THE IMPACT OF PARENTAL WEALTH ON COLLEGE ENROLLMENT & DEGREE ATTAINMENT: EVIDENCE FROM THE HOUSING BOOM & BUST

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Keywords: educational attainment, parental wealth, credit constraints, house price shocks

[*] This paper is dedicated to the scholarship and legacy of my former colleague and friend, John Quigley (1942-2012). Please direct correspondence to Rucker Johnson, University of California, Berkeley, Goldman School of Public Policy, 2607 Hearst Ave, Berkeley, CA 94547, or email to ruckerj@berkeley.edu. I am grateful for the excellent research assistance provided by Candace Hamilton Hester, and the PSID staff for access to the confidential restricted-use PSID geocode data. I wish to thank Purvi Sevak for sharing MSA house price index data from FHFA. This work benefited from comments received from seminar participants at NYU, Cornell, and the Western Economics Association meetings.

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Abstract:

A long-standing policy goal of aid is to narrow, if not close, the parental income gap in children's subsequent educational attainment. Recent research indicates that credit constraints have played a larger role in college enrollment and completion rates over the past 15-20 years (Lochner and Monge-Naranjo, 2011; Lovenheim, 2011). Prior evidence found greater credit constraints in the US than Canada (Belley et al., 2009). Housing wealth has become an increasingly important component of the college enrollment decision over the past 15 years (Bound et al., 2010). The parental wealth depletion following the Great Recession and housing market collapse has potentially important implications for college prospects of our youth. A recent survey of young adults found that 20% aged 18-29 have left or delayed college (Greenberg and Keating 2009). A survey conducted in Colorado found that 1/4 of parents with children in 2-year colleges planned on sending their kids to 4-year institutions before the recession (CollegeInvest 2009).

This study provides new evidence on the impact of parental wealth on educational attainment. In order to address the endogeneity of parental wealth, the empirical strategy analyzes parental housing wealth changes induced by local housing booms of the late 1990s and early 2000s, and the subsequent housing bust of the 2007-2009 period. Using geocoded data from the Panel Study of Income Dynamics (1968-2009) linked to MSA housing price data from the Federal Housing Finance Agency, I examine how changes in parental housing equity in the four years prior to their child being college-age affect the likelihood that the child attends college and where they attend (2-year vs. 4-year; in-state vs out-of-state; college quality). This provides a test of the role of parental wealth (and potential credit constraints) in influencing post-secondary decisions, including if, when, and where individuals attend and complete college.

I find a stronger link between parental SES (as measured by wealth, income, education) and children's subsequent educational attainment for more recent cohorts (i.e., more important in the 2000s than the early 1980s). Ignoring housing wealth will cause one to mismeasure the extent of family resources. Moreover, the combined effects of parental income and wealth are significantly greater than the effects of income alone.

The research design exploits the timing and geographic dispersion of the housing boom (beginning in late 1990s-2005) and housing bust (2007-2009) to generate exogenous parental housing wealth variation. Quasi-experimental evidence from the housing boom and bust show that families that experienced significant increase in home value during the housing boom had a much easier time financing college expenditures due to increased ease of borrowing against their home value; the contrast with the housing bust of 2007-2009 period is stark.

The results indicate that a standard deviation (unanticipated) increase in the four-year change of the MSA house price index (between ages 13-17) leads to between a $10,000-$14,200 and

$54,000-$54,600 increase in average parental home equity and wealth, respectively, in the years immediately preceding their child reaching college age. The findings indicate that the magnitude of this housing price-induced shock to parental wealth (during ages 13-17) results in between a 3.9-6.4 percentage-point increase in the probability of college attendance and between a 0.12-0.21 increase in subsequent years of completed education. Among those who attended college, the magnitude of this housing price-induced shock to parental wealth (during ages 13-17) results in a 9 percentage-point reduction in the probability of attending a community college (even among those whose parents had 4-year college expectations for their child), a 15 percentage-point decrease in the probability of attending an in-state college, a $1,700 increase in college tuition, a 6 percentage-point reduction in the proportion of students receiving federal/state grants at the college they attended, and about a 10-12 point increase in both the 25th and 75th percentiles of SAT math and verbal scores of colleges' admitted freshman class. There is also evidence that suggests the impacts of housing booms and busts on these post-secondary outcomes are asymmetric, with larger educational impacts experienced for housing market downturns. For example, among those who attended college, a one standard deviation decrease in the four-year change of the MSA house price index (between ages 13-17) is associated with a substantial increase in the likelihood of initially attending a community college, with insignificant impacts on this outcome for comparably-sized increases in the MSA house price index. These average post-secondary education effects of housing price shocks are all concentrated among children whose parents are homeowners with no estimated impacts on renters (as expected). Furthermore, the results indicate there are no significant effects of MSA house price changes (ages 13-17) on children's academic achievement during high school; rather, the MSA house price shocks are shown to impact only postsecondary education outcomes. The effects are more pronounced for children from families with relatively lower income, and it appears that higher initial parental wealth measured at age 12 acts to cushion the impact of unanticipated housing market shocks during ages 13-17 on children's subsequent postsecondary education outcomes.

It is shown that college attendance is sensitive to housing market fluctuations. The 2SLS/IV estimates indicate that a $10,000 increase in parental housing equity during ages 13-17 results in a 2.6 percentage-point increase in the probability of college attendance (by age 20) and a 0.08 significant increase in the years of completed education; and among those who attended college, a $10,000 increase in parental housing equity results in a 2.7 percentage-point decrease in the probability of attending an in-state college, a one-percentage point reduction in the probability of initially attending a community college, and increases in both college tuition and markers of college quality/selectivity. In light of the fact that the average 4-year home price change was roughly $80,000 during the boom and home prices have fallen by one-third since their peak in 2006, these effects translate into sizable impacts on both the extensive and intensive margin of postsecondary education outcomes and dimensions of college quality/selectivity. The results suggest that binding credit constraints affect the intensive margin of college enrollment. The findings indicate that the housing market downturn that accompanied the Great Recession led to a reduction in the quality of colleges attended by students, particularly those from lower-income families. One policy implication of this work is that it underscores the need for policies to insulate the training of high-skilled labor from impacts of economic downturns and housing price volatility.

I. Introduction.

The past few decades have witnessed the emergence of substantial increases in both the costs of and returns to college, which has increased the demand for credit beyond the supply available from government programs. A long-standing policy goal of financial aid is to narrow, if not close, the parental income gap in children's subsequent educational attainment. Education is widely touted as the engine that leads to socioeconomic mobility, and equitable access to higher education the key to that ignition, in order to compress the rungs on the nation's economic ladder.

However, recent studies document growing parental SES gaps in college entry/matriculation, persistence, and graduation, and the college completion gap between children from high- and low-income families has grown by about 50 percent since the late 1980s (Bailey & Dynarski, 2011). There remains considerable, spirited debate in the literature about whether the observed correlation between parental income/wealth and educational attainment has any causal element, and about the existence of financial constraints affecting post-secondary education decisions (e.g., see Krueger, 2003; Heckman, 2003). There exist differing interpretations of this empirical connection between parental wealth-schooling, and the nature of this relationship, as some argue it is simply a reflection that higher income families place greater value on education. Yet, even after controlling for cognitive ability and family background, there exists a 30 percentage-point difference in college attendance rates between children from families from the top parental income and wealth quartiles compared with those from the bottom quartiles (Lochner, 2011). Large differences in college-going by family income among those with similar test scores and the greater sensitivity of low-income youth to tuition differences are at least consistent with borrowing constraints (Ellwood & Kane, 2000).

Although a voluminous body of research has investigated the effects of changes in financial aid policy and parental economic resources on children's college enrollment decisions, this literature has largely overlooked the importance of wealth shocks arising from the housing market. Housing wealth has become an increasingly important component of the college enrollment decision over the past 15 years. In particular, there has been a marked increase in the preponderance of parents refinancing their homes in the years immediately preceding their children reaching college age. This behavioral response by parents is driven by the need to help finance higher education expenses amid rising college tuitions. Eighty-five percent of college attendees come from families who own a home, and those whose children are enrolled in college are more likely to have a home equity loan or home equity line of credit (Lovenheim, 2011). Despite the fact that housing assets represent the dominant component of parental wealth for the overwhelming majority of families, until recently, few papers have included housing variables in models of the impacts of parental economic resources on children's educational attainment. Ignoring housing wealth will lead to the mismeasurement of the extent of family resources. Given both the substantial spike in college tuition prices and the volatility in US housing markets over the past 2 decades, unanticipated shocks that are generated by house price variation might be expected to have an important effect on college attendance decisions.

There are a myriad of perceived negative consequences of housing market price volatility, from an increase in social inequality (including marital dissolution (Farnham, Schmidt, Sevak, 2011; Rainer & Smith, 2010)) to a reduction in labor mobility to a significant decline in hours of work to housing lock (i.e., the phenomena of homeowners being locked in their homes) by increased transactions costs in down markets. The recent US experience of major boom-bust housing market price cycles has renewed interest in analyzing potential socioeconomic

consequences of housing wealth shocks. Large, dramatic swings in housing prices have occurred in a relatively short period of time. Whereas US house prices rose by an average of 40% from 1995 to 2004 (Himmelberg, Mayer, Sinai, 2005), house prices have fallen by an average of one-third since their peak in April 2006 (as presented in Figure 1, Case-Shiller Composite-20 Index), and these housing price changes are even more dramatic in certain MSAs (e.g., Bay Area) in which the housing bubble/burst was most severe. Loan limits are often not large enough to cover costs, and students are often unwilling to borrow given risk preferences or debt aversion.

The housing boom of the late 1990s and early 2000s, and subsequent housing bust that has ensued since 2007, provide a unique opportunity to investigate the impacts of parental wealth on children's college enrollment decisions and degree attainment. This study uses this period as a natural experiment to learn about parental wealth effects. Specifically, I use the boom and bust of the real estate market as an exogenous shock to parental wealth by analyzing variation in house price changes across MSAs and over time to identify an effect of parental wealth on children's post-secondary educational outcomes. This research design, which capitalizes on exogenous changes in parental housing equity driven by local housing booms and busts, enables one to address concerns about the potential endogeneity of parental wealth to facilitate causal inference. I examine a broad range of post-secondary outcomes and decision margins upon which wealth effects may unfold, including college attendance, college delay, type of post-secondary institution attended (two-year vs. four-year), tuition at college attended, college quality/selectivity indicators, student work hours during college, and college completion.

The findings contribute to a new wave of evidence that supports the existence of both causal effects of parental wealth and financial constraints. The potential intergenerational consequences of housing (real estate) market volatility have only recently received attention. An

aim of this study is to test whether parents increase (or decrease) quality human capital investments in their children when exogenous factors cause their house prices to increase (or decrease). The increased price of college quality and potential impact of parental borrowing constraints on children's higher education decisions is of significant policy importance.

This paper presents new evidence that use changes in local housing market conditions to examine how parental wealth and financial constraints affect children's post-secondary outcomes. In particular, I investigate how changes in Metropolitan Statistical Area (MSA)-level housing prices during one's childhood years immediately leading up to college age affect subsequent post-secondary educational decisions. I find that short-term increases in house prices lead to significant improvements in children's postsecondary educational attainments and college quality among homeowners (with no effects on renters living in similar locations and no effects on high school academic achievement). The estimated effects persist with the inclusion of controls for MSA fixed effects, parental income, parental education, family structure and demographic factors, trends, and time-varying conditions.

The 2SLS/IV estimates indicate that a $10,000 increase in parental housing equity during ages 13-17 results in a 2.6 percentage-point increase in the probability of college attendance (by age 20) and a 0.08 significant increase in the years of completed education; and among those who attended college, a $10,000 increase in parental housing equity results in a 2.7 percentage-point decrease in the probability of attending an in-state college, a one-percentage point reduction in the probability of initially attending a community college, and increases in both college tuition and markers of college quality/selectivity. In light of the fact that the average 4-year home price change was roughly $80,000 during the boom and home prices have fallen by one-third since their peak in 2006, these effects translate into sizable impacts on both the

extensive and intensive margin of postsecondary education outcomes and dimensions of college quality/selectivity. The analysis provides evidence that parents use some of their increased housing wealth, induced by increases in local area house prices, to finance their children's college education. The impacts are particularly pronounced among children whose parents were homeowners but had limited non-housing wealth. The finding of a parental home equity effect provides empirical support that imperfect credit markets influence children's post-secondary education outcomes. The results are robust to a number of alternative specifications (and functional forms) and the results are not driven by selection/residential sorting.

The remainder of this paper is organized as follows. In the next section, I discuss the related literature and how this paper builds on and extends prior study findings. Section III describes the data and provides an overview of the empirical approach. Section IV details the research design, empirical strategy, and model specification issues. Section V presents the main results and series of robustness checks. Section VI provides concluding remarks, directions for future research, and some discussion of policy implications.

II. Related Studies

Extant empirical literature on the relationship between parental wealth and children's educational attainment offers a starting point for the analysis. Lovenheim (2011) and Lochner & Belley (2007) authored the work most closely related to the current study. This paper considers the role of parental housing wealth as borrowing collateral for college tuition expenditures. Lovenheim (2011) emphasizes similar issues with regard to house price changes.

There are several potential pathways linking parental housing wealth and children's post-secondary decisions and educational outcomes. I briefly discuss theoretically how and why they should matter. First, homeowners can use the accumulated equity in their homes as collateral for

loans or lines of credit to finance investments in their children's human capital. Families that experienced significant increases in home value (during the housing boom) had a much easier time financing college expenditures due to increased ease of borrowing against its home value. House price appreciation (losses) increase (decrease) parental homeowners' equity and in turn their ability to borrow against their homes to finance their children's higher education expenditures (e.g., average housing equity rose by more than $51,000 between 2001 and 2005).

Second, an increase in MSA-level house prices that increases available home equity, may lead to less non-collaterized (student loans, credit card) debt when young adults—which recent evidence indicates impacts early occupational choice (Rothstein & Rouse, 2011). Third, with greater parental financial resources, students tend to work fewer hours on jobs while enrolled in college to help defray tuition costs, which has been shown to increase the likelihood of college completion and reduce the time to BA degree (Bound et al., 2010).

Increases in MSA-level housing prices are associated with increased home equity extraction. There has been an increasing trend over at least the past decade for parents to consume out of housing wealth via increased home equity, either through home equity loans or lines of credit or refinanced mortgages. In fact, there is a substantial and growing literature on the propensity for households to fund current consumption out of housing wealth (see, e.g., Case, Quigley, & Shiller (2005); Benjamin, Chinloy, & Jud (2004); Bostin, Gabriel, & Painter (2009); Haurin & Rosenthal (2006)). Moreover, this recent research finds that the propensity to consume out of housing wealth is substantially greater than the propensity to consume out of financial wealth; and, it has been shown that negative house price shocks have a larger and more important effect on household consumption than positive house price shocks (Skinner, 1996; Engelhardt, 1996). Most importantly for the present study, those households which are

otherwise credit constrained and have few other liquid assets have the highest propensity to consume out of housing wealth (Hurst and Stafford (2004); Lehnart (2005)).

Lovenheim (2011) provides quasi-experimental evidence from the housing boom to examine how changes in the household's housing equity in the four years prior to its child becoming college-age affect the likelihood that child attends college. His key findings are that the 4-year growth in housing equity raises college enrollment and the effect is localized to the 2000-2005 period and to households most likely to be credit constrained, and to those who live in high housing price growth areas due to housing supply constraints. He reports that 12% of families with children in college use housing equity to relax short-run credit constraints. Lovenheim's estimates suggest that an additional $10,000 in housing equity raises college enrollment by 0.7 percentage points, with much larger effects among lower income families.

The present paper extends that work with analysis of implications for the housing market collapse, decline in housing prices, credit crunch, and increased difficulty of tapping one's home equity to pay for college experienced by families in recent years. The effect of housing market fluctuations on parental wealth accumulation around the time of college matriculation is a central focus. I consider parental wealth depletion following the Great Recession and implications for college prospects of our youth. A recent survey of young adults found that 20% aged 18-29 have left or delayed college (Greenberg and Keating 2009). A survey conducted in Colorado found that a quarter of parents with children in 2-year colleges had planned on sending their kids to 4-year institutions before the recession (CollegeInvest 2009). This delay or reduction in college attendance is costly, particularly in light of evidence of the social benefits (externalities) of education in the form of better health outcomes, lower incarceration rates, greater volunteerism rates, and greater civic participation (Moretti, 2004).

Bound et al. (2010) show that college completion rates have declined in recent decades and the length of time to collegiate degree attainment has increased significantly over the past 3 decades. These trends, which they find cannot be explained by changes in college preparedness or the demographic composition of degree recipients, are most stark for low-income students who attend public colleges outside the most selective universities. They present supportive evidence that students significant increase in work hours, spurred by declines in collegiate resources in less-selective public institutions and the need to meet rising college costs, has led to an increase in time to degree by crowding out time spent on academic pursuits.

Parental wealth shapes children's economic opportunities (Conley, 2000), providing a lifeline during economic downturns, and enables the finance of additional education and retraining. In many states, substantial tuition increases occur only during recessions. Rather than gradually increasing, tuition spikes occur precisely when families have a difficult time adjusting financially. Belley et al. (2009) found greater credit constraints in the US than Canada.

Ellwood & Kane (2000) vs Carneiro & Heckman (2003) reach different conclusions about the importance of credit constraints on college attendance decisions. Kane finds evidence that credit constraints might be important, since delayed college entry is more common in high tuition states, particularly among blacks and low-income whites. Carneiro & Heckman (2002) find that credit constraints are not sufficient to explain the gaps in college attendance across parental income groups. Likewise, Cameron & Taber (2004) using the NLSY79 conclude from their evidence that credit constraints play a minimal role in educational attainment. However, the NLSY79 does not contain parental wealth information. In comparison, this paper uses the PSID and shows that the combined effects of parental wealth and income are much greater than are the income effects alone on educational attainment. Belley & Lochner (2007) found similar

results, but use the NLSY97 to show that parental income has become a more significant determinant of college attendance over time. Their evidence suggests borrowing constraints have become more acute for college attendance over the past 10-15 years. They find that credit constraints have become a more salient predictor for explaining poorer families' post-secondary educational outcomes, while accounting for the role of cognitive ability.

Dynarski (2003) examines the relationship between parents' financial liquidity & children's college-going behavior. Her research design capitalizes on a 1992 rule change that exempted parents' home equity from consideration in financial aid need assessments, which caused many newly-eligible students for federal college loan programs. She finds students newly eligible for loans were more likely to go to college and attend four-year institutions.

Margins of decision making to consider beyond simply college attendance. There exists substantial heterogeneity in college quality in the US, both across and within two-year, four-year, public, and private institutions. While the average return to college is large and growing (Autor, Katz, & Kearney 2008), these returns may be disproportionately accruing to those who attend selective high quality institutions. One must consider differential marginal returns to schooling. It is imperative that we draw new insights that contribute to our understanding of the socioeconomic determinants of youth education choices along dimensions of post-secondary quality. These are important margins to consider especially in light of a growing body of evidence that demonstrates significant labor market returns to college quality (Andrews et al., 2011; e.g., Hoekstra (2009) finds students attending a state flagship earn 24% more than those who attend lower-tier universities (controlling for ability)).

III. Overview of Empirical Approach & Data Description

The paper explores the importance of parental wealth for children's college attendance, college quality and completion by exploiting unanticipated housing price shocks as an exogenous source of identifying variation. I investigate whether house price changes in the years immediately preceding a child's high school graduation impact their subsequent college enrollment decisions (including college quality), likelihood of college completion, and children's college-related debt. The analysis uses nationally-representative longitudinal micro data of individuals and MSA-level house price data from the FHFA House Price Index spanning 1980-2010.

Data: PSID-CDS-TA (1968-2009). In order to analyze the effect of parental housing wealth on children's post-secondary educational outcomes, I employ a nationally-representative longitudinal data set from the Panel Study of Income Dynamics and its Child Development Supplement & Transition to Adulthood (PSID-CDS-TA), spanning the years 1968 to 2009.

The PSID began interviewing a national probability sample of 5,000 families in 1968, with an oversample of low-income families and African-Americans. These families were re-interviewed each year through 1997, when interviewing became biennial. When children with the become adults and leave their parents' homes, they become their own PSID "family unit" and are interviewed in each wave. This sample of "split offs" has been found to be representative (Fitzgerald, Gottschalk and Moffitt, 1998a). The PSID has maintained high annual response rates of 95%– 98% over the 40+ year panel. By 1996, the sample had grown to include more than 8,700 families through the formation of new families by children or other sample members of the original 5,000 families.

My analysis focuses primarily on children born since 1980 who are observed until at least age 19 in the PSID. Using the PSID, I construct childhood stage-specific parental economic

resource (wealth, housing, and family income-to-needs) measures, where the stages span ages 0-4, 5-8, 9-12, and 13-17. The PSID contains extensive data on education, income, wealth, housing, work and health status, and detailed characteristics of family background. The ability to link children's post-secondary educational experiences to their parent's economic resources throughout childhood is a key asset of the data assembled for this project.

In 1997, the PSID initiated a CDS to collect data about children's development, educational achievement, and family dynamics from the PSID families with children aged 0 –12. A much richer set of childhood information is available for the CDS sample (See Mainieri, 2005, and Mainieri and Grodsky, 2006, for a detailed description of the CDS.) Up to two children within each PSID family were interviewed in person, and these children were then interviewed in person again in 2002/2003, 2007. The total sample size of CDS is 3,563 children in 2,394 families from all socioeconomic strata. The response rate is 88% at the family level. The study oversampled low-income and Black families, with Black families accounting for about 40% of the CDS sample. PSID sample weights are used to account for this oversampling to produce nationally-representative estimates.

The Transition to Adulthood (TA) Supplement was subsequently added in 2005, 2007, and 2009 with the purpose of tracing this nationally-representative child sample through their transition to adulthood years (ages 18-25). The TA sample size is 745. I utilize detailed information collected about education experiences, SAT/ACT scores, high school and college grades, courses taken, college expenses, parental savings behavior, educational expectations for child achievement (as reported by the parent, teachers, and the children themselves) for this child sample from 5 waves of the CDS-TA (1997-2009).

I use residential location histories during childhood to match local-level data on housing prices and labor market conditions to those that prevailed during an individual's childhood years. In particular, I match PSID-CDS-TA data to annual MSA-level house price data. This linking of data over time enables me to measure MSA-level house price changes at specific childhood stages of development for each child in the sample. I also match annual county-level unemployment data from the Bureau of Labor Statistics (BLS) to control for local labor market conditions, which may affect college attendance decisions.

Finally, I use information collected on college name reported by respondents between 1975 and 2009 and match it with the Integrated Post-secondary Education Data System (IPEDS) (using college name IPEDS codes) in order to link respondents with college quality/selectivity indicators for the college attended. IPEDS is the core postsecondary education data collection program for the National Center for Education Statistics (NCES). Data are collected from all primary providers of postsecondary education in the country in areas including enrollments, program completions, graduation rates, faculty, staff, finances, institutional prices, and student financial aid. I also link the PSID-CDS-TA with the Common Core data (compiled by NCES) to describe the school environments attended during K-12 school years.

The analysis sample for this paper includes 1,778 individuals, from 80 different MSAs of upbringing.

MSA House Price Data (1975-2010). The data source for MSA-level house prices is the Federal Housing Finance Agency (FHFA) housing price index (HPI), previously known as the OFHEO housing price index. The HPI is a weighted average across homes with repeat sales over time (based on Case and Shiller (1989)). The index is available for nearly all US metropolitan areas. It measures the movement of single family home prices by looking at repeat

mortgage transactions on homes with conforming, conventional mortgage purchases or securitized through Fannie Mae or Freddie Mac since 1975. The index is continually revised and looks at repeat mortgages of the same home. Because the index is calculated from changes in the prices of houses with repeat sales, it is considered a "constant quality" index. This avoids problems of changing housing quality that would be encountered if one were instead to simply use the average price of sold homes over time (or self-reported house values). I adjust nominal house prices to 2009 dollars using the CPI-U (as advised by FHFA documentation).[1] Figure 1 displays trends in mean (CPI adjusted) HPI for MSAs contained in the PSID sample, both in levels (panel (a)) and annual percentage changes between adjacent years (panel (b)), for 1980-2010. The year-to-year percentage change rises over the 1990 to 2005 period, ranging from a low of -1.7 percent to a peak of 5.9 percent in 2005. From 1990 to 2005, the house price index increases 42 percent (55 points). The housing boom of 1999-2005 was associated with an average four-year home price change of roughly $80,000. Home prices have fallen by one-third since their peak in 2006.

PSID Wealth Variables (1968-2009). The PSID has questions on homeownership, house value, amount of mortgage payment, and the outstanding mortgage (i.e., the remaining principal on the loan) in each year of the survey (1968-2009). I also utilize information from the PSID special wealth modules, included in the 1984, 1989, 1994, 1999, 2001, 2003, 2005, 2007, 2009 waves, which measure net equity in homes and non-housing assets divided into seven categories: other real estate, vehicles; farm or business ownership; stocks, mutual funds, investment trusts and stocks held in IRAs; checking, savings accounts, CD's, treasury bills, savings bonds and liquid assets in IRA's; bonds, trusts, life insurance and other assets; and other debts. The wealth

[1] I have chosen to use the FHFA index instead of the Case-Shiller index because the Case-Shiller Index is not available for 13 states and it covers fewer MSAs that overlap the PSID sample. As well, the Case-Shiller index uses only home purchases, while the FHFA index also includes refinance appraisals.

modules also include questions about new purchases and sales of individual assets, so that, in principle, active and passive (capital gains) saving can be distinguished.

Total household wealth in the PSID comprises eight components: main home equity; real estate other than home equity; a farm or private business; automobiles, motor homes, or boats; checking and saving accounts, money market funds, certificates of deposit, government saving bonds, and treasury bills, including those in investment retirement accounts; equities in publicly traded corporations, mutual funds, investment trusts, and investment retirement accounts; other savings, which include corporate bonds, rights in a trust or estate, the cash value of life insurance, and valuable collections; and total noncollateralized debt, which is negative. The first four components comprise real assets, and the last four comprise financial assets.

I construct measures of total wealth accumulation (1984-2009), active saving and each of its component parts. Following Juster, Lupton, Smith, & Stafford (2005), I create an active savings measure throughout the panel as discussed below. These active savings measures include active savings in the form of paying down the home mortgage balance and active savings via housing transactions.

The active saving measure is defined as:

- **Active saving** ≡ net inflows into the stock market + change in vehicle equity + change in value of bonds + net change in transaction account balances + net inflows to business + net inflows into real estate other than main home + decreases in noncollateralized debt + decreases in mortgage debt + home improvements + active savings via housing transactions.

- **Net worth** ≡ value of stocks + net value of vehicles + value of bonds + value of transaction accounts + net value of business assets + net value of real estate other than main home + home equity – noncollateralized debt.
- **Passive saving (capital gains)** ≡ change in the total value of stocks, businesses, and real estate minus the net amount a household puts into these assets between waves.

Further details of how I construct the active and passive savings measures are provided in the Data Appendix.

The median (mean) level of home equity (in real 2009 dollars) among parents who were homeowners when their children were between ages 13-17 was $37,350 ($101,723). Based on MSA-level house price data matched to PSID children, the average cumulative percent change in the city house price index between ages 13-17 in the sample is 14 percent. The average unanticipated cumulative 4-year percent change in the house price index during the years immediately preceding college age ranges from -15 percent to 8 percent. Table 1 provides a more detailed distribution of parental wealth and home equity levels and changes.

IV. Empirical Strategy.

The research design and empirical approach overcomes four primary challenges to credibly estimate the causal effects of parental housing wealth on children's post-secondary outcomes. First, home equity and parental housing wealth changes are likely to be endogenous in part because parents may choose to liquidate equity in their home to pay for college. Home values may also proxy for permanent income, which is likely to be positively correlated with unobserved academic ability. If higher-ability children are both more likely to attend selective colleges and have parents with greater (housing) wealth, then this could lead to a spurious correlation between parental housing wealth and college enrollment decisions and degree

attainment. I address this by using MSA-level housing price shocks during the four years prior to the student becoming college age as an instrument for parental home equity during ages 13-17. The model also controls for a rich set of family background characteristics that minimize potential omitted variables bias and mitigate concerns that parents of high-ability children sort into higher housing-price growth localities.

Second, housing prices may be correlated with local labor market demand conditions. Local home values may reflect current or future labor market opportunities, which may be correlated with college attendance decisions (e.g., if local high-skilled labor demand shocks increase local housing prices and the returns to college investment, then this could lead to upward bias). To address this concern, in the models reported below, I include controls for local labor market conditions and (county-level) unemployment rate.[2]

Third, changes in housing prices may be correlated with changes in local K-12 school quality (or other local amenities) that also influence college preparation of students upon reaching college age. I combat this issue by including renters (as a control group), who should not respond to housing wealth effects, and thus one can difference out the change in college enrollment decisions that may be due to unobserved changes in schools or local amenities capitalized into local housing values. The difference in impacts on outcomes between children whose parents were homeowners vs renters can be interpreted as a parental wealth effect that is purged of bias due to unobserved heterogeneity in local amenities.

Fourth, while self-reported data on housing values provide variation in wealth at the individual level, a drawback is they may possess significant mismeasurement. Measurement error issues may be exacerbated when analyzing changes in house values over time.

[2] In any case, the housing boom did not occur predominantly in high-income growth areas and prior evidence has demonstrated a negative correlation between mortgage credit growth and income growth (Mian and Sufi, 2009).

Furthermore, house prices may provide a poor measure of housing wealth since one may own an expensive home without having much home equity (and vice-versa). Similarly, the direct use of self-reported house price information may implicitly capture home improvements (and not accurately represent a "quality constant" index like the HPI), which may introduce another potential source of endogeneity. The instrumental variables approach taken in this paper largely circumvents these challenges. Additionally, it is reassuring that aggregate median and mean reported housing values in the PSID closely track the national FHFA housing price index (Lovenheim, 2011).

The study's research design exploits exogenous variation in house prices by location and over time period of 1980s, 1990s, and 2000s (a period that includes both the housing boom of the late 1990s-early 2000s and the housing bust of 2007-2009), and examines differential impacts by childhood stage-specific parental housing tenure choice and (non-housing) wealth. To identify the causal relationship between parental wealth and children's college enrollment and degree attainments, it is important that the regression model specification control for MSA fixed effects so that the estimated reduced-form relationship between house prices and post-secondary education outcomes is not confounded by time-invariant differences in the value placed on higher education (preferences) across MSAs. The main source of house price data for MSAs is the Federal Housing Finance Agency House Price Index (based on Case-Shiller Index). With the inclusion of MSA fixed effects and birth year fixed effects, the model's identifying variation is driven solely by differences in the geographic dispersion/timing and strength of the housing boom and bust, which captures both differences in within-city house price growth over time and between-city differences in a given year in the magnitude of recent house price growth or declines. The identification strategy thus compares college enrollment decisions and degree

attainment of students who grew up in the same MSA and possess the same observable family background characteristics but whose parents experienced different home equity growth/losses based on their children's geographic location and timing of when they became college age.

Additional Theoretical Considerations that Inform Modeling Approach. Parental savings behavior for their children's post-secondary education is an investment in future human capital. The nature of this investment is based not only on current income and wealth, but also on expectations about future housing equity, employment and earnings possibilities, and parental expectations of their children's likelihood of success in college. Brown, Scholz, & Seshadri (2009) present a theoretical model (and empirical patterns supportive of their model's predictions) that shows that parents tend to underinvest in their children's college education (as measured by the FAFSA expected family contribution) when there is uncertainty about their children's likelihood of success in college. Lack of social insurance can be a major deterrent to human capital investments (Lochner, 2011).

Under the assumption of no liquidity constraints (perfect credit markets), the optimal level of expenditures on children's schooling depends on the present value of the parents' income stream. Given those conditions, the timing of income would not matter since parents would be able to borrow against their future income to finance investments in their children's education. If instead low-income parents are liquidity constrained, then parents can no longer borrow from the future to finance the education of their children, and hence the timing of income does matter.

Allowing for the effect of parental wealth to vary by stage of childhood, I measure average parental wealth (and family income-to-needs ratio) during early childhood (0-4 years), early middle childhood (5-8 years), pre-adolescence (9-12 years), and adolescence (13-17 years). Family wealth and income in adolescence may have an effect on completed schooling because it

affects families' abilities to afford college expenses. If parents cannot smooth perfectly their income streams, then income during adolescence may be particularly important for post-secondary schooling. Parental wealth during adolescence (13-17 years old) may also be an important determinant of educational attainment.

The conceptual motivation of this paper is an investigation of the role of an increase/decrease in parent's house value (induced by MSA-level housing market shocks) as an exogenous shock to parental wealth. One conceptual issue concerns whether housing market shocks are perceived to be permanent or transitory. The permanent income hypothesis predicts that parents will alter human capital investments in their children in response to unanticipated changes in wealth. Assuming well-functioning capital markets, anticipated changes in wealth should already be factored into current parental investment decisions. If overall house price changes are comprised of an anticipated and an unanticipated component, then we should expect to find a differential parental response to the unanticipated component. Since anticipated changes in house prices may be less plausibly likely to be exogenous from a research design perspective, and because anticipated changes in house prices may not influence behavior in the same way unanticipated shocks do, I distinguish between anticipated and unanticipated changes in housing wealth. In a subset of the analyses, I estimate the impact of overall house price changes on college attendance decisions and in other analyses I estimate impacts of unanticipated housing price changes on these outcomes.

I utilize two approaches for the measurement of housing price shocks. The primary measure is constructed using deviations from the trend at the MSA level. In particular, following Rainer and Smith (2010), I compute year-by-year unanticipated housing price changes as the residuals from a logarithmic second-order auto-regression by using MSA-level house price index

house price data for 1980-2010 with the inclusion of both MSA- and year-specific fixed effects. I then calculate the cumulated residuals during a child's adolescent years (ages 13-17) to obtain for each child a MSA- and childhood stage-specific house price shock variable. This is used as a measure of cumulative unanticipated changes in house prices in the childhood years immediately preceding college age.

This approach to deriving unanticipated changes in house prices assumes that parents formulate expectations about future house price changes on the basis of the observed average housing price trend within their local area (MSA). While this is may not be a perfectly realistic depiction of the expectations formation process, it is likely that observed price changes over time within one's city are a salient feature that guides parental formation of expectations about house price changes. The effect of the housing price shock is allowed to vary with mortgage debt and parental income levels, and to be asymmetric with respect to the effect of positive and negative shocks. Since house price shocks are expected to have their most powerful effect on homeowners, I test for differential effects by parental housing tenure status.

I analyze a broad set of post-secondary outcomes including college attendance, type of institution (2-year vs 4-year), college quality/selectivity (based on SAT/ACT scores of admitted freshman class at college attended and college rankings), college completion (educational attainment), student's work hours (while enrolled), whether attended college in-state or out-of-state, the tuition at the college attended, and the amount of children's non-collaterized debt when young adults. In constructing a child-specific college tuition measure I account for whether in-state or out-of-state tuition applies to that child based on their childhood state of residence and tuition figure at age 19 (for most, the freshman year of college). The primary models estimated do not attempt to include information on financial aid received by each child. Future work will

incorporate this information in extensions of the models for the Transition to Adulthood (TA) subsample for which this information is available.

Model Specification. I estimate variants of the following 2SLS/IV model of post-secondary education outcomes:

$$CollegeOutcome_{ifct} = \beta_0 + \beta_1 Wealth_{fct_{13-17}} + \beta_2 Own_{fct_{13-17}} + \beta_3 X_{ifct} + \beta_4 Z_{ct} + \gamma_c + \delta_t + \varepsilon_{ifct}$$

$$Wealth_{fct_{13-17}} = \alpha_0 + \alpha_1 \Delta HPI_{ct_{13-17}} + \alpha_2 Own_{fct_{13-17}} + \alpha_3 (\Delta HPI * Own) + \alpha_5 X_{ifct} + \alpha_6 Z_{ct} + \theta_c + \varphi_t + u_{ifct}$$

where *i* indexes individuals, *f* indexes parental family, *c* indexes city of upbringing, *t* indexes year in which individual first became college age (age 18), ΔHPI represents the (unanticipated) 4-year change in the MSA-level house price index between ages 13-17 and is the instrument for parental housing wealth ($Wealth$). Own is an indicator for parental home ownership; X is a vector of childhood family characteristics (including parental income-to-needs ratio, parental education, mother's marital status at birth, gender, race/ethnicity, birth order, birth weight); Z is the local area unemployment rate; γ_c (θ_c) represent MSA fixed effects; δ_t (φ_t) are birth cohort year fixed effects; and u_{ifct} and ε_{ifct} are the error terms, respectively, of the first- and second-stage regressions. Standard errors are clustered at the MSA level to account for correlated errors within local areas, the strong geographic component of housing wealth, and for the multiple observations of individuals using the same measure of house-price change.

I specify changes in parental housing wealth in percentage terms (rather than dollar terms) because of the expectation that relative changes in housing wealth matter more than absolute changes. (Models that use dollars yielded similar qualitative patterns as reported here).

I also present reduced-form estimates of the effects of (unanticipated) 4-year changes in the MSA-level house price index between ages 13-17 on post-secondary education outcomes (conditional on the same set of control variables as shown above).

Robustness Checks. The results are not driven by endogenous sorting and cross-city migration (e.g., parents with high collegiate aspirations for their children selecting into high home price growth localities/areas). I find similar results when using MSA of birth instead of MSA based on residence during junior high/high school years (unsurprisingly, with some loss of precision).

Extensions. The CDS-TA sample contains information (based on surveys conducted in 1997, 2002, 2005, 2007) on parental, teacher, and child reports of expectations (and aspirations) of educational attainment (e.g., how likely did they expect child to attend college and of what quality; expectations of highest degree likely to earn) while the child was still in elementary, middle, or high school. While most students begin college with the intent of graduating, the percent of college dropouts is alarmingly high. It has been estimated that about 35 percent of students who enter college drop out during the first year; only 63 percent of students who enroll in a four-year university earn a degree, and it takes them an average of six years to do so; and, nationally, four-year colleges graduated an average of only 53 percent of entering students within six years. An increasingly reported explanation for this trend, as documented in recent survey evidence, is that "most dropouts leave college because they have trouble going to school while working to support themselves" (Lewin, 2009 (report published by Gates Foundation)).

I examine the relationship between educational expectations/aspirations and actual educational attainment outcomes and probe whether parental economic resources played a role when high educational expectations for college completion (reported by parents, teachers, and

the children themselves) were not realized by children in their actual educational attainments. With measures of their high school grades, high school course curriculum (math, science, AP, and vocational courses taken; whether on college-preparatory track), own SAT/ACT scores in their senior year of high school, I can assess (control for) the level of their academic preparation to succeed in college. I compare (parental, teacher, and children) educational expectations of college completion and children's actual realizations of collegiate degrees, and examine both systematic relatedness and deviations between them.

V. Results.

The results indicate that shocks to parental wealth during adolescence influence children's post-secondary schooling decisions. The findings demonstrate that the timing of parental wealth is important, with adolescence among the critical developmental stages for schooling outcomes. Moreover, the combined effects of parental wealth and income are stronger than the income effects alone, on educational attainment. The results are robust to a wide variety of empirical specifications and estimates across subsamples.

The findings suggest that parental wealth changes induced by city-level housing price shocks significantly affect children's higher education decisions, and that these effects are asymmetric with respect to housing wealth increases versus losses. If I find that children's college outcomes among those whose parents are renters vs homeowners respond similarly to house price shocks, this would suggest that the relationship I detect between MSA-level housing price changes and children's post-secondary enrollment decisions is spurious.[3] Instead, I find parental housing wealth effects for homeowners and none for renters, which suggests that the

[3] Or, in the case of renters who are saving up to buy a home, the estimated effect of local changes in house prices on children's college enrollment decisions among the children of renters should be in the opposite direction of the response of the children of homeowners.

findings are not driven by a failure to control for unobserved changes in local amenities. Thus, the model provides a useful specification check and the results pass this falsification test.

The results indicate that a standard deviation (unanticipated) increase in the four-year change of the MSA house price index (between ages 13-17) leads to between a $10,000-$14,200 and $54,000-$54,600 increase in average parental home equity and wealth, respectively, in the years immediately preceding their child reaching college age. The findings indicate that the magnitude of this housing price-induced shock to parental wealth (during ages 13-17) results in between a 3.9-6.4 percentage-point increase in the probability of college attendance and between a 0.12-0.21 increase in subsequent years of completed education. Among those who attended college, the magnitude of this housing price-induced shock to parental wealth (during ages 13-17) results in a 9 percentage-point reduction in the probability of attending a community college (even among those whose parents had 4-year college expectations for their child), a 15 percentage-point decrease in the probability of attending an in-state college, a $1,700 increase in college tuition, a 6 percentage-point reduction in the proportion of students receiving federal/state grants at the college they attended, and about a 10-12 point increase in both the 25^{th} and 75^{th} percentiles of SAT math and verbal scores of colleges' admitted freshman class.

The estimated aggregate house price shock effect is consistent with both positive house price shocks increasing the probability of college attendance, quality, and completion, and negative shocks decreasing these probabilities. To test whether the effects of positive and negative housing price surprises are asymmetric, I decompose the aggregate house price shock variable according to its sign. There is some evidence that suggests the impacts of housing booms and busts on these post-secondary outcomes are asymmetric, with larger educational impacts experienced for housing market downturns. Estimates suggest that the aggregate house

price shock effect on community college enrollment and in-state college decision outcomes are mainly driven by negative house price shocks, which significantly increase their respective probabilities. I find a shift in enrollment from four-year to two-year colleges for children whose parents experienced wealth losses induced by housing bust in years immediately leading up to college age. For example, among those who attended college, a one standard deviation decrease in the four-year change of the MSA house price index (between ages 13-17) is associated with a 29.7 percentage-point increase in the likelihood of initially attending a community college, with insignificant impacts on this outcome for comparably-sized increases in the MSA house price index. Positive house price shocks have the expected sign for a subset of children's college-related outcomes, but are not precisely estimated. Due to a lack of precision in some of these coefficient estimates, it is safe to interpret the results as suggestive that both positive and negative house price shocks have effects on educational attainment and college quality.

These average post-secondary education effects of housing price shocks are all concentrated among children whose parents are homeowners with no estimated impacts on renters (as expected). Furthermore, the results indicate there are no significant effects of MSA house price changes (ages 13-17) on children's academic achievement during high school; rather, the MSA house price shocks are shown to impact only postsecondary education outcomes.

The 2SLS/IV estimates indicate that a $10,000 increase in parental housing equity during ages 13-17 results in a 2.6 percentage-point increase in the probability of college attendance (by age 20) and a 0.08 significant increase in the years of completed education; and among those who attended college, a $10,000 increase in parental housing equity results in a 2.7 percentage-point decrease in the probability of attending an in-state college, a one-percentage point reduction in the probability of initially attending a community college, and increases in both

college tuition and markers of college quality/selectivity. In light of the fact that the average 4-year home price change was $80,000 during the boom and home prices have fallen by one-third since their peak in 2006, these effects translate into sizable impacts on both the extensive and intensive margin of postsecondary education outcomes and dimensions of college quality/selectivity.

The destabilizing effect of negative house price shocks on parental wealth accumulation and children's subsequent higher education outcomes is particularly pronounced for children from families with low income and high mortgage debt in the years immediately preceding college age. In addition to these asymmetries, there is considerable heterogeneity in the post-secondary educational response of children to changes in parental wealth induced by negative and positive housing shocks. All children are not equally affected by housing market fluctuations (boom and bust), and the negative educational impacts are concentrated among the children of lower-income and black parents. The severity of the impact varies by the age of the child at the time the change in parental (housing) wealth, induced by MSA housing market shock, occurred. Educational outcomes of children whose parents are homeowners with relatively low income, high household debt, and/or low levels of housing equity, are especially vulnerable to the destabilizing effects of negative house price surprises, particularly when it occurs leading up to college age.

The final set of analyses address the question: Can parental wealth (measured at age 12) cushion the impact of unanticipated MSA housing shocks during ages 13-17 on child educational outcomes? The results indicate that higher initial parental housing equity measured at age 12 acts to cushion the impact of unanticipated housing market shocks during ages 13-17 on children's subsequent postsecondary education outcomes. The results suggest that binding credit

constraints affect the intensive margin of college enrollment. The findings indicate that the housing market downturn that accompanied the Great Recession led to a reduction in the quality of colleges attended by students, particularly those from lower-income families.

The paper's findings contribute to the literature on the role of credit constraints and imperfect credit markets in influencing post-secondary education outcomes. The study also serves to highlight the importance of examination of housing markets in empirical analyses of how economic conditions affect educational outcomes. Credit constraints are becoming increasingly important for explaining teenagers' college attendance decisions (including if/when/where) (Belley & Lochner, 2007); they are more important in the 2000s than in the early 1980s. The evidence presented, however, cannot sort out to what extent credit constraints are binding on some potential college students, nor can the results distinguish between effects emanating from liquidity constraints as opposed to subsidy effects. From a policy perspective, it is critical to know the extent to which results reflect the effects of liquidity constraints as opposed to subsidy effects. If evidence supports presence of significant credit constraints, then aid policy improves both efficiency and equity; if not, then aid can be argued on equity grounds only. In the latter case, aid policy may be inefficient because aid is inducing students with low expectations of success to attend college to enroll.

VI. Conclusion.

Speculation about the potential adverse consequences of changes in house prices feature prominently in recent policy debates, the popular press, and research amid the turbulent aftermath of the housing market bust of 2007. The ripple & multiplier effects of the housing foreclosure crisis**,** historic record wealth losses with twin financial disasters of the housing market and the stock market crash, continue to be felt.

Blacks have lost more wealth due to the real estate & foreclosure crisis than any single event in recent history (due primarily to subprime loans). Home ownership accounts for more than 80% of wealth for the average US household. In California, one-eighth of all residences are in foreclosure; black and Latina households make up more than ½ of this figure and have foreclosure rates that are two times that of non-Hispanic white families. Recessions exact the biggest price on the most vulnerable families; recessions tend to increase inequality because low-income workers are concentrated in the boom-and-bust industries and in housing markets that exhibit greater volatility. Unlike the 2001 recession and the one in the early 1990s, the most recent recession caused much more by housing market collapse and job loss among the less educated than among college graduates.

Recap & Directions for Future Research. The main contribution of this study is to quantify the effect of changes in parental wealth, induced by house price shocks during years immediately preceding child high school graduation, on both the quantity and quality of children's (subsequent) educational attainment. The research design exploited the timing and geographic dispersion of housing boom and bust to generate exogenous household housing wealth variation to facilitate causal inference. The results of this paper provide clear empirical

support for the hypothesis that housing price-induced shocks to parental wealth impact children's college choice/quality and degree attainments.

These impacts portend important economic effects down the road in light of growing research evidence that documents large labor market returns (20-25%) to attending an elite public or private university (Brewer, Eide and Ehrenberg, 1999), greater returns to attending a college with higher tuition (Dale and Krueger, 2002), and, on the other hand, evidence of negative labor market and educational attainment effects of beginning at a two-year college (Reynolds, 2010; Rouse, 1995). Projecting the future consequences of these impacts and those of related studies suggests that children *entering* high school years (leading up to college age) during a recession will earn less than those entering in non-recessionary environments. The findings indicate that the parental wealth shocks have intergenerational consequences; and because of their impact on children's post-secondary enrollment decisions, lifetime earnings and occupational paths are may be affected as well.

These findings also suggest several fertile directions for future inquiry and research. Many yet unanswered questions remain. A key question is whether the pattern of results is consistent with a significant role of credit constraints on college enrollment and degree attainment. An answer to this question would not only enhance our understanding of the determinants of the parental SES gap in college-going and college completion rates, but is also policy relevant and informs debates about the optimal structure of financial aid policy with potential efficiency and equity implications. For example, are low-income individuals less (or more) sensitive to price (schooling costs) than are high-income individuals? What proportion of low versus high income groups are near the margin of college attendance?

What Can Policies Do? Causes, Consequences, Policy Responses

One policy aim could be to devise ways to reduce the variance of the distribution of unexpected changes in house prices to mitigate socioeconomic effects of boom-bust cycles in housing prices. This could help to reduce the degree to which parents are affected by money lost on their homes.

Rethinking student loan/financial aid policies

Higher Education Trust Funds. As aforementioned, in many states, substantial tuition increases occur only during recessions. Rather than gradually increasing, tuition spikes occur precisely when families have a difficult time adjusting plans. To smooth funding, states could create dedicated trust funds. The funds would build up during economic booms and then be drawn down during recessions.

Better Targeted Aid. Researchers have long been concerned that state appropriations for higher education are not well-targeted. California has created program for low-income students with good grades. They receive grant covering full tuition and required fees at public universities. During the next recovery, states should consider creating a similar entitlement for needy students. More attention needs to be given to the distributional effect of a given aid program. It is likely that the effect of educational subsidies is not homogeneous across the population. What about heterogeneity across income groups?

In sum, the findings demonstrate that college attendance is sensitive to housing market fluctuations; attendance decisions of lower- and middle-income students are most affected; and suggest that policies are needed to insulate the training of high-skilled labor from impacts of economic downturns and housing price volatility.

Data Appendix: PSID Wealth Measures

In each PSID wealth module since 1989, respondents were asked about their active saving over the previous 5 years, defined as the net purchase of assets. These questions were specific to components of wealth where capital gains are most relevant, including net investment in real estate other than the main home, farm or business, and corporate equities. Active saving in housing is computed on an annual basis, as it depends on the specific homeownership patterns of the family.

For families living in the same house between two consecutive years, active saving over that year is the change in the mortgage principal plus investments in home improvement if they owned a home, and 0 otherwise. For households moving between two consecutive years, active saving is the change in home equity. The initial equity for those that moved from renting to owning is set to 0. Active saving in housing over a 5-year period is the sum of active saving in each year. Finally, active saving in the remaining wealth components is the 5-year difference in reported values.

Capital gains in real estate, farm or business, corporate equities, and the main home are computed using the self-reported asset values and active saving. An asset can change in value for two reasons: either some of it is sold or purchased (active saving), or the price of the asset changes (capital gains or passive saving). As a result, the capital gain in an asset between any two points in time is, by definition, the change in its value less the active saving in that asset.

The decomposition of changes in wealth into active saving and capital gains (passive saving) is complicated by transfers into the household's wealth portfolio that are not covered by the assets reported in the survey. These transfers include inheritances and gifts from family and friends, as well as the effect of changes in family composition (for example, a new spouse that owns a preexisting automobile or checking account). For example, if a household receives an inheritance in the form of stocks, it may not get reported as active saving because an actual purchase was not made, and would incorrectly be treated as a capital gain. Because the form of an inheritance or gift is unknown, it is not possible to distinguish an inheritance of stocks from a capital gain in stocks. However, questions were asked in the PSID wealth modules about the value of inheritances received and the net transfers due to gifts from family or friends and changes in family composition. These values are used as controls in our modeling.

The liquidation of a pension can also cause the survey measure of wealth to change. Because defined contribution pensions are not included in the PSID's measure of wealth, a household that liquidates a pension will incorrectly show an increase in wealth as the resources get channeled to the assets that are measured, albeit reduced by any amount consumed. As with inheritances, the value of the assets removed from pension accounts was reported in the 1989 and 1994 survey. Our modeling of household saving below also controls for this type of transfer.

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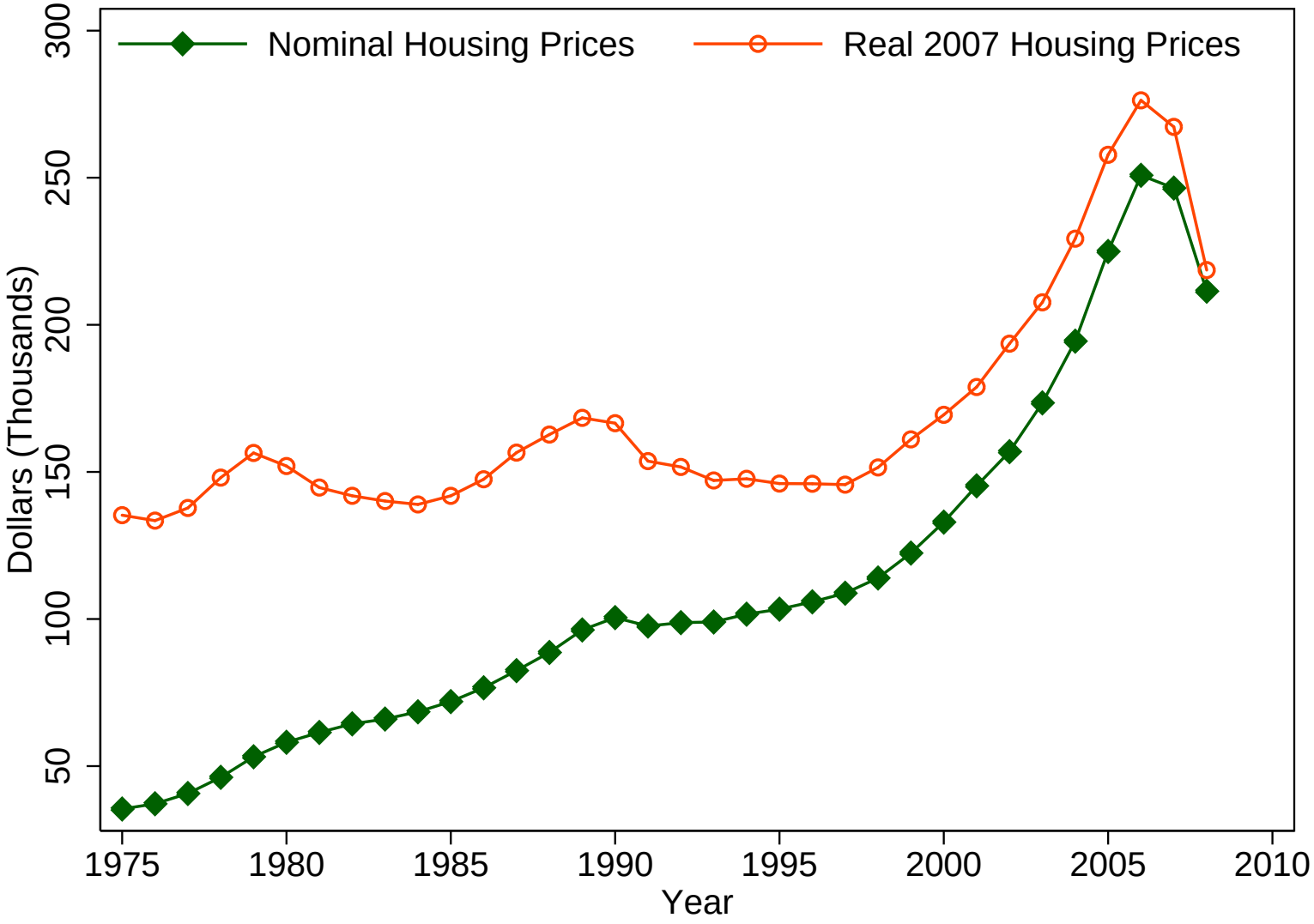
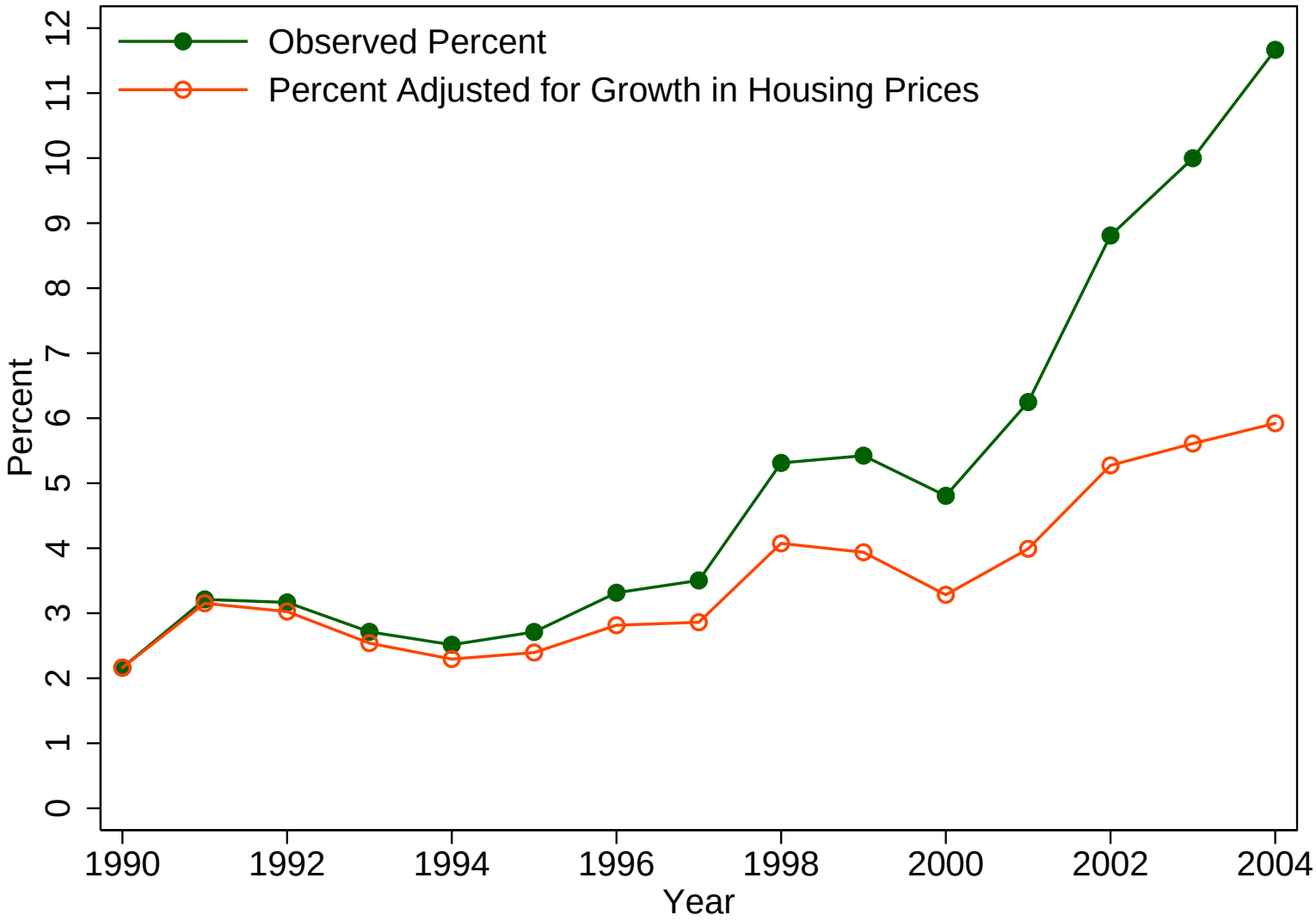
Trends in National Housing Prices



Source: Lovenheim (2011)

Trends in Equity Extraction as a Percent of Real Income



Source: Lovenheim (2011)

Resource Differences Across School Types

	Non-flagship Public	Flagship Public	Private Four-year	Two Year
25^{th} Percentile Math SAT	455.31	525.14	494.66	
75^{th} Percentile Math SAT	569.52	640.72	607.52	
Fac.-Stu. Ratio	0.041	0.063	0.045	0.020
Expend./ Student	18337	41350	25482	7698
Instruc. Expend./ Student	5649	10188	8434	2796
Graduation Rate	0.461	0.674	0.560	
In-state Tuition	4536	5746	18161	2805
Out-of-state Tuition	12072	16176	18170	6017

Source: Lovenheim (2011)

Table 1. First-Stage Model Estimates of MSA House Price Changes on Parental Wealth & Home Equity during ages 13-17

	Dependent variable:			
	Parental Home Equity, avg during ages 13-17		Parental Wealth, avg during ages 13-17	
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)
Percent change in MSA HPI b/w ages 13-17	1.4203**		1.4626**	
	(0.5966)		(0.5828)	
Unanticipated change in MSA HPI b/w ages 13-17		1.0006*		1.3931**
		(0.5929)		(0.6943)
		0.0619		0.0370
p-value of excluded instruments	0.0493	(0.0074)	0.0157	(0.0046)
MSA Fixed Effects?	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes
Number of Children	2,875	3,215	2,875	3,215
Number of MSAs	84	85	84	85

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Note: The analysis sample includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Home equity (& wealth) variables are in real 2009 $10,000 ($50,000), adjusted using the CPI. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 2. Reduced-Form Model Estimates of MSA House Price Changes (ages 13-17) on Children's Post-Secondary Educational Attainment

	Dependent variable:				
	Years of Completed Education			Prob(Attended College), (Linear Prob Model)	
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)
Percent change in MSA HPI b/w ages 13-17	0.1174*				
	(0.0610)				
Unanticipated change in MSA HPI b/w ages 13-17		0.2119***	0.1163**	0.0643***	0.0389+
		(0.0670)	(0.0539)	(0.0214)	(0.0242)
Census Division Fixed Effects?	--	yes	--	yes	--
MSA Fixed Effects?	yes	no	yes	no	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes
Number of Children	1,778	1,778	1,778	1,778	1,778
Number of MSAs	80	80	80	80	80

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis sample includes PSID children born in the 1980s & 90s who have been followed until at least age 19. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 3. Reduced-Form Model Estimates of MSA House Price Changes (ages 13-17) on Children's College Decisions & Tuition Costs

	Dependent variable:							
	Prob(Attend In-StateCollege)		College Tuition		%Students Receive Fed Grant @ College		%Students Receive State Grant @ College	
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Percent change in MSA HPI b/w ages 13-17	-0.1488**		1,738.9559**		-6.0723***		-7.8349***	
	(0.0597)		(735.1275)		(1.7104)		(1.6978)	
Unanticipated change in MSA HPI b/w ages 13-17		-0.1454***		1,687.9077***		-5.2612***		-6.6283***
		(0.0536)		(629.8703)		(1.5356)		(1.5717)
State Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes	yes	yes
Number of Children	389	389	373	373	415	415	415	415
Number of MSAs	77	77	77	77	77	77	77	77

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Note: The analysis sample is restricted to those who attended college & includes PSID children born in the 1980s & 90s who have been followed until at least age 19. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 4. Reduced-Form Model Estimates of MSA House Price Changes (ages 13-17) on Children's College Quality/Selectivity

	Dependent variable:											
	ACT Score 75th %tile @ College Selected		ACT Score 25th %tile @ College Selected		SAT Math 75th %tile @ College Selected		SAT Math 25th %tile @ College Selected		SAT Verbal 75th %tile @ College Selected		SAT Verbal 25th %tile @ College Selected	
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Percent change in MSA HPI b/w ages 13-17	0.7279**		0.5912+		12.4604*		10.1274+		11.0388*		12.1405*	
	(0.3017)		(0.3663)		(6.7162)		(7.5973)		(5.8013)		(6.5970)	
Unanticipated change in MSA HPI b/w ages 13-17		0.6963**		0.5757*		10.7519*		9.4319+		10.1197*		11.5971*
		(0.2782)		(0.3241)		(6.0837)		(6.9348)		(5.3019)		(5.9400)
State Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of Children	254	254	254	254	249	249	250	250	249	249	250	250
Number of MSAs	60	60	60	60	60	60	60	60	60	60	60	60

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis sample is restricted to those who attended college & includes PSID children born in the 1980s & 90s who have been followed until at least age 19. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 5. Reduced-Form Model Estimates of MSA House Price Changes (ages 13-17) on Children's College Type

	Dependent variable:				
	Prob(Attend 2-Yr College)			**Prob(College Choice has Low Admit Req)**	
			among parents w/4-yr college expectations		
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)
Percent change in MSA HPI b/w ages 13-17	-0.0753*			-0.0977***	
	(0.0431)			(0.0332)	
Unanticipated change in MSA HPI b/w ages 13-17		-0.0893**	-0.0914+		-0.0892***
		(0.0404)	(0.0602)		(0.0311)
State Fixed Effects?	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes
Number of Children	423	423	181	357	357

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

who have been followed until at least age 19. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative

Table 6a. MSA House Price Changes (ages 13-17) & Children's Postsecondary Outcomes: Are Impacts of Booms & Busts Symmetric?

	Dependent variable:					
MSA House Price Shock Variables:	Years of Completed Education (1)	Prob(Attend College) (2)	College Tuition (3)	Prob(Attend In-StateCollege) (4)	Prob(Attend 2-Yr College) (5)	%Students Receive Fed Grant @ College (6)
Percent **Increase** in MSA HPI b/w ages 13-17	0.1631**	0.0578**	1,456.7582+	-0.1170*	-0.0138	-5.7739***
	(0.0726)	(0.0253)	(898.0085)	(0.0598)	(0.0534)	(2.0310)
Percent **Decrease** in MSA HPI b/w ages 13-17	-0.9287**	-0.1541	-6,105.2789	0.8239*	1.4476***	12.4818
	(0.4617)	(0.1483)	(6,905.9692)	(0.4734)	(0.5187)	(14.3087)
State Fixed Effects?	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes
Number of Children	1,778	1,778	405	389	423	415

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (3)-(6) restricts sample to those who attended college The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 6b. MSA House Price Changes (ages 13-17) & Children's Postsecondary Outcomes: Are Impacts of Booms & Busts Symmetric?

	Dependent variable:					
MSA House Price Shock Variables:	Years of Completed Education (1)	Prob(Attend College) (2)	College Tuition (3)	Prob(Attend In-StateCollege) (4)	Prob(Attend 2-Yr College) (5)	%Students Receive Fed Grant @ College (6)
Unexpected Percent **Increase** in MSA HPI b/w ages 13-17	0.2712*	0.0781+	1,640.4062*	-0.1453*	-0.0186	-7.2077***
	(0.1381)	(0.0479)	(973.5784)	(0.0816)	(0.0591)	(2.4098)
Unexpected Percent **Decrease** in MSA HPI b/w ages 13-17	-0.0914	-0.0236	-1,620.7667	0.1458	0.2973*	-0.3788
	(0.1580)	(0.0514)	(1,745.5353)	(0.2028)	(0.1583)	(3.2799)
State Fixed Effects?	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes
Number of Children	1,778	1,778	405	389	423	415

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Note: The analysis includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (3)-(6) restricts sample to those who attended college The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 7. MSA House Price Changes (ages 13-17) & Children's Postsecondary Outcomes: Differential Impacts for Homeowners vs Renters

	Dependent variable:									
	Years of Completed Education		Prob(Attend College)		College Tuition		Prob(Attend In-StateCollege)		Prob(Attend 2-Yr College)	
	Renters	HomeOwner	Renters	HomeOwner	Renters	HomeOwner	Renters	HomeOwner	Renters	HomeOwner
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unanticipated change in MSA HPI b/w ages 13-17	-0.1456	0.2099**	-0.0146	0.0438+	78.8027	1,897.7070***	-0.0012	-0.1747**	-0.0895	-0.0761*
	(0.1317)	(0.0873)	(0.0483)	(0.0336)	(1,222.3399)	(697.3996)	(0.1420)	(0.0747)	(0.1706)	(0.0392)
State Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis sample includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (5)-(10) restrict sample to those who attended college. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 7b. Reduced-Form Model Estimates of MSA House Price Changes (ages 13-17) on Children's Post-Secondary Educational Attainment by Parent Income, among Homeowners

	Dependent variable:					
	Years of Completed Education			Prob(Attended College), (Linear Prob Model)		
	<$40,000	[$40-85K]	>$85K	<$40,000	[$40-85K]	>$85K
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)	(6)
Unanticipated change in MSA HPI b/w ages 13-17	0.4582***	0.1016	0.0288	0.1340***	0.0176	0.0202
	(0.1495)	(0.0891)	(0.0908)	(0.0434)	(0.0324)	(0.0379)
Census Division Fixed Effects?	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes
Number of Children	301	514	304	301	514	304
Number of MSAs	48	61	55	48	61	55

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis sample includes PSID children born in the 1980s & 90s who have been followed until at least age 19. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 8. MSA House Price Changes (ages 13-17) & Children's Postsecondary Outcomes: Can Parental Wealth Cushion the Impacts of Unanticipated Housing Price Shocks?

	Dependent variable:			
MSA House Price Shock Variables:	Years of Completed Education (1)	Prob(Attend College) (2)	Prob(Attend In-StateCollege) (3)	College Tuition (4)
Unanticipated change in MSA HPI b/w ages 13-17	0.1105	0.0581+	-0.3242*	4,092.8949+
	(0.1317)	(0.0400)	(0.1608)	(2,782.2982)
Unanticipated change in MSA $HPI_{age13-17}$ *Parental Home Equity $Wealth_{age12}$	-0.0177*	-0.0061**	0.0702**	-773.0045+
	(0.0098)	(0.0027)	(0.0282)	(496.1094)
State Fixed Effects?	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis sample includes PSID children born in the 1980s & 90s who have been followed until at least age 19. All models include main effects for parental home equity wealth measured at age 12 (expressed in real 2009 $10,000 adjusted using the CPI, where this variable is centered around its sample mean). Columns (3)-(4) restrict sample to those who attended college. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 9. Falsification Tests to Demonstrate No Effects of MSA House Price Changes (ages 13-17) on Children's Academic Achievement during High School: MSA House Price Shocks only impact postsecondary education outcomes

	Dependent variable:							
	Child's HS GPA		Child's ACT Score		Child's SAT Math Score		Child's SAT Verbal Score	
MSA House Price Shock Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Percent change in MSA HPI b/w ages 13-17	0.0333		0.3830		14.3321		11.0178	
	(0.0561)		(1.1600)		(16.8614)		(10.6815)	
Unanticipated change in MSA HPI b/w ages 13-17		0.0305		0.4842		12.0131		2.7656
		(0.0560)		(1.1274)		(17.4175)		(12.1776)
State Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Note: The analysis sample includes PSID-TA children born in the 1980s & 90s who have been followed until at least age 19. The MSA House Price Shock variables have been converted to std deviation units. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates.

Table 10. 2SLS/IV Estimates of the Impacts of Parental Housing Equity (ages 13-17) on Children's Postsecondary Outcomes

	Dependent variable (Second-Stage):						
	Years of Completed Education (1)	Prob(Attend College) (2)	Prob(Attend In-StateCollege) (3)	College Tuition (4)	Prob(Attend 2-Yr College) (5)	%Students Receive Fed Grant @ College (6)	Prob(College Choice has Low Admit Req) (7)
Parental Housing Equity, avg during ages 13-17	0.0767**	0.0256*	-0.0268*	287.4747**	-0.0129+	-0.9776**	-0.0185**
	(0.0388)	(0.0149)	(0.0137)	(140.8213)	(0.0085)	(0.4130)	(0.0079)
MSA Fixed Effects?	yes	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (3)-(7) restricts sample to those who attended college. Home equity is expressed in real 2009 $10,000, adjusted using the CPI. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates. The instrumental variable is the unanticipated 4-year change in the MSA house price index between ages 13-17.

Table 11. 2SLS/IV Estimates of the Impacts of Parental Wealth (ages 13-17) on Children's Postsecondary Outcomes

	Dependent variable (Second-Stage):						
	Years of Completed Education (1)	Prob(Attend College) (2)	Prob(Attend In-StateCollege) (3)	College Tuition (4)	Prob(Attend 2-Yr College) (5)	%Students Receive Fed Grant @ College (6)	Prob(College Choice has Low Admit Req) (7)
Parental Wealth, avg during ages 13-17	0.0649*	0.0217+	-0.0165**	172.8045**	-0.0081*	-0.6070**	-0.7447***
	(0.0382)	(0.0156)	(0.0077)	(79.8605)	(0.0047)	(0.2659)	(0.2843)
MSA Fixed Effects?	yes	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (3)-(7) restricts sample to those who attended college Parental wealth is expressed in real 2009 $50,000, adjusted using the CPI. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates. The instrumental variable is the unanticipated 4-year change in the MSA house price index between ages 13-17.

Table 12. 2SLS/IV Estimates of the Impacts of Parental Housing Equity (ages 13-17) on Children's College Quality/Selectivity

	Dependent variable (Second-Stage):					
	ACT Score 75th %tile @ College Selected	ACT Score 25th %tile @ College Selected	SAT Math 75th %tile @ College Selected	SAT Math 25th %tile @ College Selected	SAT Read 75th %tile @ College Selected	SAT Read 25th %tile @ College Selected
	(1)	(2)	(3)	(4)	(5)	(6)
Parental Housing Equity, avg during ages 13-17	0.1165**	0.0963*	1.5413+	1.3530	1.4506*	1.6635*
	(0.0511)	(0.0517)	(0.9755)	(1.0576)	(0.8186)	(0.9487)
MSA Fixed Effects?	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (3)-(6) restricts sample to those who attended college Home equity is expressed in real 2009 $10,000, adjusted using the CPI. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates. The instrumental variable is the unanticipated 4-year change in the MSA house price index between ages 13-17.

Table 13. 2SLS/IV Estimates of the Impacts of Parental Wealth (ages 13-17) on Children's College Quality/Selectivity

	Dependent variable (Second-Stage):					
	ACT Score 75th %tile @ College Selected	ACT Score 25th %tile @ College Selected	SAT Math 75th %tile @ College Selected	SAT Math 25th %tile @ College Selected	SAT Read 75th %tile @ College Selected	SAT Read 25th %tile @ College Selected
	(1)	(2)	(3)	(4)	(5)	(6)
Parental Wealth, avg during ages 13-17	0.0634**	0.0524+	0.8547+	0.7499	0.8044*	0.9220*
	(0.0318)	(0.0357)	(0.5563)	(0.5892)	(0.4602)	(0.5428)
MSA Fixed Effects?	yes	yes	yes	yes	yes	yes
Year of birth Fixed Effects?	yes	yes	yes	yes	yes	yes
Family background controls?	yes	yes	yes	yes	yes	yes
Local Unemployment rate controls?	yes	yes	yes	yes	yes	yes

Robust standard errors (clustered on MSA) in parentheses

*** p<0.01, ** p<0.05, * p<0.10; + p<0.10 (one-tailed test)

Note: The analysis includes PSID children born in the 1980s & 90s who have been followed until at least age 19. Columns (3)-(6) restricts sample to those who attended college. Parental wealth is expressed in real 2009 $50,000, adjusted using the CPI. The regressions are weighted by family weights in the PSID to produce nationally-representative estimates. The instrumental variable is the unanticipated 4-year change in the MSA house price index between ages 13-17.