

**The Causes and Consequences of
Mounting Student Debt in
Massachusetts**

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EXECUTIVE SUMMARY

This study examines the causes and consequences of growing student debt in Massachusetts, taking a critical look at changes in state support for higher education, variations in costs for students and families, shifts in the composition of financial aid, and spillover effects between public and private four-year colleges and universities in the Commonwealth. The empirical analysis focuses on four-year public and private non-profit institutions, using a combination of data sources including the Delta Cost Project Database, College Insight/Project on Student Debt data, and National Center for Education Statistics College Navigator data. After examining the roots of increasing student indebtedness, it applies a national-level model of the effect of debt on wealth and spending to the Massachusetts case.

The dominant narrative of public college costs portrays them as stable or as rising less rapidly than widely believed once financial aid and scholarships are taken into consideration.¹ It is true that the *sticker price*, or what is listed at the cost of full-time in-state tuition and fees, and the *net price*, which is the difference between the listed sticker price and financial aid and other forms of assistance, differ substantially. At Massachusetts public four-year institutions, however, both net and sticker prices have risen dramatically. In 1987, the average real sticker price was just \$2,261 in inflation-adjusted 2010 dollars. By 2010, that sticker price had jumped to \$7,442, an increase of 229%. The trend is even sharper when trends in financial aid is taken into account: The average net price for a public college education in Massachusetts has increased in real

¹ “Trends in College Pricing 2014”. College Board.
<<http://trends.collegeboard.org/sites/default/files/2014-trends-college-pricing-final-web.pdf>> Accessed December 1, 2014.

terms from \$1,556 in 1987 to over \$5,372 in 2010, an increase of 245%. While the exact distribution of these costs by family income levels cannot be determined from the data, the sharp increase should be considered in the context of stagnating median family incomes in Massachusetts over the past two decades.²

Many contending explanations of the rapid escalation of college prices have been offered. Some economists argue rising demand from students has pushed prices upward, but there is little evidence that such market dynamics have come into play. In Massachusetts, as in other states, the sticker prices of public colleges and universities are set by a political process shaped by boards of trustees and the state legislature.³ This paper offers evidence that the sticker price of public four-year colleges in Massachusetts has been primarily determined by the funding appropriated by the state for public higher education. Econometric analysis shows that state appropriations per student and sticker price have a strongly negative relationship. Declines in funding are associated with increased tuition and fees. However, there is a tendency for sticker price to rarely decline even when appropriations per student increase. Economists call this tendency a downwardly “sticky” price. Uncertainty regarding future funding levels, combined with a reluctance to discourage applications by unpredictable variation in sticker prices, creates a ratchet effect. Students and their parents make their decisions based on estimated prices over a four to six year period. The adverse effects of lowering sticker price in one year

² Sam Beckwith and Kurt Wise. “U.S. and MA Households See Few Gains During Recovery, New Census Data Show.” Massachusetts Budget and Policy Center, September 18, 2014.

<http://www.massbudget.org/report_window.php?loc=Census_Release_9-18-14.html>.

³ Tuition and Fee Rates. Massachusetts Department of Higher Education. <<http://www.mass.edu/campuses/tuitionfees.asp>> Accessed December 1, 2014.

only to raise it in the next would be significant, leading institutions to concentrate on minimizing future increases.

The declining level of public support for higher education has driven cost increases that have led to higher levels of student indebtedness. Notably, public college students in Massachusetts take out student loans at a higher proportion than their private counterparts. In 2010, an estimated 73% of public college graduates left with debt compared with just 66% at private institutions. Indeed, Massachusetts stands out as a state where public four-year college and university students are actually *more likely* on average to take out student loans than students at private institutions, a pattern that does not hold on the national level. This pattern has ominous implications for average indebtedness in the state, since 9 out of 10 graduates of public institutions in Massachusetts remain here after graduation. According to recent data, nearly 1 million individuals in Massachusetts now hold roughly \$24 billion total in outstanding student loan debt.⁴

Both the escalating price of public higher education in Massachusetts and the accumulation of greater student debt have spillover effects on private colleges and universities. The average real *net price* of private colleges and universities in the Commonwealth as a whole, though higher than that at public institutions, has not increased as rapidly. From 1987-2010, the real net sticker price at private four-year institutions rose just 55%, compared with 193% at public four-year colleges and universities.

⁴ “Data: Student Loan Borrowing by State, Q1-2013.” Federal Reserve Bank of New York. <<http://www.newyorkfed.org/householdcredit/2013-Q1/student-loan-by-state.xlsx>>

However, the private sector in the state is marked by a usually high concentration of elite colleges and universities, which skews the comparison. When private institutions with wealth endowments exceeding \$1 billion in 2011 are distinguished from others, the results differ. Only 44% of students at schools with over \$1 billion endowments graduated with any student debt. The average level of debt for these students was \$19,851 in current dollars in 2011. But at the other schools (that enroll a far higher number of students) the percentage was far higher: 74 % of students graduated with student loan debt. Average debt was also far higher, at \$31,428. The private schools with high wealth endowments enroll primarily out-of-state students. Only 16% of their students enrolled as in-state Massachusetts residents in 2011. At other private institutions, an estimated average of 43% of students enroll as state residents. Rapid escalation of prices at public institutions could help explain why students who are Massachusetts residents choose to attend private schools despite higher prices and significant risk of indebtedness at all but the wealthiest institutions.

What are the economic consequences of growing debt burdens for Massachusetts' students? Previous studies suggest that rising student debt may have both individual effects and macroeconomic impacts. On the individual level, rising student debt may delay or prevent students from graduating, prevent recent graduates from starting small businesses, and amplify existing inequalities based on class, race/ethnicity, or gender. On the macroeconomic level, rising student debt can have consumption effects by crowding out opportunities to purchase assets by taking on other forms of debt such as mortgages and auto loans. Reduced demand for such assets can hurt the economy as a whole.

An important previous effort to model this effect simulates the wealth lost in savings and home equity (due to a lower likelihood of purchasing homes and taking on mortgage debt) when displaced with student loan debt. Given the 2012 levels of borrowing, the model estimates that for every \$1 of student loan debt, there is a \$4 wealth loss associated due to forgone savings and home equity over a 40 year working lifetime. Applying this model to the Massachusetts case using the same data source yields an estimate of the lifetime cost of student loan borrowing in the state: If Massachusetts student loan borrowing were to remain at 2012 levels, the 967,000 borrowers would cumulatively experience a \$100,954,800,000 wealth loss over their working lifetimes, or roughly \$2.5 billion per year in forgone savings and equity (in current dollars). Using an approximation of average student loan payments also yields a conservative estimate of reduction in consumer spending of about \$234 million per month by student debtors in our state.

Previous research has analyzed the multiplier effects of investment in public higher education, which both increases employment and increases the taxable income of those employed.⁵ Substantial reinvestment in public higher education in Massachusetts would also alleviate some of the disturbing consequences of rising student debt. The promise of increased long-term support could mitigate the “sticky price” effect and lead to lower costs for Massachusetts’s students and families. These lower costs could lead to lower student debt, increased asset accumulation and increased consumption. The Massachusetts economy as a whole would benefit.

⁵ Michael Ash and Shantel Palacio. “Economic Impact of Investment in Public Higher Education in Massachusetts: Short-Run Employment Stimulus, Long-Run Public Returns.” April 2012. < <http://phenomonline.org/wp-content/uploads/2012/05/Ash-Report-5-4-12.pdf>>.

THE CAUSES AND CONSEQUENCES OF MOUNTING STUDENT DEBT IN MASSACHUSETTS

Public higher education in Massachusetts is facing economic problems that threaten the current and future prosperity of the Commonwealth. Students and their families have suffered steep increases in tuition and fees, even when expanded financial aid is taken into consideration. The resulting increase in student debt is likely to reduce both consumer spending and investments in housing and automobiles, lowering output and dampening economic growth.

Nationally, student debt has grown exponentially in just the past few decades, ballooning to over \$1 trillion in outstanding loan debt. Massachusetts ranks 12th amongst states with the highest average student debt burdens at graduation, with indebted college graduates averaging \$28,460 in debt in 2012.⁶

Both economists and policy-makers have expressed concerns regarding the macroeconomic impact of these increasing debt burdens.⁷ Recent findings suggest that they help explain the slow pace of recovery in the housing market following the last recession. Heavily burdened with student loan repayment, the next generation of would-be homebuyers cannot afford the homes they want, resulting in a lower growth of housing demand.⁸ Student debtors also appear less likely to borrow for automobile purchases - a sign that student debt can crowd

⁶ “Massachusetts”. Project on Student Debt State by State. 2012. <http://projectonstudentdebt.org/state_by_state-view2013.php?area=MA> Last accessed June 9, 2014; Total outstanding student loan debt and average debt at graduation in 2012 are in nominal terms for undergraduates at Massachusetts four-year colleges and universities.

⁷ Phyllis Korkki. “The Ripple Effects of Rising Student Debt.” *New York Times*. May 24, 2014. <http://www.nytimes.com/2014/05/25/business/the-ripple-effects-of-rising-student-debt.html?_r=0> Accessed July 29, 2014.

⁸ Meta Brown, Sydnee Caldwell, and Sarah Sutherland. “Young Student Loan Borrowers Remained on the Sidelines of the Housing Market in 2013.” Liberty Street Economics Blog, Federal Reserve Bank of New York. May 13, 2014. <http://libertystreeteconomics.newyorkfed.org/2014/05/just-released-young-student-loan-borrowers-remained-on-the-sidelines-of-the-housing-market-in-2013.html#.U-_Sglapqf0>

out important consumer expenditures. Another study also shows that student debtors are much less likely than others to start their own businesses and become “job creators.”⁹ State-level variation in these trends is likely to be significant, but remains underexplored despite its relevance to public policy.

This paper explores both the causes and consequences of recent increases in student debt in the Commonwealth of Massachusetts. Increasing student indebtedness lies at the intersection of several economic issues for students and working families. In Massachusetts, median household incomes have stagnated since 1979, as income inequality has grown. A recent calculation shows that if income growth were distributed equally across income-level groups, then 80% of Massachusetts households would on average have \$10-15,000 more in income than they currently take in.¹⁰ As incomes have stagnated, households with college-going students have been burdened with increasing tuition and fees and insufficient financial aid, especially at the Commonwealth’s public colleges and universities.¹¹ Over time, students from a more diverse set of socioeconomic backgrounds are enrolling in college, further intensifying the cost crunch.¹²

⁹ Brent W. Ambrose, Larry Cordell, and Shuwei Ma. “The Impact of Student Loan Debt on Small Business Formation.” Social Science Research Network. March 29, 2014. <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2417676>

¹⁰ “Labor Day 2014: Minimum Wage to Rise, But Challenges Remain.” Mass Budget. August 13, 2014.

<http://www.massbudget.org/report_window.php?loc=Labor_Day_Release_2014.html>; Estimate generated by MassBudget analysis of pre-tax incomes. Data used in this analysis was drawn from Economic Policy Institute’s analysis of Piketty’s Top Income dataset.

¹¹ “The Affordability Crisis in Massachusetts Public Higher Education.” Public Higher Education Network of Massachusetts. October 2007. <<http://www.phenonline.org/wp-content/uploads/2011/07/phenom-affordability1.pdf>>

¹² Though this trend has been reversing, with fewer Pell Grant recipients (low-income students) enrolling in college, with growth being mainly found in two-year community and for-profit colleges. “Income Stratification of Undergraduate Enrollments by Level and Sector, 1988-2011. Postsecondary Education Opportunity, 2013 (July) pp. 1-11.

In this report, I offer evidence that declining state support for higher education is largely responsible for the rising cost of tuition and fees and the resulting increase in student debt. Declines in state funding for higher education shift more of the cost to students and their families, and also create uncertainty regarding future price increases.

Student debt is a problem not only because it imposes financial hardship on young adults, but also because it reinforces existing economic inequalities, crowds out consumer spending, lowers personal wealth, and reduces future tax revenues. This paper demonstrates the links between state funding for public higher education and changes in financial aid for all institutions (including private colleges and universities), and rising student debt balances. The study then estimates potential economic impacts of increased student indebtedness at the state level.

Some national studies argue that on the aggregate level, financial aid has kept pace with tuition and fee increases, resulting in relatively stable net college costs for families and students.¹³ In Massachusetts, however, financial aid has not increased sufficiently to compensate; increases in the aid-adjusted cost have contributed to rising student indebtedness at both public four-year and private non-profit four-year colleges. Students at private colleges and universities with large endowments (over \$1 billion)—primarily students from out of state—are least affected. As the final section of this paper shows, the overall increase in student debt has ominous implications for economic growth and tax revenue in the state as a whole.

Contending Explanations for Increasing Sticker Prices in the Public Sector

Understanding why costs are rising so rapidly in the public sector of higher education is important since the majority of students attending four-year institutions attend public ones -

¹³ “Trends in College Pricing 2014.” College Board. <<https://trends.collegeboard.org/college-pricing>> Accessed August 1, 2014.

about 67% nationally as of 2011.¹⁴ This figure does not include two-year community colleges, which represent an additional important share of the public sector. Public institutions generally provide a college education at a more affordable sticker price than their private counterparts, but in recent decades prices for a public college degree have increased dramatically, both in absolute terms and relative to the cost of a private college education.¹⁵ Rising costs of tuition and fees in the 1990s and 2000s motivated considerable research seeking to explain the unprecedented increases in the cost of earning a degree. These explanations include increased demand for higher education, improved quality of educational services, and the claim that increased financial aid has fully compensated for increased sticker prices and the underfunding of public institutions. Each of these explanations deserves consideration.

The claim that that rising demand for higher education is driving up costs is based on a simple supply-and-demand model of a competitive market. Supporters argue that more high-school graduates today hope to enroll in college than in the past, and their competition for limited slots makes it possible for institutions to raise prices.¹⁶ The assumption that higher education operates in a typical supply and demand market seems implausible. Since four-year colleges and universities typically have acceptance rates far lower than 100%, they continually

¹⁴ About 67% of students enrolling in four-year colleges attend public colleges and universities, but considered alongside two-year community colleges, then 71% of all students attend public institutions.; “Enrollment by Attendance Status Over Time.” College Board. <<http://trends.collegeboard.org/college-pricing/figures-tables/enrollment-attendance-status-over-time> > Accessed September 27, 2014.

¹⁵ “Trends in College Pricing 2014.” College Board. <<https://trends.collegeboard.org/college-pricing>> Accessed August 1, 2014.

¹⁶ Donald E. Heller. “Trends in the Affordability of Public Colleges and Universities: The Contradiction of Increasing Prices and Increasing Enrollment”. *The States and Higher Education Policy*. USA: Johns Hopkins University Press, 2001. pp. 11-38.

operate in an environment of *excess demand*.¹⁷ More importantly, the level of state funding provided to public institutions significantly influence revenues, and prices are determined by administrative and legislative decision-making. Increases in program quality at public colleges and universities could be contributing to tuition and fee hikes. In other words, students may be paying higher prices for higher quality services. If this were true, however, one would expect to see concomitant increases in operating expenses per student. No such increases have been documented.

Because significant increases in financial aid have occurred over much of the same period that tuition and fees have skyrocketed, trends in sticker prices alone can be misleading. On average, on the national level, the net sticker price may have remained fairly stable over time.¹⁸ But average trends can be misleading, concealing heterogeneity both across states and across families with differing levels of income. It seems likely that declining state funding for public colleges and universities has forced them to shift more of the costs to students and their families.¹⁹ National trends seem consistent with this hypothesis. As economist Nancy Folbre explains in her book *Saving State U*, tax revolt movements along with political reluctance to increase taxes and spending has led to a fiscal crunch for state college and university budgets (as

¹⁷ On average the acceptance rate at four-year colleges and universities was 67% in 2010; Jacques Steinberg. "Over All, Colleges Accept an Average of 2 of 3 Applicants." The Choice Blog, New York Times. October 20, 2010.

<http://thechoice.blogs.nytimes.com/2010/10/20/state-of-admission/?_php=true&_type=blogs&_r=0>

¹⁸ Trends in College Pricing 2014." College Board. <<https://trends.collegeboard.org/college-pricing>> Accessed August 1, 2014.; Michael Mumper. "The Paradox of College Prices: Five Stories with No Clear Lesson". *The States and Higher Education Policy*. USA: Johns Hopkins University Press, 2001. pp. 39-63.

¹⁹ Arthur Hauptman. "Reforming The Ways States Finance Education". *The States and Higher Education Policy*. USA: Johns Hopkins University Press, 2001. pp. 64-80.

well as other public goods, such as state Medicaid contributions).²⁰ While this explanation faults state governments (and tax-averse citizens) for underfunding public higher education, it also suggests that political action could reverse the trend.

None of these different explanations regarding the rising cost of public higher education are mutually exclusive. It seems important, therefore, to examine their relevance to trends in the Commonwealth of Massachusetts. The relatively new Delta Cost Project database, which compiles institutional level data from all colleges and university in the United States from 1987-2010, was released in 2012 in order to harmonize higher education statistics into a longitudinal dataset with institutional data on enrollments, expenses, staffing, financial aid, and completion rates.²¹ These data make it possible to track sources of funding (e.g. aid, appropriations, gifts), actual expenditures (e.g. staffing, operating expenses, student financial aid), and student outcomes (e.g. graduation rates and debt loads).

Why College Costs Are Rising at Massachusetts Public Colleges & Universities

At Massachusetts's public four-year colleges and universities, the cost of attendance in terms of sticker price has more than doubled in the past few decades. The sticker price of attending college is defined as full-time in-state tuition and mandatory fees listed by institutions, or in other words, the official price tag for a college education, not including room and board, books, other expenses or financial aid. In 1987, the average real sticker price was just \$2,261 in

²⁰ Nancy Folbre. "Fiscal Hell". *Saving State U*. USA: The New Press, 2010. pp 123-141.

²¹ "IPEDS Analytics: Delta Cost Project Database." National Center for Education Statistics. <<http://nces.ed.gov/ipeds/deltacostproject/>> Last downloaded April 2014.; Data contains some missing observations and collapses averages for the University of Massachusetts system. More accurate figures for the exact sticker price for each public institution in Massachusetts are available from the Massachusetts Department of Higher Education <http://www.mass.edu/campuses/res_total.asp>.

inflation-adjusted 2010 dollars. By 2010, that sticker price had jumped to \$7,442.²² As more low- and middle-income students enroll in college with median family income stagnating, this rise in costs imposes a huge burden.²³

An analysis of enrollments, expenses, financial aid, and state appropriations helps explain this trend. As observed earlier, public colleges and universities operate in an environment of excess demand, where more students apply to a school than are actually accepted. Consistent with this observation, analysis of data from the Delta Cost Project over the 2003-2010 period (the only period for which such data are available) shows no evidence of a strong relationship between the admissions rate and the sticker price of tuition and fees (See Table 1).²⁴

Table 1: Average Admissions Rate and Average Real Sticker Price at MA Four-Year Public Colleges 2003-2010 (adjusted for inflation)

Year	Average Admissions Rate	Average Sticker Price (\$ 2010)
2003	60%	\$5,661
2004	64%	\$6,593
2005	65%	-
2006	69%	\$6,477
2007	64%	\$6,687
2008	59%	\$6,730
2009	60%	\$6,934
2010	60%	\$7,443

Source: Delta Cost Project Database

The admissions rate remained fairly constant from 2003-2010, increasing slightly until 2006, and then declining. The average sticker price increased most during the end of the period, roughly

²² In the data, the University of Massachusetts system is collapsed into one institution (rather than separated out with Amherst, Dartmouth, Boston, and Lowell as their own institutions). This limits the richness of the data, and ability to analyze sticker price between flagship campuses and other state colleges. The average sticker price for 2005 was omitted due to irregular data but was estimated to be \$7,008.

²³ “Changes in Family Income, 2002-2012.” College Board.

<<http://trends.collegeboard.org/college-pricing/figures-tables/changes-family-income-over-time>>

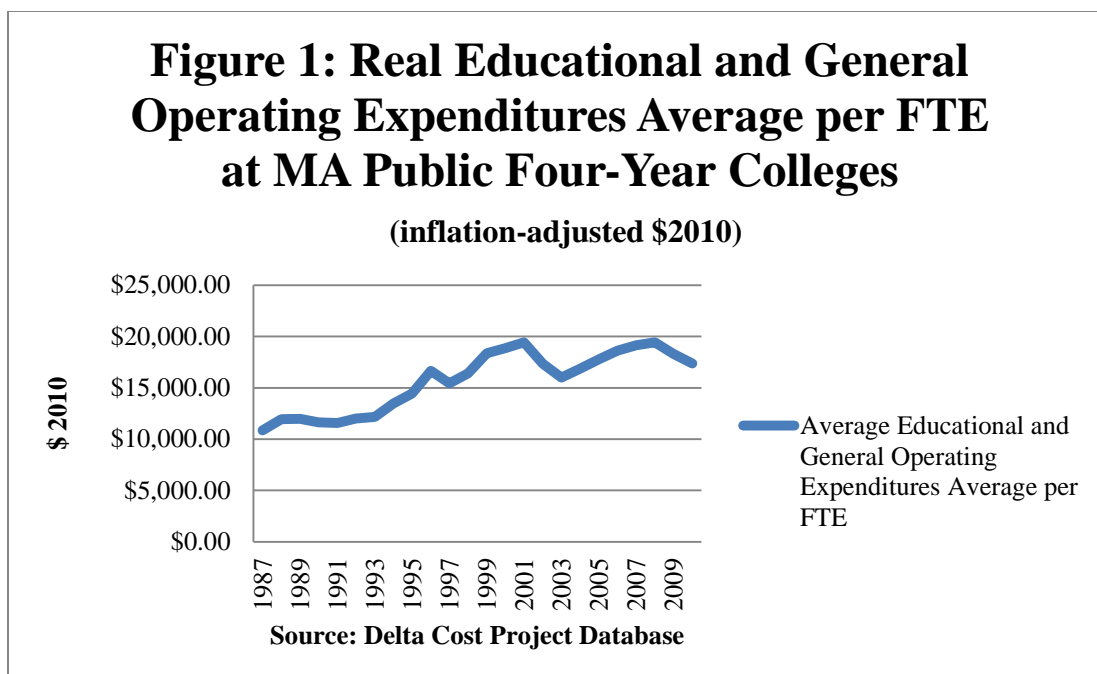
²⁴ Data only available for years 2003-2010 and contains some missing data for individual schools.

2008-2010, when the state system faced fiscal crises during the Great Recession. While tuition and fees increased rapidly the admissions rate stayed close to 60%, indicating no clear relationship between the admissions rate and sticker price. Further, the admissions rate only shows the proportion admitted out of the entire pool of applicants. If we look closer at the data, there is an overall trend of increasing applications (likely facilitated by user-friendly online submissions), relatively consistent admissions rates (with some variation), but a declining proportion of admitted students who actually enroll. Overall enrollment is stable, with slight growth through the 2000s, perhaps as a result of gradually increasing capacity.²⁵ But there is no clear correlation between enrollments, admissions rates, and sticker prices.²⁶ The data do not indicate any clear relationship between the demand for public colleges and universities and the sticker price.

Have increased expenditures per student driven up tuition and fees in the UMass higher education system? Such trends could reflect improvements in program quality, increases in classroom space and amenities, and purchases of equipment need to utilize new technologies. Consideration of educational and general operating expenditures per full-time equivalent student for Massachusetts's schools, shows that expenditures have increased, but not at a dramatic rate.

²⁵ Appendix Graph A: Full-Time Equivalent Enrollment at MA Public Four Year Colleges & Universities

²⁶ During this time period there is an overall secular trend of increasing number of applicants, likely facilitated by increased use of the Common Application and online application tools. Because of this, each year, fewer of those accepted to Massachusetts' public colleges and universities actually enroll, despite overall enrollment increasing gradually.



As Figure 1 illustrates, expenditures per student increased over time in real terms, growing steadily through 2000 with slower paced growth after that point. The fastest growth in expenditures per student takes place from 1991-1997, tops off in 2001, then declines sharply, increases to 2009, then declines again to a level below that of 2001. This pattern reflects increases in quality of programs since the 1980s, driven by changes in technologies such as computer projectors now standard in classrooms. But the patterns of increase are quite distinct. While expenditures per student nearly doubled from 1987-2010, the sticker price of tuition and fees more than tripled in real terms.²⁷ Rising expenditures per student may help explain trends before 2001, but likely do not tell the entire story. Increasing program quality is also arguably a sound investment for institutions and students. Further, changes in expenditures per student cannot answer the more important question of why they are increasing.

Pressure for increasing expenditures may be an indirect result of declining state appropriations, which create an incentive to attract more out-of-state students paying higher

²⁷ Author's calculations, see Appendix Table B for average real sticker price.

tuition, especially now that some public colleges and universities are allowed to retain these revenues.²⁸ Investments in dormitories, gymnasias, and other amenities play an important role in the recruitment process.²⁹ Unfortunately this strategy also increases costs, and possibly even debt for the university itself.³⁰

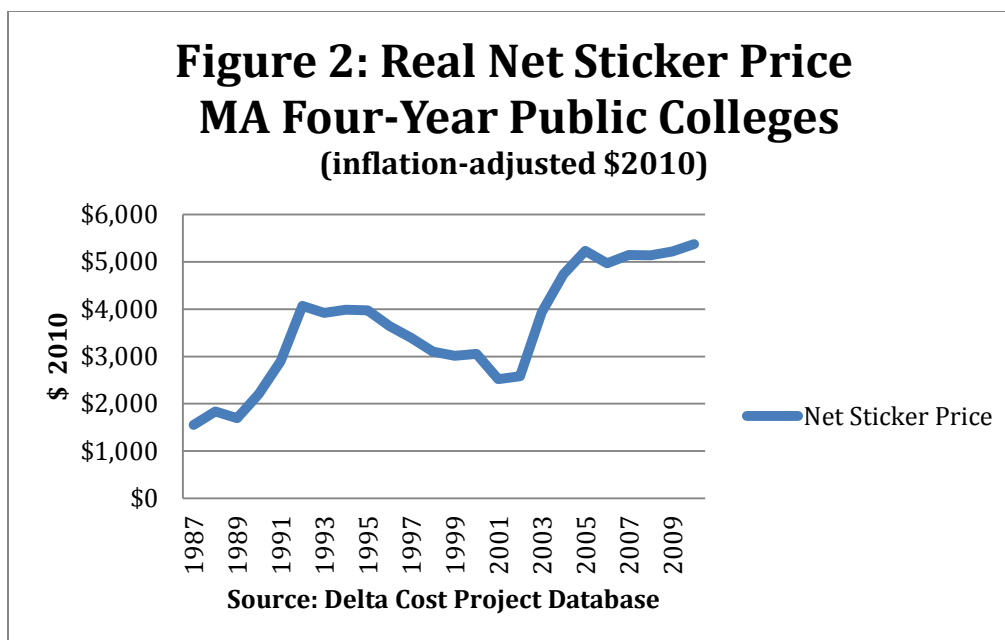
In principle, increases in tuition and fees could be fully compensated by increases in financial aid and tax credits such as the tuition and college expenses deduction and the American Opportunity Tax Credit. The College Board, one of the leading resources for higher education economic analysis, takes both financial aid levels and tax incentives into consideration in their analysis of trends in college pricing.³¹ Not all families, however, take full advantage of tax benefits (and many remain unaware of them). This report defines net sticker price more narrowly as tuition and fees minus grants and scholarships awarded.

²⁸ “MA Senate Nods to Tuition Retention by UMass Amherst.” New England Public Radio. August 5, 2010. <http://nepr.net/news/2010/08/05/ma-senate-nods-tuition-retention-umass-amherst/>; “The Affordability Crisis in Massachusetts Public Higher Education.” Public Higher Education Network of Massachusetts. October 2007. < <http://www.phenomonline.org/wp-content/uploads/2011/07/phenom-affordability1.pdf>>

²⁹ Marian Wang. “On Country Club Campuses: A Public University Ex-President Share His Second Thoughts.” Propublica. November 11, 2013. <http://www.propublica.org/article/on-country-club-campuses-a-public-university-ex-president-shares-his-second>>

³⁰ Charlie Eaton, Jacob Habinek, et al. “Swamping Our Future: How Students and Taxpayers Are Funding Risky UC Borrowing and Wall Street Profits.” *Berkeley Journal of Sociology*. November 2013.

³¹ The College Board estimates of net sticker price include tax benefits, which may or may not always be claimed, especially by lower income families. The estimates in this paper roughly calculate net sticker price by taking the difference of average sticker price and average total financial aid awarded (grants, scholarships, and other forms of aid).



As Figure 2 demonstrates, the average real net sticker price for a public college education in Massachusetts has increased in real terms from \$1,556 in 1987 to over \$5,372 in 2010- a more than three-and-a-half fold increase.³² While tuition and fees rose sharply after 1989 and again after 2001, financial aid did not keep pace. In real terms, average total financial aid awarded as a proportion of sticker price (the amount of tuition and fees covered by aid) has varied over the same time period, ranging from a low of about 19% in 1992 to a high of 38% in 2001. However, since that high in 2001, the proportion of costs covered by aid has declined, dropping to around 23% in the mid-2000s and not yet recovering.³³ In any case, the escalation of real net sticker prices has imposed a large and increased burden on students and their families in the Commonwealth.

The primary factor driving this escalation appears to be changes in state appropriations to public higher education, which have shifted a greater share of total costs onto students and their

³² The average sticker price is the un-weighted simple mean of all listed sticker prices for public four-year colleges in Massachusetts.

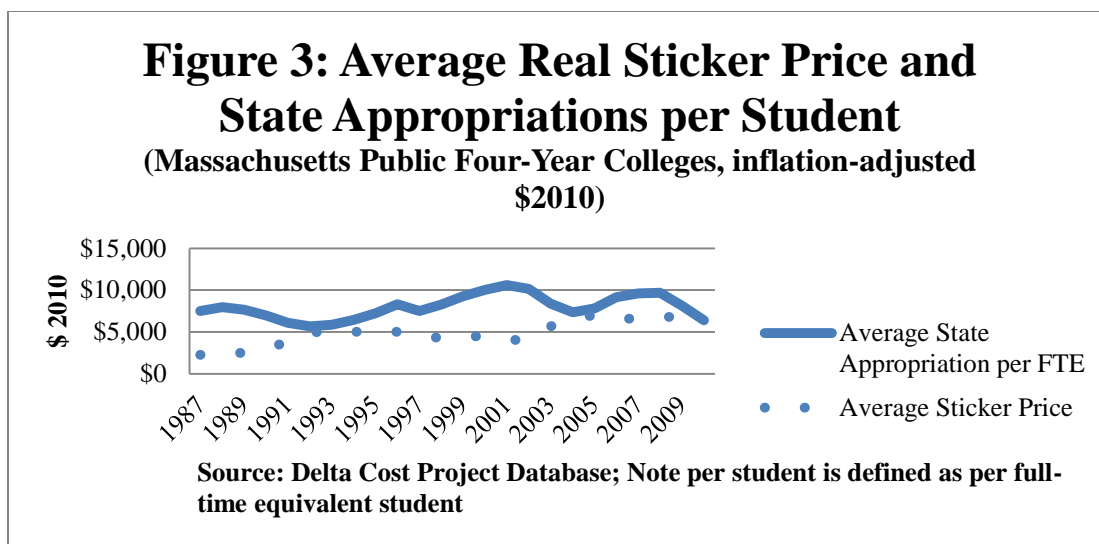
³³ Appendix Table B: Average Total Aid per Full-Time Equivalent as Proportion of Sticker Price at MA Public Four-Year Colleges & Universities

families, and have not been compensated by increases in financial aid. Trends in inflation-adjusted sticker price and state appropriations per student are clearly related.

For Massachusetts' public four-year colleges and universities, a partial "mirror image" relationship characterizes the relationships between state appropriations to public colleges and the sticker price of attendance. Generally, periods of declining appropriations correspond to rising sticker prices, and periods of more generous appropriations show at least stable sticker prices. But it is important to note that, even in these periods of increasing state appropriations per student, the sticker price rarely declines as would be expected in a true inverse relationship. Instead, sticker price seems downwardly sticky: it goes up, levels out, and then goes up again. Between appropriations per student and sticker price, there is a *downwardly rigid* mirror image pattern, where sticker price is more responsive to declines in state funding than to increases.

Figure 3 shows this pattern. Over the 1987-1991 period, the average sticker price rose while state appropriations declined. In 1991, average state appropriations increased, yet sticker price leveled off in real terms, rather than declining. Declines in sticker price did not occur until 1996, as appropriations per student continued to increase, but the decrease in real sticker price prior was largely due to inflation adjustment rather than an observed change in the nominal price.³⁴ The early 2000s marked a shift in the trend, as sticker price increased sharply and then continued to climb throughout the decade. State appropriations increased modestly after 2004, but dropped abruptly starting in 2008. The pattern suggests a lagged response to changing state funding levels.

³⁴ Appendix Graph B: Average Sticker Price Real v. Nominal at MA Public Four-Year Colleges & Universities



A notable feature of the 2000s was greater variation in average state appropriations per student, as compared with the previous decade. A drastic decline in appropriations took place in 2002, with a matched increase in sticker price. This was followed by somewhat restored levels of state funding in the mid-2000s, but no decline in sticker price. State appropriations dropped again in 2008, and sticker price continued its upward trend. In 2009, for the first time in their history, Massachusetts' public colleges and universities charged a higher average real sticker price of tuition and fees than the average amount they received in per student state appropriations. This pattern shows some turbulence over a relatively short period of time -- one decade -- in the level of state appropriations per student, but the sticker price continues in a steady upward trajectory.

This pattern, along with the partial “mirror image” in Figure 3, suggests that state appropriations have a negative relation to the sticker price of tuition and fees at Massachusetts' public institutions, but only to a certain extent. The relationship is limited since the sticker price of tuition and fees at Massachusetts four-year public institutions almost never goes down in nominal terms (and only remains flat in real terms). The very modest declines in real sticker

price shown in Figure 3 result mainly from inflation adjustment. So why does the nominal sticker price almost never decline?

This pattern probably reflects a reluctance to decrease publicly announced sticker prices due to concern that price volatility creates stressful uncertainty for students and their families. In other words, it is better to keep prices high in order to preempt future reductions in state support, than to lower them only to be forced to raise them again in response to budget shortfalls. This pattern conforms to what economists term sticky or downwardly rigid prices. Uncertainty about the future is compounded by the signaling effect of abrupt swings in price, especially since most students expect to be enrolled for at least four years.

The complex relationship between state appropriations and sticker prices suggests that a linear regression model may have limited applicability. Still, such a model provides an approximate estimate of the marginal relationship between changes in state appropriations and sticker price over the period 1987-2010. The model controls for two drivers of cost, the level of state funding per student and the educational and general expenditures per student (including expenditures on student services, academic support, and maintenance). The estimated coefficients reflect the effects of changes in state appropriations and expenses on the sticker price.

State funding, which directly subsidizes operation costs, should have a negative relationship to sticker price. Since prices are expected to be downwardly rigid, the effect should be negative but less than one-to-one. Educational and general expenses should have a positive effect on sticker price, since increased spending on programs raises the cost. The results of the regression match up with expectations of magnitude and direction. State appropriations per student have a negative effect: a one-unit (i.e., one constant dollar) increase in state

appropriations per student results in a decrease in sticker price by about 0.3 constant dollar units. Educational and general expenses per student on the other hand have a positive effect on sticker price, with a one-unit increase in expenses per student corresponding to an increase in sticker price of 0.25 constant dollar units.

Table 2: Regression Model, Effects of State Appropriations and Educational Expenses on Sticker Price at Massachusetts Four-Year Public Colleges, 1987-2010

Sticker Price, 2010 dollars	Coefficient	P> t
State Appropriations per Full-Time Equivalent Student, 2010 dollars	-0.30	0.000
Educational and General Operating Expenses per Full-Time Equivalent Student, 2010 dollars	0.26	0.000
Constant Coefficient	3520.36	0.000
Observations = 236	R-squared= 0.3986	F(2, 233) = 77.21

This analysis gives econometric evidence for the negative yet downwardly rigid relationship between state appropriations and sticker price for Massachusetts's public colleges.

It seems likely that increasingly high variations in state appropriations alongside a general decline plays an important role in price determination. Institutions adapt to instability in their expected levels of state support by relying more on fee revenues, rather than state funding, to finance operations.³⁵ This explains why tuition and fees are observed to only increase nominally even in “good” times, and how the cycle of declining funding and increasing sticker prices can be self-perpetuating. While analysis of the determinants of state appropriation levels lies outside the scope of this paper, it seems likely that a circular process comes into play, in which institutions raise prices to buffer budget shortfalls, then, partly as a result of demonstrating

³⁵ Appendix Graph C: Tuition Reliance at MA Public Four-Year Colleges & Universities; Appendix Graph D: Government Reliance at MA Public Four-Year Colleges & Universities

greater self-sufficiency, become vulnerable to further budget cuts. Students pay the price—largely by going deeper and deeper into debt.

Trends in Financial Aid at Massachusetts Public Colleges & Universities

Uncertain and declining state funding not only impacts tuition and fees, but also impacts the composition of financial aid awards given to students. Both the federal and state governments award grant-based financial aid, such as federal Pell Grants and the state-level MASSGrant. Students often qualify based on financial need. Other scholarships and grants, termed institutional aid, may come from the institution itself. This category includes funded (e.g. a specific scholarship) and unfunded (e.g. a simple tuition discount) sources covering scholarships, athletic awards, and other grants.

As direct public support from the state in terms of appropriations has declined, so has state support in the form of the state grants, including MASSGrants that are awarded based on financial need. While the average amount of state grant awards has declined only modestly, the proportion of sticker price covered by the state grant has drastically declined.³⁶ In 1987, state grants covered almost 10% of the sticker price at public colleges and universities, while in 2010 the grant covered just over 4% of tuition and fees.³⁷ Federal Pell Grants, another important source of need-based financial aid, have remained relatively constant as a proportion of sticker price and increased in absolute terms for those students receiving awards. At public colleges and universities in Massachusetts, Pell Grants and other federal grants cover roughly 10% or more of the sticker price, on average, for those awarded. Other federal grants however have declined, from an average 7% of the sticker price in 1987, to just 2% of the sticker price in 2010. Together,

³⁶ Appendix Graph E: Average State Grant Award per Full-Time Equivalent at MA Public Four-Year Colleges & Universities

³⁷ Appendix Table C: Average Grant Awards as Proportion of Sticker Price at MA Public Four-Year Colleges & Universities

MASSGrant, Pell Grants, and other state and federal grants have fallen short of covering increased prices, despite the fact that absolute total financial aid awarded is rising.

Movement away from state-provided forms of aid towards institutional aid seems to be a growing trend. Institutional aid comes in two forms: funded and unfunded. The funded form consists of awards such as athletic scholarships or scholarships that are funded by specific donors for a specific purpose. An example of funded aid could be a scholarship donated by alumni dedicated to funding only students of certain backgrounds or academic achievements. Unfunded aid on the other hand, is the financial aid money generated by the institutions themselves. Much of unfunded aid comes from institutional revenues, which are generated by the practice of tuition discounting, by which schools charge a full sticker price of tuition and fees to non-need students above the actual cost of attendance so that funds can be redistributed to lower tuition costs for students with financial need.

Tuition discounting is a form of price discrimination, using revenues paid by wealthier students to subsidize the cost of attendance for lower-income students. For example, the cost of attending college may actually be \$5,000, but institutions may charge a higher sticker price of \$10,000. With the sticker price higher than the actual cost, institutions can charge wealthier students the full sticker price, and use the excess to financial aid awards for financially needy students. In this example, charging the full price to a wealthier student could fully subsidize another student with financial need, or several students with partial financial aid packages. Tuition discounting allows colleges and universities to use what is essentially a sliding scale pricing model. This makes college at least somewhat more accessible to lower income groups by generating extra sources of aid. In order to work effectively, however, the practice requires attracting more students from wealthier backgrounds. The financial crunch of declining state

appropriations and insufficient federal and state grants puts pressure on public institutions to generate more revenues from tuition discounting in an effort to make higher education accessible to lower income students. At Massachusetts' four-year public institutions, the proportion of financial aid awarded in the form of unfunded institutional aid has grown from 10% in 1987 to more than 28% in 2010.³⁸ More students are also receiving aid in this form, with an increase from just over 14% in 2000 to over 40% in 2010.³⁹ Declining state support then, both directly in state appropriations and indirectly in state grants, forces institutions to rely more on institutional aid to keep net sticker prices somewhat equitable and affordable for students. Doing so however, creates a positive feedback loop in which sticker prices, already increasing due to declining and uncertain levels of state support, must increase even further to fund institutional aid awards for needy students and optimize revenues from wealthier students.

In an environment of drastic and sometime unexpected shortfalls in state funding, this effort has not proven successful in terms of curbing costs to students, since total unfunded institutional aid awards on average covered just 7% of sticker price in 2010.⁴⁰ Total grants and institutional aid combined covered only about one-third of the sticker price of attending a public four-year institution in Massachusetts.

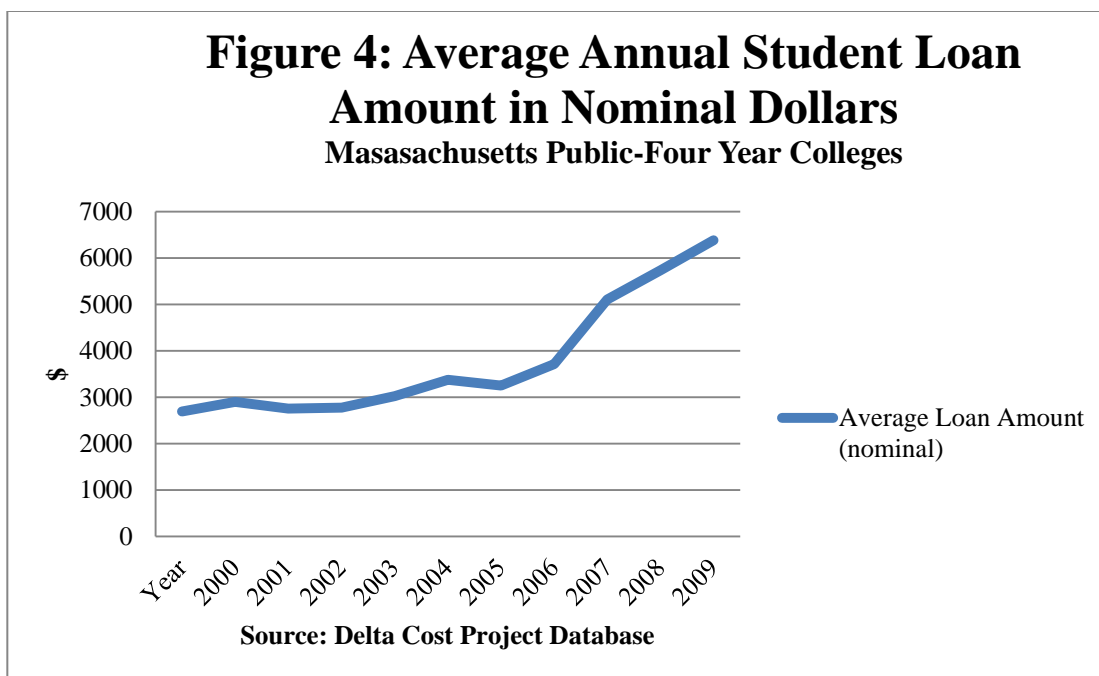
Student Debt at Massachusetts Public Colleges & Universities

The growing gap between prices and financial aid helps explain why the average annual loan amount per student at public colleges in the Commonwealth in nominal terms grew from just \$2,694 per year in 2000 to \$6,382 in 2010 (See Figure 4).

³⁸ Appendix Table D: Average Institutional Aid as Proportion of Total Aid & Sticker Price at MA Public Four-Year Colleges & Universities

³⁹ Appendix Table E: Percentage of Students Receiving Any Institutional Aid (Funded and Unfunded) at MA Public Four-Year Colleges & Universities

⁴⁰ Appendix Table D: Average Institutional Aid as Proportion of Total Aid & Sticker Price at MA Public Four-Year Colleges & Universities



During this decade, students on average took out loans equal to or in excess of 100% of the net sticker price, likely since this measure does not include other costs of college attendance such as books, transportation, room, board, and other general living expenses.⁴¹ In fact, the average loan amount in nominal terms for public college students in Massachusetts is remarkably close to that of private college students in Massachusetts, who take out an average loan of \$8,649 each year. Considering the relatively higher sticker prices of private colleges, this implies that public college students rely on loans to finance a larger proportion of their college expenses.

The percentage of all students at four-year public institutions now relying on student loans to finance their educations has increased at a dramatic rate. In 2000, 59% of students took out loans to cover college expenses, compared to 73% in 2010. By 2011-12, the percentage had grown to 75%.⁴² Beginning in the early 2000s, students at Massachusetts' public colleges and

⁴¹ Appendix Table F: Average Student Loan Amount as Proportion of Sticker Price & Net Sticker Price at MA Public Four-Year Colleges

⁴² Data from the Project on Student Debt, since Delta Cost Project Data extends only through 2010.

universities also become more likely to take out student loans than their counterparts at private schools in the Commonwealth.

Table 3: Percentage of Enrolled Students Taking Out Student Loans

Year	MA Public Four-Year Colleges	MA Private Non-Profit Four-Year Colleges
2000	59.0	61.3
2001	54.2	62.7
2002	53.0	47.5
2003	54.0	52.5
2004	59.2	53.0
2005	61.6	44.5
2006	61.8	43.0
2007	64.5	55.0
2008	64.9	60.0
2009	71.6	-
2010	73.1	66.0

Source: Delta Cost Project Database; Note: 2009 contains missing observations

This trend is counterintuitive, since generally speaking, public institutions charge lower prices.

On the national level, students at public institutions incur less debt than those at private institutions.⁴³ The Commonwealth stands out as a state in which public four-year college students are *more likely* to take out student loans.

Some individual institutions were particularly unsuccessful in meeting the needs of students with grants and scholarships. In 2012, about 85% of graduates left Bridgewater State University with student loan debt averaging over \$30,000. Just eleven years earlier in 2001, only 43% of students graduated with debt, which averaged just over \$9,000. Similarly, students at the University of Massachusetts Amherst graduated with nearly \$28,000 in student loan debt in 2012, and about 71% of graduates had taken out student loans. In contrast, in 2001, only 53% of

⁴³ “State by State Data”. The Project on Student Debt. http://projectonstudentdebt.org/state_by_state-data.php Accessed June 9, 2014.

graduates had debt that averaged about \$15,000.⁴⁴ The growing level and incidence of student debt at public institutions is a major concern since an estimated 9 out of 10 public college graduates in Massachusetts remain in state after graduation.⁴⁵

Trends in Massachusetts Private Colleges & Universities

Massachusetts hosts more than 50 private non-profit colleges, a unique concentration that shapes the higher education landscape in the state. According to the Association of Independent Colleges & Universities in Massachusetts, a private college advocacy group, Massachusetts is the only state that educates more students at private institutions than it does at public colleges and universities.⁴⁶ Many of these institutions enroll cohorts with a majority of in-state residents. As a result, it's important to consider trends in sticker price, financial aid, and student debt in this part of the higher education sector. Private colleges do not directly receive any appropriations from the state government, and rely on funds generated through tuition and fee revenues, donations, and endowment earnings. Private colleges often, however, benefit from state and federal programs that provide means-tested tuition aid to low-income students, such as federal Pell Grants or the Commonwealth's MASSGrant. Since private and public institutions operate within the same market, there are reasons to believe that changes in either sector could spillover on one another.

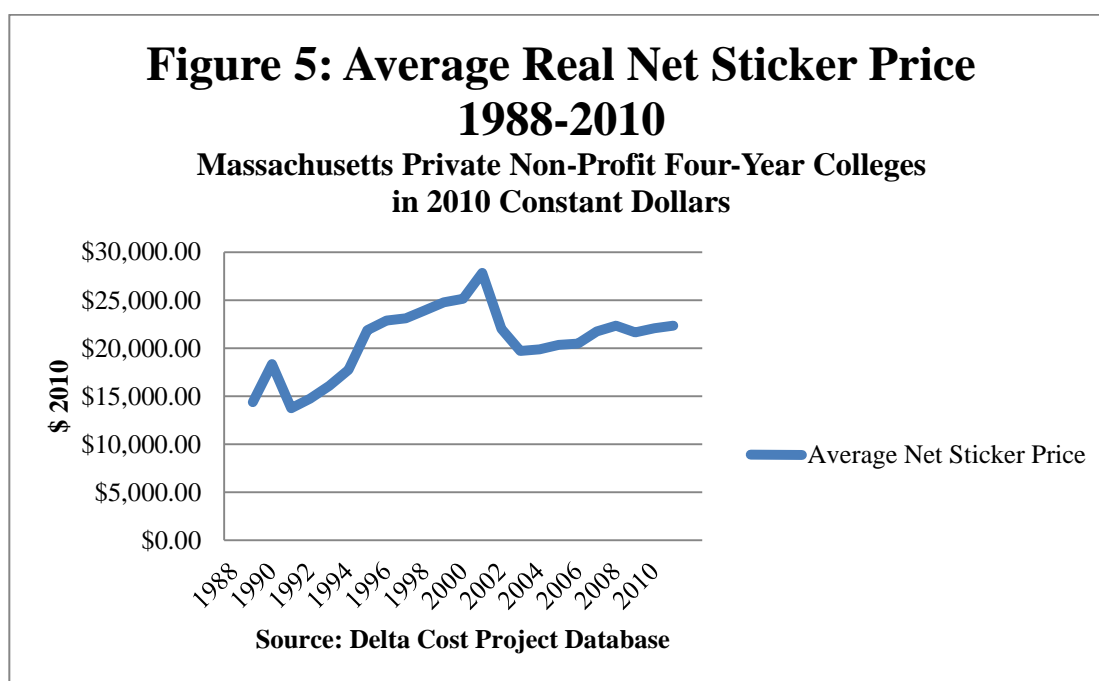
A closer look at changes in private colleges in Massachusetts can also shed some light on the causes of growing student indebtedness in Massachusetts. Analysis of the Delta Cost Project data shows that the real sticker price of private non-profit colleges in the state has increased

⁴⁴ College Insight, The Institute for College Access & Success. <<http://college-insight.org/#explore/go&h=51befaa6421228a32ec2302e46949dfa>> Accessed August 16, 2014.

⁴⁵ "Time to Lead". Massachusetts Department of Higher Education, Vision Project. September 2012. <<http://www.mass.edu/visionproject/TimeToLead.pdf>>

⁴⁶ "Facts & Figures." Association of Independents Colleges & Universities in Massachusetts. <<http://aicum.org/policy-main-page/facts-and-figures/>> Accessed August 15, 2014.

considerably over the past few decades - from an average of just over \$17,000 in 1988 to more than \$29,000 in 2010 in constant dollars.⁴⁷ While this increase is substantial in absolute terms, the total increase of 70% remains far below the 198% increase in average real sticker prices at public institutions over the same period.⁴⁸ Even in terms of net sticker prices, growth was slower in the private sector for this time period, at 55% for private non-profit schools, compared with 193% for public colleges. Net sticker prices for private colleges even decreased in the early 2000s, primarily as a result of increases in institutional financial aid awards.⁴⁹ In other words, students at private schools, on average, have faced less net price escalation.⁵⁰



⁴⁷ Appendix Graph G: Real Average Sticker Price at MA Private Colleges & Universities; Figure calculated as simple mean of sticker price for each private four-year non-profit colleges in Massachusetts.

⁴⁸ Author's calculations from Delta Cost Project Data.

⁴⁹ Appendix Table G: Average Financial Aid Awards by Type and as Proportion of Sticker Price at MA Private Colleges & Universities

⁵⁰ Data missing from 1987.

Still, the net sticker price remains high in historical terms, almost certainly contributing to increased student debt. Further, measures of average sticker price and financial aid tell little about the actual distribution of costs and aid across different institutions within the private sector.

While rising sticker prices in the public sector are largely attributable to state appropriations, trends in the private sector are more complex, in part because Massachusetts's private four-year colleges are particularly heterogeneous in terms of student body characteristics, enrollments, financial aid awards, and debt at graduation. Students at some institutions fare much better financially than at others.

Massachusetts has an unusually high concentration of wealthy, elite private colleges and universities compared with other states. The Commonwealth is home to several top-ranked institutions, including Harvard University, Massachusetts Institute of Technology, Amherst College, and Williams College. Many other private colleges and universities, however, do not fit this description. A simple way to illustrate heterogeneity is to distinguish between those with and without endowment wealth over \$1 billion in 2013.⁵¹ Those in the former category (Harvard University, MIT, Williams College, Amherst College, Boston College, Wellesley College, Smith College, Tufts University, and Boston University) represent just a handful of the 58 private non-profit bachelor's degree-granting institutions in the state.⁵² Institutions like Western New

⁵¹ "U.S. and Canadian Institutions Listed by Fiscal Year 2013 Endowment Market Value and Change in Endowment Market Value from FY 2012 to FY 2013." National Association of College and University Business Officers and Commonfund. February 2014. <http://www.nacubo.org/Research/NACUBO-Commonfund_Study_of_Endowments/Public_NCSE_Tables.html>; The \$1 billion threshold is chosen for simplicity of analysis.

⁵² College Navigator, National Center for Education Statistics. <<https://nces.ed.gov/collegenavigator/>> Last Accessed April 7, 2014.

England College, American International College, Curry College, and Merrimack College are far more typical.⁵³

High endowment wealth at elite schools, coupled with relatively small incoming class sizes and high selectivity in admissions, creates rich opportunities for a relatively small number of students from low-income families. Accumulated wealth allows institutions such as Amherst and Harvard to offer generous financial aid. In 2007, for instance, Harvard University famously pledged to maintain a no-loan policy for its undergraduate students.⁵⁴ This meant that for all accepted students from a low-income background, financial aid awards in grants and scholarships would cover all costs for those with financial need, and loans would not even be offered as an option. They further pledged that families making up to \$180,000 would at most be required to pay 10% of their income toward college, an initiative to keep costs low for the middle class. For exceptional super high-achieving students from low or middle-income backgrounds, these policies make an Amherst College education cheaper than Salem State University or UMass Amherst. But it is important to remember that only a limited selected handful of students are admitted to these elite schools, which already generally have small student bodies. Despite the generosity of these policies, they have limited aggregate impact on overall college costs and debt levels.

The *Boston Globe* recently emphasized this point, publishing a list of average student debt at graduation for some schools in Massachusetts, from the very low, manageable average

⁵³ “U.S. and Canadian Institutions Listed by Fiscal Year 2013 Endowment Market Value and Change in Endowment Market Value from FY 2012 to FY 2013.” National Association of College and University Business Officers and Commonfund. February 2014. <http://www.nacubo.org/Research/NACUBO-Commonfund_Study_of_Endowments/Public_NCSE_Tables.html>

⁵⁴ “Harvard Announces Sweeping Middle-Income Initiative.” Harvard Gazette. December 10, 2007. <<http://news.harvard.edu/gazette/story/2007/12/harvard-announces-sweeping-middle-income-initiative/>>

debt at graduation reported at Williams College of just under \$13,000, to over \$50,000 at Wheelock College.⁵⁵ This illustrates why even with no-loan colleges like Amherst College and Harvard University the average student debt burden in Massachusetts remains close to the national average of \$28,460 in student debt in 2012 with 66% of students taking out loans. The averages simply fail to reflect the important variations among different institutions.⁵⁶

Data from the National Center for Education Statistics College Navigator and the Institutions for College Access and Success make it possible to examine this variation in more detail, comparing the wealthiest institutions to those with less than \$1 billion in endowment wealth, and to public institutions. Even with this imperfect distinction, a division in the summary statistics for colleges and universities in the Commonwealth is clear. Table 4 shows the average debt at graduation and percentage for graduates with debt for the 2011 graduating cohort, alongside the proportion of in-state enrollment for bachelor's degree-granting schools in Massachusetts. At colleges in the wealthy category, just 44% graduated with student loan debt, compared to 74% at other private institutions, (a figure virtually identical to the rate at public institutions).

Table 4: 2011 Graduating Cohort Debt and Enrollment for Massachusetts Four-Year Colleges & Universities	Average Debt at Graduation per Student (nominal)	Average Percentage of Student with Debt	Average Percentage of Students Enrolled from In-State, Massachusetts
Private with Greater Than \$1 Billion Endowment	\$19,851	44%	16%
Other Private	\$31,423	74%	43%
Public	\$27,387	75%	85%

Source: NCES College Navigator

⁵⁵ Peter Schworm. "Student Debt Rises in Massachusetts and the Nation." The Boston Globe. January 6, 2014. <http://www.bostonglobe.com/news/nation/2014/01/06/local-college-students-size-mounting-loan-debt/11Kzt1b7Au7vuMdw6Lf76H/igraphic.html?p1=Article_Graphic>

⁵⁶ College InSight, The Institute for College Access and Success. <<http://www.college-insight.org>> Accessed June 12, 2014.

Average debt at graduation was also conspicuously lower at colleges in the wealthy category, at \$19,851 compared to \$31,423 at other private colleges in 2011. Even more striking is the stark difference in in-state enrollment between elites and other private colleges. The wealthiest colleges enroll, on average about 16% of their students from Massachusetts. The other private colleges and universities with higher average debt levels have much higher in-state enrollment rates, around 43% of their total student body.

Details for individual institutions vividly illustrate the inequalities in the private sector of higher education in Massachusetts. Williams College, in the wealthy category, had an estimated in-state enrollment of just 13%, and only 31% of its 2011 graduates had student debt, which averaged about \$12,750. Meanwhile Suffolk University, which is not in the wealthy category, had 95% in-state student enrollment, and 76% of its graduates had student debt, which averaged over \$32,000.⁵⁷ This tendency for private colleges with high in-state enrollment to generate high levels of student debt is cause for concern because of its potential effects on the Massachusetts economy.

In-state students may opt for private colleges, despite their high sticker price, because they believe they will enjoy higher quality services and better job prospects as a result. Moreover, rapid price escalation in the public sector—along with publicity regarding the negative effects of budget cuts—may encourage such decisions. From this perspective, increasing debt burdens among private college graduates represent, at least in part, a spillover effect of public sector trends. Cost crunches at both public and private institutions have forced many Massachusetts college students into burdensome debt.

⁵⁷ College Navigator, National Center for Education Statistics.
<<https://nces.ed.gov/collegenavigator/>> Last Accessed April 7, 2014.

The Consequences of Student Indebtedness

The economic consequences of increased debt financing for higher education can be separated into a least three distinct categories: degree completion, consumption and investment effects, and wealth effects. Degree completion refers to how increased student debt may impact graduation rates for students. This is an important concern, since accruing debt without completing a degree represents a failed investment for the individual. “Consumption effects” refer to the ways in which increased student indebtedness may affect consumption of other goods and services, especially those that are personal investments for individuals. Student debt is likely to influence the market for other forms of consumer debt such as mortgages and auto loans. “Wealth effects” describe how increased student indebtedness may negatively affect an individual’s accumulation of wealth over their lifetime. These effects work through consumption effects, as student debt may replace forms of debt that build equity over time, such as owner-occupied housing.

An overview of national studies on the impact of student debt sets the stage for a closer look at the Massachusetts case. While expanded college access via student loans has some positive effects, like increasing access during a time of rising tuition costs, the expansion of student loans also has its downside.⁵⁸ Accumulated debt can reduce the probability of degree completion, a side effect especially troubling to college administrators and financial aid officers. A recent study by sociologists Rachel Dwyer, Lauren McCloud, and Randy Hodson analyzed data from the 1997 National Longitudinal Study of Youth, a survey of cohorts attending college

⁵⁸ Sandy Baum and Michael McPherson. “Introduction,” Pp. 1-7. *The Effectiveness of Student Aid Policies: What the Research Tells Us*. Sandy Baum, Michael McPherson and Patricia Steele, editors. New York, NY: The College Board, 2008.; Donald E. Heller 2008. “The Impact of Student Loans on College Access,” Pp. 39-67. *The Effectiveness of Student Aid Policies: What the Research Tells Us*. Sandy Baum, Michael McPherson and Patricia Steele, editors. New York, NY: The College Board, 2008.

from the late 1990s through the early 2000s (around the time of the boom in student lending).

The researchers found that:

The graduation likelihoods of students from modest economic backgrounds attending public universities are significantly contingent on the debt loads that they carry. Access to at least some debt increases the graduation probabilities of these students. However, starting at about \$10,000, debt's effect on graduation rates levels out and do not increase further. Beyond \$10,000 increasing debt actually undercuts graduation probabilities for these students.⁵⁹

This finding probably reflects selection bias in that students from less economically advantaged households are those more likely to take out loans, and may also be less likely to graduate regardless of student debt. Still, the link between student debt and completion rates is cause for concern.

In another study, Dwyer, McCloud, and Hodson found that gender affects the relationship between student debt and completion rates. For women, the relative return to completing a college degree is much higher than that of men, mainly because their fallback position- jobs typically held by those without a college degree- generally pay less than those held by men without degrees. Due to the particularly wide gender pay gap in these jobs, completing a college degree offers a higher payoff for women.⁶⁰ For this reason, women are willing to accrue more college debt before making the decision to drop out than men are. Unfortunately, this result implies the greater benefits women college graduates enjoy are partially countervailed by their greater student debt burdens, and high levels of debt can amplify existing gender inequalities.

For those students managing to complete their studies, student loans may displace other forms of personal investment, with varying effects by income level. Displacement can occur for two related reasons: a reduction in disposable income after debt payments reduces all investment,

⁵⁹ Rachel E. Dwyer, Laura McCloud, and Randy Hodson. "Debt and Graduation from American Universities." *Social Forces*, Volume 90, Number 4, June 2012, Pp. 1133-1155.

⁶⁰ Rachel E. Dwyer, Randy Hodson, and Laura McCloud. "Gender, Debt, and Dropping Out of College" *Gender & Society*, Vol. 27 No. 1, February 2013. pp 30-55.

and large student loan payments may directly “crowd out” other possible investments. Not surprisingly, low earners are most likely to be affected, as research indicates a negative relationship between debt burdens and salaries. An examination of the Baccalaureate and Beyond Survey of 1992-1993 cohorts finds that earnings for those with relatively higher educational debt were less than their lower debt peers when surveyed in 1997. The study notes that the

average salary in 1997 for all students was \$31,556, but for students with educational debt burden greater than 8%, average salary was less than \$24,000.... For all students with educational debt burden greater than 8%, average debt was significantly higher and average salaries were significantly lower. This pattern holds regardless of race, ethnicity, economic class or gender.⁶¹

Even though this result partly reflects the greater likelihood that less-advantaged students will acquire debt, it also indicates that high debt may lead graduates to accept lower-paying jobs due to the urgency of finding employment immediately after graduation.⁶²

The macroeconomic conditions under which student debt has grown are also relevant. The average real wage for college graduates has stagnated over the same period that student debt has ballooned. The Center for Economic and Policy Research summarizes the trend: “In the 27 years from 1986 to 2013, Pew found that the median wage for full-time workers between the ages of 25-32 with college degrees increased from \$44,770 in 1986 to \$45,500 in 2013, a rise of 1.6 percent. This comes to an increase of 0.06 percent a year.”⁶³ It is important to note, however,

⁶¹ Derek V. Price. “Education Debt Burden Among Student Borrowers: An Analysis of the Baccalaureate and Beyond Panel, 1997 Follow-Up.” *Research in Higher Education*, Vol. 45, No. 7 (Nov., 2004), pp. 701-737.

⁶² Selection bias in that defining the debt burden as a percentage of earnings will by definition mean that those with more relative debt earn less, even holding absolute debt levels constant.

⁶³ “Pew Research Finds Almost No Gains for Young College Grads Over Last Quarter Century” Beat The Press Blog, Center for Economic and Policy Research. February 12, 2014. <<http://www.cepr.net/index.php/blogs/beat-the-press/pew-research-finds-almost-no-gains-for-young-college-grads-over-last-quarter-century>>

that the average earnings of those without a college degree have actually declined. As a result, the relative gains from a college education remain high.

Students have good reason to acquire debt if they cannot afford to complete college without it. Nonetheless, the debt itself reduces their spending power, with effects on the larger economy, especially the housing market. The New York Federal Reserve Panel on Consumer Finances reports a relative drop in auto loan and home mortgage debt for younger individuals in 2012, as student loan debt increased over previous years. Two Federal Reserve bank economists explain the aftermath of the 2008 recession as follows:

Homeownership rates fell across the board: thirty-year-olds with no history of student debt saw their homeownership rates decline by 5 percentage points. At the same time, homeownership rates among thirty-year-olds with a history of student debt fell by more than 10 percentage points. By 2012, the homeownership rate for student debtors was almost 2 percentage points lower than that of nonstudent debtors. Now, for the first time in at least ten years, thirty-year-olds with no history of student loans are more likely to have home-secured debt than those with a history of student loans.⁶⁴

A similar trend is evident in automobile loan markets. While substituting student loan debt for housing debt does not necessarily change total average debt balances, the trend away from purchasing investment goods such as housing negatively affects lifetime accumulation of wealth and equity.

The think-tank Demos recent released a study modeling the estimated loss in lifetime wealth due to student loans.⁶⁵ The model estimates wealth lost as a result of delayed or foregone home purchases -- a major source of wealth for many Americans -- as well as potentially lower

⁶⁴ Meta Brown and Sydney Caldwell. "Young Student Loan Borrowers Retreat from Housing and Auto Markets." Liberty Street Economics Blog, Federal Reserve Bank of New York. April 17, 2013. < <http://libertystreeteconomics.newyorkfed.org/2013/04/young-student-loan-borrowers-retreat-from-housing-and-auto-markets.html>>

⁶⁵ Robert Hiltonsmith. "At What Cost? How Student Debt Reduces Lifetime Wealth." Demos, August 2013.; See Appendix on Methodology in "At What Cost?" for a more detailed description of how the model was estimated.

savings rates due to crowding out by large student loan payments. The study assumes dual-headed, dual-indebted college-educated households with each member owing the average student loan balance, for a total of \$53,200 in outstanding student loan debt. The model then assumes average wages for individuals earning bachelor's degrees, average savings rates, average timing of and value of home purchases, and other economic factors. Using these parameters, it simulates a lifetime of savings, home purchases, and building home equity. Comparing the results for debtors versus non debtors, it calculates an average "student loan drain" of about \$208,000 for each household over the span of a 40-year working lifetime. With 39 million Americans holding student loan debt, Demos estimates a total wealth loss of roughly \$4 trillion for the economy as a whole- a significant loss in potential wealth.

Student Debt Impacts for Massachusetts

The Demos model can be applied to new state-level data on student loans to estimate the wealth loss from student debt for Massachusetts. The Federal Reserve Bank of New York recently published new state-level data on consumer debt, including student loans. The survey takes a 1% representative sample of the population and records their credit and debt information, including outstanding balances, monthly payments, and equity. The aggregated state-by-state data includes averages of those balances as well as the estimated total number of borrowers in each state. In Massachusetts, an estimated 967,000 individuals held outstanding student loans in 2012, with an average balance of \$26,100. These data can be plugged into the wealth loss model described above, yielding an estimate of how much wealth is lost compared to a hypothetical scenario in which no student debt is incurred. The results are presented in Table 5.

Table 5: Massachusetts Estimated Potential Student Loan Wealth Loss (2012 \$)

MA Average Student Debt	\$26,100
Per Borrower Wealth Loss	-\$104,400
Total # MA Borrowers	967,000
Total Wealth Loss (over 40 years)	-\$100,954,800,000
Total Wealth Loss Per Year	-\$2,523,870,000

Sources: Federal Reserve Consumer Credit Panel/Equifax Q1:2012 Student Borrowing by State; Hiltonsmith, Robert “At What Cost? How Student Debt Reduces Lifetime Wealth.”

The model estimates the average wealth loss over a 40-year period, from age 23 when an individual graduates and begins paying off their debt, through age 63 when retirement approaches. Each individual is assumed to carry the average debt burden for Massachusetts’ debtors, \$26,100, as estimated by the New York Federal Reserve Bank. Assuming the basic estimated impact ratio of student debt to wealth loss to be 1:4, as calculated by Demos, the model estimates that each individual borrower will experience a \$104,400 wealth loss over their working lifetime. For a dual-headed and dual-indebted household, this number would be \$209,600.⁶⁶ Massachusetts’ residents with student debt could experience a total combined lifetime wealth reduction of over \$100 billion. The estimated total annual wealth loss, given 2012 levels of student debt and number of Massachusetts debtors, comes to more than \$2.5 billion per year, which is a deadweight loss for the state economy and in particular for the housing market.

⁶⁶ This model estimates this effect for just the number of borrowers and student debt balances calculated for 2012, and not factoring in growing numbers of debtors and debt balances. There is no reason to assume that this wealth loss would be linearly perfect at \$4 lost for every \$1 in student debt, but the Demos model gives us a rough baseline ratio to estimate the aggregate impact of student debt.

Accumulated debt also reduces general consumption. Some researchers estimate the national average for student loan payments to be roughly \$242 per month, based on the national average of \$25,721 outstanding student loans.⁶⁷ A conservative estimate for the total monthly payments for the 967,000 estimated Massachusetts student borrowers would be about \$234 million per month, or about \$2.8 billion per year. When younger individuals forgo or delay home purchases due to the relative increase of student loans in their debt portfolios or reduce their consumption as a result of debt payments, the effects spill over into the local, state, and regional economy.

Local property values may decline, overall spending may slump, and tax revenues (particularly on the local level) may decline. Virtually all residents of the Commonwealth could be affected. The long-run economic effects of student debt should be a serious matter of concern for state legislators and policy-makers.

CONCLUSION

Using new sources of quantitative data, this report has analyzed both the causes and the consequences of increasing student debt in the Commonwealth of Massachusetts. It has demonstrated important links between declining state support for public higher education, trends among private higher education institutions, and rising student indebtedness at four-year colleges and universities in Massachusetts. It has also documented ominous possible consequences of reduced wealth accumulation and forgone consumer spending.

Student debt is continuing to increase at both public and most private four-year colleges, posing a threat to the economic well-being of the Commonwealth. The Legislative

⁶⁷ Beth Akers, “The Typical Household with Student Debt.” Brookings Institute, Brown Center Chalkboard Paper Number 72, June 2014.

Subcommittee on Student Debt formed in 2013, acknowledged this problem and began small steps towards reducing and preventing student indebtedness; however, this research shows more profound and impactful changes could be made.⁶⁸ Since state appropriations and sticker price at public four-year colleges and universities are closely related, it seems clear that sufficiently large reinvestments in public higher education could reverse the tuition spiral of the past two decades. By investing in public higher education to make tuition and fees affordable to students, student debt could be altogether eliminated for future cohorts at public colleges. Experimental models, like Oregon's Pay-It-Forward program, offer new financing models that would better serve in-state students and could eliminate student indebtedness altogether.⁶⁹

Moreover, investment in public higher education has important positive impacts beyond increased affordability and reductions in student indebtedness. Investment in public higher education offers direct economic benefits. A recent study by economist Michael Ash and Shantel Palacio shows that public investment in higher education creates a significant short-run stimulus to the state economy.⁷⁰ Combined with the long run benefits of reducing student debt described in this report, the overall economic payoff to increased public support appears quite high. The positive results would include increased graduation rates, higher quality jobs, increased earnings, higher property values, and greater local spending. The resulting boost to tax revenues could translate into a direct payback to all residents of the Commonwealth.

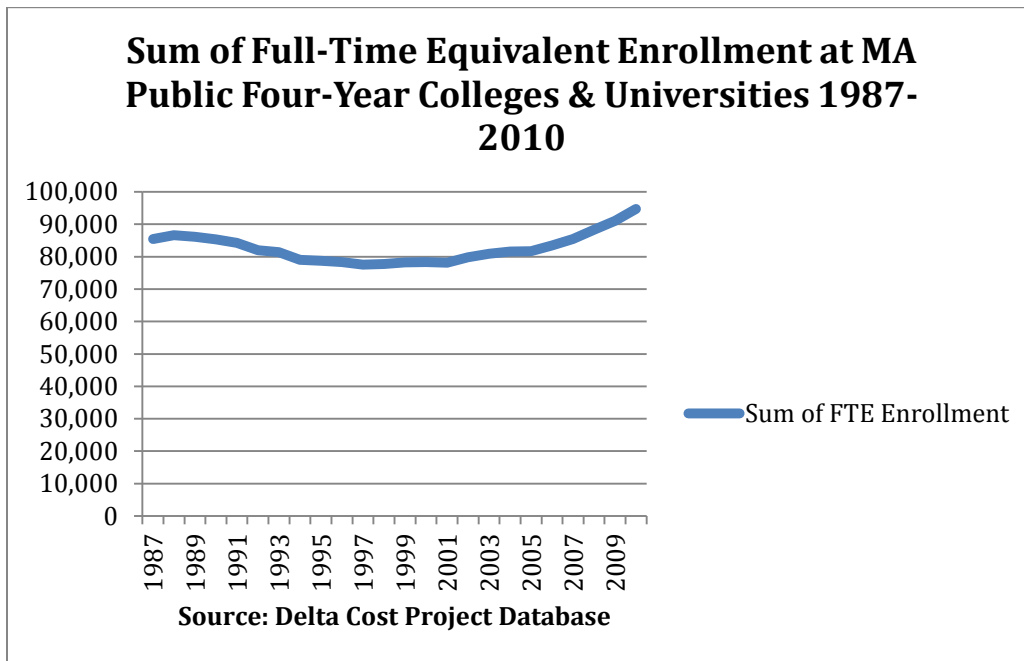
⁶⁸ The Report of the Joint Committee on Higher Education's Subcommittee on Student Loan and Debt." Massachusetts State Legislature. April 16, 2014.

⁶⁹ "Pay It Forward: Debt-Free Access to Higher Education." Economic Opportunity Institute. October 17, 2013. < <http://www.eoionline.org/education/higher-education/pay-it-forward-debt-free-access-to-higher-education-2/>>

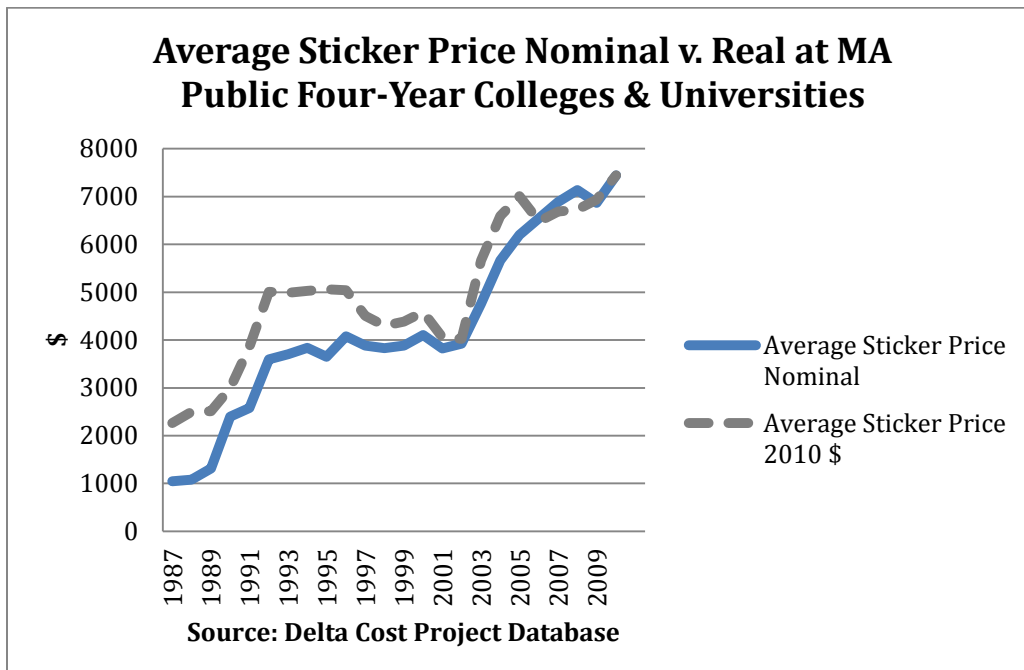
⁷⁰ Michael Ash and Shantel Palacio. "Economic Impact of Investment in Public Higher Education in Massachusetts: Short-Run Employment Stimulus, Long-Run Public Returns." April 2012. < <http://phenomonline.org/wp-content/uploads/2012/05/Ash-Report-5-4-12.pdf>>

APPENDIX I: GRAPHS

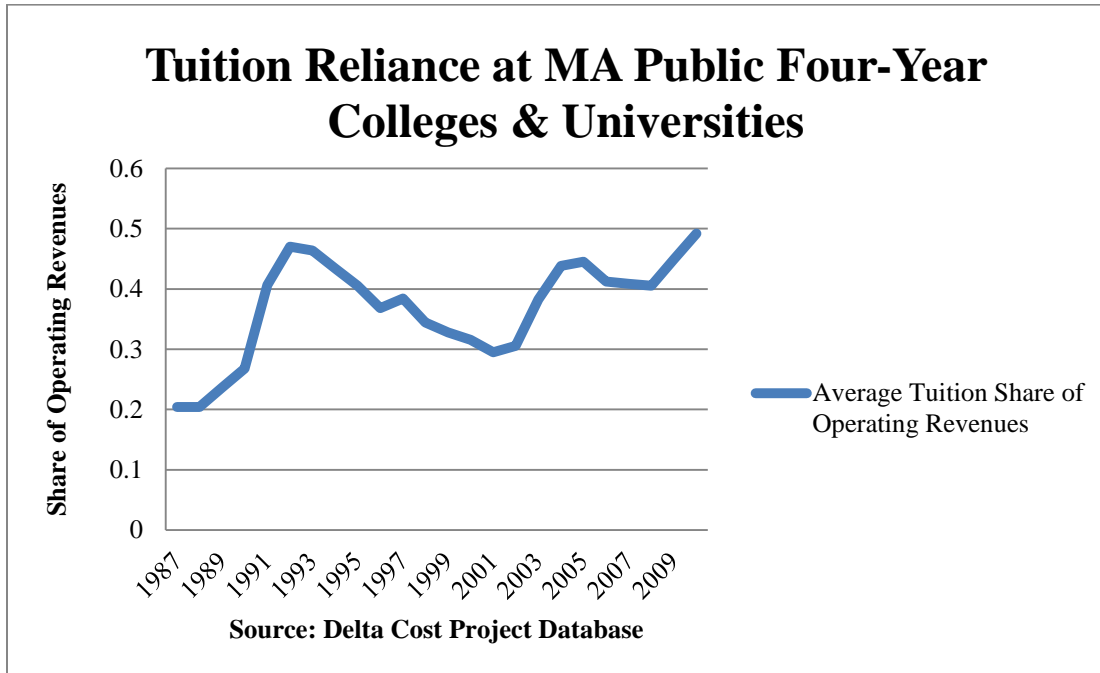
Graph A: Full-Time Equivalent Enrollment at MA Public Four Year Colleges & Universities



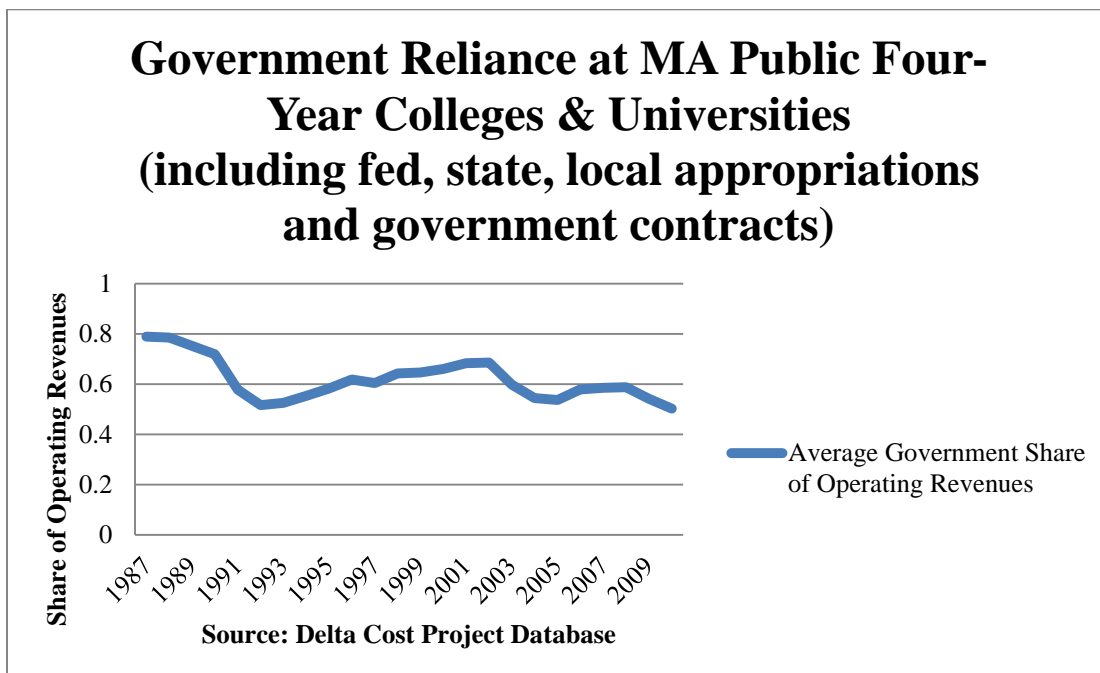
Graph B: Average Sticker Price Real v. Nominal at MA Public Four-Year Colleges & Universities



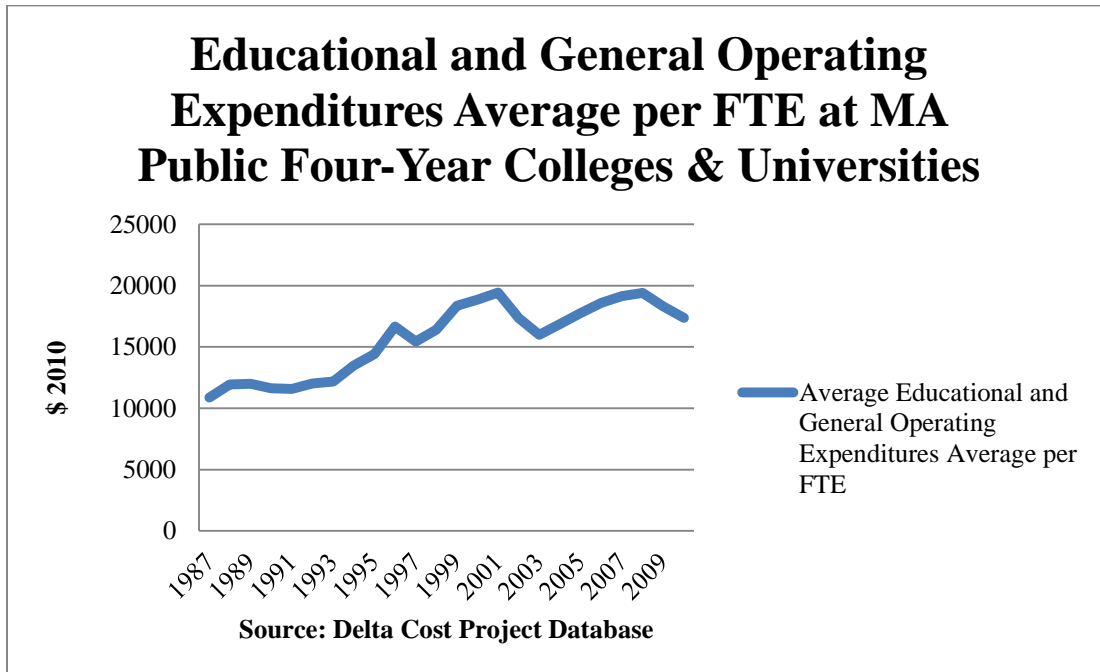
Graph C: Tuition Reliance at MA Public Four-Year College & Universities



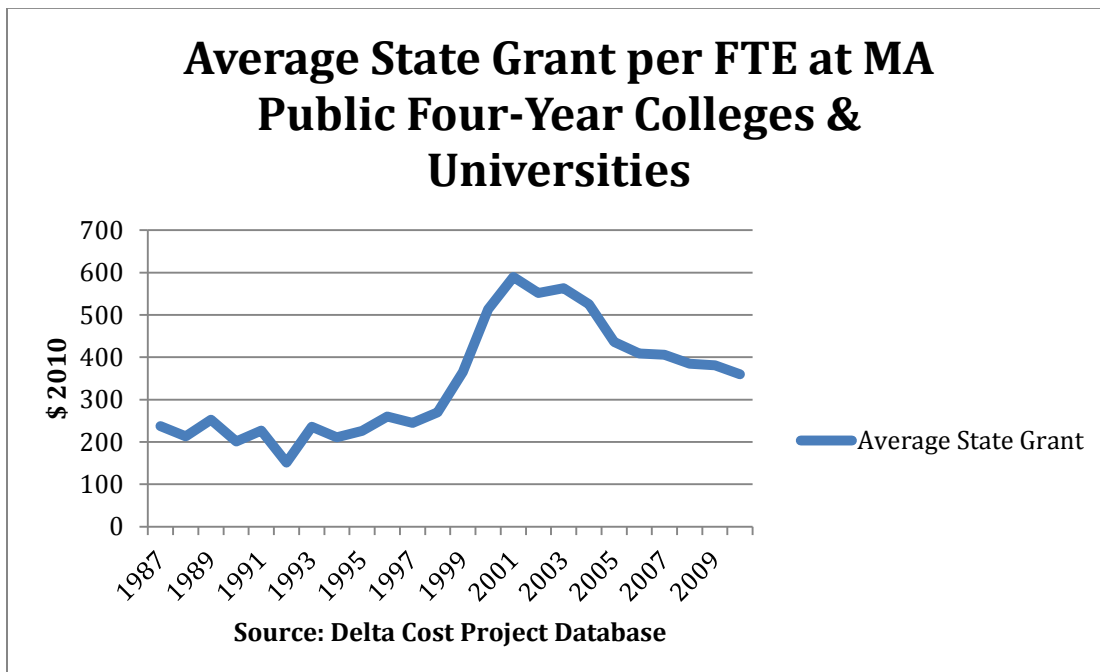
Graph D: Government Reliance at MA Public Four-Year Colleges & Universities



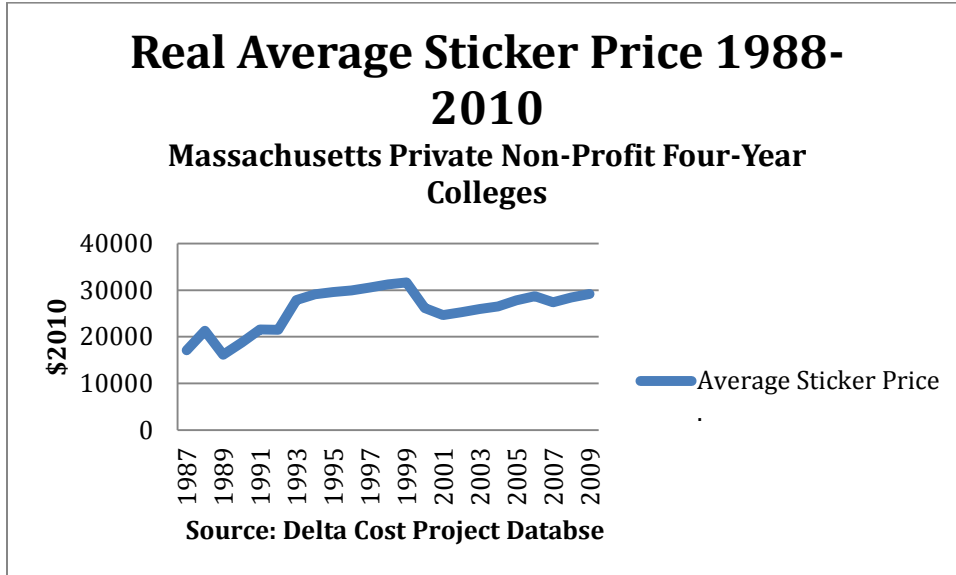
Graph E: Educational and General Operating Expenses per Full-Time Equivalent at MA Public Four Year Colleges & Universities



Graph F: Average State Grant Award per Full-Time Equivalent at Massachusetts Four-Year Colleges & Universities



Graph G: Real Average Sticker Price at MA Private Colleges & Universities



APPENDIX II: TABLES

Table A: Percentage of Admitted Students Enrolled in Fall for MA Public Four-Year Colleges & Universities

Year	Percentage of Admitted Students Enrolling in Fall	Average Real Sticker Price	Admissions Rate
2003	0.78	\$5,661	0.60
2004	0.79	\$6,593	0.64
2005	0.77	\$7,008	0.65
2006	0.72	\$6,447	0.69
2007	0.70	\$6,687	0.64
2008	0.70	\$6,730	0.59
2009	0.61	\$6,934	0.60
2010	0.55	\$7,443	0.60
Source: Delta Cost Project Database			

Table B: Average Total Aid per Full-Time Equivalent as Proportion of Sticker Price at MA Public Four-Year Colleges & Universities

Year	Real Average Total Aid per FTE	Real Average Sticker Price	Real Average Total Aid as Proportion of Sticker Price
1987	\$705	\$2,261	0.312
1988	\$661	\$2,497	0.265
1989	\$812	\$2,511	0.323
1990	\$782	\$2,991	0.261
1991	\$959	\$3,856	0.249
1992	\$939	\$5,007	0.188
1993	\$1,065	\$4,985	0.214
1994	\$1,040	\$5,028	0.207
1995	\$1,092	\$5,062	0.216
1996	\$1,396	\$5,039	0.277
1997	\$1,111	\$4,505	0.247
1998	\$1,197	\$4,300	0.278
1999	\$1,374	\$4,385	0.313
2000	\$1,534	\$4,587	0.334
2001	\$1,541	\$4,060	0.380
2002	\$1,438	\$4,021	0.358
2003	\$1,731	\$5,661	0.306
2004	\$1,856	\$6,593	0.281
2005	\$1,777	\$7,008	0.254
2006	\$1,509	\$6,477	0.233
2007	\$1,542	\$6,687	0.231
2008	\$1,594	\$6,730	0.237
2009	\$1,719	\$6,934	0.248
2010	\$2,070	\$7,443	0.278

Source: Delta Cost Project Database

Table C: Average Grant Awards as Proportion of Sticker Price at MA Public Four-Year Colleges & Universities

Year	Average State Grant per FTE	Average State Grant as Proportion of Sticker Price	Pell Grant Average per FTE	Pell Grant as Proportion of Sticker Price	Federal Grant Average per FTE	Federal Grant as Proportion of Sticker Price
1987	\$213	0.094	\$349	0.154	\$162	0.072
1988	\$217	0.087	\$306	0.123	\$105	0.042
1989	\$256	0.102	\$370	0.147	\$134	0.053
1990	\$204	0.068	\$316	0.106	\$140	0.047
1991	\$227	0.059	\$333	0.086	\$130	0.034
1992	\$151	0.030	\$408	0.081	\$164	0.033
1993	\$236	0.047	\$467	0.094	\$151	0.030
1994	\$211	0.042	\$445	0.089	\$139	0.028
1995	\$226	0.045	\$449	0.089	\$136	0.027
1996	\$260	0.052	\$439	0.087	\$367	0.073
1997	\$243	0.054	\$462	0.102	\$111	0.025
1998	\$278	0.065	\$488	0.114	\$115	0.027
1999	\$366	0.083	\$539	0.123	\$127	0.029
2000	\$513	0.112	\$484	0.105	\$137	0.030
2001	\$590	0.145	\$489	0.120	\$129	0.032
2002	\$552	0.137	\$540	0.134	\$89	0.022
2003	\$563	0.099	\$679	0.120	\$89	0.016
2004	\$526	0.080	\$720	0.109	\$99	0.015
2005	\$436	0.062	\$676	0.097	\$93	0.013
2006	\$409	0.063	\$531	0.082	\$72	0.011
2007	\$406	0.061	\$520	0.078	\$91	0.014
2008	\$385	0.057	\$594	0.088	\$91	0.014
2009	\$381	0.055	\$661	0.095	\$109	0.016
2010	\$360	0.048	\$946	0.127	\$165	0.022

Source: Delta Cost Project Database

Table D: Average Institutional Aid as Proportion of Total Aid & Sticker Price at MA Public Four-Year Colleges & Universities

Year	Average Unfunded Institutional Aid per FTE	Average Unfunded Institutional Aid as Proportion of Average Total Aid per FTE	Average Unfunded Institutional Aid as Proportion of Sticker Price
1987	\$71	0.101	0.032
1988	\$53	0.080	0.021
1989	\$113	0.139	0.045
1990	\$130	0.167	0.044
1991	\$223	0.232	0.058
1992	\$201	0.214	0.040
1993	\$211	0.198	0.042
1994	\$217	0.208	0.043
1995	\$254	0.232	0.050
1996	\$298	0.214	0.059
1997	\$328	0.296	0.073
1998	\$360	0.301	0.084
1999	\$313	0.228	0.071
2000	\$355	0.231	0.077
2001	\$308	0.200	0.076
2002	\$359	0.250	0.089
2003	\$324	0.187	0.057
2004	\$474	0.256	0.072
2005	\$491	0.276	0.070
2006	\$599	0.397	0.092
2007	\$554	0.359	0.083
2008	\$523	0.328	0.078
2009	\$563	0.327	0.081
2010	\$587	0.284	0.079

Source: Delta Cost Project Database

Table E: Percentage of Students Receiving Any Institutional Aid (Funded and Unfunded) at MA Public Four-Year Colleges & Universities

Year	Percentage of Students Receiving Any Institutional Aid (Funded and Unfunded)
2000	14.30
2001	13.30
2002	14.40
2003	22.00
2004	29.45
2005	29.27
2006	27.60
2007	30.30
2008	32.60
2009	33.78
2010	40.10

Source: Delta Cost Project Database

Table F: Average Student Loan Amount as Proportion of Sticker Price & Net Sticker Price at MA Public Four-Year Colleges

Year	Average Loan Amount	Average Loan as Proportion of Sticker Price	Average Student Loan as Proportion of Net Price
2000	\$3,450	0.752	1.130
2001	\$3,589	0.884	1.425
2002	\$3,348	0.833	1.296
2003	\$3,301	0.583	0.840
2004	\$3,522	0.534	0.743
2005	\$3,819	0.545	0.730
2006	\$3,539	0.546	0.712
2007	\$3,940	0.589	0.766
2008	\$5,226	0.776	1.017
2009	\$5,786	0.834	1.110
2010	\$6,383	0.858	1.188

Table G: Average Financial Aid Awards by Type and as Proportion of Sticker Price at MA Private Colleges & Universities

Year	Average Institutional Aid per FTE 2010 \$	Proportion Sticker Price Covered by Institutional Aid	Average Pell Grant per FTE 2010 \$	Proportion Sticker Price Covered by Pell Grant	Average State Grant per FTE 2010 \$	Proportion Sticker Price Covered by State Grant	Average Total Financial Aid per FTE 2010 \$	Average Proportion Sticker Price Covered by Total Financial
1987	\$2,097	-	\$346	-	328.23	-	\$3,470	-
1988	\$2,304	0.13	\$319	0.02	384.97	0.02	\$3,227	0.19
1989	\$2,380	0.11	\$347	0.02	393.68	0.02	\$3,386	0.16
1990	\$2,559	0.16	\$362	0.02	354.55	0.02	\$3,546	0.22
1991	\$2,963	0.16	\$366	0.02	259.63	0.01	\$3,773	0.20
1992	\$3,366	0.16	\$496	0.02	213.42	0.01	\$4,289	0.20
1993	\$3,502	0.16	\$541	0.03	199.86	0.01	\$4,559	0.21
1994	\$3,877	0.14	\$491	0.02	182.33	0.01	\$4,804	0.17
1995	\$3,998	0.14	\$500	0.02	210.69	0.01	\$5,052	0.17
1996	\$4,306	0.15	\$470	0.02	209.33	0.01	\$5,191	0.18
1997	\$3,911	0.13	\$454	0.02	239.21	0.01	\$5,436	0.18
1998	\$4,312	0.14	\$498	0.02	261.42	0.01	\$6,081	0.20
1999	\$4,591	0.15	\$700	0.02	370.64	0.01	\$6,782	0.22
2000	\$4,663	0.15	\$541	0.02	362.66	0.01	\$6,602	0.21
2001	\$4,506	0.17	\$508	0.02	374.95	0.01	\$6,828	0.26
2002	\$4,759	0.19	\$539	0.02	330.81	0.01	\$6,639	0.27
2003	\$5,809	0.23	\$579	0.02	293.47	0.01	\$7,619	0.30
2004	\$5,920	0.23	\$584	0.02	266.46	0.01	\$8,230	0.32
2005	\$6,320	0.24	\$582	0.02	261.13	0.01	\$8,363	0.32
2006	\$6,503	0.23	\$521	0.02	265.37	0.01	\$8,619	0.31
2007	\$6,749	0.24	\$494	0.02	320.08	0.01	\$8,986	0.31
2008	\$6,856	0.25	\$549	0.02	273.63	0.01	\$9,150	0.33
2009	\$7,588	0.27	\$645	0.02	274.98	0.01	\$9,477	0.33
2010	\$8,075	0.28	\$964	0.03	238.22	0.01	\$10,021	0.34

Source: Delta Cost Project Data

Note: 1987 Missing Values for Institutional Aid, Pell Grant, State Grants, and Average Total Aid per Student

Table H: Average Loan Amount and Standard Deviation at MA Private Colleges & Universities

Year	Average Loan Amount (Nominal)	Standard Deviation
2000	\$4,293	\$2,772
2001	\$4,064	\$425
2002	\$3,355	\$103
2003	\$3,750	\$479
2004	\$2,946	\$168
2005	\$2,227	\$848
2006	\$1,922	\$1,679
2007	\$1,541	\$1,351
2008	\$3,985	\$2,751
2009	-	-
2010	\$8,649	\$5,113

Source: Delta Cost Project Data

Note: 2009 contained missing observations