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THE FINANCIAL CRISIS AND DECLINING COLLEGE AFFORDABILITY: HOW HAVE STUDENTS AND THEIR FAMILIES RESPONDED?

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ABSTRACT

For families, the economic crisis has negatively impacted postsecondary affordability in multiple ways. Colleges have raised their prices and some have also reduced their institutional aid. Meanwhile, the recession has reduced family income and economic stability. This paper will examine the effects of these trends in terms of college access, choice, and expenditures. Using data from the Consumer Expenditure Survey and exploiting differences in the severity of recession by state, I investigate how the students have altered their decisions about enrollment, attendance intensity, how much they spend, and how they finance higher education. While theory suggests that reductions in family income and home ownership are likely to have a negative impact on postsecondary enrollment, past research has shown that college attendance typically increases when unemployment increases thereby making the predicted effects of the recession unclear. The analysis suggests the overall effects of the Great Recession on college enrollment were negative, especially in terms of full-time enrollment and among potentially traditional-age college students.

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I. INTRODUCTION

The economic crisis has had far-reaching effects on both the supply and demand sides of higher education. On the supply side, postsecondary institutions have experienced cuts to multiple revenue sources, including charitable giving and endowment returns, as detailed in other chapters of this volume. The level of government support has also been affected, especially in the form of state appropriations, which affect tuition prices. On the other hand, federal financial aid has remained robust during this time so that the net prices students face have not grown as much as list (published) prices. In terms of families, or the demand side of higher education, the downturn of the economy has affected incomes and unemployment rates, thereby reducing economic well-being and stability. Moreover, home ownership and equity levels have declined, reducing a major source of wealth and capital for many families. These changes have likely impacted both the probability of enrolling in college and what a family can afford and is willing to pay for school.

This paper explores the multiple ways college affordability has been impacted by the recession and the ways these changes have affected college enrollment, expenditures, and financing. The central question is how has the recession affected family and student decisions regarding college enrollment, choice, and expenditures? The trends described above lend themselves to conflicting hypotheses. While reductions in family income and home ownership could have negative effects on postsecondary enrollment, growing unemployment could have the opposite effect by reducing the foregone costs of attending school. Previous research has found that college enrollment rates often increase as the unemployment rate grows (Long 2004a). Due to these negative and positive pressures, the predicted net effect of the recession on college enrollment rates is unclear and depends on the relative sizes of each effect. The predicted impact

of the recession on college choice (i.e., which institution and how intensely to attend) is also uncertain, with the negative effects of reductions in families' access to capital (due to reductions in home equity and fewer loans and credit) perhaps being balanced with increases in federal student aid, like the growth of the Pell Grant program and increasing Stafford Student Loan limits during the same time. Finally, with growing college tuition prices, one might expect an increase in how much families are paying for college, but reductions in the financial security of families may prompt students to choose less expensive institutions or attend less intensely.

This paper aims to estimate the net effects of these multiple changes. Using the Consumer Expenditure Survey, a quarterly survey of American consumers collected by the Bureau of Labor Statistics, I investigate how families have altered decisions about whether to attend and enrollment intensity (full- versus part-time attendance). Additionally, using detailed files on spending and family finances, I examine possible changes in the amount spent on college and debt incurred from credit cards and home equity loans. To better pinpoint the effects of the recession, I exploit geographical differences in the severity of the recession and highlight changes to families in states that suffered more dramatically in terms of growth in unemployment and reductions in home values.

The preliminary analysis suggests that the overall effects of the recession have been negative in terms of college enrollment. Both full- and part-time enrollment fell among families in states that more severely experienced the recession in comparison to other states, though the negative effects on enrollment among traditional-age college students and in terms of full-time enrollment were large. Meanwhile, there was no overall change in college expenditures and some suggestive evidence that families with someone in college were paying more.

The next section of the paper details the effects of the recession on both the supply and demand sides of higher education. Then I describe the data sources and empirical framework. Section IV discusses the results, and Section V concludes.

II. THE EFFECTS OF RECESSIONS: CURRENT TRENDS AND PAST RESEARCH

Trends in Tuition Pricing

Tuition prices at colleges and universities are influenced by multiple factors with other revenue sources playing an important role due to the fact that the cost of educating a student is not fully covered by the price students pay. In the case of public institutions, the level of state appropriations is a strong determining factor of tuition levels. State appropriations allow the public colleges and universities to charge in-state students a discounted price and the level and distribution pattern of these state subsidies strongly influences student enrollment decisions (Long 2004b).

During the last several years, state appropriations to higher education have fallen significantly. According to the College Board (2011), after accounting for inflation, state appropriations per full-time equivalent (FTE) student fell 9 percent in 2008-09, another 6 percent in 2009-10, and 4 percent in 2010-11. This recent reductions are part of a longer trend of decreasing state support; appropriations per FTE was 23 percent lower in real dollars in 2010-11 than a decade earlier. Such reductions in state appropriations have had serious repercussions on tuition levels at public institutions. As shown in Figure 1, the historical pattern is that when state appropriations per full-time equivalent (FTE) student fall, the list tuition and fees charged to

students typically increase, and this has been the case during this most recent recession.[1] Because state constitutions generally require states to have balanced budgets each year, legislators have been cutting spending, and as with past recession, appropriations to higher education have been a target. From 2008-09 to 2010-11, the mean list (published) tuition and fees at public, four-year institutions increased 16.5 percent after accounting for inflation; they grew by 16.0 percent at public, two years during the same period.[2]

The impact of declining state appropriation on tuition prices has been particularly large in some states. From 2008-09 to 2010-11, a difference of only two years, mean tuition and required fees at public four-year colleges and universities increased 32 percent in Florida and Georgia, 28 percentage in Hawaii, 24 percent in Alabama, and 38 percent in California. Even community colleges, which tend to maintain low tuition growth in keeping with their mission of supporting access and affordability, have experienced increases in their prices. During the same two years, mean tuition and required fees at public two-year colleges increased 33 percent in Georgia, 32 percentage in North Carolina, and 25 percent in Virginia.[3]

Fluctuating state appropriations not only affect list tuition prices at public institutions but also students' choices between public and private colleges as well as the two-year versus four-year decision. When in-kind subsidies are large, students appear to choose public colleges even if the gap in resources between public and private options is substantial. Research also suggests

[1] Often the downturn in state appropriations to higher education is delayed by a year or two after the start of a recession. This is because appropriations are funded out of tax revenue, which can often take a year to be affected by a recession. According to estimates by the National Governors Association during the beginning of the recession, states' combined budget shortfalls for FY2009 were expected to grow to $60 billion and then $80 billion during FY2010 (Chitty 2009). As such, even though this recession began in December 2007, the effect on tax revenue, and then in turn state appropriations and tuition prices, was not felt until the increases from the 2008-09 to 2009-10 school year.

[2] Calculations by author using College Board. (2011a). Trends in College Pricing, Table 4. Tuition means are weighted by full-time undergraduate enrollment. Source: The College Board, *Annual Survey of Colleges.*

[3] Calculations by author using College Board. (2011a). Trends in College Pricing, Table 6c. Tuition means are weighted by full-time undergraduate enrollment. Source: The College Board, *Annual Survey of Colleges.*

that large levels of state appropriations, an in-kind subsidy, create incentives for students to favor public four-year colleges over two-year institutions (Long 2004b). The recent reductions in state appropriations may cause a shift in enrollment patterns.

During this same time period, the list tuition prices of private, non-profit institutions have not grown as quickly as their public counterparts. From 2008-09 to 2010-11, list tuition and fees at private, non-profit, four-year institutions grew 9.3 percent, above the norm but below the growth rate at public colleges and universities.

Trends in Financial Aid

Underlying all of these increases in college prices is the government financial aid system. Although list price can have an effect on enrollment decisions, it is the net price after the application of financial aid that is the most influential. While tuition has increased in all sectors, government financial aid has remained robust momentarily.

The Federal Pell Grant is the largest need-based aid program and serves as the foundation for other aid meaning that if students are eligible, the Pell Grant is awarded first. The majority of Pell recipients come from families with incomes in the lowest economic quartile; according to the Congressional Research Service (2011), about three-quarters of Pell Grant recipients during 2008-09 have family incomes at or below $30,000. With the start of the recession, there was increased demand for the Pell Grant. According to Chitty (2009), approximately 786,000 more students received a Pell Grant in 2008-09 than the previous year. In fact, total expenditures in the Pell Grant Program doubled from 2007-08 ($15.4 billion) to 2009-10 ($30.4 billion), continuing to rise to $34.8 billion in 2010-11 (College Board, 2011b). The growth in beneficiaries over multiple years has caused major financial shortfalls, which Congress has at

times provided additional funding to cover. Most recently, to maintain the $5,550 maximum Pell Grant award during 2011-12, the Department of Defense Full-Year Continuing Appropriations Act of 2011 (P.L. 112-10) provided $23 billion in discretionary appropriations to the program (Mahan 2011).

The federal student loan sector has also grown and changed to accommodate economic trends and increased need by families. After the recession had an effect on credit markets, causing many private student loan providers to stop or suspend lending, Congress passed the Ensuring Continued Access to Student Loans Act in 2008, which gave the U.S. Department of Education the authority to make direct loans to students. Congress also increased the loan limits for students in the Federal Stafford Loan Program. Similar to the Pell Grant Program, the total amount of government loans has increased substantially during the recession. While the total given in federal loans was $72.0 billion in 2007-08, it rose to $104.0 billion in expenditures by 2010-11 (College Board, 2011b).[4]

There has also been increased pressure on institutional aid sources, financial aid given by colleges and universities. Institutional financial aid officers note that there has been a large increase in the number of financial aid applications they receive and requests for institutional aid. Given the growing economic instability caused by the recession, many families have contacted offices with revised aid requests due to changes in their circumstance, such as recent unemployment (Schachter 2009). According to the College Board (2011b), total institutional grants have increased from $29.4 billion in 2007-08 to $38.1 billion in 2010-11. With the increases in financial aid from both the government and institutions, average net prices to families have not increased as dramatically as list prices during the recession. However, the number of families and students dependent on these aid resources has increased substantially.

[4] This figure includes Stafford Subsidized and Unsubsidized Loans, Perkins Loans, and PLUS.

Although financial aid can dramatically reduce the overall cost of college, many students still have significant unmet need (Long and Riley 2007; ACSFA 2010). Moreover, the receipt of financial aid is predicated on navigating a lengthy and complicated process, and this has been shown to be a deterrent to families accessing financial aid and attending college (Bettinger *et al.* 2012).

The Effects of the Great Recession on Families

In the face of this recession, families have suffered lost income, greater debt, and more financial insecurity, factors that might negatively impact college outcomes. First, family incomes have fallen or remained stagnant, partly due to increasing unemployment. Nationally, the unemployment rates grew from 4.7 percent in September 2007 to 10.1 percent in October 2009.[5] This period of economic turmoil has also strongly affected the housing market by reducing the value of many families' homes while others have lost their homes altogether. Glover *et al.* (2011) conclude that "the average household experienced a decline in net worth of $177,000 between the middle of 2007 and the trough of the asset price decline in the first quarter of 2009." According to the Federal Reserve, American homeowners lost more than $7 trillion in home equity.

Access to capital has also been reduced for many as families have lost the option of taking out a home equity loan due to having less equity because of declining home values or losing their home. Additionally, banks and financial institutions have been less willing to make loans or extend credit. Per household, ownership of credit cards declined 2.8 percent from November 2008 to April 2010. However, conditional on having some debt, credit card debt increased by nearly 25 percent (Hurd and Rohwedder 2010).

[5] Source: Bureau of Labor Statistics. Seasonally adjusted monthly data.

Overall, the effects of the recession have been widespread. According to Hurd and Rohwedder (2010), "between November 2008 and April 2010 about 39 percent of households had either been unemployed, had negative equity in their house or had been in arrears in their house payments." Still, the severity of the recession has varied geographically. From the beginning of 2007 to the end of 2009, state unemployment rates grew by anywhere from 2.0 to 8.8 percentage points. Looking at changes in home values, another way to measure recession severity, eight states experienced gains in home prices while other states saw their homes lose on average 41.6 percent of their values.[6]

Past Research: The College Enrollment Decision and Recessions

Under Becker's (1964) Human Capital Model, when deciding whether to continue their education, individuals compare the benefits of human capital to the costs of obtaining it. In terms of higher education decisions, an individual will weigh the costs and benefits, both monetary and otherwise, to decide whether to prepare for college, enroll in a postsecondary institution, and continue until completing a college degree. Theory suggests that college demand will depend upon the net benefit (benefits minus costs) of education, the prices of alternatives, and the preferences of the individual subject to a lifetime budget constraint. Among the costs of education are tuition and foregone earnings, the income that an individual could have made had he or she decided to enter the labor market rather than attend school. On the other side, the benefits of higher education include increased earnings. Additional non-monetary costs and benefits, such as the psychic costs of studying, the consumption value of college, and possible improved health outcomes due to education, may also be important. Numerous studies have confirmed the expected effects of the factors detailed in this model (Leslie and Brinkman 1987, Long 2007).

[6] See below for a more detailed discussion of these recession indicators.

Based on the changes brought on by the recession, one might expect college enrollment rates to possibly decrease or increase. The decrease in family income, increase in the difficulty of securing private financing, and increasing tuition prices suggest that the propensity for college enrollment would decrease. On the other hand, with growing unemployment and how that lowers the foregone earnings of attendance, college enrollment may be spurred by the recession. The uncertainty and risk introduced by the recession could also affect college decisions. Given the recession impacted the earning and job prospects of educated workers, college entrants may have had worries about the returns they would experience from their educations, though employment conditions for individuals with only a high school degree were also adversely affected.

In some ways, the Great Recession mirrors earlier recessions. During past recessions, colleges and universities have often faced diminishing revenue sources, and it was during the recession of the early 1990s that state appropriations declined for the first time in the face of competing demands for health care, prisons, roads, and K-12 education. Since that time, colleges and universities have sought to diversify their revenue sources, thereby leading some to rely more heavily on charitable giving and endowment income, two things affected by recessions. During the recession of the early 2000s, state appropriations were also cut substantially, and together with declining endowments, led to tuition increases at both public and private colleges and universities (Breneman, 2002).

While the trends of increasing tuition prices are not new, several things make the Great Recession a bit different. Even before the downturn, college prices were a higher percentage of annual family income than ever before, and student loans had become a predominant form of student financial aid. The percentage of students taking out debt, and the mean levels of student debt at baccalaureate graduation were increasing rapidly. Therefore, unlike past recessions when changes in enrollment trends are largely a matter of price increases and labor market effects, the

Great Recession highlights a new element: the importance of capital and debt. The ability to get loans and willingness to take on debt to finance postsecondary attendance is a greater determinant of college enrollment than ever before, and this recession has had a direct effect on both of those factors.

Another thing that makes this recession different than most others is the current demographic change taking place. In 2008, the United States had the largest class of graduating high school seniors, about 3.2 million students. This exceeded the peak year of the Baby Boom, which was 1979, by more than 60,000. According to Breneman (2002), during the recessions of the early 1980s and 1990s, the lack of pressure from increased enrollments "served to cushion the economic blows somewhat." The same was not true during the early 2000s, and so this helped to spur growth in student loans, which fundamentally changed higher education finance. The already important role of debt in college financing and the enormous enrollment pressure of the large cohort of traditional-age college students exacerbate the issues families have faced during this recession. This paper is the first attempt to examine how the trends of the Great Recession have affected student decisions about college enrollment, choice, and expenditures.

III. DATA AND EMPIRICAL FRAMEWORK

Data Sources

The family-level data for this study is from the Consumer Expenditure Survey (CES), which is collected by the Bureau of Labor Statistics (BLS). Although this dataset is not often used to track college enrollment decisions, it has the advantage of providing a detailed profile of a family's financial circumstance and changes to that circumstance with information on family

income, assets, and debt. Most notably in reference to the Great Recession, there is information not only on income and employment but also home ownership, mortgages, home equity loans, and credit card debt. In terms of college outcome data, one can observe whether family members attend college, whether they attend full- or part-time, and how much the household overall is spending on college tuition and other expenses. Combined with the information about loans and credit card debt, I can make some inferences about how families are paying for college.

Families in the CES are interviewed multiple times, once each quarter for up to five consecutive quarters. For this analysis, I focus on the second interview for families in the database from 2004Q1 to 2010Q4.[7] I exclude households in which the primary residence is student housing. The public-use version of the CES includes the state of residence of a household, and this information is linked to measures of the recession.[8]

To gauge the severity of the recession, I look at how indicators have changed from 2007Q1 to 2009Q4. This time frame begins and ends slightly before and after the official dates of the recessions (December 2007 to June 2009) to fully capture changes that occurred during the downturn. I use two sets of economic measures. The first are quarterly unemployment rates available from the BLS as part of their Local Area Unemployment Statistics (LAUS). The rates are by state and seasonally adjusted. States have been put into two categories based on the size of the increase in the unemployment rate. While state unemployment rates grew by 2 to 8.8 percentage points from 2007Q1 to 2009Q4, states for which the rate grew by 5 percentage points or more are categorized as having a "large increase in the unemployment rate." Appendix Table 1 lists the states in this category. As an alternative measure of the impact of the recession, I also

[7] If information is missing for the second interview, I include the family's third interview.
[8] In the Consumer Expenditure Survey (CES), for confidentiality reasons, some state codes have been suppressed. The following states are not included due to this exclusion: Arkansas, Iowa, Mississippi, Montana, New Mexico, North Carolina, North Dakota, South Dakota, Vermont, and Wyoming.

use the percentage change in the unemployment rate as a way to categorize states. The percentage change in the unemployment rate during the three years of the recession ranged from 35.5 percent to 240 percent, and states with increases more than 130 percent are categorized as experiencing an especially "large percentage increase in the unemployment rate" (also shown in Appendix Table 1). In the sample, 52.4 percent of families live in states designated as having a large absolute increase in the unemployment rate, and 36.1 percent are in state with a large percentage change in the unemployment rate.

The second economic indicator used to judge the severity of the recession focuses on home values. I use the Conventional Mortgage House Price Index (HPI), which is produced by the Federal Housing Finance Agency (FHFA). The index is based on Fannie Mae and Freddie Mac-eligible mortgages on single-family detached properties (with loan limits up to $729,750 for one-unit properties). I use the All Transaction House Price Index, which includes both sales of property and appraisal values from refinance transactions. The HPI has been used in other studies on the impact of housing value and wealth on educational outcomes (Johnson 2011; Lovenheim 2011; Lovenheim and Reynolds 2012).

From 2007Q1 to 2009Q4, the HPI fell in most states, from as little as 1.47 points up to 206 points; in seven states, the index increased during this time. I define states that had their HPI fall more than 80 points as having "large reductions in the HPI." This is 29.2 percent of the sample of families. Similar to the unemployment rate changes, I also calculated the percentage change in the HPI over the time period. This ranges from a gain of 4.4 percent to a loss of 41.6 percent. States than had a ten-percent or more decline in their HPI are categorized as experiencing a "large percentage change in the HPI." This is 52.9 percent of the sample.

Empirical Framework

Following the basic human capital framework, college enrollment is modeled as a function of family background, income, and home ownership, which proxy for preparation levels and the ability to pay for college, and unemployment, which is a proxy for the foregone costs of attendance. To determine the effects of the recession, I use a differences-in-differences (DD) methodology. The first difference is before versus after the recession to measure the effects of the changes to both the demand and supply side of higher education. The second difference is between states adversely affected by the recession to a large degree versus a small degree. Using ordinary least squares estimation, the DD calculation can be made:

$$(1) \quad y_j = \beta_1 + \beta_2 (\text{Recession\_High}_i * \text{After}_i) + \beta_3 \text{Recession\_High}_i + \beta_4 \text{After}_i + \varepsilon_i$$

where *i* is a family and y is the outcome of interest. The parameter β_2 is the reduced-form effect of the recession in highly-affected states relative to less-affected states– it measures whether families in states that experienced large, adverse effects from the recession acted differently from families in states that were not as adversely affected by the recession. If the recession and related changes to family circumstance and the supply side of higher education is the true cause of the outcomes, then the hardest hit states should have experienced larger changes in college outcomes than areas not as affected by the recession.

The variables "Recession_High" and "After" are dummy variables equal to one if the family's state suffered large increases in unemployment (or large reductions in the home price index) or the quarter was 2007Q4 or after; otherwise the variables are equal to zero. The empirical analysis includes additional controls also found to be important determinants of college and economic outcomes. These include: demographics of the head of household (age, gender, marital status), the race of the head and spouse, the maximum years of education between the

head and spouse, regional dummy variables, urban dummy variable, and family size. The standard errors are adjusted using clustering methods.

IV. THE ESTIMATED EFFECTS OF THE RECESSION

The Impact of the Recession on Family Economic Well-Being

In Table 2, I begin by replicating the simple Mincerian model to relate the family background and characteristics to the log of family income, measured by the total salary earned by all members of the household and shown in columns 1 and 2. As expected, income is positively related to education level and age and negatively associated with being in a female-headed household or from a racial or ethnic minority group (not shown in the table). Family incomes also increased over time, as shown by the year trend, but after the introduction of the recession, family incomes were 4 percent lower than before.[9] Using the DD framework, I do not find that families in states more highly impacted by the recession had any statistically different trend in salaries than other families. The same is not true in terms of unemployment and home ownership. As shown in the rest of the table, the likelihood of unemployment increased over the time period while the likelihood of a family owning their home decreased. Moreover, states that were more affected by the recession experienced larger increases in the instances of unemployment within a family (columns 3 and 4). Likewise, states that experiences larger percentage decreases in their HPI (at least a 10 percent reduction) had families that experienced larger decreases in the incidence of home ownership. These results confirm that the families represented in my sample experienced trends representative of the large trends of the nation.

[9] These results are robust to instead using the salary of the head of household or using the total salary of the head and spouse or partner.

The Effects of the Recession on College Enrollment

Table 3 focuses on the impact of the recession on college enrollment as measured both by whether anyone in a family was attending college and the total number of family members in college. Enrollment is specified as a function of family background, income, home ownership, and the unemployment status of the head of household and spouse or partner. As found in previous research, college enrollment rates are higher among families with higher family incomes, those who own their homes, and those who are employed while they are lower among families with female heads and racial and ethnic minorities (not shown). Turning to the effect of the recession and focusing on the full sample, families in the more severely affected states experienced a 17-percent decline in the likelihood of college enrollment when states are categorized by the growth in their unemployment rates (column 1) and a 14-percent reduction when categorized by large reductions in the HPI (column 2). Similarly, the number in college also declined (columns 3 and 4).

The second half of Table 3 repeats the analysis on the sample of families with a member between and including the ages of 17 and 23 that also had a high school degree. In other words, these are families with a potential traditional-age college student. Similar to the earlier results, the estimates suggest that the recession negatively impacted the likelihood of college enrollment (columns 5 and 6), but the magnitude of the effects are larger. This suggests that the Great Recession not only had negative overall effects on college enrollment, but the effects were larger among traditional-age college students. The estimates of the effects of the recession on the number in college are also larger (columns 7 and 8). All of the results in Table 3 are robust to

other possible measures of the severity of the recession (percentage change in unemployment rate and percentage change in HPI).

Table 4 examines how the recession impacted the intensity of college attendance, defined as being either full- or part-time. Again, most of the estimates suggest the Great Recession had a relatively negative impact on both full-and part-time enrollment. The results are particularly strong among families with a potential traditional-age college students (columns 5 to 8). Relatively speaking, the negative impact on full-time enrollment was larger than the negative effect on part-time enrollment. For instance, in states that experienced comparatively large increases in the unemployment rate, full-time enrollment among traditional-age college students fell by 72 percent.

The Effects of the Recession on College Spending

Next, I focus on examining the effects of the Great Recession on the level of college expenditures. Table 5 displays the results for both total college expenditures unconditional on having any costs (columns 1 to 4) and conditional on having positive costs (columns 5 to 8). These results are much more mixed than those above. While enrollment has declined in states more affected by the recession in comparison to those that were not, the estimates do not suggest a clear change in college spending levels. This suggests that increases in college tuition prices may have caused the families that did have students in college to pay more. In fact, when using the percentage change in unemployment rates to categorize states, the estimates of the effect of the recession on college spending are positive and statistically significant.[10]

[10] When using percentage change in unemployment, one gets positive estimates for each group in terms of total college expenditures (23.3 and 45.7 percent, respectively).

V. CONCLUSIONS

The Great Recession has had important effects on both the supply and demand side of higher education. Families have suffered from reduced college affordability in the form of decreasing family incomes and home values and rising college tuition prices. Meanwhile, growing unemployment has reduced the foregone costs of attendance and federal financial aid has increased suggesting some of the effects of the recession may have been positive on college enrollment and spending. Therefore, the predicted overall effect of the Great Recession is unclear. However, this paper serves as the first attempt to determine the net effect of the positive and negative influences of the economic downturn.

The results suggest that the net effect of the recession has been negative on college enrollment. Overall, fewer families had a member in college after the beginning of the recession than before, and the reduction in the college attendance rate was larger in states that experienced the recession more severely. This result is robust to which indicator is used to measure the impact of the recession at the state level.

When looking at the intensity of college enrollment, it is clear that most of the decline in enrollment has been in terms of full-time attendance. Overall, rates of part-time enrollment have also been negatively affect but not to the same degree as full-time enrollment. This suggests that while unemployment may encourage some enrollment, the negative impact of falling and unstable incomes and declining home ownership has had a larger effect on college decisions.

The effects of the recession on college expenditure are less clear. There are not many statistically significant estimates of the effects on overall expenditures, unconditional and

conditional on college attendance. Combined with the negative effects found on enrollment, this lack of change suggests families with a member in college, which are fewer than before the recession, especially in hard-hit states, are now paying more than before.

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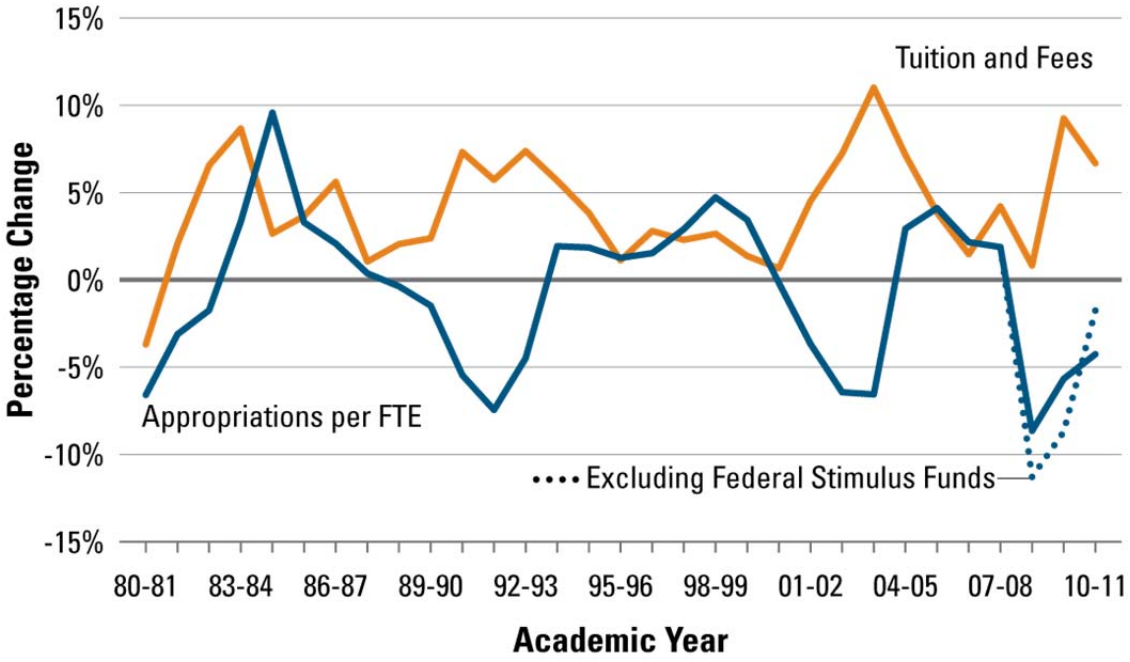
Figure 1: State Appropriations for Higher Education and Tuition and Fees at Public Four-Year Institutions (annual percentage changes in real dollars)



Source: College Board (2011) *Trends in College Pricing*, Figure 10A.
Notes: State appropriations reported per full-time equivalent (FTE) student.

Table 1: Summary Statistics

	All Families	Families with Person Age 17-23 with a High School Degree
Head of Household - Age	45.744 (13.264)	48.092 (8.861)
Female-Headed Household	0.226	0.223
Head of Household – Black	0.091	0.108
Head of Household – Hispanic	0.105	0.120
Head of Household – Asian	0.049	0.063
Head of Household – Other Races	0.016	0.023
Head of Household - Married	0.628	0.710
Family Size	2.875 (1.527)	4.063 (1.437)
Maximum Years of Education among Head and Spouse	14.702 (2.388)	14.384 (2.309)
Total Family Salaries (per $1,000)	73.962 (62.883)	85.529 (63.091)
Own Home dummy variable	0.722	0.791
Head or Spouse is Unemployed	0.007	0.011
Post the start of the Recession (2007Q4 and after)	0.557 (0.497)	0.479 (0.500)
State Unemployment Rate 2007Q1	4.426 (0.867)	4.405 (0.886)
State Unemployment Rate 2009Q4	9.808 (1.841)	9.815 (1.851)
State HPI 2007Q1	425.569 (140.944)	428.528 (139.325)
State HPI 2009Q4	361.096 (102.407)	364.496 (102.031)
Enrolled in College	0.201	0.386
Enrolled Full-time	0.046	0.026
Enrolled Part-time	0.058	0.061
Total College Expenditures	172.779 (1189.243) [52,981]	455.414 (2086.898) [4,709]
Total Credit Card Debt	5475.909 13482.290 [32,131]	4831.445 (9201.896) [2,902]
Does the Family have a Home Equity Loan	0.104	0.122
Home Equity Loan Amount	4645.54 (26,527.27)	5267.28 (24,860.37)
Observations	56,454	4,927

Table 2: The Effects of the Recession on Employment and Home Ownership

	Log(Total Family Salaries) (OLS)		Head or Spouse Unemployed (Logistic Odds Ratios)		Own Home (Logistic Odds Ratios)	
	Large Increase in Unemp. Rate (more than 5 percentage points)	Large Reduction in HPI (fell 80 points or more)	Large Increase in Unemp. Rate (more than 5 percentage points)	Large Percentage Change in Unemp. Rate (130% or more)	Large Reduction in HPI (fell 80 points or more)	Large Percent Change in HPI (fell 10% or more)
	(1)	(2)	(3)	(4)	(5)	(6)
Year Trend	0.0254 (0.0046)***	0.0260 (0.0045)***	2.0958*** (0.1324)	2.0963*** (0.1324)	0.9683** (0.0123)	0.9695** (0.0123)
After Recession (2007Q4 and after)	-0.0402 (0.0165)**	-0.0385 (0.0155)**	0.2422*** (0.0571)	0.3184*** (0.0688)	0.9143** (0.0405)	0.9532 (0.0454)
After Recession * Large Unemp. Growth	0.0046 (0.0157)		2.3494*** (0.6053)			
Large Unemp. Growth (more than 5 percentage points)	-0.0256 (0.0126)**		0.6959 (0.1620)			
After Recession * Large Unemp. Pct Change				1.6436* (0.4483)		
Large Unemp. Pct Change (130% or more)				0.6183* (0.1555)		
After Recession * Large HPI reduction		-0.0042 (0.0174)			0.9601 (0.0462)	
Large HPI reduction (fell 80 points or more)		0.1144 (0.0143)***			0.8605*** (0.0334)	
After Recession * Large HPI Pct Change						0.8984** (0.0399)
Large HPI Pct Change (fell 10% or more)						1.0638* (0.0378)
Observations	56,454	56,454	56,454	56,454	56,454	56,454
R^2	0.23	0.23	0.08			

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent

Notes: All regressions include the following controls: demographics of the head of household (age, gender, marital status), the race of the head and spouse, the maximum years of education between the head and spouse, regional dummy variables, urban dummy variable, and family size. Robust standard errors are shown in parentheses.

Table 3: The Effects of the Recession on College Enrollment

	All Families				Families with Person Age 17-23 with a High School Degree			
	Any in College (Logistic Odds Ratios)		Number in College (OLS)		Any in College (Logistic Odds Ratios)		Number in College (OLS)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year Trend	1.0394*** (0.0131)	1.0383*** (0.0131)	0.0809*** (0.0279)	0.0803*** (0.0279)	1.0115 (0.0357)	1.0103 (0.0357)	0.4338*** (0.0843)	0.4276*** (0.0843)
After Recession (2007Q4 and after)	0.9342 (0.0430)	0.8904*** (0.0384)	-0.2000* (0.1026)	-0.2605*** (0.0967)	1.0483 (0.1395)	0.9821 (0.1216)	-1.0694*** (0.3167)	-1.3876*** (0.3013)
After Recession * Large Unemp. Growth	0.8322*** (0.0358)		-0.2255** (0.0946)		0.7155*** (0.0874)		-1.1096*** (0.2982)	
Large Unemp. Growth (more than 5 pct pts)	0.9670 (0.0329)		-0.1813** (0.0762)		1.2795*** (0.1160)		0.6395*** (0.2335)	
After Recession * Large HPI reduction		0.8615*** (0.0412)		-0.1772* (0.1035)		0.6814*** (0.0938)		-0.8456*** (0.3233)
Large HPI reduction (fell 80 pts or more)		0.9694 (0.0367)		-0.0433 (0.0847)		1.1451 (0.1197)		0.0514 (0.2830)
Observations	56454	56454	56454	56454	4927	4927	4927	4927
R^2			0.08	0.08			0.06	0.06

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent

Notes: All regressions include the following controls: demographics of the head of household (age, gender, marital status), the race of the head and spouse, the maximum years of education between the head and spouse, regional dummy variables, urban dummy variable, family size, total salaries from all household members, whether the family owns their home, and whether the head or spouse was unemployed. Robust standard errors are shown in parentheses.

Table 4: The Effects of the Recession on College Enrollment Intensity (Full- and Part-time)

	All Families				Families with Person Age 17-23 with a High School Degree			
	Full-Time College Enrollment (Logistic Odds Ratios)		Part-Time College Enrollment (Logistic Odds Ratios)		Full-Time College Enrollment (Logistic Odds Ratios)		Part-Time College Enrollment (Logistic Odds Ratios)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year Trend	1.0711*** (0.0272)	1.0689*** (0.0273)	1.0311 (0.0220)	1.0341 (0.0221)	1.2648* (0.1589)	1.2536* (0.1573)	1.3809*** (0.1016)	1.3732*** (0.1013)
After Recession (2007Q4 and after)	1.1352 (0.1049)	0.9553 (0.0803)	0.7252*** (0.0583)	0.7675*** (0.0596)	1.5297 (0.7042)	0.9434 (0.3655)	0.2970*** (0.0847)	0.2504*** (0.0707)
After Recession * Large Unemp. Growth	0.6624*** (0.0571)		1.1093 (0.0809)		0.2843*** (0.1152)		0.5348** (0.1406)	
Large Unemp. Growth (more than 5 pct pts)	1.0985 (0.0772)		0.7938*** (0.0444)		2.8144*** (1.0287)		1.2445 (0.2110)	
After Recession * Large HPI reduction		0.8514 (0.0863)		0.9770 (0.0768)		0.3886** (0.1606)		0.6055* (0.1828)
Large HPI reduction (fell 80 pts or more)		0.7677*** (0.0607)		1.1815*** (0.0720)		1.6184 (0.4828)		0.8611 (0.1679)
Observations	56454	56454	56454	56454	4844	4844	4927	4927
R^2								

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent

Notes: All regressions include the following controls: demographics of the head of household (age, gender, marital status), the race of the head and spouse, the maximum years of education between the head and spouse, regional dummy variables, urban dummy variable, family size, total salaries from all household members, whether the family owns their home, and whether the head or spouse was unemployed. Robust standard errors are shown in parentheses.

Table 5: The Effects of the Recession on College Expenditures

	Total College Expenditures (unconditional)				Log (Total College Expenditures) (Conditional on having Expenditures)			
	All Families		Families with Person Age 17-23 with a High School Degree		All Families		Families with Person Age 17-23 with a High School Degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year Trend	16.6310**	16.5529**	50.9218	51.6366	0.0073	0.0069	0.0283	0.0230
	(7.0448)	(7.0686)	(40.1665)	(40.1607)	(0.0186)	(0.0186)	(0.0390)	(0.0392)
After Recession	-8.9194	-18.5012	-162.8073	-36.3381	0.0289	0.0468	-0.2193	-0.0578
(2007Q4 and after)	(24.8673)	(21.3632)	(119.9978)	(77.3286)	(0.0696)	(0.0658)	(0.1464)	(0.1393)
After Recession *	-20.5203		221.8089*		0.0303		0.3269	
Large Unemp. Growth	(19.5894)		(118.6775)		(0.0642)		(0.1332)**	
Large Unemp. Growth	7.4203		21.2683		0.0293		-0.0706	
(more than 5 pct pts)	(12.6861)		(64.9214)		(0.0501)		(0.0996)	
After Recession *		-3.2105		-44.7999		-0.0041		0.1577
Large HPI reduction		(22.9245)		(114.6979)		(0.0712)		(0.1468)
Large HPI reduction (fell		7.0170		25.5335		0.0550		0.1345
80 points or more)		(14.6331)		(62.0272)		(0.0555)		(0.1084)
Observations	52981	52981	4709	4709	7,898	7,898	1,686	1,686
R^2	0.02	0.02	0.04	0.04	0.08	0.08	0.09	0.09

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent

Notes: All regressions include the following controls: demographics of the head of household (age, gender, marital status), the race of the head and spouse, the maximum years of education between the head and spouse, regional dummy variables, urban dummy variable, family size, total salaries from all household members, whether the family owns their home, and whether the head or spouse was unemployed. Robust standard errors are shown in parentheses.

Geographic Variation in the Severity of the Recession

Appendix Table 1: Changes in Unemployment Rates, 2007Q1-2009Q4

Large Absolute Increase in Unemployment Rate (more than 5 percentage points)		Large Percentage Change in Unemployment Rate (130% or more)	
Alabama	Nevada	Arizona	Idaho
Arizona	New Jersey	California	Illinois
California	Ohio	Colorado	Nevada
Florida	Oregon	Delaware	Rhode Island
Georgia	Rhode Island	Florida	Tennessee
Idaho	South Carolina	Georgia	Utah
Illinois	Tennessee	Hawaii	Virginia
Indiana	Utah		
Michigan	Washington		

Source: Bureau of Labor Statistics (BLS), Local Area Unemployment Statistics (LAUS).
Notes: In the Consumer Expenditure Survey (CES), for confidentiality reasons, some state codes have been suppressed. The following states are not included due to this exclusion: Arkansas, Iowa, Mississippi, Montana, New Mexico, North Carolina, North Dakota, South Dakota, Vermont, and Wyoming. The correlation between the two measures is 0.529.

Appendix Table 2: Changes in the Home Price Index (HPI), 2007Q1-2009Q4

Large Absolute Reduction in HPI (fell 80 points or more)	Large Percentage Change in HPI (fell 10% or more)	
Arizona	Arizona	Minnesota
California	California	Nevada
Florida	Connecticut	New Hampshire
Hawaii	Florida	New Jersey
Maryland	Hawaii	Oregon
Massachusetts	Idaho	Rhode Island
Nevada	Illinois	Utah
New Jersey	Maryland	Virginia
Rhode Island	Massachusetts	Washington
	Michigan	

Source: Federal Housing Finance Agency (FHFA) housing price index (HPI) of Conventional Mortgages.
Notes: The HPI represents Fannie Mae and Freddie Mac-eligible mortgages on single-family detached properties (provided for loan limits up to $729,750 for one-unit properties). The All Transaction House Price Index, which includes both sales of property and appraisal values from refinance transactions, is used here. In the Consumer Expenditure Survey (CES), for confidentiality reasons, some state codes have been suppressed. The following states are not included due to this exclusion: Arkansas, Iowa, Mississippi, Montana, New Mexico, North Carolina, North Dakota, South Dakota, Vermont, and Wyoming. The correlation between the two measures is 0.607.