556.80	27	\$3,412.25	2
Maine	5.7%	17	\$119.36	8	\$0.00	28	\$693.03	18	\$627.76	36
Georgia	5.3%	18	-\$42.05	41	\$1,220.59	1	\$300.73	42	\$2,327.53	8
Connecticut	5.1%	19	\$115.42	10	\$4.14	19	\$525.58	28	\$2,506.41	6
Louisiana	5.0%	20	-\$42.24	42	\$528.18	2	\$429.44	34	\$707.75	33
Alaska	4.8%	21	-\$56.53	45	-\$3.01	44	\$843.07	8	\$231.16	46
Missouri	4.7%	22	\$50.20	17	-\$4.82	47	\$782.72	11	\$2,296.95	9
Arizona	4.2%	23	-\$14.37	35	\$0.00	33	-\$599.31	49	\$1,160.40	18
Rhode Island	4.1%	24	-\$146.05	48	\$0.00	37	\$407.95	36	\$1,454.20	12
Hawaii	3.7%	25	-\$18.58	37	\$0.00	35	\$842.59	9	-\$3,886.82	50
Montana	3.6%	26	\$45.34	20	\$29.85	15	\$842.36	10	-\$672.31	49
North Dakota	3.6%	27	-\$66.85	46	-\$1.15	41	\$340.37	40	\$465.04	41
West Virginia	3.3%	28	\$137.56	7	\$0.00	27	\$394.75	38	\$1,482.15	11
New Hampshire	2.8%	29	-\$10.53	34	-\$0.15	39	\$1,981.38	1	\$348.72	44
Iowa	2.7%	30	\$9.30	26	-\$1.32	42	\$335.27	41	\$897.94	27

Table 7. (continued) State Reports

State	College Enrollment Rate, 1992-2000		Change in Per FTE Need-Based Undergrad State Grant Funding, in 2000 Dollars		Change in Per FTE Non-Need Undergrad State Grant Funding, in 2000 Dollars		Change in Undergrad In-State Tuition and Fees for Public System, in 2000 Dollars		Change in 1992-2000 Per FTE State and Local Appropriation for Public System, in 2000 Dollars	
	% point change	Rank	\$ amount change	Rank	\$ amount change	Rank	\$ amount change	Rank	\$ amount change	Rank
New Jersey	2.7%	31	-\$182.20	49	\$36.71	13	\$1,032.99	3	\$652.99	35
Delaware	2.2%	32	-\$24.65	39	\$1.45	24	\$469.98	30	\$2,890.84	4
Colorado	1.6%	33	\$103.10	13	-\$17.50	49	\$252.71	44	\$729.73	32
Alabama	1.5%	34	-\$4.82	31	-\$4.02	45	\$565.22	26	\$796.65	29
Mississippi	1.5%	35	-\$2.04	28	\$182.90	6	-\$18.01	46	\$2,454.77	7
Virginia	1.4%	36	\$245.87	2	\$57.29	12	-\$355.91	48	\$3,043.46	3
Michigan	1.2%	37	-\$52.20	43	\$0.00	36	\$618.25	22	\$1,003.65	21
Texas	0.0%	38	\$89.19	16	\$3.51	21	\$750.85	13	\$450.19	42
Oklahoma	-0.9%	39	-\$23.86	38	\$21.56	16	\$286.31	43	\$2,751.90	5
Maryland	-1.2%	40	\$47.80	18	-\$20.10	50	\$1,138.76	2	\$1,293.73	14
Illinois	-2.3%	41	\$47.36	19	-\$12.74	48	\$1,003.87	4	\$1,135.51	19
New York	-3.0%	42	-\$274.48	50	\$2.85	23	\$431.72	33	\$310.83	45
Oregon	-3.2%	43	-\$3.04	29	\$0.00	32	\$404.60	37	\$31.84	47
Wisconsin	-3.3%	44	\$12.73	24	\$16.32	17	\$716.91	15	\$915.72	25
California	-3.7%	45	\$106.91	12	\$0.00	29	-\$83.29	47	\$929.24	24
Nebraska	-4.0%	46	\$23.10	22	\$0.00	30	\$585.64	24	\$908.77	26
Idaho	-4.2%	47	-\$6.07	32	-\$0.09	38	\$738.85	14	\$808.76	28
Vermont	-10.5%	48	-\$52.83	44	\$3.31	22	\$668.56	19	\$405.40	43
Utah	-13.6%	49	\$4.17	27	\$0.00	31	\$104.67	45	\$751.09	30
Washington	-13.8%	50	\$210.31	3	\$36.53	14	\$716.51	16	-\$378.06	48

Conclusions

Reporters and the public should be careful when interpreting policy claims about college affordability. The notion that tuition increases have been negated by corresponding increases in student aid must be rejected. Increases in tuition without adequate corresponding growth in need-based financial aid have made it more difficult for academically prepared low-income students to afford college, as compared to similarly qualified middle- and upper-income students. There are also great disparities in access for low-income students across states. A few states have improved need-based aid sufficiently to improve college enrollments for low-income students. Improvements in need-based financial aid should be on the policy agenda in most states, along with improvements in college preparation. Expansion of the federal LEAP program provides an economical way for the federal government to achieve the goals of equalizing access for low-income students and reducing inequalities in access across states.

Appendix A

Empirical Basis for the Equity Standard

Expert judgment, informed by a review of trends in higher education finance, provided the basis for the equity standard used in this text. Three factors were considered in setting the equity standard. First, trends in the financing strategies used in private colleges were important because these colleges made a sufficient institutional investment in grants in the late twentieth century, on top of state and federal grants, to remain affordable for qualified students. Second, trends in state funding of public colleges are relevant because of the trend toward privatization—shifting the burden of funding public colleges onto students and their families—accentuating the need for a new standard in public financing of higher education. Finally, it is crucial to consider the state role in providing need-based grants for both public and private colleges.

Trends in Private Colleges

A review of changes in pricing strategies in private colleges (Table A.1) reveals that private colleges substantially increased institutional funding per FTE in relation to tuition charges between 1985 and 1995.³ In 1985, institutional grant aid per FTE represented 11.4 percent of tuition, while it comprised 18 percent of the tuition in 1995. In addition, students in private colleges received a subsidy from state student grants, estimated at more than 2 percent of tuition. The combination of institutional grant aid and state grant aid was about 20.5 percent of tuition in private college in 1995.

³ The trend analyses pulled data from different sources, creating slight problems in the unit of comparison. Tuition charges were for private colleges of all types, while grant aid was for private four-year colleges. These differences in unit of analysis do not substantially change the percentages reported here, given that private two-year colleges are modest in number and would not have much influence on the reported average for tuition. The reported percentages are the most precise information available.

Table A.1. Changes in Pricing Strategies in Private Colleges: 1985-1995

1985 Tuition (average charge for private colleges)	\$9,102
1985 Grant funding per FTE from institutional sources (average for four-year private colleges)	\$1,038
Grant funding as percentage of tuition, 1985	11.4%
1995 Tuition (average for private colleges)	\$12,818
1995 Grant funding per FTE from institutional sources (average per FTE)	\$2,333
Grant funding as a percentage of tuition, 1995	18.0%
Change in tuition, 1985-1995	\$3,716
Change in institutional grants per FTE, 1985-1995	\$2,678
Average state grant per FTE, 1985	\$218
State grant as a percentage of private tuition	2.5%
Average state grant per FTE, 1995	\$304
State grant per FTE as percentage of private tuition, 1995	2.3%
Institutional grants as percentage of tuition increase, 1985-95	72.1%

Note: Calculated from trends in Appendix: Trends in Finances and Outcomes, by E. H. Asker, 2003, in E. P. St. John, *Refinancing the College Dream: Access, Equal Opportunity, and Justice for Taxpayers*, Baltimore: Johns Hopkins University Press. NCES provided sources for FTE. The College Board was the source of tuition and state grant information.

In addition, a very substantial portion (72.1 percent) of the increase in tuition in private colleges between 1985 and 1995 was used to support institutional grant aid. While revenue sources other than tuition (e.g., endowments) are used from institutional grant aid in private colleges, it is readily evident that most of the increase in tuition is being redirected toward subsidies to students.

The period of 1985-1995 was used here for illustrative purposes and because of data availability. The evidence from the National Postsecondary Student Aid Study (NPSAS) indicates that these trends in private college finance continued through 2000 (Wei, Li, & Berkner, 2004). Therefore, it is reasonable to assume that the percentage of tuition revenue used for institutional grant aid continues to grow.

Privatization of Public Institutions

While a growing percentage of tuition revenue has been used to support students with financial need in private colleges, in public colleges a growing percentage of tuition and fee revenue has been used to make up for the loss of state funding as a percentage of revenue for education and related (E&R) purposes. Specifically, tuition covered about 21 percent of E&R expenditures in 1975 and 1980, but covered 32 percent in 1995-96. Thus, a pattern of privatization has taken place. The portion of educational costs paid for by students has gone up, consuming most of the tuition increase in private colleges.

Table A.2 Changes in the Percentages of Education and Related Expenditures (E& R)* Covered by Revenue from Tuition & Fees and State & Local Sources

	1975-76	1980-81	1985-86	1990-91	1995-96
Percentage of E&R From Tuition & Fees	20.55%	20.58%	23.40%	26.58%	32.22%
Percentage of E&R from State & Local	73.66%	75.66%	74.92%	68.06%	61.62%
Percentage of E&R from Both Sources	97.30%	98.32%	94.64%	93.84%	93.84%

* Education and related expenditures (E&R) are for instruction, administration (including library support) and facilities maintenance. Expenditures of student aid and income transfers are excluded.

Note: Calculated from trends in Appendix: Trends in Finances and Outcomes, by E. H. Asker, 2003, in E. P. St. John, *Refinancing the College Dream: Access, Equal Opportunity, and Justice for Taxpayers*, Baltimore: Johns Hopkins University Press. NCES provided sources for revenue and expenditures.

The State Role

Given these trends, it is important to consider the role of the state in the new market system of finance that has emerged. The state role in funding public colleges has declined (Table A.2) while states' spending on need-based grants has not kept pace with tuition increases (see body of report). At the same time, states have an obligation to equalize the opportunity for college enrollment by students who qualify. Since grants from institutional and state sources represent about 20 percent of tuition in private colleges and public colleges are becoming like private colleges, using tuition to support operations, there is reason to emphasize the state role in equalizing opportunity.

Setting the equity standard for funding state grants at 25 percent of tuition charges recognizes that 1) a threshold of 20 percent would be needed in public colleges to approximate the pricing scenario in private colleges and 2) a substantial portion of state funding for need-based grants goes to students who enroll in private colleges. Given these circumstances, setting the equity standard for state funding of need-based grants per FTE at 25 percent of public sector tuition would create a reasonable equity threshold. It is a fair and equitable standard, given trends in state and federal financing of higher education.

Appendix B

State Indicators for Demographic and Public Finance Variables

Data reported by the National Center for Education Statistics (NCES) in the Integrated Postsecondary Education Data System (IPEDS), along with supplemental analyses provided by Tom Mortenson at Postsecondary Education Opportunity, provided the primary sources for state indicators. The indicators related to school outcomes were:

- High school graduation rate, used as an outcome measure (calculated from NCES high school graduation data and the enrollment when the cohorts were in 9th grade).
- College enrollment rate, used as an outcome measure (fall enrollment reports were used to calculate the percentage of high school graduates enrolled in higher education in the following fall).⁴

In addition, we used one indicator related to the size of the K-12 population as a control for population size:

- Size of the 9th grade cohort, used as an independent variable to control for population size (from NCES's Common Core of Data).

IPEDS was the primary data source for the indicators related to tuition and financial aid. Analysis of IPEDS represented a major part of the work required to complete this project, given the complexity of this information system.⁵ IPEDS was used for information on:

- College finances (college tuition weighted per FTE).⁶
- State system and college enrollment (fall enrollment data were used to develop weights⁷ for financial indicators and to calculate the percentage of FTE students enrolled in the various sectors of higher education, public four-

⁴ The study team used IPEDS, along with data reported annually by Tom Mortenson in Postsecondary Education Opportunity newsletter and available online at postsecondary.org. Using NCES data, Mortenson calculated college continuation rates by state based on the number of high school graduates from the Current Population Survey of the Census Bureau and college freshmen from the IPEDS Fall Enrollment.

⁵ It was frequently necessary to sum information for campuses and states across different data files in order to develop appropriate indicators.

⁶ Education revenues and expenditures as well as state appropriations were considered in preliminary analyses but not included in the final model.

⁷ College tuition charges in public colleges were weighted for each state to reflect the actual pattern of enrollment in the state. The number of undergraduates enrolling in each public college was multiplied by the undergraduate in-state tuition charge for the college; then these numbers were summed and divided by the total number of undergraduates enrolling in the state. This weighted tuition charge reflects the composition of enrollment in the state.

year, public two-year, and private colleges in the state. These analyses used total FTE rather than college freshman enrollment because this provided a better indicator of capacity).

The other indicators related to public financing of higher education included:

- Tax rate (state tax collection in a given year divided by personal income, an indicator from U.S. Census Bureau, State Government Tax Collections).
- Need-based grants adjusted per FTE (Total need-based grants were derived from the National Association of State Student Grant and Aid Programs [NASSGAP] Annual Survey Reports and divided by undergraduate FTE in the state).
- Non-need grants adjusted per FTE (the sum of total merit and other grants, calculated from NASSGAP Annual Survey Reports, divided by undergraduate FTE).
- K-12 expenditures per FTE (NCES National Public Education Financial Survey).

In addition, this report uses the following state indicators, developed from other data sources:⁸

- Percentage poverty in the population⁹ (U.S. Census Bureau, Current Population Survey).
- Percentage African American (U.S. Census Bureau, Population Estimates).
- Percentage Hispanic (U.S. Census Bureau, Population Estimates).
- Percentage other minority (calculated by adding the percentages of Native Americans and Asians and dividing by the state population, U.S. Census Bureau, Population Estimates).
- Percentage of the population with bachelor's degrees or higher¹⁰ (U.S. Census Bureau, Current Population Survey).

⁸ These indicators were generally available as state averages. We generated these indicators by abstracting information from generally available sources, which did not require the extensive reanalysis necessary to work with the cumbersome IPEDS databases.

⁹ We also examined other possible indicators related to state economic conditions, including unemployment rates and income per capita.

¹⁰ This variable provides a logical control for the influence of parents' education. There is a high correlation between the percentage of high school students in a state whose parents attended college and the percentage of the population with a four-year degree or higher. We also tested the inclusions of a variable for the percentage of the population with at least a high school diploma and/or some college. Including this variable had no discernable effect on the results, so it was left out of the final model.

Appendix C

Simulations of Costs and Benefits of Meeting Minimum Equity Standards

This appendix provides simulations of the costs and benefits of meeting the proposed equity standards by providing adequate funding for state need-based grant programs. The simulation method for these estimates was presented in text Box 1 of this report. In this appendix, Table C.1 presents a baseline estimate based on the average using the estimated regression in coefficient. Table C.2 presents the low-range estimate of enrollment effects. Table C.3 presents the high-range estimate of enrollment effects.

Table C.1. Simulation of Costs and Benefits of Meeting the Minimum Equity Standards: A State-by-State Analysis—Baseline Estimate[†]

State	90s Avg Tuition (A)	Targeted Funding per FTE 90s Avg (B)	Grant Funding per FTE 90s Avg (C)	Gap in New Grant Funding per FTE 90s Avg (D=B-C)	Increase in Enrollment as Result of Filling Gap (E)	90s Avg Number of Freshmen (F)	Cost of Additional Grant Funding [‡] (G=D*(E+F))	Cost per New Student (H=G/E)
Alabama	\$2,195	\$549	\$16	\$533	3,200	24,174	\$14,600,000	\$4,500
Alaska	\$2,601	\$650	\$24	\$626	500	2,487	\$1,900,000	\$3,500
Arizona	\$2,243	\$561	\$27	\$534	2,700	16,714	\$10,300,000	\$3,900
Arkansas	\$2,102	\$525	\$230	\$296	1,100	13,695	\$4,400,000	\$4,000
California	\$1,369	\$342	\$371	\$0	0	163,058	\$0	\$0
Colorado	\$2,459	\$615	\$244	\$371	1,900	19,015	\$7,700,000	\$4,200
Connecticut	\$3,416	\$854	\$399	\$455	2,200	20,620	\$10,400,000	\$4,700
Delaware	\$3,703	\$926	\$52	\$874	900	4,406	\$4,700,000	\$5,100
Florida	\$1,592	\$398	\$146	\$252	3,800	53,474	\$14,400,000	\$3,800
Georgia	\$2,004	\$501	\$19	\$482	4,600	37,183	\$20,200,000	\$4,400
Hawaii	\$1,558	\$389	\$21	\$369	600	7,130	\$2,900,000	\$4,600
Idaho	\$2,185	\$546	\$21	\$525	1,100	6,969	\$4,200,000	\$4,000
Illinois	\$4,213	\$1,053	\$894	\$160	2,800	76,639	\$12,700,000	\$4,600
Indiana	\$3,283	\$821	\$496	\$325	2,800	34,671	\$12,200,000	\$4,400
Iowa	\$2,512	\$628	\$409	\$220	1,100	21,942	\$5,000,000	\$4,800
Kansas	\$1,959	\$490	\$122	\$367	1,500	17,203	\$6,900,000	\$4,700
Kentucky	\$2,069	\$517	\$305	\$212	1,200	21,186	\$4,800,000	\$4,000
Louisiana	\$2,183	\$546	\$39	\$507	3,300	25,049	\$14,400,000	\$4,300
Maine	\$3,734	\$934	\$254	\$679	1,300	7,334	\$5,900,000	\$4,400
Maryland	\$4,059	\$1,015	\$297	\$718	5,000	27,440	\$23,300,000	\$4,700
Massachusetts	\$3,669	\$917	\$358	\$559	4,800	40,196	\$25,200,000	\$5,200
Michigan	\$3,651	\$913	\$362	\$551	7,700	56,959	\$35,600,000	\$4,600
Minnesota	\$3,125	\$781	\$734	\$47	400	30,070	\$1,400,000	\$4,100
Mississippi	\$2,010	\$503	\$13	\$489	2,000	17,330	\$9,500,000	\$4,700
Missouri	\$2,952	\$738	\$115	\$623	4,800	28,693	\$20,900,000	\$4,300
Montana	\$2,588	\$647	\$26	\$621	900	5,703	\$4,100,000	\$4,600
Nebraska	\$2,162	\$540	\$66	\$475	1,400	12,509	\$6,600,000	\$4,900
Nevada	\$1,601	\$400	\$123	\$277	400	4,425	\$1,300,000	\$3,100
New Hampshire	\$4,920	\$1,230	\$41	\$1,189	2,100	7,192	\$11,100,000	\$5,200
New Jersey	\$4,105	\$1,026	\$1,034	\$0	0	51,626	\$0	\$0
New Mexico	\$1,568	\$392	\$313	\$79	200	9,579	\$800,000	\$4,000

[†] Numbers are reported rounded for the columns Increase in Enrollment, Cost of Additional Grant Funding, and Cost per New Student.

[‡] The United States figure is the sum of all states' values. The formula presented is not working for the United States since the United States value is the weighted sum of individual states' funding amounts, weighted by the number of students.

New York	\$3,349	\$837	\$1,160	\$0	0	111,533	\$0	\$0
North Carolina	\$1,385	\$346	\$121	\$226	2,000	35,745	\$8,500,000	\$4,200
North Dakota	\$2,525	\$631	\$69	\$563	700	5,772	\$3,600,000	\$5,400
Ohio	\$3,725	\$931	\$307	\$624	10,600	64,539	\$46,900,000	\$4,400
Oklahoma	\$1,810	\$452	\$170	\$283	1,400	17,565	\$5,400,000	\$3,900
Oregon	\$2,595	\$649	\$197	\$452	1,900	15,327	\$7,800,000	\$4,200
Pennsylvania	\$5,122	\$1,281	\$736	\$544	9,700	73,746	\$45,400,000	\$4,700
Rhode Island	\$3,387	\$847	\$167	\$680	900	6,140	\$4,800,000	\$5,100
South Carolina	\$2,838	\$709	\$239	\$471	2,400	19,313	\$10,200,000	\$4,300
South Dakota	\$3,008	\$752	\$15	\$737	900	5,049	\$4,400,000	\$4,800
Tennessee	\$1,924	\$481	\$146	\$335	2,300	25,962	\$9,500,000	\$4,100
Texas	\$1,751	\$438	\$112	\$326	8,800	97,524	\$34,600,000	\$4,000
Utah	\$2,036	\$509	\$21	\$488	1,900	13,444	\$7,500,000	\$4,000
Vermont	\$6,349	\$1,587	\$589	\$999	1,000	3,475	\$4,400,000	\$4,600
Virginia	\$3,159	\$790	\$287	\$503	4,500	34,694	\$19,700,000	\$4,400
Washington	\$2,160	\$540	\$385	\$155	1,100	28,714	\$4,600,000	\$4,000
West Virginia	\$2,273	\$568	\$203	\$365	1,000	10,528	\$4,200,000	\$4,100
Wisconsin	\$2,722	\$681	\$327	\$353	2,900	33,982	\$13,000,000	\$4,500
Wyoming	\$1,635	\$409	\$11	\$398	300	3,187	\$1,400,000	\$4,200
United States	\$2,601	\$650	\$386	\$264	120,500	1,470,914	\$533,100,000	\$4,400

Table C.2. Simulation of Costs and Benefits of Meeting the Minimum Equity Standards: A State-by-State Analysis—Low-Range Estimate[†]

State	90s Avg Tuition (A)	Targeted Funding per FTE 90s Avg (B)	Grant Funding per FTE 90s Avg (C)	Gap in New Grant Funding per FTE 90s Avg (D=B-C)	Increase in Enrollment as Result of Filling Gap (E)	90s Avg Number of Freshmen (F)	Cost of Additional Grant Funding ‡ (G=D*(E+F))	Cost per New Student (H=G/E)
Alabama	\$2,195	\$549	\$16	\$533	1,400	24,174	\$13,600,000	\$9,700
Alaska	\$2,601	\$650	\$24	\$626	200	2,487	\$1,700,000	\$8,200
Arizona	\$2,243	\$561	\$27	\$534	1,100	16,714	\$9,500,000	\$8,700
Arkansas	\$2,102	\$525	\$230	\$296	400	13,695	\$4,200,000	\$9,500
California	\$1,369	\$342	\$371	\$0	0	163,058	\$0	\$0
Colorado	\$2,459	\$615	\$244	\$371	800	19,015	\$7,300,000	\$9,700
Connecticut	\$3,416	\$854	\$399	\$455	900	20,620	\$9,800,000	\$10,800
Delaware	\$3,703	\$926	\$52	\$874	400	4,406	\$4,200,000	\$10,600
Florida	\$1,592	\$398	\$146	\$252	1,600	53,474	\$13,900,000	\$8,600
Georgia	\$2,004	\$501	\$19	\$482	2,000	37,183	\$18,900,000	\$9,200
Hawaii	\$1,558	\$389	\$21	\$369	300	7,130	\$2,700,000	\$10,300
Idaho	\$2,185	\$546	\$21	\$525	400	6,969	\$3,900,000	\$9,500
Illinois	\$4,213	\$1,053	\$894	\$160	1,200	76,639	\$12,400,000	\$10,700
Indiana	\$3,283	\$821	\$496	\$325	1,200	34,671	\$11,600,000	\$10,000
Iowa	\$2,512	\$628	\$409	\$220	400	21,942	\$4,900,000	\$11,400
Kansas	\$1,959	\$490	\$122	\$367	600	17,203	\$6,500,000	\$10,800
Kentucky	\$2,069	\$517	\$305	\$212	500	21,186	\$4,600,000	\$9,400
Louisiana	\$2,183	\$546	\$39	\$507	1,500	25,049	\$13,400,000	\$9,200
Maine	\$3,734	\$934	\$254	\$679	500	7,334	\$5,300,000	\$10,100
Maryland	\$4,059	\$1,015	\$297	\$718	2,000	27,440	\$21,200,000	\$10,400
Massachusetts	\$3,669	\$917	\$358	\$559	2,000	40,196	\$23,600,000	\$11,500
Michigan	\$3,651	\$913	\$362	\$551	3,200	56,959	\$33,100,000	\$10,300
Minnesota	\$3,125	\$781	\$734	\$47	100	30,070	\$1,400,000	\$10,300
Mississippi	\$2,010	\$503	\$13	\$489	900	17,330	\$8,900,000	\$9,900
Missouri	\$2,952	\$738	\$115	\$623	1,900	28,693	\$19,100,000	\$9,800
Montana	\$2,588	\$647	\$26	\$621	400	5,703	\$3,800,000	\$10,600
Nebraska	\$2,162	\$540	\$66	\$475	500	12,509	\$6,200,000	\$11,300
Nevada	\$1,601	\$400	\$123	\$277	200	4,425	\$1,300,000	\$7,700
New Hampshire	\$4,920	\$1,230	\$41	\$1,189	900	7,192	\$9,600,000	\$11,000
New Jersey	\$4,105	\$1,026	\$1,034	\$0	0	51,626	\$0	\$0
New Mexico	\$1,568	\$392	\$313	\$79	100	9,579	\$800,000	\$9,300

[†] Numbers are reported rounded for the columns Increase in Enrollment, Cost of Additional Grant Funding, and Cost per New Student.

[‡] The United States figure is the sum of all states' values. The formula presented is not working for the United States since the United States value is the weighted sum of individual states' funding amounts, weighted by the number of students.

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North Carolina	\$1,385	\$346	\$121	\$226	900	35,745	\$8,300,000	\$9,500
North Dakota	\$2,525	\$631	\$69	\$563	300	5,772	\$3,400,000	\$12,300
Ohio	\$3,725	\$931	\$307	\$624	4,300	64,539	\$43,000,000	\$10,000
Oklahoma	\$1,810	\$452	\$170	\$283	500	17,565	\$5,100,000	\$9,400
Oregon	\$2,595	\$649	\$197	\$452	800	15,327	\$7,300,000	\$9,600
Pennsylvania	\$5,122	\$1,281	\$736	\$544	4,000	73,746	\$42,300,000	\$10,700
Rhode Island	\$3,387	\$847	\$167	\$680	400	6,140	\$4,400,000	\$11,100
South Carolina	\$2,838	\$709	\$239	\$471	1,100	19,313	\$9,600,000	\$9,100
South Dakota	\$3,008	\$752	\$15	\$737	400	5,049	\$4,000,000	\$10,900
Tennessee	\$1,924	\$481	\$146	\$335	1,000	25,962	\$9,000,000	\$9,200
Texas	\$1,751	\$438	\$112	\$326	3,700	97,524	\$33,000,000	\$8,900
Utah	\$2,036	\$509	\$21	\$488	700	13,444	\$6,900,000	\$9,500
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Wyoming	\$1,635	\$409	\$11	\$398	100	3,187	\$1,300,000	\$10,000
United States	\$2,601	\$650	\$386	\$264	50,000	1,470,914	\$498,300,000	\$10,000

Table C.3 Simulation of Costs and Benefits of Meeting the Minimum Equity Standards: A State-by-State Analysis—High-Range Estimate[†]

State	90s Avg Tuition (A)	Targeted Funding per FTE 90s Avg (B)	Grant Funding per FTE 90s Avg (C)	Gap in New Grant Funding per FTE 90s Avg (D=B-C)	Increase in Enrollment as Result of Filling Gap (E)	90s Avg Number of Freshmen (F)	Cost of Additional Grant Funding ‡ (G=D*(E+F))	Cost per New Student (H=G/E)
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Connecticut	\$3,416	\$854	\$399	\$455	3,500	20,620	\$11,000,000	\$3,200
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Hawaii	\$1,558	\$389	\$21	\$369	1,000	7,130	\$3,000,000	\$3,000
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Montana	\$2,588	\$647	\$26	\$621	1,400	5,703	\$4,400,000	\$3,100
Nebraska	\$2,162	\$540	\$66	\$475	2,200	12,509	\$7,000,000	\$3,200
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New Mexico	\$1,568	\$392	\$313	\$79	300	9,579	\$800,000	\$2,600

[†] Numbers are reported rounded for the columns Increase in Enrollment, Cost of Additional Grant Funding, and Cost per New Student.

[‡] The United States figure is the sum of all states' values. The formula presented is not working for the United States since the United States value is the weighted sum of individual states' funding amounts, weighted by the number of students.

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North Carolina	\$1,385	\$346	\$121	\$226	3,200	35,745	\$8,800,000	\$2,700
North Dakota	\$2,525	\$631	\$69	\$563	1,100	5,772	\$3,800,000	\$3,600
Ohio	\$3,725	\$931	\$307	\$624	16,900	64,539	\$50,900,000	\$3,000
Oklahoma	\$1,810	\$452	\$170	\$283	2,200	17,565	\$5,600,000	\$2,500
Oregon	\$2,595	\$649	\$197	\$452	3,000	15,327	\$8,300,000	\$2,800
Pennsylvania	\$5,122	\$1,281	\$736	\$544	15,400	73,746	\$48,500,000	\$3,100
Rhode Island	\$3,387	\$847	\$167	\$680	1,500	6,140	\$5,200,000	\$3,500
South Carolina	\$2,838	\$709	\$239	\$471	3,700	19,313	\$10,800,000	\$2,900
South Dakota	\$3,008	\$752	\$15	\$737	1,500	5,049	\$4,800,000	\$3,300
Tennessee	\$1,924	\$481	\$146	\$335	3,600	25,962	\$9,900,000	\$2,700
Texas	\$1,751	\$438	\$112	\$326	13,800	97,524	\$36,200,000	\$2,600
Utah	\$2,036	\$509	\$21	\$488	3,000	13,444	\$8,000,000	\$2,600
Vermont	\$6,349	\$1,587	\$589	\$999	1,600	3,475	\$5,000,000	\$3,200
Virginia	\$3,159	\$790	\$287	\$503	7,200	34,694	\$21,100,000	\$2,900
Washington	\$2,160	\$540	\$385	\$155	1,800	28,714	\$4,700,000	\$2,600
West Virginia	\$2,273	\$568	\$203	\$365	1,700	10,528	\$4,400,000	\$2,700
Wisconsin	\$2,722	\$681	\$327	\$353	4,600	33,982	\$13,600,000	\$3,000
Wyoming	\$1,635	\$409	\$11	\$398	500	3,187	\$1,500,000	\$2,800
United States	\$2,601	\$650	\$386	\$264	191,000	1,470,914	\$568,000,000	\$3,000

Appendix D

Simulations of Costs and Benefits of Expanding the State-Federal Partnership

This appendix presents the state-by-state simulations of costs and benefits of the proposed state-federal partnership in a second tier grant program. Simulation methods for these estimates are presented in Box D.1. Table D.1 provides baseline estimates of effects. Table D.2 provides low-range estimates of effects. Table D.3 provides high-range estimates of effects.

Box D.1. Method for Calculating Costs and Benefits of the Proposed State-Federal Partnership

I. Baseline Estimation.

- *Step 1:* The average tuition charge (Column A) was multiplied by $\frac{1}{4}$ to set the target grant amount of the new program (Column B).
- *Step 2:* The estimated enrollment increase was calculated for each state using the regression model (Column C).
- *Step 3:* The average number of freshmen in the 1990s (Column D) was added to the estimated number of new students and multiplied by the grant costs ($B*(C+D)$) to calculate required program costs (Column E).
- *Step 4:* The federal and state shares of costs were calculated by assigning $\frac{1}{3}$ to the federal government (Column F) and $\frac{2}{3}$ to states (Column G).
- *Step 5:* The cost per new student was calculated by dividing the program cost by the number of new students (Column H= E/C).

II. Low- and High-Range Estimations.

The logical steps used in the low- and high-range simulations were exactly the same as for the baseline estimation. However, for the low- and high-range simulations, the low- and high-end values of the 95 percent confidence interval of the coefficient have been applied to find the appropriate estimated increase in enrollment in Step 2 for Column C computation.

Box D.1. (continued)

III. National Figure Estimation.

The United States figures were estimated as follows:

- *Step 1:* The average weighted tuition for the United States in the 1990s (Column A) is multiplied by $\frac{1}{4}$ to set the target grant amount for the United States (Column B).
- *Step 2:* The estimated enrollment increase was calculated for the United States by adding up all the state's enrollment increases (Column C).
- *Step 3:* The average number of total freshmen in the 1990s (Column D) was calculated by adding up all the state's numbers, and the total program cost for the United States was obtained by adding up all the state's required costs (Column E).
- *Step 4:* The federal and state shares of costs were calculated by assigning $\frac{1}{3}$ to the federal government (Column F) and $\frac{2}{3}$ to states (Column G).
- *Step 5:* The cost per new student was calculated by dividing the program cost by the number of new students (Column H=E/C).

Table D.1. Simulation of the Costs and Benefits of the Proposed State-Federal Partnership: A State-by-State Analysis—Baseline Estimate[†]

State	90s Avg Tuition (A)	New Grant (B)	Increase in Enrollment as result of New Grant (C)	90s Avg Number of Freshmen (D)	Required Cost [‡] (E=B*(C+D))	Federal Share (F=1/3*E)	State Share (G=2/3*E)	Cost per New Student (H=E/C)
Alabama	\$2,195	\$549	3,300	24,174	\$15,100,000	\$5,000,000	\$10,100,000	\$4,500
Alaska	\$2,601	\$650	600	2,487	\$2,000,000	\$700,000	\$1,300,000	\$3,600
Arizona	\$2,243	\$561	2,800	16,714	\$10,900,000	\$3,600,000	\$7,300,000	\$3,900
Arkansas	\$2,102	\$525	2,000	13,695	\$8,200,000	\$2,700,000	\$5,500,000	\$4,200
California	\$1,369	\$342	14,400	163,058	\$60,700,000	\$20,200,000	\$40,500,000	\$4,200
Colorado	\$2,459	\$615	3,100	19,015	\$13,600,000	\$4,500,000	\$9,100,000	\$4,400
Connecticut	\$3,416	\$854	4,200	20,620	\$21,200,000	\$7,100,000	\$14,100,000	\$5,100
Delaware	\$3,703	\$926	1,000	4,406	\$5,000,000	\$1,700,000	\$3,300,000	\$5,100
Florida	\$1,592	\$398	6,100	53,474	\$23,700,000	\$7,900,000	\$15,800,000	\$3,900
Georgia	\$2,004	\$501	4,800	37,183	\$21,000,000	\$7,000,000	\$14,000,000	\$4,400
Hawaii	\$1,558	\$389	700	7,130	\$3,000,000	\$1,000,000	\$2,000,000	\$4,600
Idaho	\$2,185	\$546	1,100	6,969	\$4,400,000	\$1,500,000	\$2,900,000	\$4,000
Illinois	\$4,213	\$1,053	18,800	76,639	\$100,500,000	\$33,500,000	\$67,000,000	\$5,400
Indiana	\$3,283	\$821	7,200	34,671	\$34,400,000	\$11,500,000	\$22,900,000	\$4,800
Iowa	\$2,512	\$628	3,100	21,942	\$15,700,000	\$5,200,000	\$10,500,000	\$5,100
Kansas	\$1,959	\$490	2,000	17,203	\$9,400,000	\$3,100,000	\$6,300,000	\$4,800
Kentucky	\$2,069	\$517	2,900	21,186	\$12,500,000	\$4,200,000	\$8,300,000	\$4,300
Louisiana	\$2,183	\$546	3,600	25,049	\$15,600,000	\$5,200,000	\$10,400,000	\$4,400
Maine	\$3,734	\$934	1,800	7,334	\$8,600,000	\$2,900,000	\$5,700,000	\$4,700
Maryland	\$4,059	\$1,015	7,100	27,440	\$35,000,000	\$11,700,000	\$23,400,000	\$4,900
Massachusetts	\$3,669	\$917	8,000	40,196	\$44,200,000	\$14,700,000	\$29,500,000	\$5,500
Michigan	\$3,651	\$913	12,900	56,959	\$63,800,000	\$21,300,000	\$42,500,000	\$4,900
Minnesota	\$3,125	\$781	5,900	30,070	\$28,100,000	\$9,400,000	\$18,700,000	\$4,800
Mississippi	\$2,010	\$503	2,100	17,330	\$9,800,000	\$3,300,000	\$6,500,000	\$4,700
Missouri	\$2,952	\$738	5,800	28,693	\$25,400,000	\$8,500,000	\$17,000,000	\$4,400
Montana	\$2,588	\$647	900	5,703	\$4,300,000	\$1,400,000	\$2,900,000	\$4,600
Nebraska	\$2,162	\$540	1,500	12,509	\$7,600,000	\$2,500,000	\$5,100,000	\$4,900
Nevada	\$1,601	\$400	600	4,425	\$2,000,000	\$700,000	\$1,300,000	\$3,200
New Hampshire	\$4,920	\$1,230	2,200	7,192	\$11,600,000	\$3,900,000	\$7,700,000	\$5,200
New Jersey	\$4,105	\$1,026	11,700	51,626	\$65,000,000	\$21,700,000	\$43,400,000	\$5,500
New Mexico	\$1,568	\$392	1,000	9,579	\$4,100,000	\$1,400,000	\$2,800,000	\$4,300

[†] Numbers are reported rounded for the columns Increase in Enrollment, Required Cost, Federal Share, State Share, and Cost per New Student.

[‡] The United States figure is the sum of all states' values. The formula presented is not working for the United States since the United States value is the weighted sum of individual states' funding amounts, weighted by the number of students.

New York	\$3,349	\$837	20,900	111,533	\$110,900,000	\$37,000,000	\$73,900,000	\$5,300
North Carolina	\$1,385	\$346	3,100	35,745	\$13,500,000	\$4,500,000	\$9,000,000	\$4,300
North Dakota	\$2,525	\$631	800	5,772	\$4,100,000	\$1,400,000	\$2,700,000	\$5,500
Ohio	\$3,725	\$931	16,000	64,539	\$75,000,000	\$25,000,000	\$50,000,000	\$4,700
Oklahoma	\$1,810	\$452	2,200	17,565	\$8,900,000	\$3,000,000	\$6,000,000	\$4,100
Oregon	\$2,595	\$649	2,700	15,327	\$11,700,000	\$3,900,000	\$7,800,000	\$4,400
Pennsylvania	\$5,122	\$1,281	23,300	73,746	\$124,300,000	\$41,400,000	\$82,900,000	\$5,300
Rhode Island	\$3,387	\$847	1,200	6,140	\$6,200,000	\$2,100,000	\$4,100,000	\$5,300
South Carolina	\$2,838	\$709	3,600	19,313	\$16,300,000	\$5,400,000	\$10,800,000	\$4,500
South Dakota	\$3,008	\$752	900	5,049	\$4,500,000	\$1,500,000	\$3,000,000	\$4,800
Tennessee	\$1,924	\$481	3,300	25,962	\$14,100,000	\$4,700,000	\$9,400,000	\$4,200
Texas	\$1,751	\$438	11,800	97,524	\$47,900,000	\$16,000,000	\$31,900,000	\$4,000
Utah	\$2,036	\$509	2,000	13,444	\$7,800,000	\$2,600,000	\$5,200,000	\$4,000
Vermont	\$6,349	\$1,587	1,600	3,475	\$8,000,000	\$2,700,000	\$5,300,000	\$5,100
Virginia	\$3,159	\$790	7,200	34,694	\$33,100,000	\$11,000,000	\$22,100,000	\$4,600
Washington	\$2,160	\$540	4,000	28,714	\$17,700,000	\$5,900,000	\$11,800,000	\$4,400
West Virginia	\$2,273	\$568	1,600	10,528	\$6,900,000	\$2,300,000	\$4,600,000	\$4,300
Wisconsin	\$2,722	\$681	5,600	33,982	\$26,900,000	\$9,000,000	\$18,000,000	\$4,800
Wyoming	\$1,635	\$409	300	3,187	\$1,400,000	\$500,000	\$1,000,000	\$4,200
United States	\$2,601	\$650	255,300	1,470,914	\$1,225,700,000	\$408,600,000	\$817,200,000	\$4,800

Table D.2. Simulation of the Costs and Benefits of the Proposed State-Federal Partnership: A State-by-State Analysis—Low-Range Estimate[†]

State	90s Avg Tuition (A)	New Grant (B)	Increase in Enrollment as result of New Grant (C)	90s Avg Number of Freshmen (D)	Required Cost [‡] (E=B*(C+D))	Federal Share (F=1/3*E)	State Share (G=2/3*E)	Cost per New Student (H=E/C)
Alabama	\$2,195	\$549	1,400	24,174	\$14,100,000	\$4,700,000	\$9,400,000	\$9,700
Alaska	\$2,601	\$650	200	2,487	\$1,800,000	\$600,000	\$1,200,000	\$8,200
Arizona	\$2,243	\$561	1,100	16,714	\$10,000,000	\$3,300,000	\$6,700,000	\$8,800
Arkansas	\$2,102	\$525	800	13,695	\$7,600,000	\$2,500,000	\$5,100,000	\$9,700
California	\$1,369	\$342	6,000	163,058	\$57,900,000	\$19,300,000	\$38,600,000	\$9,700
Colorado	\$2,459	\$615	1,300	19,015	\$12,500,000	\$4,200,000	\$8,300,000	\$9,900
Connecticut	\$3,416	\$854	1,700	20,620	\$19,100,000	\$6,400,000	\$12,700,000	\$11,100
Delaware	\$3,703	\$926	400	4,406	\$4,500,000	\$1,500,000	\$3,000,000	\$10,700
Florida	\$1,592	\$398	2,600	53,474	\$22,300,000	\$7,400,000	\$14,900,000	\$8,700
Georgia	\$2,004	\$501	2,100	37,183	\$19,700,000	\$6,600,000	\$13,100,000	\$9,300
Hawaii	\$1,558	\$389	300	7,130	\$2,900,000	\$1,000,000	\$1,900,000	\$10,300
Idaho	\$2,185	\$546	400	6,969	\$4,000,000	\$1,300,000	\$2,700,000	\$9,500
Illinois	\$4,213	\$1,053	7,800	76,639	\$88,900,000	\$29,600,000	\$59,300,000	\$11,400
Indiana	\$3,283	\$821	3,000	34,671	\$30,900,000	\$10,300,000	\$20,600,000	\$10,400
Iowa	\$2,512	\$628	1,200	21,942	\$14,600,000	\$4,900,000	\$9,700,000	\$11,700
Kansas	\$1,959	\$490	800	17,203	\$8,800,000	\$2,900,000	\$5,900,000	\$10,900
Kentucky	\$2,069	\$517	1,200	21,186	\$11,600,000	\$3,900,000	\$7,700,000	\$9,700
Louisiana	\$2,183	\$546	1,600	25,049	\$14,500,000	\$4,800,000	\$9,700,000	\$9,200
Maine	\$3,734	\$934	700	7,334	\$7,500,000	\$2,500,000	\$5,000,000	\$10,300
Maryland	\$4,059	\$1,015	2,900	27,440	\$30,800,000	\$10,300,000	\$20,500,000	\$10,600
Massachusetts	\$3,669	\$917	3,400	40,196	\$40,000,000	\$13,300,000	\$26,700,000	\$11,800
Michigan	\$3,651	\$913	5,400	56,959	\$56,900,000	\$19,000,000	\$37,900,000	\$10,600
Minnesota	\$3,125	\$781	2,300	30,070	\$25,300,000	\$8,400,000	\$16,900,000	\$10,900
Mississippi	\$2,010	\$503	900	17,330	\$9,200,000	\$3,100,000	\$6,100,000	\$9,900
Missouri	\$2,952	\$738	2,300	28,693	\$22,900,000	\$7,600,000	\$15,300,000	\$9,900
Montana	\$2,588	\$647	400	5,703	\$3,900,000	\$1,300,000	\$2,600,000	\$10,600
Nebraska	\$2,162	\$540	600	12,509	\$7,100,000	\$2,400,000	\$4,700,000	\$11,400
Nevada	\$1,601	\$400	200	4,425	\$1,900,000	\$600,000	\$1,200,000	\$7,800
New Hampshire	\$4,920	\$1,230	900	7,192	\$10,000,000	\$3,300,000	\$6,600,000	\$11,100
New Jersey	\$4,105	\$1,026	4,800	51,626	\$57,900,000	\$19,300,000	\$38,600,000	\$12,000
New Mexico	\$1,568	\$392	400	9,579	\$3,900,000	\$1,300,000	\$2,600,000	\$9,600

[†] Numbers are reported rounded for the columns Increase in Enrollment, Required Cost, Federal Share, State Share, and Cost per New Student.

[‡] The United States figure is the sum of all states' values. The formula presented is not working for the United States since the United States value is the weighted sum of individual states' funding amounts, weighted by the number of students.

New York	\$3,349	\$837	9,400	111,533	\$101,200,000	\$33,700,000	\$67,500,000	\$10,800
North Carolina	\$1,385	\$346	1,300	35,745	\$12,800,000	\$4,300,000	\$8,600,000	\$9,600
North Dakota	\$2,525	\$631	300	5,772	\$3,800,000	\$1,300,000	\$2,600,000	\$12,400
Ohio	\$3,725	\$931	6,500	64,539	\$66,100,000	\$22,000,000	\$44,100,000	\$10,200
Oklahoma	\$1,810	\$452	900	17,565	\$8,300,000	\$2,800,000	\$5,600,000	\$9,500
Oregon	\$2,595	\$649	1,100	15,327	\$10,700,000	\$3,600,000	\$7,100,000	\$9,700
Pennsylvania	\$5,122	\$1,281	9,500	73,746	\$106,600,000	\$35,500,000	\$71,000,000	\$11,300
Rhode Island	\$3,387	\$847	500	6,140	\$5,600,000	\$1,900,000	\$3,700,000	\$11,300
South Carolina	\$2,838	\$709	1,600	19,313	\$14,800,000	\$4,900,000	\$9,900,000	\$9,300
South Dakota	\$3,008	\$752	400	5,049	\$4,100,000	\$1,400,000	\$2,700,000	\$10,900
Tennessee	\$1,924	\$481	1,400	25,962	\$13,200,000	\$4,400,000	\$8,800,000	\$9,300
Texas	\$1,751	\$438	5,000	97,524	\$44,900,000	\$15,000,000	\$29,900,000	\$9,000
Utah	\$2,036	\$509	800	13,444	\$7,200,000	\$2,400,000	\$4,800,000	\$9,500
Vermont	\$6,349	\$1,587	600	3,475	\$6,500,000	\$2,200,000	\$4,300,000	\$10,800
Virginia	\$3,159	\$790	2,900	34,694	\$29,700,000	\$9,900,000	\$19,800,000	\$10,200
Washington	\$2,160	\$540	1,600	28,714	\$16,400,000	\$5,500,000	\$10,900,000	\$10,000
West Virginia	\$2,273	\$568	600	10,528	\$6,300,000	\$2,100,000	\$4,200,000	\$9,900
Wisconsin	\$2,722	\$681	2,300	33,982	\$24,700,000	\$8,200,000	\$16,400,000	\$10,900
Wyoming	\$1,635	\$409	100	3,187	\$1,400,000	\$500,000	\$900,000	\$10,000
United States	\$2,601	\$650	106,100	1,470,914	\$1,107,100,000	\$369,000,000	\$738,100,000	\$10,400

Table D.3. Simulation of the Costs and Benefits of the Proposed State-Federal Partnership: A State-by-State Analysis—High-Range Estimate[†]

State	90s Avg Tuition (A)	New Grant (B)	Increase in Enrollment as result of New Grant (C)	90s Avg Number of Freshmen (D)	Required Cost [‡] (E=B*(C+D))	Federal Share (F=1/3*E)	State Share (G=2/3*E)	Cost per New Student (H=E/C)
Alabama	\$2,195	\$549	5,200	24,174	\$16,100,000	\$5,400,000	\$10,700,000	\$3,100
Alaska	\$2,601	\$650	900	2,487	\$2,200,000	\$700,000	\$1,500,000	\$2,500
Arizona	\$2,243	\$561	4,500	16,714	\$11,900,000	\$4,000,000	\$7,900,000	\$2,700
Arkansas	\$2,102	\$525	3,200	13,695	\$8,900,000	\$3,000,000	\$5,900,000	\$2,800
California	\$1,369	\$342	22,700	163,058	\$63,600,000	\$21,200,000	\$42,400,000	\$2,800
Colorado	\$2,459	\$615	5,000	19,015	\$14,700,000	\$4,900,000	\$9,800,000	\$3,000
Connecticut	\$3,416	\$854	6,600	20,620	\$23,300,000	\$7,800,000	\$15,500,000	\$3,500
Delaware	\$3,703	\$926	1,500	4,406	\$5,500,000	\$1,800,000	\$3,700,000	\$3,600
Florida	\$1,592	\$398	9,600	53,474	\$25,100,000	\$8,400,000	\$16,700,000	\$2,600
Georgia	\$2,004	\$501	7,500	37,183	\$22,400,000	\$7,500,000	\$14,900,000	\$3,000
Hawaii	\$1,558	\$389	1,000	7,130	\$3,200,000	\$1,100,000	\$2,100,000	\$3,000
Idaho	\$2,185	\$546	1,800	6,969	\$4,800,000	\$1,600,000	\$3,200,000	\$2,700
Illinois	\$4,213	\$1,053	29,800	76,639	\$112,100,000	\$37,400,000	\$74,700,000	\$3,800
Indiana	\$3,283	\$821	11,400	34,671	\$37,800,000	\$12,600,000	\$25,200,000	\$3,300
Iowa	\$2,512	\$628	4,900	21,942	\$16,900,000	\$5,600,000	\$11,200,000	\$3,400
Kansas	\$1,959	\$490	3,100	17,203	\$9,900,000	\$3,300,000	\$6,600,000	\$3,200
Kentucky	\$2,069	\$517	4,600	21,186	\$13,400,000	\$4,500,000	\$8,900,000	\$2,900
Louisiana	\$2,183	\$546	5,600	25,049	\$16,700,000	\$5,600,000	\$11,200,000	\$3,000
Maine	\$3,734	\$934	2,900	7,334	\$9,600,000	\$3,200,000	\$6,400,000	\$3,300
Maryland	\$4,059	\$1,015	11,300	27,440	\$39,300,000	\$13,100,000	\$26,200,000	\$3,500
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Minnesota	\$3,125	\$781	9,500	30,070	\$30,900,000	\$10,300,000	\$20,600,000	\$3,300
Mississippi	\$2,010	\$503	3,200	17,330	\$10,300,000	\$3,400,000	\$6,900,000	\$3,200
Missouri	\$2,952	\$738	9,200	28,693	\$28,000,000	\$9,300,000	\$18,600,000	\$3,000
Montana	\$2,588	\$647	1,500	5,703	\$4,700,000	\$1,600,000	\$3,100,000	\$3,100
Nebraska	\$2,162	\$540	2,500	12,509	\$8,100,000	\$2,700,000	\$5,400,000	\$3,300
Nevada	\$1,601	\$400	1,000	4,425	\$2,200,000	\$700,000	\$1,500,000	\$2,100
New Hampshire	\$4,920	\$1,230	3,500	7,192	\$13,200,000	\$4,400,000	\$8,800,000	\$3,700
New Jersey	\$4,105	\$1,026	18,700	51,626	\$72,100,000	\$24,000,000	\$48,100,000	\$3,900
New Mexico	\$1,568	\$392	1,500	9,579	\$4,300,000	\$1,400,000	\$2,900,000	\$2,900

[†] Numbers are reported rounded for the columns Increase in Enrollment, Required Cost, Federal Share, State Share, and Cost per New Student.

[‡] The United States figure is the sum of all states' values. The formula presented is not working for the United States since the United States value is the weighted sum of individual states' funding amounts, weighted by the number of students.

New York	\$3,349	\$837	32,500	111,533	\$120,600,000	\$40,200,000	\$80,400,000	\$3,700
North Carolina	\$1,385	\$346	4,900	35,745	\$14,100,000	\$4,700,000	\$9,400,000	\$2,900
North Dakota	\$2,525	\$631	1,200	5,772	\$4,400,000	\$1,500,000	\$2,900,000	\$3,700
Ohio	\$3,725	\$931	25,500	64,539	\$83,900,000	\$28,000,000	\$55,900,000	\$3,300
Oklahoma	\$1,810	\$452	3,500	17,565	\$9,500,000	\$3,200,000	\$6,400,000	\$2,700
Oregon	\$2,595	\$649	4,300	15,327	\$12,700,000	\$4,200,000	\$8,500,000	\$3,000
Pennsylvania	\$5,122	\$1,281	37,200	73,746	\$142,100,000	\$47,400,000	\$94,700,000	\$3,800
Rhode Island	\$3,387	\$847	1,800	6,140	\$6,800,000	\$2,300,000	\$4,500,000	\$3,700
South Carolina	\$2,838	\$709	5,600	19,313	\$17,700,000	\$5,900,000	\$11,800,000	\$3,100
South Dakota	\$3,008	\$752	1,500	5,049	\$4,900,000	\$1,600,000	\$3,300,000	\$3,300
Tennessee	\$1,924	\$481	5,300	25,962	\$15,000,000	\$5,000,000	\$10,000,000	\$2,900
Texas	\$1,751	\$438	18,600	97,524	\$50,800,000	\$16,900,000	\$33,900,000	\$2,700
Utah	\$2,036	\$509	3,200	13,444	\$8,500,000	\$2,800,000	\$5,600,000	\$2,700
Vermont	\$6,349	\$1,587	2,500	3,475	\$9,500,000	\$3,200,000	\$6,300,000	\$3,800
Virginia	\$3,159	\$790	11,500	34,694	\$36,500,000	\$12,200,000	\$24,300,000	\$3,200
Washington	\$2,160	\$540	6,500	28,714	\$19,000,000	\$6,300,000	\$12,700,000	\$2,900
West Virginia	\$2,273	\$568	2,600	10,528	\$7,500,000	\$2,500,000	\$5,000,000	\$2,900
Wisconsin	\$2,722	\$681	8,900	33,982	\$29,200,000	\$9,700,000	\$19,500,000	\$3,300
Wyoming	\$1,635	\$409	600	3,187	\$1,500,000	\$500,000	\$1,000,000	\$2,800
United States	\$2,601	\$650	404,500	1,470,914	\$1,344,300,000	\$448,100,000	\$896,200,000	\$3,300

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