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

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How the Financial Crisis and Great Recession Affected Higher Education
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ABSTRACT

This paper explores how the Great Recession affected college enrollment and costs to families. As with past recessions, reductions in income and increases in tuition prices could have had negative effects on enrollment, while growing unemployment could have had the opposite effect by reducing the foregone costs of attending school. However, the Great Recession occurred within a much more complex postsecondary context than ever before, with the important role of loans and changing availability of debt, a major increase in the number of college-age students, and substantial policy changes in federal financial aid. The net effect of these positive and negative pressures is unclear and likely to vary for different subpopulations. Using data from the Consumer Expenditure Survey, I investigate how the Great Recession altered decisions about college enrollment, attendance intensity, and household expenditures. The analysis suggests college enrollment increased at a faster pace during the recession than the previous period; college expenditures per household also grew. However, the effects of the recession on college decisions differed by household characteristics, and states that suffered the most from the recession had slower growth in college enrollment relative to other states.

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I. INTRODUCTION

The Great Recession 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. 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 Great Recession and the ways these changes have affected college enrollment and expenditures. The central question is how has the Great 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 increases in tuition prices 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), especially among 16 to 24-year-olds due to lack of employment opportunities (Bell and Blanchflower 2011). 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 Great Recession is also distinctive from earlier recessions in several important ways. At the start of the Great Recession, college costs and student debt levels were at historic highs suggesting that the role of loans in college enrollment was much more significant than during previous periods. In regard to the recession, it is important to highlight the substantially large, negative impact the economic downturn had on liquidity for many families. Additionally, the Great Recession coincided with the largest cohort of graduating high school students, thereby exacerbating the need for resources and pressure on institutional capacity. On the other hand, federal financial aid increased to an unprecedented level with the goal of enabling more individuals to access college. Therefore, although price increases and labor market effects may have largely determined the impact of past recessions on enrollment trends, the Great Recession occurred in a much more complex context, and the net effect of all of these changes in income, tuition prices, liquidity, demographics, and financial aid is not clear ex ante.

This paper investigates the net effects of these multiple changes. Using the Consumer Expenditure Survey (CES), a quarterly survey of American consumers collected by the Bureau of Labor Statistics, I investigate how families 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. The CES provides a unique perspective because "it is the only Federal survey to provide information on the complete range of consumers' expenditures and incomes, as well as the characteristics of those consumers."[1] Beyond looking at general trends, I also examine how the impact of the Great Recession on college enrollment varied by household characteristics. Finally, I exploit geographical differences in the severity of the recession to highlight enrollment and expenditure

[1] Source: Bureau of Labor Statistics. http://www.bls.gov/cex/

trends for families in states that suffered more dramatically in terms of growth in unemployment and reductions in home values relative to families in other states.

The analysis suggests college enrollment increased at a faster pace during the Great Recession than previous cyclical downturns. The growth in attendance appears to be concentrated among older students and was relatively faster within households headed by a person of color or a woman. College expenditures per household also grew post-recession. However, states hit the hardest by the Great Recession, as measured by having the largest increases in unemployment and reductions in home values, had relatively slower growth in college enrollment and expenditures in comparison to other states. This suggests that the more severe economic conditions in those states had an attenuating effect on the opposing trends that helped to encourage enrollment (i.e., declining foregone earnings and financial aid).

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 (2012a), after accounting for inflation, state appropriations per full-time equivalent (FTE) student fell 25 percent from 2006-07 to 2011-12, including a 10 percent reduction from 2010-11 to 2011-12. 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.[2] 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 2007-08 to 2011-12, the mean list (published) tuition and fees at public, four-year institutions increased 27 percent after accounting for inflation; they grew by 24 percent at public, two years during the same period (College Board 2012a).[3]

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

[2] 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 2008-09 and 2009-10 school years.

[3] Tuition means are weighted by full-time undergraduate enrollment. Source: The College Board, *Annual Survey of Colleges*.

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.[4]

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 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 2007-08 to 2011-12, list tuition and fees at private, non-profit, four-year institutions grew 13 percent, above the norm but about half of the growth rate at public colleges and universities (College Board, 2012a).

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

[4] 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*.

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 ($15.9 billion) to 2009-10 ($31.5 billion), continuing to rise to $37.0 billion in 2010-11 (College Board, 2012b). 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 $74.6 billion in 2007-08, it rose to $110.4 billion in expenditures by 2010-11 (College Board, 2012b).

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 (2012b), total institutional grants have increased from $30.5 billion in 2007-08 to $42.1 billion in 2011-12. 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. 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 the Economic Conditions of 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] For people under the age of 25, unemployment increased from 11.5 percent during the first quarter of 2008 to 18.3 percent during the fourth quarter of 2010 (Bell and Blanchflower 2011).

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

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. Previous research suggests that changes in home values can affect educational attainment (Johnson 2011), and other research has found that families rely on home equity as a way to finance college (Lovenheim 2011). Therefore, with reductions in home values and the ease of getting a home equity loan, there is some concern that the Great Recession may have reduced the likelihood of college attendance. Access to capital has also been reduced for many as families as 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).

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]

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

Recessions and the College Enrollment Decision

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 relationship between the factors detailed in the model and enrollment trends (Leslie and Brinkman 1987, Long 2007).

With regard to recessions and the business cycle, as earnings decrease and unemployment becomes more likely, theory suggests that individuals will be more likely to attend college. Such a pattern has been found during earlier recessions. For instance, Dellas and Sakellaris (2003) find that college enrollment decisions are countercyclical with the business cycle. Using the Current Population Survey from 1968 to 1988, which includes four U.S. recessions, they find that a one percentage-point increase in the unemployment rates is associated with a two-percent increase in college enrollment. Other work has also found a positive relationship between unemployment rates and college enrollment (Card and Lemieux 2001; Long 2004a).

In some ways, the trends of the Great Recession mirror the economic changes of earlier recessions, and so one might expect to find the same pattern of increasing postsecondary enrollment. There were rampant increases in unemployment and reductions in income. It is also certainly not the first time that colleges and universities have suffered reductions in state appropriations. For instance, during the recession of the early 1990s, state appropriations also fell substantially, and this led to substantial tuition increases at publics institutions. More recently, during the recession of early 2000s, reductions in state appropriates coupled with declining endowments resulted in significant tuition growth at both public and private colleges and universities (Breneman, 2002).

However, while many of the changes brought on by the Great Recession have also been experienced during previous recessions, several factors make the current context very different. Even before the downturn, college prices were a much higher percentage of annual family income than any previous recession, making any marginal increase in tuition harder to overcome than ever before. The percentage of students taking out debt and the mean levels of student debt at baccalaureate graduation were also at historical highs and continuing to increase rapidly. 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. On the other hand, financial aid has increased substantially during this period, much more than any previous recessions. As noted above, total expenditures in the Pell Grant Program went from $15.9 billion in 2007-08 to $37.0 billion in 2010-11 (College Board, 2012b).

Another thing that makes this recession different than most others is the demographic change that was also taking place at the same time. 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. The already important role of debt in college financing and the enormous enrollment pressure of the largest cohort of traditional-age college students has exacerbated the need for resources and capacity by institutions and families.

Therefore, unlike past recessions when changes in enrollment trends were largely a matter of price increases and labor market effects, the Great Recession has happened in a much more complex context with positive and negative pressures that might influence college enrollment, and this could have differently effects on various subgroup populations. The growth in unemployment and financial aid could encourage many to enroll in college, but the decrease in family income, increase in the difficulty of securing private financing, increasing tuition prices, and strain on institutional capacity suggest that the propensity for college enrollment could decrease. The uncertainty and risk introduced by the recession could also affect college decisions as families may be less likely to take on more expensive, multi-year investments. Given the recession impacted the earning and job prospects of educated workers, some have even questioned whether the returns to college justify the cost, though employment conditions for individuals with only a high school degree were also adversely affected.

Early work confirms that the effects of the Great Recession have been distinctive from previous periods. Overall, Barr and Turner (2012) find that the enrollment response to the Great Recession has been larger, and they attribute the large growth in attendance to the unusual

increase in the availability of financial aid (i.e. the Pell Grant) as well as extensions in Unemployment Insurance benefits. Their research suggests that older students were proportionately more responsive to the recession. The largest shocks to enrollment occurred at community colleges and private baccalaureate (no research) colleges. To summarize, Barr and Turner conclude that while the reductions in state appropriations and increases in tuition prices might attenuate the overall enrollment response, these factors would not strong enough to "undo" the increase in attendance.

This analysis augments the previous work by bringing additional insight to the effects of the recession. I use the Consumer Expenditure Survey, which has the advantage of providing a more detailed profile of a family's financial circumstance and changes to that circumstance with information on family income, assets, and debt as well as college enrollment and expenditures, information not available in other datasets. Additionally, I investigate how the impact of the Great Recession varied by household characteristics and whether the enrollment effects differed according to the severity of the recession.

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). The CES has information not only on income and employment but also home ownership, mortgages, home equity loans, and credit card debt. Although this dataset is not often used to track college enrollment decisions, 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] Households with a head age 70 or above or under 18 were dropped from the sample.

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. In the sample, 52.4 percent of families live in states designated as having a large absolute increase in the unemployment rate.[9]

[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.
[9] As an alternative measure of the impact of the recession, I also calculated 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 were

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." Appendix Table 2 lists the states in this category. This is 29.2 percent of the sample of families.[10]

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. I determine the effects of the recession in two ways. First, I document trends in college enrollment by contrasting enrollment rates pre and post the start of the recession, using a dummy variable $After_i$ that is equal to one if the quarter is the data is from 2007Q4 or after.

categorized as experiencing an especially "large percentage increase in the unemployment rate." In the sample, 36.1 percent are in state with a large percentage change in the unemployment rate. The conclusions of the analysis do not change when I use this alternative measure of the severity of the recession.

[10] 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. Again, the conclusions of the analysis did not change much when using this alternative measure of the severity of the recession.

However, because college enrollment rates have generally increased during the last several decades and would have likely continued to increase regardless of the recession, I must also control for this secular trend. I do so by also including a year trend, $Year_i$, in the model. To control for differences in state higher education systems and underlying propensities for enrollment, I also include state fixed effects (γ_i). The resulting equation is:

$$(1) \quad y_j = \alpha_1 + \alpha_2 X_i + \alpha_3 Year_i + \alpha_4 After_i + \gamma_i + \varepsilon_i$$

where *i* is a family, y is the outcome of interest, and X is vector of household characteristics. In this equation, α_3 measures the annual growth in college enrollment rates over the entire period (the upward trend that would have happened regardless of the recession), and α_4 gives a sense of whether trends in college enrollment changed from the previous trajectory after the start of the Great Recession. If the Great Recession precipitated a jump in the percentage of individuals attending college *beyond* the already positive annual growth, one would expect α_4 to be positive.

The empirical analysis includes additional controls (X_i) 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, the maximum years of education between the head and spouse, 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. The standard errors are adjusted using clustering methods. I use OLS models to estimate the effects on college expenditures and logistic regressions to estimate the effects on college enrollment (reporting logistic odds ratios in the tables).

To determine how the severity of the recession had differential effects on the outcomes, 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:

$$(2) \quad y_j = \beta_1 + \beta_2 (\text{Recession\_High}_i * \text{After}_i) + \beta_3 \text{Recession\_High}_i + \beta_4 \text{After}_i + \varepsilon_i$$

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 the largest adverse effects from the recession acted differently from families in states that were not as affected by the recession (though almost every state experienced the economic downturn to some extent). 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. In the hardest hit states, the balance between the negative effects of declining incomes and rising tuition levels could have more strongly attenuated the positive effects of increasing unemployment and financial aid.

IV. THE ESTIMATED EFFECTS OF THE GREAT RECESSION

Table 1 displays the summary statistics of the Consumer Expenditure Survey sample. On the left is the sample of all families. To investigate the effects of the Great Recession on college enrollment among families with a member who is traditional college age, the right column describes the sample with a person in the household age 17 to 23 who has a high school degree but not a college bachelor's degree. While the means of raw samples are close to the national averages for the United States, because of sampling errors, attrition, and the fact that all states

are not represented in the CES, the comparison is not exact.[11] Therefore, in the analysis, I show both the unweighted and weighted results, using the survey population weights to be more reflective of national trends.

The Effects of the Recession on College Enrollment and Spending

Table 2 focuses on the impact of the recession on college enrollment as measured both by whether anyone in a family was attending college and if the family had positive college expenditures. Because the outcome is binary, I use logistic regression and report odds ratios in the table. Enrollment is specified as a function of family demographics, income, education level, home ownership status, and whether the head of household or spouse/partner is unemployed. As found in previous research, college enrollment rates are generally higher among families with higher family incomes and those who own their homes while they are lower among racial and ethnic minorities (not shown).

Focusing on the effects of the Great Recession on college engagement, as shown by the "After Recession" dummy variable, college enrollment rates were higher post the beginning of the recession. However, the dummy variable denoting the time period during the Great Recession gives an inflated sense of the effects of the economic downturn given the fact that college enrollment rates were generally increasing each year even before the start of the recession. Therefore, to control for the secular trends in enrollment rates that would have likely continued even without the start of the recession, the next set of specifications include a year trend. Including that variable reduces the estimated effect of the recession on college enrollment

[11] 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.

(from about 6 or 7 percent to 3.4 percent referring to the weighted results), but the overall estimated effect of the Great Recession on enrollment is still positive.

While specifications (1) through (4) focus on the full sample of families, specifications (5) and (6) limit the analysis to families with traditional-age college students. In contrast, to the overall positive effect on enrollment in the larger population, enrollment among more traditional-age students slowed after the Great Recession, with the estimated year trend being positive but the recession dummy variable suggesting a negative effect. Similar to the findings of Barr and Turner (2012), this suggests that the positive enrollment effect was concentrated among older, non-traditional students. One hypothesis about this finding is that the huge cohort size of traditional-age students that coincided with the Great Recession could have slowed enrollment for these students overall, with capacity constraints and declining resources at the types of colleges these students are more likely to attend slowing enrollment growth.

Table 3 investigates how full-time versus part-time college enrollment changed after the start of the Great Recession.[12] As shown in specifications (1) through (4), the likelihood of full-time enrollment increased substantially post-recession, with the growth being about 5 percent over the previous period once accounting for the generally positive annual trend that pre-dated the downturn. In contrast, the probability of a person enrolling part-time appears to have declined after the beginning of the Great Recession. Higher unemployment rates may have allowed more full-time attendance.

Next, I focus on the effects of the Great Recession on college expenditures. Table 4 displays the results for both total college expenditures unconditional on having any costs (Panel A) and conditional on having positive expenditures (Panel B) using OLS regressions. These

[12] It is important to note that I have limited information on the intensity of college enrollment. While these data are available if the household signifies a member is in college, many households just denote the fact that they had college expenditures without details about attendance.

results also suggest increases in college involvement. Using the entire sample of families, college expenditures are estimated to have increased about $67 on average during the period after the recession started. The amount of unconditioned growth was larger among families with a traditional college-age student (about $159). Once limiting the sample to families who had positive college expenditures (Panel B), the amount of growth is larger, as expected—approximately $542 for all families and $414 for families with someone age 17-23 in the household.

The Effects on College Enrollment by the Severity of the Recession

In Table 5, I investigate how the impact of Great Recession on college enrollment varied by the severity of the economic effects of the recession. I measure how much the recession affected state economic conditions using two indicators. First, I use quarterly unemployment rates with states that experienced 5 percentage points or more growth in unemployment being categorized as having suffered stronger effects from the recession (see Appendix Table 1). Second, I using the Conventional Mortgage House Price Index (HPI) and designate states that had their HPI fall by more than 80 points as having felt the recession more severely (see Appendix Table 2). As shown in the table, states that had larger growth in unemployment and/or larger reductions in home values experienced relatively slower growth in college enrollment rates in comparison to other states. This was found for both the full sample of families and among families with members of traditional college age. This may suggest that during severe economic downturns, the negative pressures on college enrollment have a stronger effect than the positive pressures, and so the net effect on enrollment is smaller in these states in comparison to states that did not suffer as much.

According to Table 6, however, not all kinds of enrollment were impacted the same. While full-time enrollment was relatively smaller in the states hit harder by the recession, part-time enrollment grew more in these states after the start of the Great Recession. Therefore, the growth in full-time college enrollment seems to be centered in states that experienced the recession to a lesser degree, while part-time enrollment was positively effected in states that had larger increases in unemployment and decreases in home values.

Table 7 examines on the effects on college expenditures by the severity of the recession. While expenditures were relatively smaller in the hardest hit states, once limiting the sample to families with members who would be traditional-age college students, the estimated effect is positive for those states. This may reflect the fact that college tuition prices grew by more in states that were affected to a greater degree, necessitating families to have to pay more to attend. Conditional on having expenditures, both the full- and sub-sample groups spent relatively more on college in the states that experienced the worse economic changes. Although not shown, I found similar results measuring recession intensity by changes in the home price index.

The Effects of the Recession by Subgroup

In Table 8, I display estimates of the interaction between the recession period and the characteristics of the household. The interactions give one a sense of whether that group experienced relatively larger or smaller growth in college enrollment after the beginning of the Great Recession. Panel A focuses on gender. As shown by the female dummy variable, households headed by women were more likely to have someone in college generally over the period. After the beginning of the Great Recession, they experienced more growth in enrollment relative to households headed by men or couples. As shown in Panel B, households headed by a

racial or ethnic minority also realized relatively more growth in college enrollment compared to White households. However, minority households are generally less likely to have someone in college overall.

Finally, home ownership, while having a positive effect on the likelihood of college enrollment generally, did not have the same effect post-recession. Home owners had relatively less positive growth in college attendance during the recession (Panel C). Stated another way, during the Great Recession, home ownership was less of a positive determinant of college enrollment than before. This could be due to the fact that home values declined and access to home equity loans declined, thereby reducing access to capital for many homeowners during the recession. Other research has also found the home price index is positively related to the probability of college attendance (Johnson 2011), so it is not surprising that college enrollment would fall as home values fall.

V. CONCLUSIONS

The Great Recession has had important effects on both the supply and demand sides of higher education. Families suffered from reduced college affordability in the form of decreasing family incomes and home values and rising college tuition prices. Meanwhile, growing unemployment reduced the foregone costs of attendance, suggesting some of the trends caused by the recession could have had positive effects on college enrollment and spending. Moreover, complications such as the strong reliance on debt to finance college expenditures, large cohorts of recent high school graduates, and changing federal aid policy made the conditions surrounding

the Great Recessions even more complicated. Taken together, it was unclear, *ex ante*, what the overall effect of the Great Recession would be on college enrollment and family expenditures.

The results suggest that the net effect of the recession has been positive on college enrollment. While college enrollment increases generally each year, after the start of the Great Recession, there was an additional increase in attendance rates. The increase was concentrated among older, non-traditional students, and full-time enrollment was favored. College expenditures also increases, which may be a reflection of both increased attendance but also the increased costs of college due to declining institutional subsidies.

Given all the factors that changed during the Great Recession, it is not surprising that the impact of the recession on higher education on subgroups has been a bit mixed. The relative strength of the positive and negative influences on enrollment varied by state and household demographics. For example, states that had larger growth in unemployment and/or larger reductions in home values experienced relatively slower growth in college enrollment rates in comparison to other states. This may be some indication that the negative pressures on college enrollment, including reductions in family income, assets, and stability, had a relatively stronger effect, thus resulting in a smaller net effect on enrollment in comparison to states that did not suffer as much.

Taken in sum, like during previous recessions, college enrollment increased after the start of Great Recession. The positive influences of reductions in foregone earnings and substantial increase in the Pell Grant likely explain this trend. However, reductions in college affordability and uneven responses across groups suggests the effects of the Great Recession on college engagement are not all positive.

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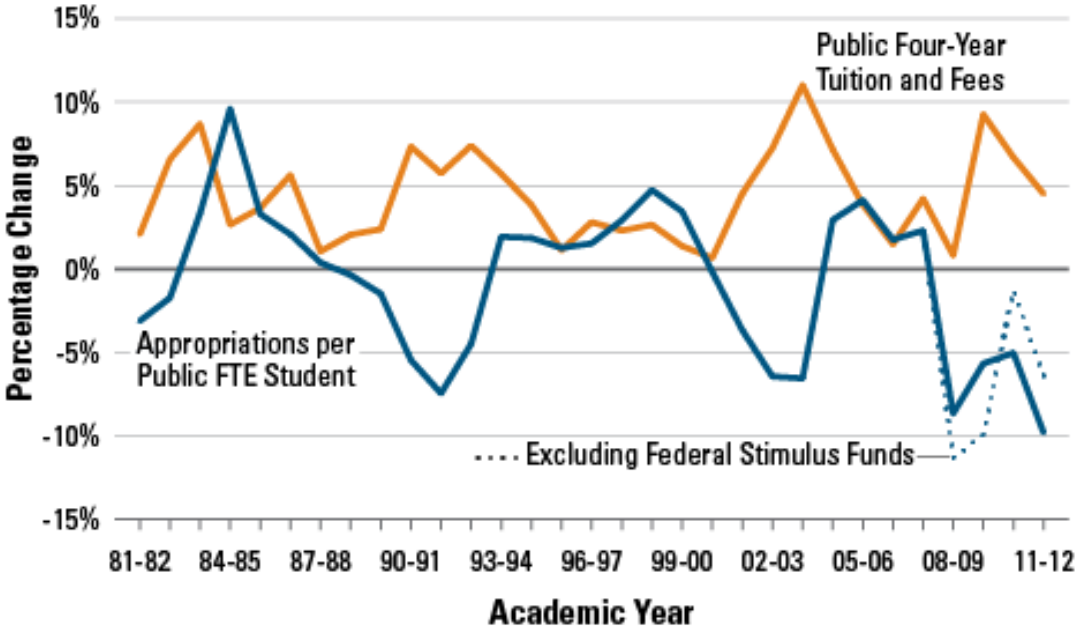
Figure 1: Annual Percentage Change in State Appropriations for Higher Education and Real Tuition and Fees at Public Four-Year Institutions



Source: College Board (2012a). Figure 12A.
Notes: State appropriations reported per full-time equivalent (FTE) student. Enrollment for fall 2011 was estimated based on preliminary IPEDS numbers. Appropriations are for institutional operating expenses, not for capital expenditures. Funding includes both tax revenues and other state funds allocated to higher education.

Table 1: Summary Statistics

	All Families	Families With Person Age 17-23 with only a HS Degree or Some College
Household Demographics		
Head of Household - Age	43.675 (13.470)	46.461 (10.051)
Female-Headed Household	0.286	0.274
Head of Household – Black	0.132	0.139
Head of Household – Hispanic	0.149	0.194
Head of Household – Asian	0.057	0.058
Head of Household – Other Races	0.016	0.016
Head of Household – Married	0.512	0.629
Family Size	2.640 (1.545)	3.855 (1.499)
Household Education and Economics		
Maximum Years of Education among Head and Spouse	13.939 (2.910)	13.536 (2.796)
Total Family Salary (per $1,000)	$54,570 (64,461) [36,724]	$61,050 (61,023) [2,963]
Own Home dummy variable	0.580	0.684
Head or Spouse is Unemployed	0.011	0.015
College Outcomes		
Enrolled in College	0.073	0.058
Enrolled Full-time	0.036	0.020
Enrolled Part-time	0.037	0.038
Enrolled in College and/or had College Expenditures	0.122	0.254
Total College Expenditures	$222 (1,877) [37,259]	$717 (3,331) [3,028]
Measures of Economic Conditions		
State Unemployment Rate 2007Q1 (before the Recession)	4.402 (0.862)	4.419 (0.874)
State Unemployment Rate 2009Q4 (during the Recession)	9.844 (1.851)	9.922 (1.857)
State Home Price Index 2007Q1 (before the Recession)	427.190 (142.635)	433.651 (142.660)
State Home Price Index 2009Q4 (during the Recession)	360.557 (103.533)	364.087 (103.209)
Observations	38,919	3,124

Sources: Consumer Expenditure Survey, 2004-2010; Bureau of Labor Statistics; Federal Housing Finance Agency.

Table 2: The Effects of the Recession on College Enrollment
Dependent Variable: Anyone in College or Paid College Expenditures (Logistic Odds Ratios)

	All Families				Families With Person Age 17-23 with only a HS Degree or Some College	
	After Recession Start		Adding Year Trend			
	No Weights	Using weights	No Weights	Using weights	No Weights	Using weights
	(1)	(2)	(3)	(4)	(5)	(6)
After Recession (2007Q4 & after)	1.0671**	1.0554***	0.9512	1.0344***	0.8202	0.8878***
	(0.0342)	(0.0003)	(0.0573)	(0.0005)	(0.1320)	(0.0012)
Year Trend			1.0407**	1.0070***	1.0784	1.0407***
			(0.0187)	(0.0001)	(0.0530)	(0.0004)
Observations	38,919	38,919	38,919	38,919	3,119	3,119

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent
Notes: All regressions include the following additional controls: demographics of the head of household (age, gender, marital status), the race of the head, the maximum years of education between the head and spouse, urban dummy variable, family size, total salaries from all household members, whether the family owns their home, whether the head or spouse was unemployed, and state fixed effects. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample.

Table 3: The Effects of the Recession on College Enrollment Intensity (Full- and Part-time)
Dependent Variable: Anyone in the Household attended College Full- or Part-Time (Logistic Odds Ratios)

	Attended Full-Time				Attended Part-Time			
	After Recession Start		Adding Year Trend		After Recession Start		Adding Year Trend	
	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After Recession (2007Q4 & after)	1.2728***	1.2094***	1.0462	1.0490***	0.8805**	0.8795***	0.7674**	0.8469***
	(0.0750)	(0.0006)	(0.1131)	(0.0009)	(0.0480)	(0.0004)	(0.0802)	(0.0007)
Year Trend			1.0708**	1.0510***			1.0489	1.0133***
			(0.0351)	(0.0003)			(0.0326)	(0.0002)
Observations	38,851	38,851	38,851	38,851	38,851	38,851	38,851	38,851

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent
Notes: All regressions include the following additional controls: demographics of the head of household (age, gender, marital status), the race of the head, the maximum years of education between the head and spouse, urban dummy variable, family size, total salaries from all household members, whether the family owns their home, whether the head or spouse was unemployed, and state fixed effects. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample.

Table 4: The Effects of the Recession on College Expenditures
Dependent Variable: Educational Expenditures for College (dollars)

	All Families				Families With Person Age 17-23 with only a HS Degree or Some College	
	After Recession Start		Adding Year Trend			
A. TOTAL COLLEGE EXPENDITURES						
	No Weights (1)	Pop. Weights (2)	No Weights (3)	Pop. Weights (4)	No Weights (5)	Pop. Weights (6)
After Recession (2007Q4 & after)	$68.51*** (17.92)	$84.19*** (0.18)	$35.39 (37.72)	$66.93*** (0.37)	$142.07 (223.91)	$159.28*** (2.07)
Year Trend			11.47 (10.97)	6.03*** (0.11)	-21.01 (67.21)	-37.21*** (0.61)
R^2	0.01	0.02	0.01	0.02	0.08	0.09
Observations	38,919	38,919	38,919	38,919	3,124	3,124
B. COLLEGE EXPENDITURES CONDITIONAL ON POSITIVE SPENDING						
	No Weights (7)	Pop. Weights (8)	No Weights (9)	Pop. Weights (10)	No Weights (11)	Pop. Weights (12)
After Recession (2007Q4 & after)	$868.21*** (224.63)	$821.11*** (1.68)	$532.36 (479.79)	$542.49*** (3.58)	$392.70 (1,007.25)	$414.03*** (7.60)
Year Trend			$113.67 (134.24)	$95.61*** (1.01)	-$32.37 (270.20)	-$77.32*** (2.05)
R^2	0.08	0.07	0.08	0.07	0.12	0.12
Observations	2,907	2,907	2,907	2,907	687	687

* significant at 10 percent ** significant at 5 percent *** significant at 1 percent
Notes: All regressions include the following additional controls: demographics of the head of household (age, gender, marital status), the race of the head, the maximum years of education between the head and spouse, urban dummy variable, family size, total salaries from all household members, whether the family owns their home, whether the head or spouse was unemployed, and state fixed effects. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample.

Table 5: The Effects on College Enrollment by the Severity of the Recession
Dependent Variable: Anyone in College or Paid College Expenditures (Logistic Odds Ratios)

	All Families				Families With Person Age 17-23 with only a HS Degree or Some College			
	Change in the Unemployment Rate		Change in the Housing Price Index		Change in the Unemployment Rate		Change in the Housing Price Index	
	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After Recession (2007Q4 and after)	1.0417	1.1514***	0.9921	1.0870***	1.0627	1.2301***	0.8901	0.9691***
	(0.0711)	(0.0006)	(0.0629)	(0.0005)	(0.1960)	(0.0018)	(0.1494)	(0.0013)
Large Unemp. Growth (more than 5 pct pts)	0.9565	0.8843***			1.1761	1.2169***		
	(0.0484)	(0.0004)			(0.1611)	(0.0014)		
After Recession * Large Unemp. Growth	0.8444***	0.8247***			0.6415**	0.5768***		
	(0.0538)	(0.0004)			(0.1116)	(0.0008)		
Large HPI reduction (fell 80 pts or more)			0.9725	0.9694***			0.9663	0.9678***
			(0.0540)	(0.0004)			(0.1463)	(0.0012)
After Recession * Large HPI reduction			0.8804*	0.8558***			0.8189	0.8444***
			(0.0618)	(0.0005)			(0.1569)	(0.0013)
Observations	38,919	38,919	38,919	38,919	3,124	3,124	3,124	3,124

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

Notes: All regressions include the following additional controls: demographics of the head of household (age, gender, marital status), the race of the head, 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, whether the head or spouse was unemployed, and a year trend. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample.

Table 6: The Effects on Full- and Part-Time College Enrollment by Severity of the Recession
Dependent Variable: Anyone in College or Paid College Expenditures (Logistic Odds Ratios)

	Full-Time Enrollment				Part-Time Enrollment			
	Change in the Unemployment Rate		Change in the Housing Price Index		Change in the Unemployment Rate		Change in the Housing Price Index	
	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After Recession (2007Q4 and after)	1.2746**	1.2599***	1.1500	1.1551***	0.7308***	0.8087***	0.7510**	0.8315***
	(0.1555)	(0.0012)	(0.1285)	(0.0010)	(0.0863)	(0.0007)	(0.0847)	(0.0007)
Large Unemp. Growth (more than 5 pct pts)	1.1164	0.9473***			0.8420**	0.7969***		
	(0.1079)	(0.0007)			(0.0703)	(0.0005)		
After Recession * Large Unemp. Growth	0.6995***	0.7246***			1.0851	1.0827***		
	(0.0821)	(0.0007)			(0.1177)	(0.0009)		
Large HPI reduction (fell 80 pts or more)			1.0025	0.9196***			1.0828	1.1192***
			(0.1066)	(0.0008)			(0.0986)	(0.0008)
After Recession * Large HPI reduction			0.7310**	0.7094***			1.0574	1.0472***
			(0.0986)	(0.0008)			(0.1226)	(0.0009)
Observations	38,919	38,919	38,919	38,919	38,919	38,919	38,919	38,919

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

Notes: All regressions include the following additional controls: demographics of the head of household (age, gender, marital status), the race of the head, 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, whether the head or spouse was unemployed, and a year trend. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample.

Table 7: The Effects of the Recession on College Expenditures by Severity of the Recession
Dependent Variable: Educational Expenditures for College (dollars)

	Total College Expenditures				College Expenditures Conditional on Spending>0			
	All Families		Families with Person Age 17-23 with only a HS Degree or Some College		All Families		Families with Person Age 17-23 with only a HS Degree or Some College	
	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights	No Weights	Pop. Weights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year Trend	$10.49	$4.35***	-$40.99	-$64.51***	$132.98	$110.46***	-$26.20	-$37.80***
	(10.93)	(0.11)	(66.93)	(0.62)	(132.61)	(1.00)	(288.89)	(2.25)
After Recession (2007Q4 and after)	60.28	101.74***	122.62	72.00***	415.06	403.50***	-345.97	-592.17***
	(45.98)	(0.47)	(244.28)	(2.29)	(559.92)	(4.26)	(1084.81)	(8.50)
Large Unemp. Growth (more than 5 pct pts)	13.40	2.08***	-12.96	-65.80***	184.39	142.21***	-429.88	-533.53***
	(23.22)	(0.24)	(155.50)	(1.50)	(282.23)	(2.27)	(637.60)	(5.18)
After Recession * Large Unemp. Growth	-46.16	-61.31***	109.34	231.66***	-11.80	43.19***	1,146.41	1,442.30***
	(36.50)	(0.36)	(225.84)	(2.07)	(433.91)	(3.29)	(922.30)	(6.96)
Observations	38,919	38,919	3,124	3,124	2,907	2,907	687	687
R^2	0.01	0.01	0.05	0.06	0.06	0.05	0.07	0.07

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

Notes: All regressions include the following additional controls: demographics of the head of household (age, gender, marital status), the race of the head, 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, whether the head or spouse was unemployed, and a year trend. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample. Similar results are found if measuring recession intensity by changes in the home price index.

Table 8: The Effects of the Recession on College Enrollment by Household Demographics
Dependent Variable: Anyone in College or Paid College Expenditures (Logistic Odds Ratios)

	All Families		Families with Person Age 17-23 with only a HS Degree or Some College	
A. GENDER OF THE HEAD OF HOUSEHOLD				
	No Weights (1)	Using weights (2)	No Weights (3)	Using weights (4)
After Recession (2007Q4 & after)	0.9298	1.0072***	0.8028	0.8517***
	(0.0590)	(0.0005)	(0.1347)	(0.0012)
Head of Household is Female	1.0203	1.0544***	1.1494	1.2209***
	(0.0612)	(0.0005)	(0.2282)	(0.0020)
After Recession * Female Head	1.0849	1.1024***	1.0958	1.1897***
	(0.0769)	(0.0006)	(0.2291)	(0.0020)
Observations	38,919	38,919	3,124	3,124
B. RACE OF THE HEAD OF HOUSEHOLD				
	No Weights (5)	Using weights (6)	No Weights (7)	Using weights (8)
After Recession (2007Q4 & after)	0.9479	1.0287***	0.8129	0.8561***
	(0.0609)	(0.0005)	(0.1399)	(0.0012)
Head of Household is a Minority	0.9180	0.9303***	0.8929	0.8672***
	(0.0498)	(0.0004)	(0.1300)	(0.0011)
After Recession * Minority Head	1.0101	1.0152***	1.0207	1.0889***
	(0.0691)	(0.0006)	(0.1887)	(0.0017)
Observations	38,919	38,919	3,119	3,119
C. HOME OWNERSHIP STATUS				
	No Weights (9)	Using weights (10)	No Weights (11)	Using weights (12)
After Recession (2007Q4 & after)	0.9898	1.0767***	0.8838	0.9183***
	(0.0693)	(0.0006)	(0.1966)	(0.0017)
Own Home	1.2789***	1.0256***	1.6280***	1.2912***
	(0.0699)	(0.0004)	(0.2808)	(0.0018)
After Recession * Own Home	0.9342	0.9358***	0.9075	0.9573***
	(0.0604)	(0.0005)	(0.1924)	(0.0017)
Observations	38,919	38,919	3,119	3,119

* 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, 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, state of residence unemployment rate for the quarter, and a year trend. Robust standard errors are shown in parentheses. Households with a head age 70 or above or under 18 were dropped from the sample.

Appendix: 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)	
Alabama	Nevada
Arizona	New Jersey
California	Ohio
Florida	Oregon
Georgia	Rhode Island
Idaho	South Carolina
Illinois	Tennessee
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)
Arizona
California
Florida
Hawaii
Maryland
Massachusetts
Nevada
New Jersey
Rhode Island

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. The correlation between the two measures is 0.607.In the Consumer Expenditure Survey (CES), 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.