American Economic Review 101 (August 2011): 2132–2156
http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.5.2132

House Prices, Home Equity–Based Borrowing, and the US Household Leverage Crisis[†]

By Atif Mian and Amir Sufi*

US household leverage sharply increased in the years preceding the 2007 economic recession. The top panel of Figure 1 shows the steady rise in household debt since 1975, which accelerated beginning in 2002. In just five years, the household sector doubled its debt balance. In comparison, the contemporaneous increase in corporate debt was modest. The middle panel shows that the increase in household debt from 2002 to 2007 translated into a striking rise in household leverage as measured by the debt-to-income ratio. During the same time period, corporate leverage declined. The dramatic absolute and relative rise in US household leverage from 2002 to 2007 is unprecedented compared to the last 25 years.

One reason for the rapid expansion in household leverage during this period is that mortgage credit became more easily available to new home buyers (Mian and Sufi 2009). Strong house price appreciation from 2002 to 2006, however, which may have been fueled by the availability of mortgage credit to a riskier set of new home buyers, could also have had an important feedback effect on household leverage through *existing homeowners*. Given that 65 percent of US households already owned their primary residence before the acceleration in house prices, the feedback from house prices to borrowing may be an important source of the rapid rise in household leverage that preceded the economic downturn.

Our central goals in this study are to estimate how homeowner borrowing responded to the increase in house prices and to identify which homeowners responded most aggressively. We examine this *home equity–based borrowing channel* using a dataset consisting of anonymous individual credit files of a national consumer credit bureau agency. We follow a random sample of over 74,000 US homeowners (who owned their homes as of 1997) at an annual frequency from the end of 1997 until the end of 2008.

The bottom panel of Figure 1 plots the growth in debt of 1997 homeowners over time and shows that existing homeowners borrow significantly more debt as their house prices appreciate from 2002 to 2006. While the aggregate trend is suggestive

* Mian: Haas School of Business, University of California, Berkeley, S545 Student Services Building, Berkeley, CA 94720-1900 (e-mail: atif@haas.berkeley.edu); Sufi: University of Chicago Booth School of Business, 5807 South Woodlawn Avenue, Chicago, IL 60615 (e-mail: amir.sufi@chicagobooth.edu). We thank Neil Bhutta, Erik Hurst, Andreas Lehnert, Sydney Ludvigson, Jeremy Stein, Francesco Trebbi, Robert Vishny, and seminar participants at Boston College, the University of British Columbia, the University of California, Berkeley, the University of Chicago, Harvard Business School, Duke University, Princeton University, New York University, Wharton, London Business School, the London School of Economics, Stanford University, and the NBER Monetary Economics, Risk and Financial Institutions, and Aggregate Implications of Microeconomic Behavior sessions for comments. We are grateful to the National Science Foundation and the Initiative on Global Markets at the University of Chicago Booth School of Business for funding.

[†] To view additional materials, visit the article page at http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.5.2132.

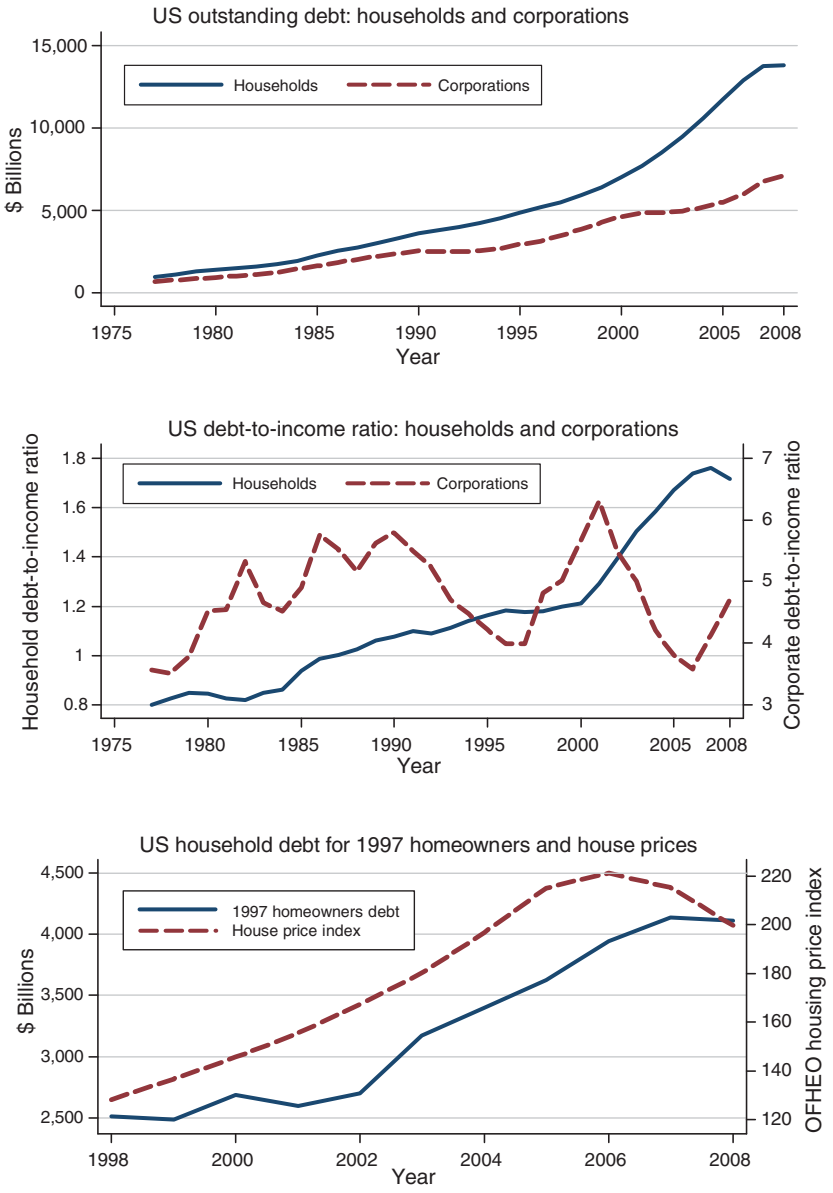

FIGURE 1. AGGREGATE US LEVERAGE AND HOUSE PRICE PATTERNS

Notes: This figure presents aggregate US leverage and house price patterns. Aggregate debt information comes from the Federal Reserve flow of funds data, aggregate income comes from National Income and Product Accounts (NIPA), and aggregate house price index data come from Office of Federal Housing Enterprise Oversight (OFHEO). In the bottom right panel, aggregate debt for 1997 homeowners comes from Equifax data where homeowners are defined to be individuals who have either an existing mortgage account with positive balance as of 1997 or a previous mortgage account.

of a link, changes in house prices and homeowner borrowing may be jointly determined by an omitted variable such as a shock to expected income growth (Orazio P. Attanasio and Guglielmo Weber 1994; John Muellbauer and Anthony Murphy 1997). As a result, proper identification of the effect of house prices on borrowing requires an exogenous source of variation in house price growth.

We use two different instruments for house price growth, one based on across–metropolitan statistical area (MSA) variation and another based on within-MSA variation. The across-MSA specification uses housing supply elasticity at the MSA level as an instrument for house prices. MSAs with elastic housing supply should experience only modest increase in house prices in response to large shifts in the demand for housing because housing supply can be expanded relatively easily. In contrast, inelastic housing supply MSAs should experience large house price changes in response to the same housing demand shock (Edward Glaeser, Joseph Gyourko, and Albert Saiz 2008).

We confirm this relationship in our data using the land topology–based measure of housing supply elasticity introduced by Saiz (2010) as an instrument. The across-MSA instrumental variables estimate suggests an elasticity of borrowing with respect to increased home equity of 0.52, or borrowing of 25 cents for every dollar gain in home equity from 2002 to 2006.[1] Our within-MSA estimates using the fraction of subprime borrowers in a zip code interacted with MSA elasticity as an instrument for house price growth reveals similar estimates.

The home equity–based borrowing channel is not uniform across households. Homeowners with high credit card utilization rates and low initial credit scores have the strongest tendency to borrow against an increase in home equity. In fact, we find no effect of house prices on borrowing for homeowners in the top quartile of credit score distribution. These results suggest the presence of credit constraints at the household level under the assumption that low credit scores and high credit card utilization rates proxy for borrowing difficulty. However, these same characteristics may also proxy for individuals with self-control problems.[2] Finally, contrary to predictions of a standard life cycle–based borrowing model, we find that the home equity–based borrowing channel is stronger for younger homeowners.

The real effects of the home equity–based borrowing channel depend on what households do with the borrowed money. We find no evidence that borrowing in response to increased house prices is used to purchase new homes or investment properties. In fact, home equity–based borrowing is not used to pay down expensive credit card balances, even for households with a heavy dependence on credit card borrowing. Given the high cost of keeping credit card balances, this result suggests a high marginal private return to borrowed funds.

The increase in leverage due to the home equity–based borrowing channel plays an important role in the ensuing financial crisis. Our data contain information on defaults, and we show that borrowing against rising home equity is accompanied by a relative decline in default rates from 2002 to 2006, especially for low credit score and high credit card utilization homeowners. However, the relative decline in default rate begins to reverse starting in 2006. By the end of 2008, the default rate of homeowners experiencing house price growth from 2002 to 2006 skyrockets past homeowners experiencing no previous house price appreciation.

[1] A concern with our IV specification might be that MSAs with inelastic housing supply received differential non–house price–related credit shocks during the boom years (e.g., higher permanent income shocks). However, we show through a number of tests that this does not appear to be the case. See Section II for more details.

[2] Like much of the previous literature (e.g., David Gross and Nicholas S. Souleles 2002), we do not attempt to distinguish liquidity constraints from self-control problems, which we believe is a fruitful avenue for future research.

Our random sample of the entire US population allows us to use our microeconomic estimates to calculate the aggregate impact of the home equity–based borrowing channel. Our conservative estimate is that a total of $1.25 trillion of the rise in household debt from 2002 to 2006 is attributable to existing homeowners borrowing against the increased value of their homes. We also estimate that at least 39 percent of total new defaults seen between 2006 and 2008 are from 1997 homeowners who borrowed aggressively against the rising value of their houses.

Our findings are related to research on the effect of house price growth on consumption, refinancing, and borrowing behavior (Erik Hurst and Frank Stafford 2004; Andreas Lehnert 2004; Karl Case, John Quigley, and Robert Shiller 2005; Donald Haurin and Stuart S. Rosenthal 2006; John Campbell and Joao Cocco 2007; Alan Greenspan and James Kennedy 2008; Raphael Bostic, Stuart Gabriel, and Gary Painter 2009; Daniel H. Cooper 2009). Our results complement this research by using a novel dataset and a novel empirical strategy to isolate the effect of house prices on borrowing. We believe that the empirical strategy we utilize is of first-order importance given that house prices, borrowing behavior, and consumption are likely jointly driven by unobservable permanent income shocks.

I. Data and Summary Statistics

A. *Data*

The final dataset used in our analysis consists of detailed credit report information from Equifax for 74,149 homeowners in 2,307 zip codes located in 68 MSAs. The initial random sample includes a total of 266,005 individuals that live in 3,079 zip codes located in 95 MSAs covered by the Fiserv Case Shiller Weiss (FCSW) zip code–level house price indices as of 1997. We choose to focus on the FCSW zip codes given the importance of zip code level house prices in our empirical tests. As noted in Mian and Sufi (2009), these zip codes represent over 45 percent of aggregate home debt outstanding. Within these zip codes, we randomly sample individuals at a rate of 0.45 percent per zip code. Given the importance of housing supply elasticity as an instrument for house price growth, we further limit the sample to zip codes located within an MSA covered by the Saiz (2010) topography-based elasticity measure. This reduces the sample to 208,119 individuals within 2,340 zip codes in 68 MSAs.[3]

The Equifax data do not contain an explicit measure of homeownership. Instead, we measure homeownership by splitting the sample into three groups of individuals based on 1997 credit report information. The first group (34 percent) contains individuals that have mortgage or home equity debt outstanding. The second group (8 percent) contains individuals that do not currently have mortgage or home equity debt outstanding, but their credit report indicates that they have had a mortgage or home equity account in the past. The third group (58 percent) contains individuals

[3] In an unreported robustness test, we match the remaining FCSW zip codes to the closest MSA covered by the Saiz (2010) measure. The results are similar.

that do not have either a current or previous mortgage account. We define as "1997 homeowners" individuals in the first two groups.[4]

The rate of homeownership among individuals in the credit report data (42 percent) is significantly lower than the fraction of households that own their primary residence in census data (65 percent). We believe that this difference is driven by the fact that our measures are for individuals, not for households. As a result, individuals with no current or previous mortgage debt who live in a home in which some other individual has mortgage debt will not be counted as homeowners. In addition, any homeowner with no previous or current mortgage debt outstanding will be excluded in our definition of homeownership.

There are 88,769 homeowners in our sample. The final restriction we make is to exclude homeowners who move from their 1997 zip code between 1997 and 1999. Approximately 17 percent of homeowners move within the first two years of our sample, at which point the fraction that moves levels off significantly. We exclude these "transient" individuals since we want to ensure that when the house price shock hits, the homeowners are living in the zip code we assign them to initially. This leaves 74,149 homeowners in 2,307 zip codes located in 68 MSAs.[5]

Due to restrictions on the dissemination of individual credit report information, Equifax provides us data on these homeowners only in groups of at least five individuals. We are free to sort the data in any way before the groups are formed. The primary data-sort that we utilize sorts homeowners by their 1997 zip code and then by their 1997 credit score before groups are formed. This ensures that our unit of observation, a group of five homeowners on average, is as homogenous as possible on observed characteristics. In a few tests where we estimate heterogeneity of our main effect, we re-sort the data to maximize available variation along the dimension of interest. For example, we re-sort data by zip code and then age when testing whether young homeowners behave differently than old homeowners.

We augment the individual-level data with several additional datasets. We use the following zip code–level time-varying sources of data: house price data from FCSW, IRS income data, employment and payroll information from the Census Business Statistics, aggregate consumer credit score data from Equifax. All of these additional datasets are described in detail in the appendix of Mian and Sufi (2009). The IRS data are available only for 1998, 2002, 2003, 2005, and 2006. We add information for missing years by interpolating data prior to 2006 and extrapolating data post 2006 based on observed time trends. We also use 2000 decennial census zip code level information on demographics. Finally, the primary measure of topology-based housing supply elasticity comes from Saiz (2010).

B. *Summary Statistics*

Table 1 presents summary statistics for the sample of 74,149 1997 homeowners grouped into units containing five to nine individuals. The median home debt

[4] The second group includes two types of individuals that we cannot separate: individuals who own their home but have paid off their mortgage and individuals who previously had a mortgage but are now renters. We include this group as homeowners given that they have a low probability of moving, which suggests that they are homeowners. All results are materially unchanged if we exclude this group from our homeowner classification.

[5] Online Appendix Tables 1 and 2 show statistics on renters and homeowners who move zip codes between 1997 and 1999.

Table 1—Summary Statistics

	N	Mean	Median	SD
Equifax individual-level data				
Total debt, 1997 (thousands US dollars)	13,337	100	94	72
Home debt, 1997 (thousands US dollars)	13,337	88	82	70
Growth in total debt, 1998–2002	13,337	0.086	0.079	0.619
Growth in total debt, 2002–2006	13,337	0.344	0.320	0.684
Growth in home debt, 1998–2002	13,337	0.094	0.051	0.899
Growth in home debt, 2002–2006	13,337	0.394	0.355	0.901
Total debt to income ratio, 1997	13,043	2.537	2.515	1.524
Change in debt-to-income ratio, 1998–2002	13,336	–0.002	–0.085	0.903
Change in debt-to-income ratio, 2002–2006	13,336	0.754	0.424	1.381
Total debt default rate, 1997	13,337	0.038	0.000	0.111
Change in default rate, 1998–2006	13,333	–0.007	0.000	0.132
Change in default rate, 2006–2008	13,328	0.038	0.000	0.168
Credit score, 1997	13,337	780	789	95
Credit card utilization fraction, 1997	13,336	0.332	0.260	0.256
Age, 1997	13,336	48	47	7
Male	13,323	0.513	0.500	0.257
Income, 1997 (thousands US dollars)	13,336	79	73	35
Fiserv Case Shiller Weiss zip-level data				
House price growth, zip level, 1998–2002	13,295	0.402	0.423	0.141
House price growth, zip level, 2002–2006	13,337	0.465	0.468	0.227
Saiz (2010) MSA-level elasticity measure				
Housing supply elasticity	13,337	1.228	0.998	0.641
Median home value, 1997, $thousands	13,328	129	193	135
IRS zip-level income data				
Per capita wage growth, 2002–2006	13,336	0.116	0.110	0.061
Census business statistics zip-level data				
Per capita payroll growth, 2002–2006	12,993	0.118	0.117	0.121
Employment growth, 2002–2006	12,993	0.082	0.071	0.189
Equifax zip-level aggregate data				
Fraction of zip code with credit score under 659, 1997	13,334	0.306	0.292	0.116

Notes: This table presents summary statistics for 74,149 individuals who have either an existing mortgage account with positive balance as of 1997 or a previous mortgage account. The sample is further restricted to individuals who do not move zip codes between 1997 and 1999. Individuals are sorted into groups of at least 5 individuals. Each group consists of individuals living in the same zip code as of 1997, and the individuals are sorted by 1997 credit score before groups are formed. The income in the denominator of the debt-to-income ratio comes from zip-level IRS data. The zip code–level median home value as of 1997 comes from the 2000 value reported in the decennial census multiplied by the growth rate from 2000 to 1997 reported in the Fiserv Case Shiller Weiss data. The housing supply elasticity measure we use is from Saiz (2010). The Saiz (2010) measure is increasing in elasticity from 0 to 12. There are 2,307 zip codes and 68 MSAs that are represented in the sample.

(mortgage plus home equity) outstanding as of 1997 is $88,000, which is higher than the average amount of $62,000 reported in the 1998 Survey of Consumer Finances (SCF).[6] The discrepancy is likely due to two factors: first, we do not count as homeowners any individual who has never used debt to finance a home purchase. Second, the 1998 SCF separates out debt used for the purchase of second homes or residential investment properties, whereas we cannot separate primary residence

[6] See Arthur Kennickell, Martha Starr-McCluer, and Brian Surette (2000).

versus other residential mortgage debt. Mortgage debt makes up 88 percent of total debt outstanding for homeowners.

After remaining relatively constant from 1998 to 2002, total debt grows by 34 percent from 2002 to 2006. This growth is driven almost exclusively by home debt. The increase in leverage can also be seen in the sharp increase in the total debt-to-income ratio, which increases by 0.8 from 2002 to 2006, which is more than one-half a standard deviation of the 1997 level. Default rates are stable from 1998 to 2006, at which point they rise sharply by 3.8 percentage points from 2006 to 2008, which is a doubling of the 1997 level. Table 1 also includes information on individual 1997 credit score, 1997 credit card utilization, 1997 age, sex, and 2008 income.[7]

The topology-based housing supply elasticity measure in Saiz (2010) varies from 0 to 12 and is increasing in elasticity. Online Appendix Figure 1 shows the elasticity measure for the 68 MSAs in our sample and plots house price growth from 2002 to 2006 against elasticity. Both the zip code–level IRS wage data and the census business statistics payroll data show growth of about 12 percent from 2002 to 2006. Employment growth is 8 percent over the same time period. One measure from Mian and Sufi (2009) that we use is the fraction of all consumers in a zip code with a "subprime" credit score, which is defined to be a score below 660 as of 1997. In our sample, homeowners on average live in a zip code with 31 percent subprime consumers.

II. The Effect of House Prices on Home Equity–Based Borrowing

A. *Theoretical Motivation*

How should an individual homeowner respond to an increase in house price, all else being equal? This is the thought experiment that our empirical specification attempts to implement using instruments for house price growth. The theoretical answer to this question depends on the underlying model of consumer behavior.

A useful starting benchmark is *unconstrained long-lived* homeowners. These homeowners plan on using housing consumption in the foreseeable future, perhaps due to bequest motives, and are not credit-constrained when choosing their consumption paths. Todd Sinai and Souleles (2005) and Campbell and Cocco (2007) show that such households are naturally hedged against house price fluctuations in the absence of credit constraints or substitution effects. Any increase in house prices makes future housing consumption more expensive. As a result, the propensity to borrow out of housing gains is zero.[8]

A second possible model is based on *short-lived* homeowners who do not value housing bequests very highly and plan on consuming part of their housing capital before death. Such homeowners would like to borrow against unexpected increases in home equity to finance consumption, with the propensity to borrow being strongest for older homeowners with shorter life horizons.

[7] Individual income data are available from Equifax only for 2008. This estimate is based on payroll data that Equifax matches with its records.

[8] An important caveat is a situation in which homeowners have short expected tenure or a high probability of moving. In this case, a relative house price shock may be treated as a real wealth shock.

A third possibility is *credit-constrained* homeowners who want to borrow more today to smooth consumption over time but are unable to do so due to limited collateral. Such homeowners would borrow more against increases in home equity to relax their budget constraints (Francois Ortalo-Magné and Sven Rady 2006; Hanno Lustig and Stijn Van Nieuwerburgh 2005). Finally, following David Laibson (1997), homeowners with *limited self-control* may aggressively borrow against increased access to housing wealth in order to finance current consumption.

B. *Across-MSA Empirical Strategy*

Our empirical strategy is designed to estimate the effect of house prices on home equity–based borrowing. As the aggregate data in Figure 1 show, there is a strong correlation between house price growth and homeowner debt growth. However, it is possible that omitted time-varying factors drive both house prices and borrowing behavior. Perhaps the most worrisome time-varying trend is changes in productivity or permanent income.

Our first empirical test exploits variation across MSAs in housing supply elasticity. The intuition of the tests is straightforward: for an equivalent housing demand shock, the slope of the housing supply curve determines the degree to which housing prices rise in an area. The insight of Glaeser, Gyourko, and Saiz (2008) is that this basic prediction holds under most models of house price evolution. As long as builders respond to house prices, an increase in housing supply puts an upper bound on house price appreciation in elastic housing supply MSAs.

In the top panel of Figure 2, we show evidence consistent with this intuition. The panel plots the growth in average house prices relative to 2001 for MSAs in the highest and lowest quartile categories based on the Saiz (2010) housing supply elasticity measure. The most elastic housing supply MSAs experience almost no increase in house prices from 1997 to 2008. In contrast, inelastic housing supply MSAs experience strong growth of over 100 percent from 2001 to 2006. The pattern in the top panel of Figure 2 is also seen in our first-stage estimate in column 1 of Table 2, which shows a strong effect of housing supply elasticity on house price growth. The magnitude suggests that a one-standard-deviation decrease in MSA housing supply elasticity leads to a one-half-standard-deviation increase in house price growth from 2002 to 2006.

The bottom two panels of Figure 2 plot the growth in total debt for all homeowners and the change in the aggregate debt-to-income ratio, respectively, for inelastic and elastic MSAs. The total debt growth and the change in debt to income are significantly higher in inelastic MSAs from 2002 to 2006. The growth rate is 20 percentage points higher and the debt-to-income change is 0.6 higher in inelastic MSAs relative to elastic MSAs.

Figure 2 and the estimate in column 1 of Table 2 motivate the following first-differenced instrumental variables (IV) specification:

$$(1)\quad LeverageGrowth0206_{izm} = \theta X_{izm} + \beta \widehat{HousePriceGrowth0206_{zm}} + \upsilon_{izm},$$

$$(2)\quad HousePriceGrowth0206_{zm} = \delta X_{izm} + \rho Elasticity_{m,1997} + \varepsilon_{izm},$$

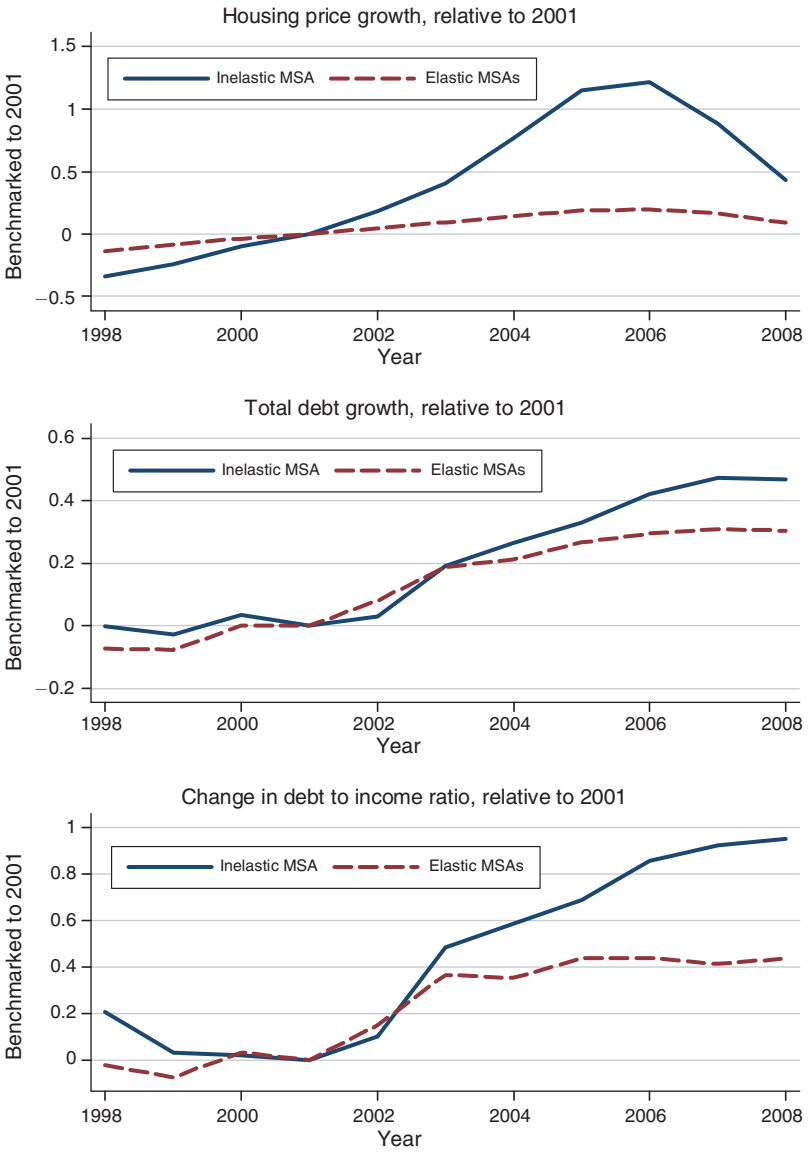

FIGURE 2. HOUSE PRICE AND LEVERAGE PATTERNS, INELASTIC VERSUS ELASTIC HOUSING SUPPLY MSAS

Notes: This figure presents house price, total debt, and total debt-to-income patterns for the top and bottom quartile MSAs based on housing supply elasticity from Saiz (2010). The sample includes individuals with mortgage debt outstanding as of 1997 or with a previous mortgage account.

where $LeverageGrowth0206_{izm}$ represents the change in homeowner leverage from 2002 to 2006 for individual i living in zip code z within MSA m. Equation (2) represents the first stage, where the instrument is MSA-level housing supply elasticity ($Elasticity$). All standard errors are clustered at the MSA level.

Column 2 of Table 2 presents the instrumental variables estimate with no control variables. The estimated elasticity of debt with respect to house prices is 0.52

TABLE 2—THE EFFECT OF HOUSE PRICES ON HOUSEHOLD BORROWING FOR 1997 HOMEOWNERS

Left-hand-side variable	HP growth 2002–2006	Total debt growth 2002–2006				Change in total debt-to-income ratio 2002–2006			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Housing supply elasticity	−0.172*** (0.038)								
Instrumented HP growth, 2002–2006		0.519*** (0.108)	0.651*** (0.126)	0.587*** (0.118)	0.498*** (0.083)	1.473*** (0.292)	1.511*** (0.306)	1.323*** (0.270)	1.195*** (0.209)
(Credit score, 1997)/100			−0.020* (0.010)				−0.115*** (0.028)		
Ln(household income, 2008)			0.141*** (0.019)				0.223*** (0.036)		
Debt-to-income ratio, 1997			−0.035*** (0.006)				0.065*** (0.015)		
Age, 1997			−0.013*** (0.001)				−0.030*** (0.003)		
Male dummy variable			0.031 (0.025)	0.028 (0.023)	0.018 (0.024)		0.131** (0.056)	0.125** (0.051)	0.098* (0.053)
Additional control variables				Individual dummy variables	Individual dummy, census, income variables			Individual dummy variables	Individual dummy, census, income variables
Observations	13,337	13,337	13,028	13,028	12,605	13,336	13,027	13,027	12,605
R^2	0.24	0.01	0.01	0.04	0.05	0.01	0.05	0.09	0.12

Notes: This table presents estimates of the effect of house prices on household borrowing for individuals who have either an existing mortgage account with positive balance as of 1997 or a previous mortgage account. Individual dummy variables are quintile indicator variables for 2 percentile bins of the 1997 credit score, 2008 income, 1997 debt-to-income ratio, and 1997 age variables. Census controls are zip code–level variables for the vacancy rate, fraction white, fraction black, education indicator variables for less than high school and high school diploma only, the unemployment rate, the poverty rate, and the fraction of households in the zip code living in an urban setting, all measured as of 2000. Income controls are zip code–level variables from the IRS and census business statistics for the logarithm of the 2002 employment, per capita wage, and per capita payroll level, and the growth in wage, payroll, and employment from 1997 to 2000, 2000 to 2002, and 2002 to 2006. All standard errors are clustered at the MSA level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

among homeowners. The estimate increases when including individual-level control variables when added linearly (column 3) or when added nonparametrically with 50 indicator variables for 2 percentile bins (column 4). The estimate is reduced slightly when we include a host of zip code–level census demographic control variables and zip code–level controls for the growth in wages, payroll, and employment (column 5).[9]

An alternative IV specification using the debt-to-income ratio also shows a positive effect of house prices on leverage. The estimate of 1.5 in column 6 implies that a one-standard-deviation change in house prices leads to a one-quarter-standard-deviation increase in the debt-to-income ratio. The effect of house prices on debt to income ratios is insensitive to individual-level controls (columns 7 and 8), and slightly sensitive to zip code–level demographics and income patterns (column 9).

[9]The IV estimate in Table 2 assumes a linear relationship between total debt growth from 2002 to 2006 and predicted house price growth over the same period. A nonparametric plot of the second-stage relationship shows that this assumption is reasonable (see online Appendix Figure 2).

TABLE 3—THE EFFECT OF HOUSE PRICES ON HOUSEHOLD BORROWING FOR 1997 HOMEOWNERS, DOLLAR-FOR-DOLLAR CHANGES

Left-hand-side variable	Change in home value 2002–2006 (thousands US dollars)	Change in total debt 2002–2006 (thousands US dollars)			
	(1)	(2)	(3)	(4)	(5)
Housing supply elasticity	–50.736*** (11.179)				
Instrumented change in home value, 2002–2006		0.245*** (0.050)	0.271*** (0.056)	0.253*** (0.056)	0.246*** (0.065)
Median home value, 2002	0.459*** (0.103)	0.020 (0.039)	–0.014 (0.044)	–0.010 (0.037)	–0.076 (0.079)
(Credit score, 1997)/100			–8.176*** (1.260)		
Ln(household income, 2008)			26.960*** (3.858)		
Debt to income ratio, 1997			4.537*** (1.150)		
Age, 1997			–1.847*** (0.216)		
Male dummy variable			7.287* (4.234)	6.978* (3.996)	6.253 (4.259)
Additional control variables				Individual dummy variables	Individual dummy, census, income variables
Observations	13,328	13,328	13,199	13,199	12,497
R^2	0.6	0.03	0.07	0.1	0.12

Notes: This table presents estimates of the effect of house prices on household borrowing for individuals who have either an existing mortgage account with positive balance as of 1997 or a previous mortgage account. Individual dummy variables are quintile indicator variables for 2 percentile bins of the 1997 credit score, 2008 income, 1997 debt-to-income ratio, and 1997 age variables. Census controls are zip code–level variables for the vacancy rate, fraction white, fraction black, education indicator variables for less than high school and high school diploma only, the unemployment rate, the poverty rate, and the fraction of households in the zip code living in an urban setting, all measured as of 2000. Income controls are zip code–level variables from the IRS and census business statistics for the logarithm of the 2002 employment, per capita wage, and per capita payroll level, and the growth in wage, payroll, and employment from 1997 to 2000, 2000 to 2002, and 2002 to 2006. All standard errors are clustered at the MSA level.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

In Table 3, we present IV estimates of the effect of an increase in home equity on home borrowing in dollar units. The first-stage estimate in column 1 implies that a one-standard-deviation decrease in housing supply elasticity leads to a $32,000 increase in home equity. The second-stage estimates in columns 2 through 5 suggest that 1997 homeowners borrow 25 cents on every dollar of additional home equity value. As columns 3 to 5 show, the estimate is insensitive to both individual and zip code–level control variables.

C. *Does the Home Equity–Based Borrowing Channel Vary by Consumer Type?*

Exploring the cross-sectional heterogeneity of the effect provides important insights into the underlying model of consumer behavior that is most consistent

with the home equity–based borrowing channel. We examine how the propensity to borrow against increased home equity varies by the homeowner's base year credit score and credit card utilization rate. Credit scores play an important role in the availability and pricing of consumer credit, and consumers below critical thresholds are often unable to obtain financing at reasonable interest rates.[10] Credit card utilization rate is measured by the fraction of the total available credit card limit that is used. Credit scores and credit card utilization rates have a correlation coefficient of -0.88 in our sample of homeowners, and an OLS regression of one on the other yields an R^2 of 0.78. The literature on consumer credit often interprets low credit scores and high credit card utilization rates as indicators for liquidity constrained households (see Gross and Souleles 2002). However, such variables may also be systematically correlated with an underlying behavioral attribute of households such as self-control problems.

The top four panels of Figure 3 examine debt growth patterns for inelastic and elastic MSAs by 1997 homeowner credit score and credit card utilization rate. We define "high" and "low" categories as the top and bottom quartile of the respective distribution. The top panel of Figure 3 shows a very strong home equity–based borrowing effect for low credit quality borrowers. In contrast there is almost no effect for high quality borrowers as both elastic and inelastic debt growth path are similar throughout the sample period. A similar pattern is revealed in the middle panel that uses 1997 credit card utilization to separate borrowers.

In addition to showing cross-sectional heterogeneity, the top four panels of Figure 3 also provide support for the exclusion restriction in our instrumental variables specification. The fact that there is almost no difference in borrowing between inelastic and elastic MSAs for high credit quality and low credit card utilization zip codes is inconsistent with a general non–housing related credit demand shift in inelastic MSAs. An alternative channel for higher borrowing in inelastic MSAs must explain why the effect is absent in high credit score and low credit card utilization individuals.

As we discuss in Section IIA, a standard model without liquidity constraints hypothesizes that older consumers should be more willing to extract cash from the increased value of home equity. The bottom two panels of Figure 3 do not show evidence in favor of this hypothesis. We split the sample into consumers in the lowest and highest quartile of the age distribution; the inelastic-elastic differential in debt growth does not appear to be significantly different for young and old homeowners.

In Table 4, we present estimates of the following specification:

$$(3)\quad \mathit{LeverageGrowth}0206_{izm} = \theta X_{izm} + \beta \widehat{\mathit{HousePriceGrowth}0206}_{zm} + \tau \widehat{\mathit{HousePriceGrowth}0206}_{zm} \times \text{InteractionTerm}_{izm} + \upsilon_{izm},$$

$$(4)\quad \mathit{HousePriceGrowth}0206_{zm} = \delta \times X_{izm} + \rho \mathit{Inelasticity}_{m,1997} + \omega \mathit{Inelasticity}_{m,1997} + \text{InteractionTerm}_{izm} + \varepsilon_{izm}.$$

[10] See http://www.freddiemac.com/corporate/reports/moseley/chap6.htm and congressional testimony of Staten (2004) at http://financialservices.house.gov/media/pdf/033004ms.pdf#page=3.

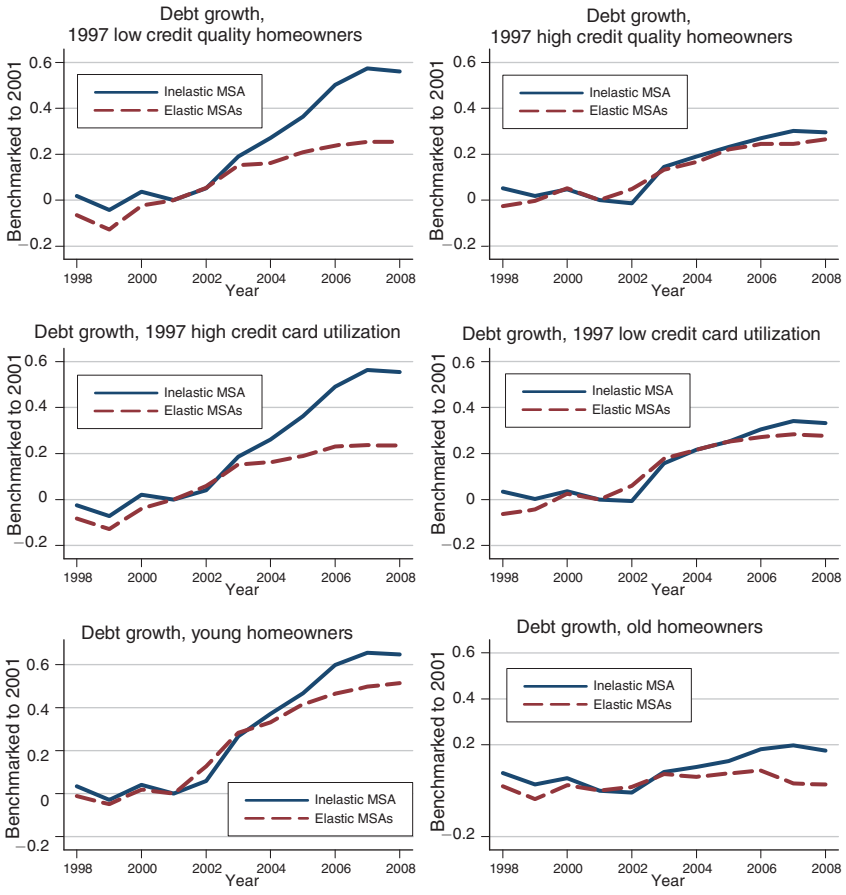

FIGURE 3. CROSS-SECTIONAL HETEROGENEITY IN LEVERAGE PATTERNS FOR 1997 HOMEOWNERS BY HOUSING SUPPLY ELASTICITY

Notes: This figure presents household leverage patterns for the highest and lowest quartile of housing supply elasticity MSAs, by the credit quality of borrowers as of 1997 (top two panels), the credit card utilization rate of borrowers as of 1997 (middle two panels), and the age of borrowers (bottom two panels). The sample includes individuals with mortgage debt outstanding as of 1997 or with a previous mortgage account.

As equation (4) shows, the instruments in the first stage are housing supply inelasticity and housing supply inelasticity interacted with the relevant interaction variable listed at the top of the column in Table 4. In column 1, the estimated coefficient on the interaction term is negative, which implies that the effect of house price growth on home equity–based borrowing from 2002 to 2006 is lower for individuals with a higher 1997 credit score. The magnitude of the difference is large. For a consumer one standard deviation above the mean 1997 credit score, the elasticity of debt with respect to house prices is 0.35. For a consumer one standard deviation below the mean 1997 credit score, the elasticity is 0.76.

The positive estimate on the interaction term in column 2 implies that individuals with a high credit card utilization rate have a larger borrowing response to house price growth. The estimate implies that for a consumer one standard deviation below the mean 1997 credit card utilization rate, the elasticity of debt with respect to house

TABLE 4—CROSS-SECTIONAL HETEROGENEITY IN EFFECT OF HOUSE PRICES ON HOUSEHOLD BORROWING FOR 1997 HOMEOWNERS

Left-hand-side variable	Total debt growth 2002–2006					
Interaction variable	(Credit score, 1997)/100 (1)	CC utilization, 1997 (2)	Debt to income, 1997 (3)	Ln(household income, 2008) (4)	Age, 1997 (5)	Male (6)
Instrumented house price growth, 2002–2006	2.282***	0.361***	0.356**	0.789*	1.416***	0.684***
	(0.497)	(0.108)	(0.177)	(0.400)	(0.362)	(0.142)
Instrumented house price growth, 2002–2006 *interaction term (listed at top of column)	−0.213***	0.825***	0.130	−0.032	−0.017**	0.016
	(0.059)	(0.241)	(0.099)	(0.085)	(0.007)	(0.128)
(Credit score, 1997)/100	0.054*	−0.044**	−0.036**	0.002	0.004	−0.055**
	(0.032)	(0.018)	(0.018)	(0.031)	(0.030)	(0.024)
Credit cart utilization, 1997	−0.096*	−0.479***	−0.043	0.048	0.135**	−0.097*
	(0.056)	(0.106)	(0.055)	(0.054)	(0.051)	(0.057)
Ln(household income, 2008)	0.146***	0.147***	0.162***	0.202***	0.148***	0.148***
	(0.019)	(0.019)	(0.020)	(0.042)	(0.018)	(0.021)
Debt-to-income ratio, 1997	−0.032***	−0.032***	−0.104**	−0.044***	−0.041***	−0.037***
	(0.006)	(0.006)	(0.046)	(0.007)	(0.005)	(0.007)
Age, 1997	−0.012***	−0.012***	−0.014***	−0.015***	−0.008***	−0.012***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)
Male dummy variable	0.031	0.031	0.017	0.003	−0.002	0.006
	(0.026)	(0.026)	(0.022)	(0.025)	(0.029)	(0.054)
Observations	13,198	13,198	13,198	12,598	12,889	11,690
R^2	0.02	0.02	0.01	0.04	0.07	0.01

Notes: This table presents estimates of the cross-sectional heterogeneity of the effect of house prices on household borrowing for individuals who have either positive outstanding mortgage debt as of 1997 or a previous mortgage account. In each column, we interact house price growth with the variable in the top of the column. The instruments in the first stage are MSA-level housing supply elasticity and MSA-level housing supply elasticity interacted with the interaction variable listed in the top of the column. In all columns, we use the data sorts that maximize variation in the interaction variable. More specifically, in columns 1 and 2 we utilize data sorted by credit score before groups are formed. In columns 4 to 6, we utilize data sorted by each interaction variable before groups are formed. All standard errors are clustered at the MSA level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

prices is 0.36. For a consumer one standard deviation above the mean 1997 credit card utilization rate, the elasticity is 0.78.

An alternative measure of liquidity constraints is the debt-to-income ratio as of 1997, which we examine in column 3. There is some evidence that households with higher debt-to-income ratios as of 1997 borrow more aggressively, but the coefficient estimate is not statistically significant at a reasonable confidence level.[11] In addition, the coefficient estimate on the interaction term is not significant for either sex or household income. The coefficient estimate on the age interaction term in column 5 is negative and statistically significant at the 5 percent level. The evidence suggests that the borrowing of older consumers is less responsive to house price growth than that of young consumers, which is inconsistent with life-cycle models of consumer financial behavior.

[11] Debt-to-income ratios are only slightly negatively correlated to credit scores, which suggests they are not an accurate measure of credit constraints.

D. *Examining the Exclusion Restriction*

One concern with the findings above is the validity of the exclusion restriction. It is possible that differential trends in inelastic and elastic MSAs during this time period would lead to differential borrowing patterns even in the absence of differential house price growth. Of course, the robustness of our findings to a series of rigorous control variables partially mitigates this concern, but omitted factors not captured by our control variables could still be a worry.

In Table 5, we examine the exclusion restriction directly. Panel A presents evidence on the correlation between housing supply elasticity and zip code–level measures of per capita payroll, per capita wage, and total employment growth. Our goal in panel A is to present evidence on differential permanent income or productivity shocks that may drive household borrowing and house price appreciation in inelastic areas. While there is a negative correlation between housing supply elasticity and IRS per capita wage growth over the 2002 to 2006 time period, this correlation is not robust across the different measures of payroll and employment growth (columns 1 and 3).

However, a comparison of the *level* of income growth from 2002 to 2006 is not necessarily the proper empirical test. As permanent income theory would predict, what matters for changes in household borrowing behavior is the *change* in expected income growth. When we examine the *difference* in growth rates between 1998–2002 and 2002–2006, we find no positive correlation with housing supply inelasticity. Instead, column 4 of Table 4 presents evidence that elastic MSAs receive a *positive* payroll shock from 2002 to 2006.

In panel B, we conduct additional tests to examine the exclusion restriction. Columns 1 and 2 show that the positive effect of house prices on borrowing is driven by an increase in home (mortgage plus home equity) debt. In columns 3 and 4, we show that the effect of house price growth on credit card balances is statistically insignificant and very close to 0 for the credit card balances–to–income ratio.[12] The specifications in columns 2 and 4 include the interaction term of credit score and house price growth and show that lower credit quality homeowners borrow aggressively against their home but do not increase credit card balances. In columns 5 and 6, we examine renters who never buy into the rising housing market during the sample period. As the estimates show, there is no statistically significant differential increase in borrowing among renters in inelastic areas, even for low credit quality renters (column 6).

While it is impossible to test the exclusion restriction explicitly, there is little evidence to suggest that the increased homeowner borrowing that we find in inelastic housing supply MSAs is driven by something other than house prices. The fact that the increased borrowing is concentrated in home-related debt is consistent with a home equity–based borrowing channel. Further evidence in support of the exclusion

[12] Ideally, we would want to examine outstanding credit card debt on which interest is being paid. However, the credit bureau collects only outstanding credit card balances. Several tests suggest that balances are strongly correlated with outstanding debt, especially among high credit card utilization individuals. Increases in credit card balances are strongly positively correlated with future default, and outstanding credit card balances are strongly negatively correlated with credit scores. Further, given that all of our tests are done in first-differences, any error in using balances instead of debt that is similar across housing supply elasticity is removed.

TABLE 5—EXAMINING EXCLUSION RESTRICTION

Panel A. Income and employment measures

Left-hand-side variable	Business payroll growth 2002–2006	IRS wage growth 2002–2006	Employment growth 2002–2006	Payroll growth shock	Wage growth shock	Employment growth shock
	(1)	(2)	(3)	(4)	(5)	(6)
Housing supply elasticity	−0.003	−0.020***	−0.006	0.016**	−0.006	−0.002
	(0.006)	(0.003)	(0.013)	(0.007)	(0.005)	(0.014)
Observations	2,241	2,306	2,241	2,220	2,306	2,220
R^2	0.00	0.04	0.00	0.00	0.00	0.00

Panel B. Home, credit card, and renters' debt

Left-hand-side variable	Home debt growth 2002–2006		Credit card balances growth 2002–2006		Total debt growth 2002–2006	
Sample	Homeowners		Homeowners		Renters	
	(1)	(2)	(3)	(4)	(5)	(6)
Instrumented HP growth, 2002–2006	0.535***	2.718***	0.080	−0.139	−0.029	0.260
	(0.120)	(0.617)	(0.110)	(0.426)	(0.161)	(1.280)
Instrumented HP growth, 2002–2006 *(Credit score, 1997)/100		−0.283***		0.023		−0.041
		(0.073)		(0.058)		(0.160)
(Credit score, 1997)/100		0.093***		0.069***		−0.007
		(0.033)		(0.026)		(0.081)
Observations	13,337	13,337	13,337	13,337	5,058	5,058
R^2	0.00	0.00	0.01	0.00	0.00	0.00

Notes: This table presents evidence on the exclusion restriction for the MSA-level analysis in Tables 2 and 3. Panel A examines the correlation between economic activity and housing supply elasticity in the sample of homeowners. "Growth shocks" represent the differences in 1998 to 2002 and 2002 to 2006 growth rates for each respective variable. Panel B examines the home debt and credit card balances for homeowners and debt patterns for renters. Renters are defined as individuals who have no housing related debt from 1997 to 2006. All standard errors are clustered at the MSA level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

restriction comes from our earlier result that there is almost no differential effect for high credit score and low credit card utilization borrowers. If something other than house prices drives borrowing in inelastic MSAs, it would have to uniquely apply to low credit quality homeowners and lead them to borrow only against their homes.

E. *Within-MSA Estimation Strategy*

As a further robustness check to the across-MSA estimation strategy, we outline an alternative within-MSA estimation technique that exploits variation at the zip code level to identify the effect of house prices on homeowner borrowing. We describe the full details of our within-MSA technique in the online Appendix; we provide a brief outline here given space constraints.

The motivation for this test comes from Mian and Sufi (2009), who show that from 2002 to 2005 house price appreciation in subprime zip codes was significantly stronger than in prime zip codes in the same MSA.[13] However, this relationship

[13] A subprime (prime) zip code is one in which a high (low) fraction of the population has a credit score below 660.

holds true *only* in MSAs with inelastic supply of housing: in elastic MSAs, there is no differential appreciation for subprime zip codes. Mian and Sufi (2009) argue that these trends are driven by an expansion in the supply of credit to subprime zip codes everywhere, but the expansion leads to a relative increase in subprime zip code house prices only where there are natural restrictions to the expansion of housing supply. Based on this evidence, we propose a triple difference-in-differences estimator that utilizes zip code–level within-MSA variation in house prices. This idea translates into estimating the following reduced-form regression equation:

$$(5)\quad y_{izmt} - y_{izm,1998} = \alpha_m\ \delta^t \times X_{izmt} + y^t \times Subprime_{zm,1997} + \beta^t \times Subprime_{zm,1997} \times Inelasticity_{m,1997}\ \varepsilon_{izmt} \quad for\ t = 1999, 2000, \ldots, 2008,$$

which examines the growth in y from the base year 1998 to t for individual i living in zip code z within MSA m. We relate the growth in y to MSA fixed effects, individual and zip code–level control variables (X), the fraction of subprime borrowers (*Subprime*) in zip code z within MSA m in 1997, and the interaction between the zip code fraction of subprime borrowers and the housing supply inelasticity (*inelasticity*) of MSA m.[14] The coefficient of interest is β.

Figure 4 presents the estimate of β for years 1999 to 2008. The top panel examines the relative growth in house prices for high subprime share zip codes in highly inelastic MSAs. House price growth is strongest in subprime zip codes of inelastic MSAs. The bottom two graphs show a relative increase in debt growth and debt-to-income ratios for homeowners living in high subprime share zip codes within highly inelastic MSAs. These graphs are based on a triple-difference estimate which compares homeowner leverage in high subprime share zip codes within inelastic MSAs to both homeowners in high subprime share zip codes in elastic MSAs and homeowners in low subprime share zip codes in the same MSA.

Figure 4 suggests that a potential instrument for house prices is the zip code–level share of subprime borrowers as of 1997 interacted with MSA housing supply inelasticity. In the online Appendix, we examine how this instrument is correlated with debt and debt-to-income levels in 2002. Homeowners' debt amounts and debt-to-income ratios in high subprime share zip codes within inelastic MSAs are not significantly different than those of homeowners in high subprime share zip codes within elastic MSAs prior to the house price acceleration in 2002. We describe and report the within-MSA instrumental variables specification in the online Appendix, and we find estimates that are qualitatively similar to the estimates from the across-MSA analysis presented in the previous subsection.

The within-MSA approach explores a different source of house price variation relative to the across-MSA approach. In econometric terms, both the across and within approaches are local average treatment effect (LATE) estimators with the "local average" computed over mutually exclusive parts of the house price distribution. Yet the two approaches produce similar estimates of the effect of house prices on homeowner borrowing, which demonstrates the robustness of our core estimates.

[14] To help with interpretation, we use *housing supply inelasticity* which is 4 minus the Saiz elasticity measure.

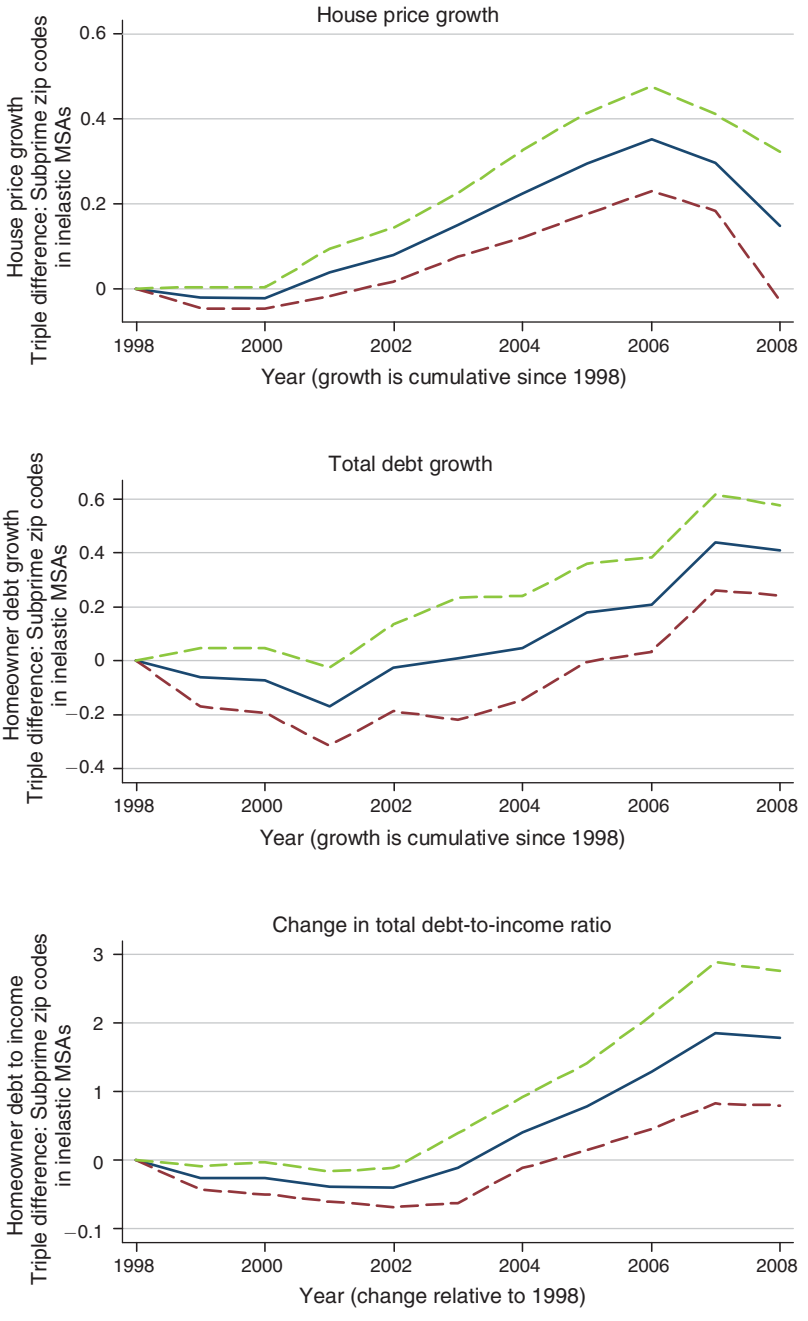

FIGURE 4. HOUSE PRICE AND LEVERAGE PATTERNS FOR HOMEOWNERS LIVING IN HIGH SUBPRIME SHARE ZIP CODES IN INELASTIC HOUSING SUPPLY MSAS

Notes: This figure plots the coefficient estimates for β^t for the following specification for each year t:

$$y_{ict} - y_{ic,1998} = \delta^t = Subprime_{ic,1998} + \beta^t = Subprime_{ic,1998} \times Inelastic_{c,1998} + \alpha_c + \varepsilon_{ict},$$

where y is the natural logarithm of house prices in the top graph, the natural logarithm of total debt in the middle graph, and the debt-to-income ratio in the bottom graph. The graphs show differential patterns for homeowners living in high subprime share zip codes in inelastic housing supply MSAs relative to both homeowners living in low subprime share zip codes in the same MSA and homeowners in high subprime share zip codes in elastic housing supply MSAs.

III. The Macroeconomic Impact of the Home Equity–Based Borrowing Channel

A. *What Are Consumers Doing with Borrowed Money?*

What do homeowners do with the money borrowed against home equity? The question is important in order to understand the real effects of the home equity–based borrowing channel. For example, if home equity borrowing is used to pay down other more expensive forms of consumer credit such as credit card debt, then home equity borrowing may not have a large aggregate impact. However, if home equity–based borrowing is used primarily for consumption or home improvement, then the real and policy implications are substantial.

We first test whether high house prices lead homeowners to "trade up" by taking a bigger mortgage to move to a bigger home. Our data record the current zip code of each individual borrower. We can therefore construct an indicator variable for whether a homeowner moves from 2002 to 2006. Columns 1 and 2 of panel A in Table 6 show that house price appreciation is not correlated with the probability of moving. This is true when examining the OLS specification or when using MSA housing supply inelasticity as an instrument for house price growth. These estimates are inconsistent with the argument that households are much more likely to move to new homes after realizing an increased value of home equity. In columns 3 and 4, respectively, we split the sample into homeowners who move and do not move zip codes between 2002 and 2006. The elasticity of debt growth with respect to house price growth is similar in both samples, showing that borrowed money is unlikely to finance the purchase of new homes.[15]

In panel B, we examine whether homeowners use the increased value of home equity to buy investment properties. While we do not have data on the purchase of investment properties, the consumer credit reports contain the number of mortgage accounts. Under the assumption that consumers must obtain a new mortgage to purchase an investment property, we should detect any systematic use of increased home equity to purchase an investment property by examining the number of mortgage accounts.

Column 1 and 2 of panel B show that the change in the number of mortgage accounts from 2002 to 2006 is *negatively* correlated with house price growth. In other words, our estimates suggest that homeowners in high house price appreciation MSAs are less likely to buy investment properties. In column 3, we control for the change in the number of mortgage accounts and find a similar elasticity of debt growth with respect to house price growth. Finally, in column 4, we exclude any consumer with any change in the number of mortgage accounts and find a similar estimate of the effect of house price growth on debt growth. The evidence in panel B shows that our effect is not driven by purchase of investment properties by homeowners.[16]

[15] A remaining concern is within–zip code moves, which we cannot measure using our data. In an unreported robustness test, we isolate the sample to zip codes below the median and below the 30th percentile in total households. The underlying assumption is that within–zip code moves are less likely in these smaller zip codes. In these zip codes, homeowners who do not move to a new zip code have even larger increases in debt. While we cannot rule out the argument that within–zip code moves are responsible for the increase in homeowner debt, this test casts doubt on the alternative hypothesis.

[16] Homeowners with low house price appreciation appear more likely to buy a second home instead. One possibility is that this is driven by low house price appreciation homeowners buying an investment property in "hot markets" to ride the housing wave that did not affect their city.

TABLE 6— WHAT DO HOMEOWNERS DO WITH BORROWED MONEY?

Panel A. Purchase of new homes?

Sample	MSA averages	Full	Total debt growth 2002–2006	
Left-hand-side variable	Probability of moving	Probability of moving	Movers	Nonmovers
	(1)	(2)	(3)	(4)
HP growth, 2002–2006	0.046			
	(0.036)			
Instrumented HP growth, 2002–2006		0.010	0.668***	0.662***
		(0.076)	(0.140)	(0.134)
Observations	68	13,196	6,673	6,523
R^2	0.40	0.02	0.01	0.01

Panel B. Purchase of investment properties?

Sample	Full	Full	Full	No change in no. of mortgages
Left-hand-side variable	Change in no. of mortgages 2001–2005		Total debt growth 2002–2006	
	(1)	(2)	(3)	(4)
HP growth, 2002–2006	–0.011			
	(0.021)			
Instrumented HP growth, 2002–2006		–0.109**	0.624***	0.642***
		(0.047)	(0.097)	(0.138)
Change in no. of mortgages, 2001–2005			0.633***	
			(0.030)	
Observations	12,772	12,772	12,772	3,827
R^2	0.02	0.02	0.10	0.02

Panel C. Paying down credit card balances?

Sample	Top quartile credit card utilization as of 1997			
Left-hand-side variable	Home debt growth 2002–2006	Credit card balance growth 2002–2006	Change in home debt to income 2002–2006	Change in credit card balance to income 2002–2006
	(1)	(2)	(3)	(4)
Instrumented HP growth, 2002–2006	0.750***	0.084	1.875***	0.017
	(0.153)	(0.143)	(0.394)	(0.022)
Observations	3,233	3,233	3,233	3,233
R^2	0.02	0.01	0.06	0.01

Notes: Panel A examines whether households in high house price growth areas are more likely to move to a new zip code and whether movers and nonmovers experience differential growth rates in debt from 2002 to 2006. Panel B examines whether households in high house price growth areas are more likely to increase their number of mortgages, which is a proxy for the purchase of an investment property. Panel C isolates the sample to individuals in the top quartile of the 1997 credit card utilization distribution and examines whether households in high house price appreciation areas are more likely to pay down credit card balances. All specifications include controls for 1997 credit score, 2008 income, 1997 debt to income, age, and sex. Standard errors are clustered at the MSA level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

We do not have individual information on financial assets. However, evidence from the Survey of Consumer Finances is inconsistent with the view that homeowners use borrowing to buy additional financial assets.[17] According to the SCF, the

[17] See Ana M. Aizcorbe, Arthur B. Kennickell, and Kevin B. Moore (2003), Brian Bucks, Kennickell, and Moore (2006), and Bucks et al. (2009).

fraction of families holding almost every class of financial security *declined* from 2001 to 2007. This is true of stocks (21.3 percent to 17.9 percent), savings bonds (16.7 percent to 14.9 percent), and pooled investment vehicles (17.7 percent to 11.4 percent). Only retirement accounts increased slightly (52.2 percent to 52.6 percent). Conditional on having a financial asset, the SCF reports a decline in the median value of financial assets from $29,800 to $25,300 from 2001 to 2007.

Do consumers use their home equity–based borrowing to pay down expensive credit card balances? Panel C isolates the sample to homeowners in the top quartile of the credit card utilization distribution as of 1997. The mean credit card balance outstanding among this group is almost $10,000, and the mean credit card utilization rate (amount outstanding divided by the high limit) is 0.7. Column 1 shows an elasticity of home debt borrowing with respect to house price growth of 0.75 among this sample. Despite the large increase in home equity–based borrowing and the large amount of outstanding credit card balances, the estimates in columns 2 and 4 show that these individuals do not pay down credit card balances in response to house price growth. While we cannot see the exact use of borrowed funds in our data, the results in panel C suggest that the marginal return to the use of borrowed funds is quite high.

While we do not have direct data on real outlays by individuals, we show that consumers do not use home equity–based borrowing to buy real estate or financial assets, and consumers do not use borrowed funds to pay down credit card debt with a high interest rate. While more evidence is needed, our findings are suggestive that a large fraction of home equity–based borrowing is used for consumption or home improvement. This conclusion is consistent with survey evidence by Peter Brady, Glenn Canner, and Dean Maki (2000) who find that from 1998 to 1999, 40 percent of households cite home improvement as a reason for home equity extraction, and 39 percent cite consumer expenditures. Using similar survey data, Canner, Karen Dynan, and Wayne Passmore (2002) find that over 50 percent of funds liquefied from home equity are used for either home improvement or consumer expenditures.

B. Home Equity–Based Borrowing and Defaults

What role did the unprecedented increase in leverage for high house price growth homeowners play in the ensuing financial crisis? A unique advantage of our dataset is that we can estimate the default rate implications of aggressive home equity–based borrowing.

The top panel in Figure 5 examines total debt default rates for 1997 homeowners in the highest and lowest quartile MSAs based on house price elasticity. During the early period of the sample when house prices grow, there is a relative decline in the default rate for homeowners in inelastic versus elastic MSAs. However, from 2006 to 2008, homeowners in inelastic MSAs experience a sharp increase in default rates, *surpassing* the default rate in elastic areas. The middle and lower panel examine the lowest and highest quartile of credit quality (credit score) distribution, respectively. The middle panel shows that the aforementioned result is concentrated among low-credit-quality borrowers—the same homeowners who borrow aggressively against their rising home equity in the early part of the sample.

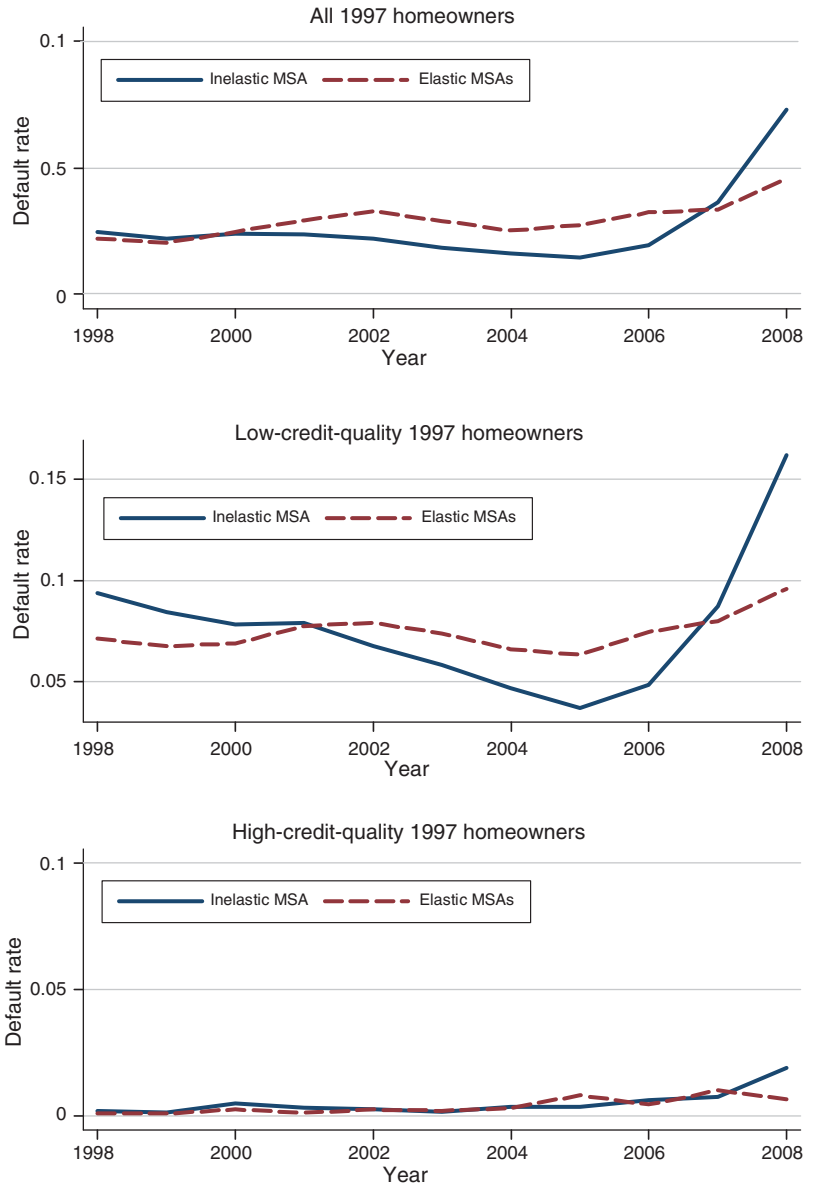

FIGURE 5. DEFAULT PATTERNS FOR HOMEOWNERS, BY HOUSING SUPPLY ELASTICITY AND 1997 CREDIT QUALITY

Notes: This figure presents default patterns for the highest and lowest quartile of housing supply elasticity MSAs, by the credit quality of borrowers as of 1997. The top graph examines the full sample. The middle graph examines borrowers in the lowest quartile of the 1997 credit score distribution, and the bottom graph examines borrowers in the highest quartile of the 1997 credit score distribution. The sample includes individuals with mortgage debt outstanding as of 1997 or with a previous mortgage account.

The magnitudes for low-credit-quality borrowers are large. From 2001 to 2005, the default rate falls by almost 5 full percentage points in inelastic MSAs, whereas it falls by only 2 percentage points in elastic MSAs. When house prices begin to decelerate and fall from 2006 to 2008, the default rate for low-credit-quality borrowers in

inelastic MSAs skyrockets past the corresponding default rate in elastic MSAs (an increase of 12 versus 4 percentage points, respectively).[18]

C. Aggregate Impact

How much of the increase in mortgage credit can be attributed to a direct effect of existing homeowners borrowing against the increasing value of their housing equity? Since our estimates of the home equity–based borrowing channel are based on a representative sample of the United States, we can integrate our estimated effect to compute the economywide magnitude of home equity–based borrowing due to higher house prices.

Our baseline estimate of column 2 in Table 2 suggests that homeowners increase their total borrowing by 0.52 percent for every 1.0 percent increase in house prices. Since our estimated effect is based on a difference-in-differences approach, the *level* impact of house prices on borrowing is not identifiable. Therefore, the appropriate in-sample aggregate effect of our estimate should be computed using relative differences in house price growth.

Let i index an MSA such that the MSAs are ordered by their housing supply inelasticity, with $i = 1$ being the most elastic. Let $\Delta \hat{P}_i$ be the predicted percentage change in house prices for MSA i given its supply inelasticity. Given our borrowing elasticity estimate of 0.52, the average percentage change in total borrowing due to the house price channel for a homeowner living in MSA i is given by $\left[0.52 \times (\Delta \hat{P}_i - \Delta \hat{P}_l)\right]$.[19] Since we know each homeowner's level of initial debt, we can convert the percentage change in debt into new debt taken out in dollars. Aggregating this procedure for all MSAs gives us an aggregate borrowing due to house price appreciation effect of $1.25 trillion dollars over four years from 2002 to 2006.[20] This increase represents 53 percent of the overall increase in debt of homeowners from 2002 to 2006.

We repeat our analysis to examine the effect of house price appreciation on total defaults for the US economy. Using estimates from online Appendix Table 5, we find that defaults due to the home equity–based borrowing channel represent 39 percent of total new defaults in the US economy. This suggests that the current mortgage default crisis is not entirely driven by individuals buying into a rising housing market. A significant part of the default crisis is driven by existing homeowners borrowing heavily against the rising value of their house.

[18] In the online Appendix, we report regressions that show results similar to those shown in Figure 5.

[19] We use 0.52 because it is the *average estimated effect*, which is the appropriate weighted average of the underlying heterogeneity in the effects. One concern is that the equal-weighting of low- and high-credit-quality individuals is inappropriate given results in Table 4. However, high- and low-credit-score homeowners have on average the same debt amounts, so dollar weighting and equal weighting produce similar results.

[20] The sum of home equity–based borrowing over our regression sample is equal to $2.2 billion. Since our random sample has a sampling rate of 0.494 percent, and we dropped 18 percent of homeowners (dollar weighted) due to early moves, the total effect in our sample of zip codes is: $2.2/(0.00494*(1 – 0.18)) = $543 billion. The zip codes in our regression sample represent 28.6 percent of US household credit in 2002. To estimate the home-equity borrowing channel effect for remaining zip codes not in our sample, we apply our home equity–based borrowing elasticity estimate of 0.52 to the house price appreciation for these zip codes. House price appreciation is measured using zip code–level price estimate from zillow.com wherever possible, and using MSA-level OFHEO price index otherwise. For 10.4 percent of dollar-weighted zip codes, we do not have any house price data and assume a home equity borrowing effect of zero to be conservative. The aggregate home equity borrowing effect comes out to be $1.25 trillion.

VI. Conclusion

We provide evidence of a strong link between asset prices and household borrowing. The use of individual-level data and an instrumental variables methodology enables us to estimate the magnitude of the home equity–based borrowing channel and identify the type of borrowers for whom this effect is the strongest. Since our individual-level data is representative of the US household sector, we also back out the economywide magnitude of our findings.

In addition, we show that the effect of house prices on borrowing is not uniform across the population but concentrates largely among homeowners with low credit scores and a high propensity to borrow on credit cards. Whether such heterogeneity reflects traditional credit constraints at the household level or self-control problems remains an open question for future research. These results support models in which the balance sheet strength of agents has important effects on borrowing and real economic activity (Benjamin Bernanke and Mark Gertler 1989; Jeremy Stein 1995; Nobuhiro Kiyotaki and John Moore 1997).

The link we show between house prices and household borrowing suggests that housing and household leverage play an important role in macroeconomic fluctuations. Such a connection is increasingly being recognized in the literature (e.g., Kosuke Aoki, James Proudman, and Gertjan Vlieghe 2004; Matteo Iacoviello 2005; Karten Jeske and Dirk Krueger 2005; Iacoviello and Raoul Manetti 2008; Edward Leamer 2009; Jack Favilukis, Sydney Ludvigson, and Van Nieuwerburgh 2009; Reuven Glick and Kevin Lansing 2010). Indeed, Mian and Sufi (2010) show that changes in household leverage at the county level serve as an early and powerful predictor of the onset and severity of the recession of 2007 to 2009.

REFERENCES

Aizcorbe, Ana M., Arthur B. Kennickell, and Kevin B. Moore. 2003. "Recent Changes in U.S. Family Finances: Evidence from the 1998 and 2001 Survey of Consumer Finances." *Federal Reserve Bulletin*, 89(1): 1–32.

Aoki, Kosuke, James Proudman, and Gertjan Vlieghe. 2004. "House Prices, Consumption, and Monetary Policy: A Financial Accelerator Approach." *Journal of Financial Intermediation*, 13(4): 414–35.

Attanasio, Orazio P., and Guglielmo Weber. 1994. "The UK Consumption Boom of the Late 1980s: Aggregate Implications of Microeconomic Evidence." *Economic Journal*, 104(427): 1269–1302.

Bernanke, Benjamin, and Mark Gertler. 1989. "Agency Costs, Net Worth, and Business Fluctuations." *American Economic Review*, 79(1): 14–31.

Bostic, Raphael, Stuart Gabriel, and Gary Painter. 2009. "Housing Wealth, Financial Wealth, and Consumption: New Evidence from Micro Data." *Regional Science and Urban Economics*, 39(1): 79–89.

Brady, Peter, Glenn Canner, and Dean Maki. 2000. "The Effects of Recent Mortgage Refinancing." *Federal Reserve Bulletin*, 86(7): 441–50.

Bucks, Brian K., Arthur B. Kennickell, and Kevin B. Moore. 2006. "Recent Changes in U.S. Family Finances: Evidence from the 2001 and 2004 Survey of Consumer Finances." *Federal Reserve Bulletin*, 92: A1–38.

Bucks, Brian K., Arthur B. Kennickell, Traci L. Mach, and Kevin B. Moore. 2009. "Changes in U.S. Family Finances from 2004 to 2007: Evidence from the Survey of Consumer Finances." *Federal Reserve Bulletin*, 95: A1–55.

Campbell, John, and Joao F. Cocco. 2007. "How Do House Prices Affect Consumption? Evidence from Micro Data." *Journal of Monetary Economics*, 54(3): 591–621.

Canner, Glenn, Karen Dynan, and Wayne Passmore. 2002. "Mortgage Refinancing in 2001 and Early 2002." *Federal Reserve Bulletin*, 88(12): 469–81.

Case, Karl, John Quigley, and Robert Shiller. 2005. "Comparing Wealth Effects: The Stock Market versus the Housing Market." *Advances in Macroeconomics*, 5(1): Article 1.

Cooper, Daniel. 2009. "Impending U.S. Spending Bust?: The Role of Housing Wealth as Borrowing Collateral." Federal Reserve Bank of Boston Public Policy Discussion Paper 09-9.

Favilukis, Jack, Sydney Ludvigson, and Stijn Van Nieuwerburgh. 2009. "The Macroeconomic Effects of Housing Wealth, Housing Finance, and Limited Risk-Sharing in General Equilibrium." Unpublished.

Glaeser, Edward, Joseph Gyourko, and Albert Saiz. 2008. "Symposium: Mortgages and the Housing Crash: Housing Supply and Housing Bubbles." *Journal of Urban Economics*, 64(2): 198–217.

Glick, Reuven, and Kevin Lansing. 2010. "Global Household Leverage, House Prices, and Consumption." Federal Reserve Bank of San Francisco Economic Letter 2010-01.

Greenspan, Alan, and James Kennedy. 2008. "Sources and Uses of Equity Extracted from Homes." *Oxford Review of Economic Policy*, 24(1): 120–44.

Gross, David B., and Nicholas S. Souleles. 2002. "Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data." *Quarterly Journal of Economics*, 117(1): 149–85.

Haurin, Donald, and Stuart S. Rosenthal. 2006. "House Price Appreciation, Savings, and Consumer Expenditures." Unpublished.

Hurst, Erik, and Frank Stafford. 2004. "Home Is Where the Equity Is: Mortgage Refinancing and Household Consumption." *Journal of Money, Credit, and Banking*, 36(6): 985–1014.

Iacoviello, Matteo. 2005. "House Prices, Borrowing Constraints, and Monetary Policy in the Business Cycle." *American Economic Review*, 95(3): 739–64.

Iacoviello, Matteo, and Raoul Minetti. 2008. "The Credit Channel of Monetary Policy: Evidence from the Housing Market." *Journal of Macroeconomics*, 30(1): 69–96.

Jeske, Karsten, and Dirk Krueger. 2005. "Housing and the Macroeconomy: The Role of Implicit Guarantees for Government-Sponsored Enterprises." Federal Reserve Bank of Atlanta Working Paper 2005-15.

Kennickell, Arthur, Martha Starr-McCluer, and Brian Surette. 2000. "Recent Changes in U.S. Family Finances: Results from the 1998 Survey of Consumer Finances." *Federal Reserve Bulletin*, 86(1): 1–29.

Kiyotaki, Nobuhiro, and John Moore. 1997. "Credit Cycles." *Journal of Political Economy*, 105(2): 211–48.

Laibson, David. 1997. "Golden Eggs and Hyperbolic Discounting." *Quarterly Journal of Economics*, 112(2): 443–77.

Leamer, Edward. 2009. *Macroeconomic Patterns and Stories: A Guide for MBAs.* Berlin: Springer Verlag.

Lehnert, Andreas. 2004. "Housing, Consumption, and Credit Constraints." Board of Governors of the Federal Reserve System Finance and Economics Discussion Paper 2004-63.

Lustig, Hanno N., and Stijn G. van Nieuwerburgh. 2005. "Housing Collateral, Consumption Insurance, and Risk Premia: An Empirical Perspective." *Journal of Finance*, 60(3): 1167–1219.

Mian, Atif, and Amir Sufi. 2009. "The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis." *Quarterly Journal of Economics*, 124(4): 1449–96.

Mian, Atif, and Amir Sufi. 2010. "Household Leverage and the Recession of 2007–09." *IMF Economic Review*, 58(1): 74–117.

Mian, Atif, and Amir Sufi. 2011. "House Prices, Home Equity–Based Borrowing, and the US Household Leverage Crisis: Dataset." *American Economic Review*, http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.5.2132.

Muellbauer, John, and Anthony Murphy. 1997. "Booms and Busts in the UK Housing Market." *Economic Journal*, 107(445): 1701–27.

Ortalo-Magné, François, and Sven Rady. 2006. «Housing Market Dynamics: On the Contribution of Income Shocks and Credit Constraints.» *Review of Economic Studies*, 73(2): 459–85.

Saiz, Albert. 2010. "The Geographic Determinants of Housing Supply." *Quarterly Journal of Economics*, 125(3): 1253–96.

Sinai, Todd, and Nicholas S. Souleles. 2005. "Owner-Occupied Housing as a Hedge against Rent Risk." *Quarterly Journal of Economics*, 120(2): 763–89.

Stein, Jeremy. 1995. "Prices and Trading Volume in the Housing Market: A Model with Down-Payment Effects." *Quarterly Journal of Economics*, 110(2): 379–406.

This article has been cited by:

1. Arito Ono, Hirofumi Uchida, Gregory F. Udell, Iichiro Uesugi. 2021. Lending pro-cyclicality and macroprudential policy: Evidence from Japanese LTV ratios. *Journal of Financial Stability* **53**, 100819. [Crossref]
2. ADAM M. GUREN, ARVIND KRISHNAMURTHY, TIMOTHY J. MCQUADE. 2021. Mortgage Design in an Equilibrium Model of the Housing Market. *The Journal of Finance* **76**:1, 113-168. [Crossref]
3. BRONSON ARGYLE, TAYLOR NADAULD, CHRISTOPHER PALMER, RYAN PRATT. 2021. The Capitalization of Consumer Financing into Durable Goods Prices. *The Journal of Finance* **76**:1, 169-210. [Crossref]
4. Chi-Wei Su, Xu-Yu Cai, Meng Qin, Ran Tao, Muhammad Umar. 2021. Can bank credit withstand falling house price in China?. *International Review of Economics & Finance* **71**, 257-267. [Crossref]
5. Xuefeng Pan, Weixing Wu. 2021. Housing returns, precautionary savings and consumption: Micro evidence from China. *Journal of Empirical Finance* **60**, 39-55. [Crossref]
6. Keqing Liu, Qingliang Fan. 2021. Credit Expansion, Bank Liberalization, and Structural Change in Bank Asset Accounts. *Journal of Economic Dynamics and Control* 104066. [Crossref]
7. John Muellbauer. 2020. Implications of household-level evidence for policy models: the case of macro-financial linkages. *Oxford Review of Economic Policy* **36**:3, 510-555. [Crossref]
8. Nikodem Szumilo. 2020. New Mortgage Lenders and the Housing Market*. *Review of Finance* **29**. . [Crossref]
9. Veronica Guerrieri, Guido Lorenzoni, Marta Prato. 2020. Schumpeter Lecture 2019: Slow Household Deleveraging. *Journal of the European Economic Association* **18**:6, 2755-2775. [Crossref]
10. MARCO DI MAGGIO, AMIR KERMANI, KAVEH MAJLESI. 2020. Stock Market Returns and Consumption. *The Journal of Finance* **75**:6, 3175-3219. [Crossref]
11. Scott R Baker, Robert A Farrokhnia, Steffen Meyer, Michaela Pagel, Constantine Yannelis. 2020. How Does Household Spending Respond to an Epidemic? Consumption during the 2020 COVID-19 Pandemic. *The Review of Asset Pricing Studies* **10**:4, 834-862. [Crossref]
12. Tomasz Piskorski, Amit Seru. 2020. Debt relief and slow recovery: A decade after Lehman. *Journal of Financial Economics* . [Crossref]
13. Pinghan Liang, Nan Gao. 2020. Homevalue misestimation and household leverage: An empirical study of Chinese urban households. *Cities* 103043. [Crossref]
14. Zhenyu Gao, Michael Sockin, Wei Xiong. 2020. Learning about the Neighborhood. *The Review of Financial Studies* **118**. . [Crossref]
15. Ariadna Jou, Nuria Mas, Carles Vergara-Alert. 2020. Housing Wealth, Health and Deaths of Despair. *The Journal of Real Estate Finance and Economics* **34**. . [Crossref]
16. Zhenyu Gao, Michael Sockin, Wei Xiong. 2020. Economic Consequences of Housing Speculation. *The Review of Financial Studies* **33**:11, 5248-5287. [Crossref]
17. Gene Amromin, Neil Bhutta, Benjamin J. Keys. 2020. Refinancing, Monetary Policy, and the Credit Cycle. *Annual Review of Financial Economics* **12**:1, 67-93. [Crossref]
18. Guoxu Wei, He Zhu, Sheng Han, Jing Chen, Luwen Shi. 2020. Impact of House Price Growth on Mental Health: Evidence from China. *SSM - Population Health* **31**, 100696. [Crossref]
19. Albert Alex Zevelev. 2020. Does Collateral Value Affect Asset Prices? Evidence from a Natural Experiment in Texas. *The Review of Financial Studies* . [Crossref]

20. Nimrod Segev, Matthew Schaffer. 2020. Monetary policy, bank competition and regional credit cycles: Evidence from a quasi-natural experiment. *Journal of Corporate Finance* **64**, 101494. [Crossref]
21. Peter Ganong, Pascal Noel. 2020. Liquidity versus Wealth in Household Debt Obligations: Evidence from Housing Policy in the Great Recession. *American Economic Review* **110**:10, 3100-3138. [Abstract] [View PDF article] [PDF with links]
22. Mariarosaria Comunale. 2020. New synchronicity indices between real and financial cycles: Is there any link to structural characteristics and recessions in European Union countries?. *International Journal of Finance & Economics* **25**:4, 617-641. [Crossref]
23. Yongjia Li, Salman Tahsin. 2020. Home price appreciation and residential lending standards. *Journal of Economics and Business* 105954. [Crossref]
24. Benedicta Marzinotto. 2020. Euro area current account imbalances: A tale of two financial liberalizations. *Journal of International Money and Finance* 102310. [Crossref]
25. Dongyang Zhang, Rui Guo. 2020. The consumption response to household leverage in China: The role of investment at household level. *International Review of Financial Analysis* **71**, 101580. [Crossref]
26. Jonathan Spader. 2020. Can Changing Demographics or Refinancing Behaviors Explain the Rising Levels of Housing Debt Among Older Americans?. *Housing Policy Debate* **91**, 1-16. [Crossref]
27. Marius M. Mihai. 2020. Do credit booms predict US recessions?. *Journal of Forecasting* **39**:6, 887-910. [Crossref]
28. Yuting Huang, Qiang Li, Kim Hiang Liow, Xiaoxia Zhou. 2020. Is Housing the Business Cycle? A Multiresolution Analysis for OECD Countries. *Journal of Housing Economics* **49**, 101692. [Crossref]
29. Xiaoyun Xing, Mingsong Wang, Yougui Wang, H. Eugene Stanley. 2020. Credit creation under multiple banking regulations: The impact of balance sheet diversity on money supply. *Economic Modelling* **91**, 720-735. [Crossref]
30. Adam D. Nowak, Patrick S. Smith. 2020. Quality-Adjusted House Price Indexes. *American Economic Review: Insights* **2**:3, 339-356. [Abstract] [View PDF article] [PDF with links]
31. Salman Khan, Saad Azmat. 2020. Debt externality in equity markets: Leveraged portfolios and Islamic indices. *International Review of Economics & Finance* **69**, 152-177. [Crossref]
32. Xinghua Liu, Satish Chand. 2020. The impact of a positive wealth shock on consumption: evidence from a housing reform in China. *Pacific Rim Property Research Journal* **104**, 1-15. [Crossref]
33. Xudong An, Yongheng Deng, Stuart A Gabriel. 2020. Default Option Exercise over the Financial Crisis and beyond*. *Review of Finance* **113**. . [Crossref]
34. ANNAMARIA LUSARDI, OLIVIA S. MITCHELL, NOEMI OGGERO. 2020. Debt and Financial Vulnerability on the Verge of Retirement. *Journal of Money, Credit and Banking* **52**:5, 1005-1034. [Crossref]
35. Da Zhao, Yifan Chen, Jim.H. Shen. 2020. Mortgage payments and household consumption in urban China. *Economic Modelling* . [Crossref]
36. Minjie Guo, John McDermott. 2020. Sovereign debt and the length of economic depressions. *Economic Modelling* **90**, 79-91. [Crossref]
37. Max Breitenlechner, Johann Scharler. 2020. Private Sector Debt, Financial Constraints, and the Effects of Monetary Policy: Evidence from the US. *Oxford Bulletin of Economics and Statistics* **82**:4, 889-915. [Crossref]
38. Patrick J. Kehoe, Pierlauro Lopez, Virgiliu Midrigan, Elena Pastorino. 2020. On the importance of household versus firm credit frictions in the Great Recession. *Review of Economic Dynamics* **37**, S34-S67. [Crossref]

39. Narayan Kundan Kishor. 2020. Forecasting real-time economic activity using house prices and credit conditions. *Journal of Forecasting* **30**. . [Crossref]
40. Alessia De Stefani. 2020. House price history, biased expectations, and credit cycles: The role of housing investors. *Real Estate Economics* **76**. . [Crossref]
41. Masanori Kuroki, Wan Wei. 2020. The Housing and Rental Price Effects of Unskilled and Skilled Immigration in the United States: 2013–2017. *Journal of Housing Research* **29**:2, 179-194. [Crossref]
42. Berrak Bahadir, Neven Valev. 2020. INSTITUTIONS, HOUSEHOLD CREDIT COMPOSITION, AND THE BUSINESS CYCLE. *Economic Inquiry* **58**:3, 1401-1413. [Crossref]
43. By Kadir Atalay, Garry F Barrett, Rebecca Edwards, Chaoran Yu. 2020. House Price Shocks, Credit Constraints and Household Indebtedness. *Oxford Economic Papers* **72**:3, 780-803. [Crossref]
44. Saleem Bahaj, Angus Foulis, Gabor Pinter. 2020. Home Values and Firm Behavior. *American Economic Review* **110**:7, 2225-2270. [Abstract] [View PDF article] [PDF with links]
45. Tong-yob Nam. 2020. Geographic Heterogeneity in Housing Market Risk and Portfolio Choice. *The Journal of Real Estate Finance and Economics* **62**. . [Crossref]
46. Jennifer Brown, David A. Matsa. 2020. Locked in by leverage: Job search during the housing crisis. *Journal of Financial Economics* **136**:3, 623-648. [Crossref]
47. Florian Huber, Maria Teresa Punzi. 2020. INTERNATIONAL HOUSING MARKETS, UNCONVENTIONAL MONETARY POLICY, AND THE ZERO LOWER BOUND. *Macroeconomic Dynamics* **24**:4, 774-806. [Crossref]
48. Leming Lin. 2020. Bank Deposits and the Stock Market. *The Review of Financial Studies* **33**:6, 2622-2658. [Crossref]
49. Luke Petach. 2020. Local financialization, household debt, and the great recession. *Papers in Regional Science* **99**:3, 807-839. [Crossref]
50. Guglielmo Barone, Francesco David, Guido de Blasio, Sauro Mocetti. 2020. How do house prices respond to mortgage supply?. *Journal of Economic Geography* **134**. . [Crossref]
51. Jesse Bricker, Jacob Krimmel, Rodney Ramcharan. 2020. Signaling Status: The Impact of Relative Income on Household Consumption and Financial Decisions. *Management Science* . [Crossref]
52. Mairead de Roiste, Apostolos Fasianos, Robert Kirkby, Fang Yao. 2020. Are Housing Wealth Effects Asymmetric in Booms and Busts?. *The Journal of Real Estate Finance and Economics* **107**. . [Crossref]
53. Alina K. Bartscher, Moritz Kuhn, Moritz Schularick, Ulrike I. Steins. 2020. Modigliani Meets Minsky: Inequality, Debt, and Financial Fragility in America, 1950-2016. *Institute for New Economic Thinking Working Paper Series* 1-77. [Crossref]
54. Adam M Guren, Timothy J McQuade. 2020. How Do Foreclosures Exacerbate Housing Downturns?. *The Review of Economic Studies* **87**:3, 1331-1364. [Crossref]
55. Marco Di Maggio, Amir Kermani, Christopher J Palmer. 2020. How Quantitative Easing Works: Evidence on the Refinancing Channel. *The Review of Economic Studies* **87**:3, 1498-1528. [Crossref]
56. Paige Ouimet, Geoffrey Tate. 2020. Attention for the Inattentive: Positive Effects of Negative Financial Shocks*. *Review of Finance* **24**:3, 615-646. [Crossref]
57. Rüdiger Bachmann, Sebastian K. Rüth. 2020. SYSTEMATIC MONETARY POLICY AND THE MACROECONOMIC EFFECTS OF SHIFTS IN RESIDENTIAL LOAN-TO-VALUE RATIOS. *International Economic Review* **61**:2, 503-530. [Crossref]
58. Saad Azmat, M. Kabir Hassan, Hamza Ghaffar, A.S.M. Sohel Azad. 2020. State contingent banking and asset price bubbles: The case of Islamic banking industry. *Global Finance Journal* 100531. [Crossref]

59. Adam M Guren, Alisdair McKay, Emi Nakamura, Jón Steinsson. 2020. Housing Wealth Effects: The Long View. *The Review of Economic Studies* **117**. . [Crossref]

60. Dario Pontiggia, Petros Stavrou Sivitanides. 2020. House prices and credit cycles: the case of Cyprus. *Journal of Property Investment & Finance* **38**:6, 539-550. [Crossref]

61. Trond-Arne Borgersen. 2020. Loan-to-value and the price-rent ratio. *Journal of European Real Estate Research* **13**:2, 149-159. [Crossref]

62. Mario Rafael Silva. 2020. UNSECURED CREDIT, PRODUCT VARIETY, AND UNEMPLOYMENT DYNAMICS. *Macroeconomic Dynamics* **67**, 1-37. [Crossref]

63. Zhao Rong, Jinlan Ni. 2020. How do housing cycles influence listed firms' R&D investment: evidence from the collateral channel. *Economics of Innovation and New Technology* **29**:3, 287-312. [Crossref]

64. ATIF MIAN, AMIR SUFI, EMIL VERNER. 2020. How Does Credit Supply Expansion Affect the Real Economy? The Productive Capacity and Household Demand Channels. *The Journal of Finance* **75**:2, 949-994. [Crossref]

65. Pierpaolo Benigno, Gauti B. Eggertsson, Federica Romei. 2020. Dynamic Debt Deleveraging and Optimal Monetary Policy. *American Economic Journal: Macroeconomics* **12**:2, 310-350. [Abstract] [View PDF article] [PDF with links]

66. Yan Wu, Nico Heerink, Linhui Yu. 2020. Real estate boom and resource misallocation in manufacturing industries: Evidence from China. *China Economic Review* **60**, 101400. [Crossref]

67. Sri Noerhidajati, Agung Bayu Purwoko, Hesti Werdaningtyas, Amalia Insan Kamil, Teguh Dartanto. 2020. Household financial vulnerability in Indonesia: Measurement and determinants. *Economic Modelling* . [Crossref]

68. Ozlem Akin, José M Marín, and José-Luis Peydró. 2020. Anticipating the financial crisis: evidence from insider trading in banks. *Economic Policy* **35**:102, 213-267. [Crossref]

69. Henrik Yde Andersen, Søren Leth-Petersen. 2020. Housing Wealth or Collateral: How Home Value Shocks Drive Home Equity Extraction and Spending. *Journal of the European Economic Association* **29**. . [Crossref]

70. Jim Been, Susann Rohwedder, Michael Hurd. 2020. Does Home Production Replace Consumption Spending? Evidence from Shocks in Housing Wealth in the Great Recession. *The Review of Economics and Statistics* **102**:1, 113-128. [Crossref]

71. Han Li, Jiangyi Li, Yi Lu, Huihua Xie. 2020. Housing wealth and labor supply: Evidence from a regression discontinuity design. *Journal of Public Economics* **183**, 104139. [Crossref]

72. Yun K. Kim. 2020. Household Debt Accumulation and the Great Recession of the United States: A Comparative Perspective. *Review of Radical Political Economics* **52**:1, 26-49. [Crossref]

73. Jouchi Nakajima. 2020. The role of household debt heterogeneity on consumption: Evidence from Japanese household data. *Economic Analysis and Policy* **65**, 186-197. [Crossref]

74. Alessia De Stefani. 2020. Debt, inequality and house prices: Explaining the dynamics of household borrowing prior to the great recession. *Journal of Housing Economics* **47**, 101601. [Crossref]

75. Anil Kumar, Carles Vergara-Alert. 2020. The Effect of Financial Flexibility on Payout Policy. *Journal of Financial and Quantitative Analysis* **55**:1, 263-289. [Crossref]

76. DANIEL GARCÍA. 2020. Employment in the Great Recession: How Important Were Household Credit Supply Shocks?. *Journal of Money, Credit and Banking* **52**:1, 165-203. [Crossref]

77. HUI CHEN, MICHAEL MICHAUX, NIKOLAI ROUSSANOV. 2020. Houses as ATMs: Mortgage Refinancing and Macroeconomic Uncertainty. *The Journal of Finance* **75**:1, 323-375. [Crossref]

78. DAVID BERGER, NICHOLAS TURNER, ERIC ZWICK. 2020. Stimulating Housing Markets. *The Journal of Finance* **75**:1, 277-321. [Crossref]

79. Jakob Engel. 2020. Regulation, financialization and fraud in Chinese commodity markets after the Global Financial Crisis. *Regional Studies* **54**:2, 219-228. [Crossref]
80. Rui Guo, Wei Sun, Jianqiu Wang, Gang Xiao. 2020. Why do retired workers claim their social security benefits so early? A potential explanation based on the cumulative prospect theory. *Applied Economics* **52**:5, 490-505. [Crossref]
81. Mark Setterfield. 2020. Managing the discontent of the losers. *Review of Social Economy* **78**:1, 77-97. [Crossref]
82. Arthur Acolin. 2020. Housing Wealth and Consumption Over the 2001–2013 Period: The Role of the Collateral Channel. *Journal of Housing Research* **29**:1, 68-88. [Crossref]
83. Joel A. Elvery, Mark E. Schweitzer. 2020. PARTIALLY DISAGGREGATED HOUSEHOLD-LEVEL DEBT SERVICE RATIOS: CONSTRUCTION, VALIDATION, AND RELATIONSHIP TO BANKRUPTCY RATES. *Contemporary Economic Policy* **38**:1, 166-187. [Crossref]
84. Mattia Guerini, Alessio Moneta, Mauro Napoletano, Andrea Roventini. 2020. THE JANUS-FACED NATURE OF DEBT: RESULTS FROM A DATA-DRIVEN COINTEGRATED SVAR APPROACH. *Macroeconomic Dynamics* **24**:1, 24-54. [Crossref]
85. Nelson Camanho, Ronit Levine-Schnur, Tal Farber. Dealing with an Anchoring Bias in the Mortgage Market: A Regulatory Approach 191-204. [Crossref]
86. Antonio Gargano, Marco Giacoletti, Elvis Jarnecic. 2020. Attention and Housing Search: Evidence from Online Listings. *SSRN Electronic Journal* . [Crossref]
87. Yavuz Arslan, Bulent Guler, Burhanettin Kuruscu. 2020. Credit Supply Driven Boom-Bust Cycles. *SSRN Electronic Journal* . [Crossref]
88. Robert N. Killins. 2020. Real estate prices and banking performance: evidence from Canada. *Journal of Economics and Finance* **44**:1, 78-98. [Crossref]
89. Greg Howard, Carl Liebersohn. 2020. Regional Divergence and House Prices. *SSRN Electronic Journal* . [Crossref]
90. Egle Jakucionyte, Swapnil Singh. 2020. Bowling Alone, Buying Alone: The Decline of Co-borrowers in the US Mortgage Market. *SSRN Electronic Journal* . [Crossref]
91. Francis Wong. 2020. Mad as Hell: Property Taxes and Financial Distress. *SSRN Electronic Journal* . [Crossref]
92. Sumit Agarwal, Wenlan Qian, Ruth Tan. Borrowing 247-278. [Crossref]
93. Einar C. Kjenstad, Anil Kumar. 2020. The Effect of Real Estate Prices on Peer Firms. *SSRN Electronic Journal* . [Crossref]
94. Trevor Gallen. 2020. Broken Instruments. *SSRN Electronic Journal* . [Crossref]
95. Kristian Blickle, João A. C. Santos. 2020. The Costs of Corporate Debt Overhang. *SSRN Electronic Journal* . [Crossref]
96. Claes Bäckman, Natalia Khorunzhina. 2020. Interest-Only Mortgages and Consumption Growth: Evidence from a Mortgage Market Reform. *SSRN Electronic Journal* . [Crossref]
97. Agostino Capponi, David Aaron Rios. 2020. COVID-19 Mortgage Forbearance: Implications on the Housing Market. *SSRN Electronic Journal* . [Crossref]
98. Manuel Adelino, W. Ben McCartney, Antoinette Schoar. 2020. Is There a Leverage Cycle in the US Housing Market? The Role of Government and Private Actors. *SSRN Electronic Journal* . [Crossref]
99. Sheheryar Banuri, Ha Nguyen. 2020. Borrowing to Keep Up (With the Joneses): Inequality, Debt, and Conspicuous Consumption. *SSRN Electronic Journal* . [Crossref]

100. Keqing Liu, Qingliang Fan. 2020. Credit Expansion, Bank Liberalization, and Structural Change in Bank Asset Accounts. *SSRN Electronic Journal* . [Crossref]
101. Ramón Adalid, Matteo Falagiarda. 2019. How Repayments Manipulate Our Perceptions about Loan Dynamics after a Boom. *Jahrbücher für Nationalökonomie und Statistik* **240**:6, 697-742. [Crossref]
102. Kathleen Weiss Hanley, Gerard Hoberg. 2019. Dynamic Interpretation of Emerging Risks in the Financial Sector. *The Review of Financial Studies* **32**:12, 4543-4603. [Crossref]
103. Roberto Pancrazi, Mario Pietrunti. 2019. Natural expectations and home equity extraction. *Journal of Housing Economics* **46**. . [Crossref]
104. William F. Lincoln, Andrew H. McCallum, Michael Siemer. 2019. The Great Recession and a Missing Generation of Exporters. *IMF Economic Review* **67**:4, 703-745. [Crossref]
105. Paola D'Orazio. 2019. Income inequality, consumer debt, and prudential regulation: An agent-based approach to study the emergence of crises and financial instability. *Economic Modelling* **82**, 308-331. [Crossref]
106. Piotr Ciżkowicz, Andrzej Rzońca, Andrzej Torój. 2019. In Search of an Appropriate Lower Bound. The Zero Lower Bound vs. the Positive Lower Bound under Discretion and Commitment. *German Economic Review* **20**:4. . [Crossref]
107. Masanori Kuroki. 2019. Are American homeowners more satisfied with their lives than renters?. *International Journal of Consumer Studies* **43**:6, 536-548. [Crossref]
108. Ben Etheridge. 2019. HOUSE PRICES AND CONSUMPTION INEQUALITY. *International Economic Review* **60**:4, 1781-1822. [Crossref]
109. Prodosh Simlai. 2019. Subprime credit, idiosyncratic risk, and foreclosures. *The Quarterly Review of Economics and Finance* **74**, 175-189. [Crossref]
110. Johannes Stroebel. 2019. Hauspreise und Inflation. *Zeitschrift für Immobilienökonomie* **5**:1-2, 155-160. [Crossref]
111. De-Graft Owusu-Manu, David John Edwards, Ken A. Donkor-Hyiaman, Richard Ohene Asiedu, M. Reza Hosseini, E. Obiri-Yeboah. 2019. Housing attributes and relative house prices in Ghana. *International Journal of Building Pathology and Adaptation* **37**:5, 733-746. [Crossref]
112. Changyan Peng, Weisong Qiu, Quanyun Song, Bihong Huang. 2019. Housing wealth appreciation and consumption: evidence from China. *Journal of the Asia Pacific Economy* **24**:4, 556-577. [Crossref]
113. Yuliya Demyanyk, Elena Loutskina, Daniel Murphy. 2019. Fiscal Stimulus and Consumer Debt. *The Review of Economics and Statistics* **101**:4, 728-741. [Crossref]
114. Shinichiro Asayama, Mike Hulme. 2019. Engineering climate debt: temperature overshoot and peak-shaving as risky subprime mortgage lending. *Climate Policy* **19**:8, 937-946. [Crossref]
115. Masanori Kuroki. 2019. Imbalanced sex ratios and housing prices in the U.S. *Growth and Change* **29**. . [Crossref]
116. David Splinter. 2019. The Mortgage Interest Deduction: Causes of Fluctuations in a Procyclical Tax Expenditure. *Public Finance Review* **47**:5, 807-827. [Crossref]
117. Elliot Anenberg, Aurel Hizmo, Edward Kung, Raven Molloy. 2019. Measuring mortgage credit availability: A frontier estimation approach. *Journal of Applied Econometrics* **34**:6, 865-882. [Crossref]
118. Wayne Passmore, Shane M. Sherlund. 2019. FHA, Fannie Mae, Freddie Mac and the Great Recession. *Real Estate Economics* **125**. . [Crossref]
119. Natalya Vinokurova. 2019. Failure to learn from failure: The 2008 mortgage crisis as a déjà vu of the mortgage meltdown of 1994. *Business History* **61**:6, 1005-1050. [Crossref]
120. Anthony A Defusco, Stephanie Johnson, John Mondragon. 2019. Regulating Household Leverage. *The Review of Economic Studies* **130**. . [Crossref]

121. Sarah Brown, Daniel Gray, Alberto Montagnoli. 2019. Credit supply shocks and household leverage: Evidence from the US banking deregulation. *Journal of Financial Stability* **43**, 97-115. [Crossref]
122. BRUNO ALBUQUERQUE. 2019. One Size Fits All? Monetary Policy and Asymmetric Household Debt Cycles in U.S. States. *Journal of Money, Credit and Banking* **51**:5, 1309-1353. [Crossref]
123. Michael J. Osei, John V. Winters. 2019. Labor Demand Shocks and Housing Prices Across the United States: Does One Size Fit All?. *Economic Development Quarterly* **33**:3, 212-219. [Crossref]
124. Carolin Martin, Frank Westerhoff. 2019. Regulating Speculative Housing Markets via Public Housing Construction Programs: Insights from a Heterogeneous Agent Model. *Jahrbücher für Nationalökonomie und Statistik* **239**:4, 627-660. [Crossref]
125. H. Youn Kim, Keith R. Mclaren, K. K. Gary Wong. 2019. CONSUMER DEMAND, CONSUMPTION, AND ASSET PRICING: AN INTEGRATED ANALYSIS WITH INTERTEMPORAL TWO-STAGE BUDGETING. *Macroeconomic Dynamics* **19**, 1-47. [Crossref]
126. Ashrafee Tanvir Hossain, Lawrence Kryzanowski. 2019. Global financial crisis after ten years: a review of the causes and regulatory reactions. *Managerial Finance* **45**:7, 904-924. [Crossref]
127. Sebastian Stumpner. 2019. Trade and the geographic spread of the great recession. *Journal of International Economics* **119**, 169-180. [Crossref]
128. Yuliya Demyanyk, Dmytro Hryshko, María José Luengo-Prado, Bent E. Sørensen. 2019. The Rise and Fall of Consumption in the 2000s: A Tangled Tale. *Economica* **86**:343, 495-531. [Crossref]
129. Ph. S. Kartaev. 2019. How to teach Econometrics to Economists: Bachelor level ..... 72 Macroeconomic Policy. *Scientific Research of Faculty of Economics. Electronic Journal* **11**:2, 72-90. [Crossref]
130. Bjorn Berggren, Andreas Fili, Mats Wilhelmsson. 2019. Homeownership and entrepreneurship. *International Journal of Housing Markets and Analysis* **12**:3, 456-473. [Crossref]
131. James Cloyne, Kilian Huber, Ethan Ilzetzki, Henrik Kleven. 2019. The Effect of House Prices on Household Borrowing: A New Approach. *American Economic Review* **109**:6, 2104-2136. [Abstract] [View PDF article] [PDF with links]
132. Costas Azariadis, James Bullard, Aarti Singh, Jacek Suda. 2019. Incomplete credit markets and monetary policy. *Journal of Economic Dynamics and Control* **103**, 83-101. [Crossref]
133. Scott R. Baker, Lorenz Kueng, Leslie McGranahan, Brian T. Melzer. 2019. Do Household Finances Constrain Unconventional Fiscal Policy?. *Tax Policy and the Economy* **33**, 1-32. [Crossref]
134. JASON RODERICK DONALDSON, GIORGIA PIACENTINO, ANJAN THAKOR. 2019. Household Debt Overhang and Unemployment. *The Journal of Finance* **74**:3, 1473-1502. [Crossref]
135. Seda Durguner. 2019. Relaxed Credit Standards in the U.S. Housing Boom: Changes in Risk Characteristics of Mortgage Recipients. *International Review of Finance* **14**. . [Crossref]
136. Marco Angrisani, Michael Hurd, Susann Rohwedder. 2019. THE EFFECT OF HOUSING WEALTH LOSSES ON SPENDING IN THE GREAT RECESSION. *Economic Inquiry* **57**:2, 972-996. [Crossref]
137. Nurlan Turdaliev, Yahong Zhang. 2019. Household debt, macroprudential rules, and monetary policy. *Economic Modelling* **77**, 234-252. [Crossref]
138. Yahong Zhang. 2019. Household debt, financial intermediation, and monetary policy. *Journal of Macroeconomics* **59**, 230-257. [Crossref]
139. Stijn Van Nieuwerburgh. 2019. Why are REITS Currently So Expensive?. *Real Estate Economics* **47**:1, 18-65. [Crossref]
140. Bing Lu, Xiaofen Tan, Jinhui Zhang. 2019. The crowding out effect of booming real estate markets on corporate TFP: evidence from China. *Accounting & Finance* **58**:5, 1319-1345. [Crossref]

141. Charles A. Towe, Constant I. Tra. 2019. Hedonic analysis and time-varying capitalization: An application using school quality. *Journal of Regional Science* **59**:2, 250-280. [Crossref]
142. Michael Siemer. 2019. Employment Effects of Financial Constraints during the Great Recession. *The Review of Economics and Statistics* **101**:1, 16-29. [Crossref]
143. Keongtae Kim, Il-Horn Hann. 2019. Crowdfunding and the Democratization of Access to Capital—An Illusion? Evidence from Housing Prices. *Information Systems Research* **30**:1, 276-290. [Crossref]
144. Alexander N. Bogin, William M. Doerner, William D. Larson. 2019. Local House Price Paths: Accelerations, Declines, and Recoveries. *The Journal of Real Estate Finance and Economics* **58**:2, 201-222. [Crossref]
145. David Aikman, Jonathan Bridges, Anil Kashyap, Caspar Siegert. 2019. Would Macroprudential Regulation Have Prevented the Last Crisis?. *Journal of Economic Perspectives* **33**:1, 107-130. [Abstract] [View PDF article] [PDF with links]
146. Gábor Pintér. 2019. House Prices and Job Losses. *The Economic Journal* **129**:618, 991-1013. [Crossref]
147. Holger M. Mueller, Constantine Yannelis. 2019. The rise in student loan defaults. *Journal of Financial Economics* **131**:1, 1-19. [Crossref]
148. Patrick A. Pintus, Jacek Suda. 2019. Learning financial shocks and the Great Recession. *Review of Economic Dynamics* **31**, 123-146. [Crossref]
149. John V. Duca, Lilit Popoyan, Susan M. Wachter. 2019. REAL ESTATE AND THE GREAT CRISIS: LESSONS FOR MACROPRUDENTIAL POLICY. *Contemporary Economic Policy* **37**:1, 121-137. [Crossref]
150. Kerwin Kofi Charles, Erik Hurst, Matthew J Notowidigdo. 2019. Housing Booms, Manufacturing Decline and Labour Market Outcomes. *The Economic Journal* **129**:617, 209-248. [Crossref]
151. Jason Roderick Donaldson, Giorgia Piacentino, Anjan V. Thakor. 2019. Household Debt Overhang and Unemployment. *SSRN Electronic Journal* . [Crossref]
152. Martin Beraja, Erik Hurst, Juan Ospina. 2019. The Aggregate Implications of Regional Business Cycles. *SSRN Electronic Journal* . [Crossref]
153. Steven J. Davis, John C. Haltiwanger. 2019. Dynamism Diminished: The Role of Housing Markets and Credit Conditions. *SSRN Electronic Journal* . [Crossref]
154. N. Kundan Kishor. 2019. Forecasting Real-Time Economic Activity Using House Prices and Credit Conditions. *SSRN Electronic Journal* . [Crossref]
155. Katya Kartashova, Xiaoqing Zhou. 2019. Mortgage Rate Refinancing and Household Balance Sheets: Evidence from Expansionary and Contractionary Monetary Policy Episodes. *SSRN Electronic Journal* . [Crossref]
156. Francesco D'Acunto, Daniel Hoang, Michael Weber. 2019. Managing Households' Expectations with Salient Economic Policies. *SSRN Electronic Journal* . [Crossref]
157. Erin McGuire. 2019. Returns to Entrepreneurial Experience over the Business Cycle. *SSRN Electronic Journal* . [Crossref]
158. Martin Beraja, Erik Hurst, Juan Ospina. 2019. The Aggregate Implications of Regional Business Cycles. *Econometrica* **87**:6, 1789-1833. [Crossref]
159. Henrik Yde Andersen, Soren Leth-Petersen. 2019. Housing Wealth or Collateral: How Spending and Home Equity Extraction Respond to Unanticipated Housing Wealth Gains. *SSRN Electronic Journal* . [Crossref]
160. Fergus Cumming, Paul Hubert. 2019. The Role of Households' Borrowing Constraints in the Transmission of Monetary Policy. *SSRN Electronic Journal* . [Crossref]

161. Clement Bellet. 2019. The McMansion Effect: Top Size Inequality, House Satisfaction and Home Improvement in U.S. Suburbs. *SSRN Electronic Journal* . [Crossref]
162. Jennifer Brown, Mark Jansen. 2019. Consumer Protection Laws in Auto Lending. *SSRN Electronic Journal* . [Crossref]
163. Nuri Ersahin, Rustom M Irani. 2018. Collateral Shocks and Corporate Employment*. *Review of Finance* **117**. . [Crossref]
164. A.S.M.S. Azad, Saad Azmat, Abdelaziz Chazi, Amirul Ahsan. 2018. Sailing with the non-conventional stocks when there is no place to hide. *Journal of International Financial Markets, Institutions and Money* **57**, 1-16. [Crossref]
165. Mihály Tamás Borsi. 2018. Credit contractions and unemployment. *International Review of Economics & Finance* **58**, 573-593. [Crossref]
166. Mihnea Constantinescu, Povilas Lastauskas. 2018. The knotty interplay between credit and housing. *The Quarterly Review of Economics and Finance* **70**, 241-266. [Crossref]
167. Manuel Adelino, Antoinette Schoar, Felipe Severino. 2018. The Role of Housing and Mortgage Markets in the Financial Crisis. *Annual Review of Financial Economics* **10**:1, 25-41. [Crossref]
168. Trond-Arne Borgersen. 2018. Mortgage supply, LTV and risk pricing. *International Journal of Housing Policy* **18**:4, 522-544. [Crossref]
169. Kerwin Kofi Charles, Erik Hurst, Matthew J. Notowidigdo. 2018. Housing Booms and Busts, Labor Market Opportunities, and College Attendance. *American Economic Review* **108**:10, 2947-2994. [Abstract] [View PDF article] [PDF with links]
170. Cindy K Soo. 2018. Quantifying Sentiment with News Media across Local Housing Markets. *The Review of Financial Studies* **31**:10, 3689-3719. [Crossref]
171. Siu Kei Wong, Kuang Kuang Deng, Ka Shing Cheung. 2018. Housing wealth effects for private and subsidized homeowners. *International Journal of Housing Markets and Analysis* **11**:5, 771-787. [Crossref]
172. Umberto Filotto, Claudio Giannotti, Gianluca Mattarocci, Xenia Scimone. 2018. Residential mortgages, the real estate market, and economic growth: evidence from Europe. *Journal of Property Investment & Finance* **36**:6, 552-577. [Crossref]
173. Hyeongjun Kim, Hoon Cho, Doojin Ryu. 2018. An empirical study on credit card loan delinquency. *Economic Systems* **42**:3, 437-449. [Crossref]
174. Gerhard Illing, Yoshiyasu Ono, Matthias Schlegl. 2018. Credit booms, debt overhang and secular stagnation. *European Economic Review* **108**, 78-104. [Crossref]
175. Julien Bengui, Toan Phan. 2018. Asset pledgeability and endogenously leveraged bubbles. *Journal of Economic Theory* **177**, 280-314. [Crossref]
176. Gang-Zhi Fan, Ming Pu, Xiaoying Deng, Seow Eng Ong. 2018. Optimal portfolio choices and the determination of housing rents under housing market uncertainty. *Journal of Housing Economics* **41**, 200-217. [Crossref]
177. Vicente Cuñat, Dragana Cvijanović, Kathy Yuan. 2018. Within-Bank Spillovers of Real Estate Shocks. *The Review of Corporate Finance Studies* **7**:2, 157-193. [Crossref]
178. Richard Stanton, Johan Walden, Nancy Wallace. 2018. Mortgage Loan Flow Networks and Financial Norms. *The Review of Financial Studies* **31**:9, 3595-3642. [Crossref]
179. Shinichi Kamiya. 2018. C REDIT C RUNCH AND I NSURANCE C ONSUMPTION : T HE A FTERMATH OF THE S UBPRIME M ORTGAGE C RISIS. *Journal of Risk and Insurance* **85**:3, 721-747. [Crossref]

180. Elora Lee Raymond. 2018. Race, uneven recovery and persistent negative equity in the southeastern United States. *Journal of Urban Affairs* **40**:6, 824-837. [Crossref]

181. Patrick J. Kehoe, Virgiliu Midrigan, Elena Pastorino. 2018. Evolution of Modern Business Cycle Models: Accounting for the Great Recession. *Journal of Economic Perspectives* **32**:3, 141-166. [Abstract] [View PDF article] [PDF with links]

182. Atif Mian, Amir Sufi. 2018. Finance and Business Cycles: The Credit-Driven Household Demand Channel. *Journal of Economic Perspectives* **32**:3, 31-58. [Abstract] [View PDF article] [PDF with links]

183. Indraneel Chakraborty, Itay Goldstein, Andrew MacKinlay. 2018. Housing Price Booms and Crowding-Out Effects in Bank Lending. *The Review of Financial Studies* **31**:7, 2806-2853. [Crossref]

184. Richard Disney, John Gathergood. 2018. House Prices, Wealth Effects and Labour Supply. *Economica* **85**:339, 449-478. [Crossref]

185. Peter Öhman, Darush Yazdanfar. 2018. Bank lending and housing prices in Sweden. *International Journal of Housing Markets and Analysis* **11**:3, 498-519. [Crossref]

186. Kim Abildgren. 2018. Household leverage and consumption during the Great Depression. *Journal of Financial Regulation and Compliance* **26**:2, 287-299. [Crossref]

187. Annamaria Lusardi, Olivia S. Mitchell, Noemi Oggero. 2018. The Changing Face of Debt and Financial Fragility at Older Ages. *AEA Papers and Proceedings* **108**, 407-411. [Abstract] [View PDF article] [PDF with links]

188. Ruth Ben-Yashar, Miriam Krausz, Shmuel Nitzan. 2018. Government loan guarantees and the credit decision-making structure. *Canadian Journal of Economics/Revue canadienne d'économique* **51**:2, 607-625. [Crossref]

189. Alberto Cardaci. 2018. Inequality, household debt and financial instability: An agent-based perspective. *Journal of Economic Behavior & Organization* **149**, 434-458. [Crossref]

190. Sheung-Chi Chow, Juncal Cunado, Rangan Gupta, Wing-Keung Wong. 2018. Causal relationships between economic policy uncertainty and housing market returns in China and India: evidence from linear and nonlinear panel and time series models. *Studies in Nonlinear Dynamics & Econometrics* **22**:2. . [Crossref]

191. Bing Chen, Frank P. Stafford. 2018. A Farewell to ARMs or Ever Changing Market Segments?. *The Journal of Real Estate Finance and Economics* **20**. . [Crossref]

192. Steven Laufer. 2018. Equity extraction and mortgage default. *Review of Economic Dynamics* **28**, 1-33. [Crossref]

193. ANTHONY A. DEFUSCO. 2018. Homeowner Borrowing and Housing Collateral: New Evidence from Expiring Price Controls. *The Journal of Finance* **73**:2, 523-573. [Crossref]

194. Kamila Sommer, Paul Sullivan. 2018. Implications of US Tax Policy for House Prices, Rents, and Homeownership. *American Economic Review* **108**:2, 241-274. [Abstract] [View PDF article] [PDF with links]

195. Anil Kumar. 2018. Do Restrictions on Home Equity Extraction Contribute to Lower Mortgage Defaults? Evidence from a Policy Discontinuity at the Texas Border. *American Economic Journal: Economic Policy* **10**:1, 268-297. [Abstract] [View PDF article] [PDF with links]

196. Tod Van Gunten, Edo Navot. 2018. Varieties of indebtedness: Financialization and mortgage market institutions in Europe. *Social Science Research* **70**, 90-106. [Crossref]

197. ARI HYYTINEN, HANNA PUTKURI. 2018. Household Optimism and Overborrowing. *Journal of Money, Credit and Banking* **50**:1, 55-76. [Crossref]

198. Sumit Agarwal, Souphala Chomsisengphet, Neale Mahoney, Johannes Stroebel. 2018. Do Banks Pass through Credit Expansions to Consumers Who want to Borrow?*. *The Quarterly Journal of Economics* **133**:1, 129-190. [Crossref]

199. Paul Krugman. 2018. Good enough for government work? Macroeconomics since the crisis. *Oxford Review of Economic Policy* **34**:1-2, 156-168. [Crossref]

200. Sergi Basco. Globalization and Housing Bubbles 37-63. [Crossref]

201. Sergi Basco. Consequences of Housing Bubbles 65-83. [Crossref]

202. Naqun Huang, Jing Li, Amanda Ross. 2018. The impact of the cost of car ownership on the house price gradient in Singapore. *Regional Science and Urban Economics* **68**, 160-171. [Crossref]

203. Iain Pirie. 2018. Korea and Taiwan: The Crisis of Investment-Led Growth and the End of the Developmental State. *Journal of Contemporary Asia* **48**:1, 133-158. [Crossref]

204. Krislert Samphantharak, Scott Schuh, Robert M. Townsend. 2018. INTEGRATED HOUSEHOLD SURVEYS: AN ASSESSMENT OF U.S. METHODS AND AN INNOVATION. *Economic Inquiry* **56**:1, 50-80. [Crossref]

205. William N. Goetzmann, Milad Nozari. 2018. Art as Collateral. *SSRN Electronic Journal* . [Crossref]

206. Marco Di Maggio, Amir Kermani, Kaveh Majlesi. 2018. Stock Market Returns and Consumption. *SSRN Electronic Journal* . [Crossref]

207. Atif R. Mian, Amir Sufi. 2018. Finance and Business Cycles: The Credit-Driven Household Demand Channel. *SSRN Electronic Journal* . [Crossref]

208. J. W. Mason. 2018. Income Distribution, Household Debt, and Aggregate Demand: A Critical Assessment. *SSRN Electronic Journal* . [Crossref]

209. Nikodem Szumilo. 2018. Local Bank Competition, Credit Markets and House Prices. *SSRN Electronic Journal* . [Crossref]

210. Weihuang Wong. 2018. The American Dream and Support for the Social Safety Net: Evidence from Experiment and Survey Data. *SSRN Electronic Journal* . [Crossref]

211. Atif R. Mian, Amir Sufi. 2018. Credit Supply and Housing Speculation. *SSRN Electronic Journal* . [Crossref]

212. Alberto Martin, Enrique Moral-Benito, Tom Schmitz. 2018. The Financial Transmission of Housing Bubbles: Evidence from Spain. *SSRN Electronic Journal* . [Crossref]

213. David Aikman, Jonathan Bridges, Anil K. Kashyap, Caspar Siegert. 2018. Would Macroprudential Regulation Have Prevented the Last Crisis?. *SSRN Electronic Journal* . [Crossref]

214. Matteo Benetton. 2018. Leverage Regulation and Market Structure: An Empirical Model of the UK Mortgage Market. *SSRN Electronic Journal* . [Crossref]

215. Sandra Eickmeier, Benedikt Kolb, Esteban Prieto. 2018. Effects of Bank Capital Requirement Tightenings on Inequality. *SSRN Electronic Journal* . [Crossref]

216. Mark Setterfield. 2018. Managing the Discontent of the Losers. *SSRN Electronic Journal* . [Crossref]

217. Stephen Millard, Alexandra Varadi, Eran Yashiv. 2018. Shock Transmission and the Interaction of Financial and Hiring Frictions. *SSRN Electronic Journal* . [Crossref]

218. Sandesh Dhungana, Keshav Dogra. 2018. Regional Heterogeneity in Fiscal Stimulus Effectiveness: The Economic Stimulus Payments of 2008. *SSRN Electronic Journal* . [Crossref]

219. Tomasz Piskorski, Amit Seru. 2018. Debt Relief and Slow Recovery: A Decade after Lehman. *SSRN Electronic Journal* . [Crossref]

220. Alex Xi He, Daniel le Maire. 2018. How Does Liquidity Constraint Affect Employment and Wages? Evidence from Danish Mortgage Reform. *SSRN Electronic Journal* . [Crossref]

221. Scott R. Baker, Lorenz Kueng, Leslie McGranahan, Brian Melzer. 2018. Do Household Finances Constrain Unconventional Fiscal Policy?. *SSRN Electronic Journal* . [Crossref]

222. Quanlin Gu, Jia He, Wenlan Qian. 2018. Housing Booms and Shirking. *SSRN Electronic Journal* . [Crossref]

223. William Diamond, Tim Landvoigt. 2018. Credit Cycles with Market Based Household Leverage. *SSRN Electronic Journal* . [Crossref]

224. Harald Hau, Difei Ouyang. 2018. Capital Scarcity and Industrial Decline: Evidence from 172 Real Estate Booms in China. *SSRN Electronic Journal* . [Crossref]

225. James Graham. 2018. House Prices and Consumption: A New Instrumental Variables Approach. *SSRN Electronic Journal* . [Crossref]

226. Sebastian Doerr. 2018. Collateral, Reallocation, and Aggregate Productivity: Evidence from the U.S. Housing Boom. *SSRN Electronic Journal* . [Crossref]

227. Robert A. Connolly, Tobias Muhlhofer. 2018. Leverage Cycles in a Mature Asset Class: New Evidence From a Natural Laboratory. *SSRN Electronic Journal* . [Crossref]

228. Boyao Li, Wanting Xiong, Liujun Chen, Yougui Wang. 2017. The impact of the liquidity coverage ratio on money creation: A stock-flow based dynamic approach. *Economic Modelling* **67**, 193-202. [Crossref]

229. Eugenio Cerutti, Jihad Dagher, Giovanni Dell'Ariccia. 2017. Housing finance and real-estate booms: A cross-country perspective. *Journal of Housing Economics* **38**, 1-13. [Crossref]

230. Marco Di Maggio, Amir Kermani, Benjamin J. Keys, Tomasz Piskorski, Rodney Ramcharan, Amit Seru, Vincent Yao. 2017. Interest Rate Pass-Through: Mortgage Rates, Household Consumption, and Voluntary Deleveraging. *American Economic Review* **107**:11, 3550-3588. [Abstract] [View PDF article] [PDF with links]

231. Aditya Aladangady. 2017. Housing Wealth and Consumption: Evidence from Geographically Linked Microdata. *American Economic Review* **107**:11, 3415-3446. [Abstract] [View PDF article] [PDF with links]

232. Georgios Bampinas, Panagiotis Konstantinou, Theodore Panagiotidis. 2017. Inequality, demographics and the housing wealth effect: Panel quantile regression evidence for the US. *Finance Research Letters* **23**, 19-22. [Crossref]

233. Matthew P. Richardson, Stijn Van Nieuwerburgh, Lawrence J. White. 2017. What to Do About the GSEs?. *Annual Review of Financial Economics* **9**:1, 21-41. [Crossref]

234. Mustafa ŞİT. 2017. TÜRKİYE'NİN KÜRESEL FİNANSAL KRİZE MAKRO EKONOMİK TEPKİSİ: AMPİRİK BİR UYGULAMA. *Elektronik Sosyal Bilimler Dergisi* **16**:63, 1127-1141. [Crossref]

235. Katya Kartashova, Ben Tomlin. 2017. House prices, consumption and the role of non-Mortgage debt. *Journal of Banking & Finance* **83**, 121-134. [Crossref]

236. Luca Guerrieri, Matteo Iacoviello. 2017. Collateral constraints and macroeconomic asymmetries. *Journal of Monetary Economics* **90**, 28-49. [Crossref]

237. MATHIAS KLEIN. 2017. Austerity and Private Debt. *Journal of Money, Credit and Banking* **49**:7, 1555-1585. [Crossref]

238. MARK J. GARMAISE, GABRIEL NATIVIDAD. 2017. Consumer Default, Credit Reporting, and Borrowing Constraints. *The Journal of Finance* **72**:5, 2331-2368. [Crossref]

239. Edward L. Glaeser, Charles G. Nathanson. 2017. An extrapolative model of house price dynamics. *Journal of Financial Economics* **126**:1, 147-170. [Crossref]

240. Bing Zhu, Michael Betzinger, Steffen Sebastian. 2017. Housing market stability, mortgage market structure, and monetary policy: Evidence from the euro area. *Journal of Housing Economics* **37**, 1-21. [Crossref]

241. Manuel Adelino, Igor Cunha, Miguel A. Ferreira. 2017. The Economic Effects of Public Financing: Evidence from Municipal Bond Ratings Recalibration. *The Review of Financial Studies* **30**:9, 3223-3268. [Crossref]
242. Nan-Kuang Chen, Han-Liang Cheng. 2017. House price to income ratio and fundamentals: Evidence on long-horizon forecastability. *Pacific Economic Review* **22**:3, 293-311. [Crossref]
243. LUC LAEVEN, ALEXANDER POPOV. 2017. Waking Up from the American Dream: On the Experience of Young Americans during the Housing Boom of the 2000s. *Journal of Money, Credit and Banking* **49**:5, 861-895. [Crossref]
244. Atif Mian, Amir Sufi. 2017. Fraudulent Income Overstatement on Mortgage Applications During the Credit Expansion of 2002 to 2005. *The Review of Financial Studies* **30**:6, 1832-1864. [Crossref]
245. Tim Landvoigt. 2017. Housing Demand During the Boom: The Role of Expectations and Credit Constraints. *The Review of Financial Studies* **30**:6, 1865-1902. [Crossref]
246. Jihad Dagher, Ning Fu. 2017. What Fuels the Boom Drives the Bust: Regulation and The Mortgage Crisis. *The Economic Journal* **127**:602, 996-1024. [Crossref]
247. GIOVANNI FAVARA, MARIASSUNTA GIANNETTI. 2017. Forced Asset Sales and the Concentration of Outstanding Debt: Evidence from the Mortgage Market. *The Journal of Finance* **72**:3, 1081-1118. [Crossref]
248. MANUEL ADELINO, SONG MA, DAVID ROBINSON. 2017. Firm Age, Investment Opportunities, and Job Creation. *The Journal of Finance* **72**:3, 999-1038. [Crossref]
249. RAJ CHETTY, LÁSZLÓ SÁNDOR, ADAM SZEIDL. 2017. The Effect of Housing on Portfolio Choice. *The Journal of Finance* **72**:3, 1171-1212. [Crossref]
250. Arthur Acolin, Xudong An, Raphael W. Bostic, Susan M. Wachter. 2017. Homeownership and Nontraditional and Subprime Mortgages. *Housing Policy Debate* **27**:3, 393-418. [Crossref]
251. BRIAN T. MELZER. 2017. Mortgage Debt Overhang: Reduced Investment by Homeowners at Risk of Default. *The Journal of Finance* **72**:2, 575-612. [Crossref]
252. Yvonne McCarthy, Kieran McQuinn. 2017. Deleveraging in a Highly Indebted Property Market: Who does it and are there Implications for Household Consumption?. *Review of Income and Wealth* **63**:1, 95-117. [Crossref]
253. Sumit Agarwal, Wenlan Qian. 2017. Access to Home Equity and Consumption: Evidence from a Policy Experiment. *Review of Economics and Statistics* **99**:1, 40-52. [Crossref]
254. Edmond Berisha, John Meszaros. 2017. Household debt, economic conditions, and income inequality: A state level analysis. *The Social Science Journal* **54**:1, 93-101. [Crossref]
255. Rebecca Diamond. 2017. Housing Supply Elasticity and Rent Extraction by State and Local Governments. *American Economic Journal: Economic Policy* **9**:1, 74-111. [Abstract] [View PDF article] [PDF with links]
256. Pengfei Wang, Yi Wen, Zhiwei Xu. 2017. Two-Way Capital Flows and Global Imbalances. *The Economic Journal* **127**:599, 229-269. [Crossref]
257. Efraim Benmelech, Ralf R. Meisenzahl, Rodney Ramcharan. 2017. The Real Effects of Liquidity During the Financial Crisis: Evidence from Automobiles*. *The Quarterly Journal of Economics* **132**:1, 317-365. [Crossref]
258. Xavier Giroud, Holger M. Mueller. 2017. Firm Leverage, Consumer Demand, and Employment Losses During the Great Recession*. *The Quarterly Journal of Economics* **132**:1, 271-316. [Crossref]
259. Carlos Garriga, Bryan Noeth, Don E. Schlagenhauf. 2017. Household Debt and the Great Recession. *Review* **99**:2, 183-205. [Crossref]

260. Xavier Giroud, Holger M. Mueller. 2017. Redistribution of Local Labor Market Shocks through Firms' Internal Networks. *SSRN Electronic Journal* . [Crossref]

261. Xavier Giroud, Holger M. Mueller. 2017. Firm Leverage, Consumer Demand, and Employment Losses during the Great Recession. *SSRN Electronic Journal* . [Crossref]

262. Mattia Guerini, Alessio Moneta, Mauro Napoletano. 2017. The Janus-Faced Nature of Debt: Results from a Data-Driven Cointegrated SVAR Approach. *SSRN Electronic Journal* . [Crossref]

263. Sanvi Avouyi-Dovi, Claire Labonne, Remy Lecat, Simon Ray. 2017. Insight from a Time-Varying VAR Model with Stochastic Volatility of the French Housing and Credit Markets. *SSRN Electronic Journal* . [Crossref]

264. Sumit Agarwal, Wenlan Qian. 2017. The Effectiveness of Housing Collateral Tightening Policy. *SSRN Electronic Journal* . [Crossref]

265. James Cloyne, Kilian Huber, Ethan Ilzetzki, Henrik Kleven. 2017. The Effect of House Prices on Household Borrowing: A New Approach. *SSRN Electronic Journal* . [Crossref]

266. Holger M. Mueller, Constantine Yannelis. 2017. Students in Distress: Labor Market Shocks, Student Loan Default, and Federal Insurance Programs. *SSRN Electronic Journal* . [Crossref]

267. Mark Egan, Stefan Lewellen. 2017. The Cross Section of Bank Value. *SSRN Electronic Journal* . [Crossref]

268. Vadim Elenev. 2017. Mortgage Credit, Aggregate Demand, and Unconventional Monetary Policy. *SSRN Electronic Journal* . [Crossref]

269. Fabio Braggion, Alberto Manconi, Haikun Zhu. 2017. Is FinTech a Threat to Financial Stability? Evidence from Peer-to-Peer Lending in China. *SSRN Electronic Journal* . [Crossref]

270. Stijn Van Nieuwerburgh. 2017. Why are Reits Currently so Expensive?. *SSRN Electronic Journal* . [Crossref]

271. Atif R. Mian, Amir Sufi, Emil Verner. 2017. How Do Credit Supply Shocks Affect the Real Economy? Evidence from the United States in the 1980s. *SSRN Electronic Journal* . [Crossref]

272. Christos Andreas Makridis, Michael Ohlrogge. 2017. Foreclosures and the Labor Market: Evidence from Millions of Households across the United States, 2000-2014. *SSRN Electronic Journal* . [Crossref]

273. Leming Lin. 2017. Bank Deposits and the Stock Market. *SSRN Electronic Journal* . [Crossref]

274. Christos Andreas Makridis, Michael Ohlrogge. 2017. Well-Being and Large Financial Shocks: Evidence from Foreclosures between 2008-2014. *SSRN Electronic Journal* . [Crossref]

275. Wei Ma, Jinlong Li, Weiping Wu. 2017. Housing Prices, Investments and Macroeconomic Fluctuations. *SSRN Electronic Journal* . [Crossref]

276. Zi-Yi Guo. 2017. Housing Dynamics, Empirical Facts and the Business Cycle. *SSRN Electronic Journal* . [Crossref]

277. Siwapong Uruyos, Ahmad Chaman, Nye Wusin, Mario Phichinni. 2017. How Housing Prices Affect Macroeconomic Fluctuations: The Role of Residential and Nonresidential Investments. *SSRN Electronic Journal* . [Crossref]

278. Christos Andreas Makridis, Pei-Yu Chen, Bin Gu. 2017. Does Housing Make I.T. Boom? The Collateral Channel, Information Technology, and Skilled Labor. *SSRN Electronic Journal* . [Crossref]

279. Annamaria Lusardi, Olivia S. Mitchell, Noemi Oggero. 2017. Debt and Financial Vulnerability on the Verge of Retirement. *SSRN Electronic Journal* . [Crossref]

280. Yuxi Yao. 2017. Accounting for the Decline in Homeownership Among the Young. *SSRN Electronic Journal* . [Crossref]

281. Michael LaCour-Little, Yanan Zhang. 2017. Adverse Selection in the Home Equity Line of Credit Market. *SSRN Electronic Journal* . [Crossref]

282. Thorsten Franz. 2017. Monetary Policy, Housing, and Collateral Constraints. *SSRN Electronic Journal* . [Crossref]

283. Jieying Li, Xin Zhang. 2017. House Prices, Home Equity, and Personal Debt Composition. *SSRN Electronic Journal* . [Crossref]

284. Christos Andreas Makridis. 2017. Sentimental Business Cycles and the Protracted Great Recession. *SSRN Electronic Journal* . [Crossref]

285. Jonathan Hartley, Jonathan Dorf. 2017. The Mortgage Interest Tax Deduction and the Great Recession. *SSRN Electronic Journal* . [Crossref]

286. Matteo Cacciatore, Romain Duval, Giuseppe Fiori, Fabio Ghironi. 2017. Market Reforms at the Zero Lower Bound. *IMF Working Papers* **17**:215, 1. [Crossref]

287. Nitzan Tzur-Ilan. 2017. The Effect of Credit Constraints on Housing Choices: The Case of LTV Limit. *SSRN Electronic Journal* . [Crossref]

288. Marianne Bertrand, Adair Morse. 2016. Trickle-Down Consumption. *Review of Economics and Statistics* **98**:5, 863-879. [Crossref]

289. Rawley Z. Heimer, Timothy Stehulak, Caitlin Treanor. 2016. Geographic Mobility and Consumer Financial Health: Evidence from Oil Production Boom Towns. *Economic Commentary (Federal Reserve Bank of Cleveland)* 1-4. [Crossref]

290. André K. Anundsen, Karsten Gerdrup, Frank Hansen, Kasper Kragh-Sørensen. 2016. Bubbles and Crises: The Role of House Prices and Credit. *Journal of Applied Econometrics* **31**:7, 1291-1311. [Crossref]

291. Ting Chen, J.K.-S. Kung. 2016. Do land revenue windfalls create a political resource curse? Evidence from China. *Journal of Development Economics* **123**, 86-106. [Crossref]

292. Juan Luo, Limin Xu, Ralf Zurbruegg. 2016. The Impact of Housing Wealth on Stock Liquidity. *Review of Finance* **102**, rfw057. [Crossref]

293. Donald Haurin, Chao Ma, Stephanie Moulton, Maximilian Schmeiser, Jason Seligman, Wei Shi. 2016. Spatial Variation in Reverse Mortgages Usage: House Price Dynamics and Consumer Selection. *The Journal of Real Estate Finance and Economics* **53**:3, 392-417. [Crossref]

294. Viral V. Acharya, Anjan V. Thakor. 2016. The dark side of liquidity creation: Leverage and systemic risk. *Journal of Financial Intermediation* **28**, 4-21. [Crossref]

295. Michael D. Bordo, John V. Duca, Christoffer Koch. 2016. Economic policy uncertainty and the credit channel: Aggregate and bank level U.S. evidence over several decades. *Journal of Financial Stability* **26**, 90-106. [Crossref]

296. Therese C. Scharlemann, Stephen H. Shore. 2016. The Effect of Negative Equity on Mortgage Default: Evidence From HAMP's Principal Reduction Alternative. *Review of Financial Studies* **29**:10, 2850-2883. [Crossref]

297. Sumit Agarwal, Luojia Hu, Xing Huang. 2016. Rushing into the American Dream? House Prices Growth and the Timing of Homeownership. *Review of Finance* **20**:6, 2183-2218. [Crossref]

298. Jie Chen, Woon Sau Leung, Kevin P. Evans. 2016. Are employee-friendly workplaces conducive to innovation?. *Journal of Corporate Finance* **40**, 61-79. [Crossref]

299. Zhao Rong, Wenchun Wang, Qiang Gong. 2016. Housing price appreciation, investment opportunity, and firm innovation: Evidence from China. *Journal of Housing Economics* **33**, 34-58. [Crossref]

300. Norbert Hiller, Oliver W. Lerbs. 2016. Aging and urban house prices. *Regional Science and Urban Economics* **60**, 276-291. [Crossref]

301. Meta Brown, John Grigsby, Wilbert van der Klaauw, Jaya Wen, Basit Zafar. 2016. Financial Education and the Debt Behavior of the Young. *Review of Financial Studies* **29**:9, 2490-2522. [Crossref]

302. Norbert Hiller, Sören Gröbel. 2016. Wie der Immobilienmarkt auf Schocks reagiert. *Bankmagazin* **65**:10, 24-27. [Crossref]

303. Merike Kukk. 2016. How did household indebtedness hamper consumption during the recession? Evidence from micro data. *Journal of Comparative Economics* **44**:3, 764-786. [Crossref]

304. Chintal Ajitbhai Desai. 2016. Mortgage credit and bankruptcy chapter choice: a case of US counties. *Managerial Finance* **42**:7, 680-705. [Crossref]

305. Neil Bhutta, Benjamin J. Keys. 2016. Interest Rates and Equity Extraction During the Housing Boom. *American Economic Review* **106**:7, 1742-1774. [Abstract] [View PDF article] [PDF with links]

306. Dean Karlan, Adam Osman, Jonathan Zinman. 2016. Follow the money not the cash: Comparing methods for identifying consumption and investment responses to a liquidity shock. *Journal of Development Economics* **121**, 11-23. [Crossref]

307. S. Borağan Aruoba, Morris A. Davis, Randall Wright. 2016. Homework in monetary economics: Inflation, home production, and the production of homes. *Review of Economic Dynamics* **21**, 105-124. [Crossref]

308. Manuel Adelino, Antoinette Schoar, Felipe Severino. 2016. Loan Originations and Defaults in the Mortgage Crisis: The Role of the Middle Class. *Review of Financial Studies* **29**:7, 1635-1670. [Crossref]

309. . References 303-327. [Crossref]

310. Kerwin Kofi Charles, Erik Hurst, Matthew J. Notowidigdo. 2016. The Masking of the Decline in Manufacturing Employment by the Housing Bubble. *Journal of Economic Perspectives* **30**:2, 179-200. [Abstract] [View PDF article] [PDF with links]

311. Po-Hsin Ho, Chia-Wei Huang, Chih-Yung Lin, Ju-Fang Yen. 2016. CEO overconfidence and financial crisis: Evidence from bank lending and leverage. *Journal of Financial Economics* **120**:1, 194-209. [Crossref]

312. Barry Z. Cynamon, Steven M. Fazzari. 2016. Inequality, the Great Recession and slow recovery. *Cambridge Journal of Economics* **40**:2, 373-399. [Crossref]

313. SEWIN CHAN, ANDREW HAUGHWOUT, ANDREW HAYASHI, WILBERT VAN DER KLAAUW. 2016. Determinants of Mortgage Default and Consumer Credit Use: The Effects of Foreclosure Laws and Foreclosure Delays. *Journal of Money, Credit and Banking* **48**:2-3, 393-413. [Crossref]

314. Daisuke Ikeda, Toan Phan. 2016. Toxic asset bubbles. *Economic Theory* **61**:2, 241-271. [Crossref]

315. Azizjon Alimov. 2016. Product market effects of real estate collateral. *Journal of Corporate Finance* **36**, 75-92. [Crossref]

316. Daniel Cooper, Karen Dynan. 2016. WEALTH EFFECTS AND MACROECONOMIC DYNAMICS. *Journal of Economic Surveys* **30**:1, 34-55. [Crossref]

317. Aviral K. Tiwari, Claudiu T. Albulescu, Rangan Gupta. 2016. Time–frequency relationship between US output with commodity and asset prices. *Applied Economics* **48**:3, 227-242. [Crossref]

318. Xun Bian. 2016. Leverage and Elderly Homeowners' Decisions to Downsize. *Housing Studies* **31**:1, 20-41. [Crossref]

319. Trond-Arne Borgersen. 2016. Housing appreciations and the (in)stable relation between housing and mortgage markets. *International Journal of Housing Policy* **16**:1, 91-110. [Crossref]

320. A. Mian, A. Sufi. Who Bears the Cost of Recessions? The Role of House Prices and Household Debt 255-296. [Crossref]

321. V. Guerrieri, H. Uhlig. Housing and Credit Markets 1427-1496. [Crossref]
322. M. Piazzesi, M. Schneider. Housing and Macroeconomics 1547-1640. [Crossref]
323. Christian E. Weller. More Risk, Greater Wealth Inequality 27-40. [Crossref]
324. Jing Shi, Yongxiang Wang, Weixing Wu, tony zhong. 2016. The Crowding-Out Effect of Real Estate Markets on Corporate Innovation: Evidence from China. *SSRN Electronic Journal* . [Crossref]
325. Steven C. Bourassa, Donald R. Haurin. 2016. A Dynamic Housing Affordability Index. *SSRN Electronic Journal* . [Crossref]
326. David M. Blau, Donald R. Haurin. 2016. The Effect of a Metropolitan Area's Price of Housing on Child and Young Adult Outcomes. *SSRN Electronic Journal* . [Crossref]
327. Martin Beraja, Erik Hurst, Juan Ospina. 2016. The Aggregate Implications of Regional Business Cycles. *SSRN Electronic Journal* . [Crossref]
328. Andrew Davidson, Alex Levin, Andrey D. Pavlov, Susan M. Wachter. 2016. Why are Aggressive Mortgage Products Bad for the Housing Market?. *SSRN Electronic Journal* . [Crossref]
329. Paige Parker Ouimet, Geoffrey A. Tate. 2016. Investor Experience and Attention: The Effect of Financial Shocks on Individual Trading Decisions. *SSRN Electronic Journal* . [Crossref]
330. Valentina Michelangeli, Enrico Sette. 2016. How Does Bank Capital Affect the Supply of Mortgages? Evidence from a Randomized Experiment. *SSRN Electronic Journal* . [Crossref]
331. Kathleen Weiss Hanley. 2016. Dynamic Interpretation of Emerging Systemic Risks. *SSRN Electronic Journal* . [Crossref]
332. Xavier Giroud, Holger M. Mueller. 2016. Redistribution of Local Labor Market Shocks Through Firmss Internal Networks. *SSRN Electronic Journal* . [Crossref]
333. Mihhly Tamms Borsi. 2016. Credit Contractions and Unemployment. *SSRN Electronic Journal* . [Crossref]
334. Francesco D'Acunto, Daniel Hoang, Michael Weber. 2016. The Effect of Unconventional Fiscal Policy on Consumption Expenditure. *SSRN Electronic Journal* . [Crossref]
335. Kieran James Walsh. 2016. A Theory of Portfolio Choice and Partial Default. *SSRN Electronic Journal* . [Crossref]
336. Barney Hartman-Glaser, William Mann. 2016. Collateral Constraints, Wealth Effects, and Volatility: Evidence from Real Estate Markets. *SSRN Electronic Journal* . [Crossref]
337. Ben Gilbert, Julian Wade. 2016. Health Care and the Housing Crisis. *SSRN Electronic Journal* . [Crossref]
338. Mathias Klein. 2016. Austerity and Private Debt. *SSRN Electronic Journal* . [Crossref]
339. Richard F. Disney, John Gathergood. 2016. House Prices, Wealth Effects and Labour Supply. *SSRN Electronic Journal* . [Crossref]
340. Cristian Badarinza. 2016. The Informational Role of Housing Market Liquidity. *SSRN Electronic Journal* . [Crossref]
341. William Benedict McCartney, Avni M. Shah. 2016. 'I'll Have What She's Having': Identifying Social Influence in Household Mortgage Decisions. *SSRN Electronic Journal* . [Crossref]
342. Stephanie Moulton. 2016. How Home Equity Extraction and Reverse Mortgages Affect the Credit Outcomes of Senior Households. *SSRN Electronic Journal* . [Crossref]
343. Gerhard Illing, Yoshiyasu Ono, Matthias Schlegl. 2016. Asset Prices and Leverage in a Model of Persistent Stagnation. *SSRN Electronic Journal* . [Crossref]

344. Chandler Lutz, Aleksandra Anna Rzeznik, Ben Sand. 2016. Local Economic Conditions and Local Equity Preferences: Evidence from Mutual Funds during the U.S. Housing Boom and Bust. *SSRN Electronic Journal* . [Crossref]
345. John V. Duca, Lilit Popoyan, Susan M. Wachter. 2016. Real Estate and the Great Crisis: Lessons for Macro-Prudential Policy. *SSRN Electronic Journal* . [Crossref]
346. Robert C. Merton, Rose Neng Lai. 2016. On an Efficient Design of Reverse Mortgages: A Possible Solution for Aging Asian Populations. *SSRN Electronic Journal* . [Crossref]
347. Rohan Ganduri. 2016. Repo Regret?. *SSRN Electronic Journal* . [Crossref]
348. Manish Gupta. 2016. Does Mortgage Debt Affect Homeowner Mobility?. *SSRN Electronic Journal* . [Crossref]
349. Xiaoqing Zhou. 2016. Home Equity Extraction and the Boom-Bust Cycle in Consumption and Residential Investment. *SSRN Electronic Journal* . [Crossref]
350. Tobias Adrian, Daniel Covitz, Nellie Liang. 2015. Financial Stability Monitoring. *Annual Review of Financial Economics* **7**:1, 357-395. [Crossref]
351. Pu Chen, Chunyang Wang, Yangyan Liu. 2015. Real estate prices and firm borrowings: Micro evidence from China. *China Economic Review* **36**, 296-308. [Crossref]
352. Christoph Basten, Catherine Koch. 2015. The causal effect of house prices on mortgage demand and mortgage supply: Evidence from Switzerland. *Journal of Housing Economics* **30**, 1-22. [Crossref]
353. TOMASZ PISKORSKI, AMIT SERU, JAMES WITKIN. 2015. Asset Quality Misrepresentation by Financial Intermediaries: Evidence from the RMBS Market. *The Journal of Finance* **70**:6, 2635-2678. [Crossref]
354. ATIF MIAN, AMIR SUFI, FRANCESCO TREBBI. 2015. Foreclosures, House Prices, and the Real Economy. *The Journal of Finance* **70**:6, 2587-2634. [Crossref]
355. Neil Bhutta. 2015. The ins and outs of mortgage debt during the housing boom and bust. *Journal of Monetary Economics* **76**, 284-298. [Crossref]
356. Stephanie Moulton, Donald R. Haurin, Wei Shi. 2015. An analysis of default risk in the Home Equity Conversion Mortgage (HECM) program. *Journal of Urban Economics* **90**, 17-34. [Crossref]
357. Nicolas L. Ziebarth. 2015. The Great Depression Through the Eyes of the Census of Manufactures. *Historical Methods: A Journal of Quantitative and Interdisciplinary History* **48**:4, 185-194. [Crossref]
358. Manuel Adelino, Antoinette Schoar, Felipe Severino. 2015. House prices, collateral, and self-employment. *Journal of Financial Economics* **117**:2, 288-306. [Crossref]
359. Martina Lawless, Brian O'Connell, Conor O'Toole. 2015. SME recovery following a financial crisis: Does debt overhang matter?. *Journal of Financial Stability* **19**, 45-59. [Crossref]
360. Stefano Corradin, Alexander Popov. 2015. House Prices, Home Equity Borrowing, and Entrepreneurship. *Review of Financial Studies* **28**:8, 2399-2428. [Crossref]
361. Jonathan Zinman. 2015. Household Debt: Facts, Puzzles, Theories, and Policies. *Annual Review of Economics* **7**:1, 251-276. [Crossref]
362. JOHN Y. CAMPBELL, JOÃO F. COCCO. 2015. A Model of Mortgage Default. *The Journal of Finance* **70**:4, 1495-1554. [Crossref]
363. Wendy Nyakabawo, Stephen M. Miller, Mehmet Balcilar, Sonali Das, Rangan Gupta. 2015. Temporal causality between house prices and output in the US: A bootstrap rolling-window approach. *The North American Journal of Economics and Finance* **33**, 55-73. [Crossref]
364. Chao He, Randall Wright, Yu Zhu. 2015. Housing and liquidity. *Review of Economic Dynamics* **18**:3, 435-455. [Crossref]

365. Michel Dietsch, Joël Petey. 2015. The credit-risk implications of home ownership promotion: The effects of public subsidies and adjustable-rate loans. *Journal of Housing Economics* **28**, 103-120. [Crossref]

366. Phuong V. Ngo. 2015. Household leverage, housing markets, and macroeconomic fluctuations. *Journal of Macroeconomics* **44**, 191-207. [Crossref]

367. Karen Dynan, Daniel Cooper. Household Wealth Effects and the US Macroeconomy 1-17. [Crossref]

368. Leming Lin. 2015. Collateral and the Choice Between Bank Debt and Public Debt. *Management Science* 150415113159009. [Crossref]

369. Karyn L. Neuhauser. 2015. The Global Financial Crisis: what have we learned so far?. *International Journal of Managerial Finance* **11**:2, 134-161. [Crossref]

370. Tim Landvoigt, Monika Piazzesi, Martin Schneider. 2015. The Housing Market (s) of San Diego. *American Economic Review* **105**:4, 1371-1407. [Abstract] [View PDF article] [PDF with links]

371. Fredrik Andersson, Tom Mayock. 2015. The microdynamics of household credit use through a boom–bust cycle. *Journal of Housing Economics* **27**, 22-36. [Crossref]

372. Keith Ihlanfeldt, Tom Mayock. 2015. Introduction to the special issue on Housing Finance. *Journal of Housing Economics* **27**, 1-3. [Crossref]

373. YAVUZ ARSLAN, BULENT GULER, TEMEL TASKIN. 2015. Joint Dynamics of House Prices and Foreclosures. *Journal of Money, Credit and Banking* **47**:S1, 133-169. [Crossref]

374. ANDREA FERRERO. 2015. House Price Booms, Current Account Deficits, and Low Interest Rates. *Journal of Money, Credit and Banking* **47**:S1, 261-293. [Crossref]

375. JOHN MUELLBAUER. 2015. Housing and the Macroeconomy: Inflation and the Financial Accelerator. *Journal of Money, Credit and Banking* **47**:S1, 51-58. [Crossref]

376. META BROWN, SARAH STEIN, BASIT ZAFAR. 2015. The Impact of Housing Markets on Consumer Debt: Credit Report Evidence from 1999 to 2012. *Journal of Money, Credit and Banking* **47**:S1, 175-213. [Crossref]

377. RAY BOSHARA, WILLIAM R. EMMONS. 2015. A Balance Sheet Perspective on Financial Success: Why Starting Early Matters. *Journal of Consumer Affairs* **49**:1, 267-298. [Crossref]

378. Mark D. Partridge, Dan S. Rickman, Ying Tan, M. Rose Olfert. 2015. U.S. Regional Poverty Post-2000. *Economic Development Quarterly* **29**:1, 38-48. [Crossref]

379. Morris A. Davis, Stijn Van Nieuwerburgh. Housing, Finance, and the Macroeconomy 753-811. [Crossref]

380. Sewin Chan, Andrew Haughwout, Joseph Tracy. How Mortgage Finance Affects the Urban Landscape 987-1045. [Crossref]

381. Elena Loutskina, Philip E. Strahan. 2015. Financial integration, housing, and economic volatility. *Journal of Financial Economics* **115**:1, 25-41. [Crossref]

382. Alejandro Justiniano, Giorgio E. Primiceri, Andrea Tambalotti. 2015. Household leveraging and deleveraging. *Review of Economic Dynamics* **18**:1, 3-20. [Crossref]

383. Irlandia Ginanjar, Sapto W. Indratno. Identify the ability to purchase a house in the five major cities of Java for the Indonesian middle class using correspondence analysis 020022. [Crossref]

384. Manuel Adelino, Antoinette Schoar, Felipe Severino. 2015. Changes in Buyer Composition and the Expansion of Credit During the Boom. *SSRN Electronic Journal* . [Crossref]

385. Shinichi Kamiya. 2015. Credit Crunch and Insurance Consumption: The Aftermath of the Subprime Mortgage Crisis. *SSRN Electronic Journal* . [Crossref]

386. Xun Bian. 2015. Leverage and Elderly Homeownerss Decisions to Downsize. *SSRN Electronic Journal* . [Crossref]

387. Francesco D'Acunto, Daniel Hoang, Michael Weber. 2015. Inflation Expectations and Consumption Expenditure. *SSRN Electronic Journal* . [Crossref]

388. Yao-Min Chiang, Jarjisu Sa-Aadu, James D. Shilling. 2015. Unconventional Monetary Policy and U.S. Housing Markets Dynamics. *SSRN Electronic Journal* . [Crossref]

389. Xavier Giroud, Holger M. Mueller. 2015. Firm Leverage and Unemployment During the Great Recession. *SSRN Electronic Journal* . [Crossref]

390. Azizjon Alimov. 2015. Product Market Effects of Real Estate Collateral. *SSRN Electronic Journal* . [Crossref]

391. Marco Angrisani, Michael D. Hurd, Susann Rohwedder. 2015. The Effect of Housing and Stock Wealth Losses on Spending in the Great Recession. *SSRN Electronic Journal* . [Crossref]

392. Caroline Flammer, Ioannis Ioannou. 2015. The Dog that Didnnt Bark: Long-Term Strategies in Times of Recession. *SSRN Electronic Journal* . [Crossref]

393. Atif R. Mian, Amir Sufi. 2015. Fraudulent Income Overstatement on Mortgage Applications During the Credit Expansion of 2002 to 2005. *SSRN Electronic Journal* . [Crossref]

394. Atif R. Mian, Amir Sufi. 2015. Household Debt and Defaults from 2000 to 2010: Facts from Credit Bureau Data. *SSRN Electronic Journal* . [Crossref]

395. Rendon Silvio, Nuria Quella. 2015. Interactions between Job Search and Housing Decisions: A Structural Estimation. *SSRN Electronic Journal* . [Crossref]

396. Sari Pekkala Kerr, William R. Kerr, Ramana Nanda. 2015. House Money and Entrepreneurship. *SSRN Electronic Journal* . [Crossref]

397. Alejandro Justiniano, Giorgio E. Primiceri, Andrea Tambalotti. 2015. Credit Supply and the Housing Boom. *SSRN Electronic Journal* . [Crossref]

398. Therese C. Scharlemann, Stephen H. Shore. 2015. The Effect of Negative Equity on Mortgage Default: Evidence from HAMP PRA. *SSRN Electronic Journal* . [Crossref]

399. Luca Guerrieri, Matteo M. Iacoviello. 2015. Collateral Constraints and Macroeconomic Asymmetries. *SSRN Electronic Journal* . [Crossref]

400. Jie Chen, Woon Sau Leung, Kevin P. Evans. 2015. Are Employee-Friendly Workplaces Conducive to Innovation?. *SSRN Electronic Journal* . [Crossref]

401. Stephanie Moulton, Samuel Dodini, Donald R. Haurin, Maximilian D. Schmeiser. 2015. How House Price Dynamics and Credit Constraints Affect the Equity Extraction of Senior Homeowners. *SSRN Electronic Journal* . [Crossref]

402. Nuri Ersahin, Rustom M. Irani. 2015. Collateral Values and Corporate Employment. *SSRN Electronic Journal* . [Crossref]

403. Thomas Hintermaier. 2015. Household Debt and Crises of Confidence. *SSRN Electronic Journal* . [Crossref]

404. Philippe Bracke, Christian A. L. Hilber, Olmo Silva. 2015. Mortgage Debt and Entrepreneurship. *SSRN Electronic Journal* . [Crossref]

405. Isaac Hacamo. 2015. Helping the Middle-Class: How Interest Rates Affect the Distribution of Housing Wealth. *SSRN Electronic Journal* . [Crossref]

406. Julien Bengui, Toan Phan. 2015. Inequality, Financial Frictions, and Leveraged Bubbles. *SSRN Electronic Journal* . [Crossref]

407. Anthony A. DeFusco. 2015. Homeowner Borrowing and Housing Collateral: New Evidence from Expiring Price Controls. *SSRN Electronic Journal* . [Crossref]

408. Anil Kumar, Carles Vergara-Alert. 2015. Payout Policy and Real Estate Prices. *SSRN Electronic Journal* . [Crossref]

409. Marco Di Maggio, Amir Kermani, Christopher Palmer. 2015. Unconventional Monetary Policy and the Allocation of Credit. *SSRN Electronic Journal* . [Crossref]

410. Gabor Pinter. 2015. House Prices and Job Losses. *SSRN Electronic Journal* . [Crossref]

411. Benjamin Bennett, Radhakrishnan Gopalan, Thomas Andreas Maurer. 2015. The Collateral Value of Housing: Evidence from Service Member Pension Choices. *SSRN Electronic Journal* . [Crossref]

412. Kristoph Kleiner. 2015. Collateral and Small Firm Labor. *SSRN Electronic Journal* . [Crossref]

413. Eugenio Cerutti, Jihad Dagher, Giovanni Dell'Ariccia. 2015. Housing Finance and Real-Estate Booms: A Cross-Country Perspective. *Staff Discussion Notes* **15**:12, 1. [Crossref]

414. Rima Turk. 2015. Housing Price and Household Debt Interactions in Sweden. *IMF Working Papers* **15**:276, 1. [Crossref]

415. Jinfei Sheng. 2015. The Real Effects of Government Intervention: Firm-Level Evidence from TARP. *SSRN Electronic Journal* . [Crossref]

416. Dan S. Rickman, Mouhcine Guettabi. 2015. THE GREAT RECESSION AND NONMETROPOLITAN AMERICA. *Journal of Regional Science* **55**:1, 93-112. [Crossref]

417. Ceyhun Elgin, Burak R. Uras. 2014. Homeownership, informality and the transmission of monetary policy. *Journal of Banking & Finance* **49**, 160-168. [Crossref]

418. Erling Røed Larsen. 2014. The Engel Curve of Owner-Occupied Housing Consumption. *Journal of Applied Economics* **17**:2, 325-352. [Crossref]

419. Michael Amior, Jonathan Halket. 2014. Do households use home-ownership to insure themselves? Evidence across U.S. cities. *Quantitative Economics* **5**:3, 631-674. [Crossref]

420. Anand M. Goel, Fenghua Song, Anjan V. Thakor. 2014. Correlated leverage and its ramifications. *Journal of Financial Intermediation* **23**:4, 471-503. [Crossref]

421. Alicia Robb, Robert Seamans. The Role of R&D in Entrepreneurial Finance and Performance 341-373. [Crossref]

422. Christopher Mayer, Edward Morrison, Tomasz Piskorski, Arpit Gupta. 2014. Mortgage Modification and Strategic Behavior: Evidence from a Legal Settlement with Countrywide. *American Economic Review* **104**:9, 2830-2857. [Abstract] [View PDF article] [PDF with links]

423. Daniel Chandler, Richard Disney. 2014. The Housing Market in the United Kingdom: Effects of House Price Volatility on Households. *Fiscal Studies* **35**:3, 371-394. [Crossref]

424. Martin Neil Baily. 2014. Taking advantage of innovation. *Journal of Policy Modeling* **36**:4, 654-673. [Crossref]

425. Maisy Wong. 2014. Estimating the distortionary effects of ethnic quotas in Singapore using housing transactions. *Journal of Public Economics* **115**, 131-145. [Crossref]

426. Shawn Cole, Anna Paulson, Gauri Kartini Shastry. 2014. Smart Money? The Effect of Education on Financial Outcomes. *Review of Financial Studies* **27**:7, 2022-2051. [Crossref]

427. Jonathan Zinman. 2014. Consumer Credit: Too Much or Too Little (or Just Right)?. *The Journal of Legal Studies* **43**:S2, S209-S237. [Crossref]

428. Martin Feldkircher. 2014. The determinants of vulnerability to the global financial crisis 2008 to 2009: Credit growth and other sources of risk. *Journal of International Money and Finance* **43**, 19-49. [Crossref]

429. John V. Duca, Anil Kumar. 2014. Financial literacy and mortgage equity withdrawals. *Journal of Urban Economics* **80**, 62-75. [Crossref]

430. Michael LaCour-Little, Wei Yu, Libo Sun. 2014. The Role of Home Equity Lending in the Recent Mortgage Crisis. *Real Estate Economics* **42**:1, 153-189. [Crossref]

431. Mamoru Nagano, Dong-Ho Yeom. 2014. Another Determinant of Household Leverage: Evidence from Japan's Mortgage Loan Data. *International Review of Finance* **14**:1, 105-139. [Crossref]
432. Ity Shurtz. 2014. Malpractice Law, Physicians' Financial Incentives, and Medical Treatment: How Do They Interact?. *The Journal of Law and Economics* **57**:1, 1-29. [Crossref]
433. Joshua Goodman, Adam Levitin. 2014. Bankruptcy Law and the Cost of Credit: The Impact of Cramdown on Mortgage Interest Rates. *The Journal of Law and Economics* **57**:1, 139-158. [Crossref]
434. Julia Giese, Henrik Andersen, Oliver Bush, Christian Castro, Marc Farag, Sujit Kapadia. 2014. THE CREDIT-TO-GDP GAP AND COMPLEMENTARY INDICATORS FOR MACROPRUDENTIAL POLICY: EVIDENCE FROM THE UK. *International Journal of Finance & Economics* **19**:1, 25-47. [Crossref]
435. Manel Antelo, David Peón. 2014. Fiscal consolidation and the sustainability of public debt in the GIPSI countries. *Cuadernos de Economía* **37**:103, 52-71. [Crossref]
436. Yongqiang Chu. 2014. Credit constraints, inelastic supply, and the housing boom. *Review of Economic Dynamics* **17**:1, 52-69. [Crossref]
437. David S. Bieri. 2014. Moonlights, Sunspots and Frontier Finance: On the Nexus between Money, Credit and Urban Form. *SSRN Electronic Journal* . [Crossref]
438. Romain Bouis. 2014. Household Deleveraging and Saving Rates: A Cross-Country Analysis. *SSRN Electronic Journal* . [Crossref]
439. John Carter Braxton, Edward S. Knotek. 2014. Consumer Debt Dynamics: Follow the Increasers. *SSRN Electronic Journal* . [Crossref]
440. Huong Dieu Nguyen. 2014. Uncertainty in the Housing Market: A Learning Model and Evidence from Household Survey Data. *SSRN Electronic Journal* . [Crossref]
441. Fredrik Andersson, Tom Mayock. 2014. The Microdynamics of the Household Balance Sheet in a Boom-Bust Housing Cycle. *SSRN Electronic Journal* . [Crossref]
442. Donald R. Haurin, Chao Ma, Stephanie Moulton, Maximilian D. Schmeiser, Jason S. Seligman, Wei Shi. 2014. Spatial Variation in Reverse Mortgages Usage: House Price Dynamics and Consumer Selection. *SSRN Electronic Journal* . [Crossref]
443. Stephanie Moulton, Donald R. Haurin, Wei Shi. 2014. An Analysis of Default Risk in the Home Equity Conversion Mortgage (HECM) Program. *SSRN Electronic Journal* . [Crossref]
444. Ceyhun Elgin, Burak Uras. 2014. Homeownership, Informality and the Transmission of Monetary Policy. *SSRN Electronic Journal* . [Crossref]
445. Tobias Adrian, Nellie Liang. 2014. Monetary Policy, Financial Conditions, and Financial Stability. *SSRN Electronic Journal* . [Crossref]
446. Juan Luo, Limin Xu, Ralf Zurbruegg. 2014. The Relationship between the Housing Market and Stock Liquidity. *SSRN Electronic Journal* . [Crossref]
447. John Mondragon. 2014. Household Credit and Employment in the Great Recession. *SSRN Electronic Journal* . [Crossref]
448. Synne Almaas, Line Bystrrm, Fredrik Carlsen, Xunhua Su. 2014. Home Equity-Based Refinancing and Household Financial Difficulties: The Case of Norway. *SSRN Electronic Journal* . [Crossref]
449. Lawrence J. Jin. 2014. A Speculative Asset Pricing Model of Financial Instability. *SSRN Electronic Journal* . [Crossref]
450. Daisuke Ikeda, Toan Phan. 2014. Toxic Asset Bubbles. *SSRN Electronic Journal* . [Crossref]
451. Ron Cheung, Chris Cunningham, Stephan Whitaker. 2014. Household Debt and Local Public Finances. *SSRN Electronic Journal* . [Crossref]

452. Aditya Aladangady. 2014. Homeowner Balance Sheets and Monetary Policy. *SSRN Electronic Journal* . [Crossref]

453. Manuel Adelino, Igor Cunha, Miguel A. Ferreira. 2014. The Economic Effects of Public Financing: Evidence from Municipal Bond Ratings Recalibration. *SSRN Electronic Journal* . [Crossref]

454. Kim Kaivanto. 2014. Visceral Emotions, Within-Community Communication, and (Ill-Judged) Endorsement of Financial Propositions. *SSRN Electronic Journal* . [Crossref]

455. Mark Calabria. 2014. The Role of Mortgage Finance in Financial (In)Stability. *SSRN Electronic Journal* . [Crossref]

456. Alejandro Justiniano, Giorgio E. Primiceri, Andrea Tambalotti. 2014. Credit Supply and the Housing Boom. *SSRN Electronic Journal* . [Crossref]

457. Trond-Arne Borgersen. 2014. Mortgage Supply, LTV and Risk Pricing. *SSRN Electronic Journal* . [Crossref]

458. Monika Piazzesi, Martin Schneider, Johannes Stroebel. 2014. Segmented Housing Search. *SSRN Electronic Journal* . [Crossref]

459. Roberto Pancrazi, Mario Pietrunti. 2014. Natural Expectations and Home Equity Extraction. *SSRN Electronic Journal* . [Crossref]

460. Ron S. Jarmin, C.J. Krizan, Adela Luque. 2014. Owner Characteristics and Firm Performance During the Great Recession. *SSRN Electronic Journal* . [Crossref]

461. Thais Laerkholm Jensen, SSren LethhPetersen, Ramana Nanda. 2014. Housing Collateral, Credit Constraints and Entrepreneurship - Evidence from a Mortgage Reform. *SSRN Electronic Journal* . [Crossref]

462. Felipe Severino, Meta Brown, Brandi Coates. 2014. Personal Bankruptcy Protection and Household Debt. *SSRN Electronic Journal* . [Crossref]

463. André Ebner. 2013. A micro view on home equity withdrawal and its determinants: Evidence from Dutch households. *Journal of Housing Economics* **22**:4, 321-337. [Crossref]

464. Atif Mian, Kamalesh Rao, Amir Sufi. 2013. Household Balance Sheets, Consumption, and the Economic Slump*. *The Quarterly Journal of Economics* **128**:4, 1687-1726. [Crossref]

465. Fabian T. Pfeffer, Sheldon Danziger, Robert F. Schoeni. 2013. Wealth Disparities Before and After the Great Recession. *The ANNALS of the American Academy of Political and Social Science* **650**:1, 98-123. [Crossref]

466. Guglielmo Maria Caporale, Mauro Costantini, Antonio Paradiso. 2013. Re-examining the decline in the US saving rate: The impact of mortgage equity withdrawal. *Journal of International Financial Markets, Institutions and Money* **26**, 215-225. [Crossref]

467. Gavin Wood, Sharon Parkinson, Beverley Searle, Susan J. Smith. 2013. Motivations for Equity Borrowing: A Welfare-switching Effect. *Urban Studies* **50**:12, 2588-2607. [Crossref]

468. Teresa C Fort, John Haltiwanger, Ron S Jarmin, Javier Miranda. 2013. How Firms Respond to Business Cycles: The Role of Firm Age and Firm Size. *IMF Economic Review* **61**:3, 520-559. [Crossref]

469. Shi Li, John Whalley, Xiliang Zhao. 2013. Housing price and household savings rates: evidence from China. *Journal of Chinese Economic and Business Studies* **11**:3, 197-217. [Crossref]

470. Wolfram Berger, Friedrich Kissmer. 2013. Monetary policy and asset prices: When cleaning up hits the zero lower bound. *Swiss Journal of Economics and Statistics* **149**:3, 291-312. [Crossref]

471. Chris Mayer, Tomasz Piskorski, Alexei Tchistyi. 2013. The inefficiency of refinancing: Why prepayment penalties are good for risky borrowers. *Journal of Financial Economics* **107**:3, 694-714. [Crossref]

472. L. Laeven, F. Valencia. Resolution of Banking Crises 231-258. [Crossref]
473. Eric Ghysels, Alberto Plazzi, Rossen Valkanov, Walter Torous. Forecasting Real Estate Prices 509-580. [Crossref]
474. Jack Strauss. 2013. Does housing drive state-level job growth? Building permits and consumer expectations forecast a state's economic activity. *Journal of Urban Economics* **73**:1, 77-93. [Crossref]
475. Eleonora Fichera, John Gathergood. 2013. House Prices, Home Equity and Health. *SSRN Electronic Journal* . [Crossref]
476. Grant Graziani, Wilbert van der Klaauw, Basit Zafar. 2013. A Boost in the Paycheck: Survey Evidence on Workers' Response to the 2011 Payroll Tax Cuts. *SSRN Electronic Journal* . [Crossref]
477. Alejandro Justiniano, Giorgio E. Primiceri, Andrea Tambalotti. 2013. Household Leveraging and Deleveraging. *SSRN Electronic Journal* . [Crossref]
478. Marianne Bertrand, Adair Morse. 2013. Trickle-Down Consumption. *SSRN Electronic Journal* . [Crossref]
479. Indraneel Chakraborty, Itay Goldstein, Andrew MacKinlay. 2013. Do Asset Price Bubbles Have Negative Real Effects?. *SSRN Electronic Journal* . [Crossref]
480. Tobias Adrian, Daniel M. Covitz, Nellie Liang. 2013. Financial Stability Monitoring. *SSRN Electronic Journal* . [Crossref]
481. Meta Brown, Sarah Kathryn Stein, Basit Zafar. 2013. The Impact of Housing Markets on Consumer Debt: Credit Report Evidence from 1999 to 2012. *SSRN Electronic Journal* . [Crossref]
482. Steven Laufer. 2013. Equity Extraction and Mortgage Default. *SSRN Electronic Journal* . [Crossref]
483. Kerwin Kofi Charles, Erik Hurst, Matthew Notowidigdo. 2013. Manufacturing Decline, Housing Booms, and Non-Employment. *SSRN Electronic Journal* . [Crossref]
484. Sumit Agarwal, Wenlan Qian. 2013. Access to Housing Wealth and Consumption: Evidence from a Natural Experiment. *SSRN Electronic Journal* . [Crossref]
485. Wendy Nyakabawo, Stephen M. Miller, Mehmet Balcilar, Sonali Das, Rangan Gupta. 2013. Temporal Causality between House Prices and Output in the U. S.: A Bootstrap Rolling-Window Approach. *SSRN Electronic Journal* . [Crossref]
486. Richard F. Disney, John Gathergood. 2013. House Prices, Wealth Effects and Labour Supply. *SSRN Electronic Journal* . [Crossref]
487. Patrick Pintus, Jacek Suda. 2013. Learning Leverage Shocks and the Great Recession. *SSRN Electronic Journal* . [Crossref]
488. Daniel Cooper, Karen E. Dynan. 2013. Wealth Shocks and Macroeconomic Dynamics. *SSRN Electronic Journal* . [Crossref]
489. Cindy K. Soo. 2013. Quantifying Animal Spirits: News Media and Sentiment in the Housing Market. *SSRN Electronic Journal* . [Crossref]
490. Keongtae Kim, Il-Horn Hann. 2013. Does Crowdfunding Democratize Access to Capital? A Geographical Analysis. *SSRN Electronic Journal* . [Crossref]
491. Meta Brown, Wilbert van der Klaauw, Jaya Wen, Basit Zafar. 2013. Financial Education and the Debt Behavior of the Young. *SSRN Electronic Journal* . [Crossref]
492. Alicia Robb, Robert Seamans. 2013. The Role of R&D in Entrepreneurial Finance and Performance. *SSRN Electronic Journal* . [Crossref]
493. Olivier Coibion, Yuriy Gorodnichenko, Dmitri K. Koustas. 2013. Amerisclerosis? The Puzzle of Rising U.S. Unemployment Persistence. *SSRN Electronic Journal* . [Crossref]
494. Anand M. Goel, Fenghua Song, Anjan V. Thakor. 2013. Correlated Leverage and its Ramifications. *SSRN Electronic Journal* . [Crossref]

495. Jonathan Zinman. 2013. Consumer Credit: Too Much or Too Little (or Just Right)?. *SSRN Electronic Journal* . [Crossref]

496. Olympia Bover, Jose Maria Casado, Sonia Costa, Philip Du Caju, Yvonne McCarthy, Eva Sierminska, Panagiota Tzamourani, Ernesto Villanueva, Tibor Zavadil. 2013. The Distribution of Debt Across Euro Area Countries: The Role of Individual Characteristics, Institutions and Credit Conditions. *SSRN Electronic Journal* . [Crossref]

497. Neil Bhutta, Benjamin J. Keys. 2013. Interest Rates and Equity Extraction During the Housing Boom. *SSRN Electronic Journal* . [Crossref]

498. Sanjiv R. Das. 2012. The Principal Principle. *Journal of Financial and Quantitative Analysis* **47**:6, 1215-1246. [Crossref]

499. Jeremy M. Burke,, Curtis R. Taylor,, Liad Wagman. 2012. Information Acquisition in Competitive Markets: An Application to the US Mortgage Market. *American Economic Journal: Microeconomics* **4**:4, 65-106. [Abstract] [View PDF article] [PDF with links]

500. Thomas Chaney,, David Sraer,, David Thesmar. 2012. The Collateral Channel: How Real Estate Shocks Affect Corporate Investment. *American Economic Review* **102**:6, 2381-2409. [Abstract] [View PDF article] [PDF with links]

501. Chadi S. Abdallah,, William D. Lastrapes. 2012. Home Equity Lending and Retail Spending: Evidence from a Natural Experiment in Texas. *American Economic Journal: Macroeconomics* **4**:4, 94-125. [Abstract] [View PDF article] [PDF with links]

502. João Ricardo Faria, Le Wang, Zhongmin Wu. 2012. Debts on debts. *The North American Journal of Economics and Finance* **23**:2, 203-219. [Crossref]

503. Gauti B. Eggertsson, Paul Krugman. 2012. Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach*. *The Quarterly Journal of Economics* **127**:3, 1469-1513. [Crossref]

504. John Gathergood. 2012. How do consumers respond to house price declines?. *Economics Letters* **115**:2, 279-281. [Crossref]

505. Chau Do. 2012. Withdrawing Home Equity: Differences Across Race and Ethnicity. *Housing Studies* **27**:3, 299-323. [Crossref]

506. Shawn Allen Cole, Anna L. Paulson, Gauri Kartini Shastry. 2012. Smart Money: The Effect of Education on Financial Behavior. *SSRN Electronic Journal* . [Crossref]

507. Alessandro Previtero. 2012. Stock Market Returns and Annutization: A Case of Myopic Extrapolation. *SSRN Electronic Journal* . [Crossref]

508. Neil Bhutta. 2012. Mortgage Debt and Household Deleveraging: Accounting for the Decline in Mortgage Debt Using Consumer Credit Record Data. *SSRN Electronic Journal* . [Crossref]

509. Pengfei Wang, Lifang Xu, Zhiwei Xu. 2012. Financial Development and Aggregate Saving Rates: A Hump-Shaped Relationship. *SSRN Electronic Journal* . [Crossref]

510. Ari Hyytinen, Hanna Putkuri. 2012. Household Optimism and Borrowing. *SSRN Electronic Journal* . [Crossref]

511. Rudiger Ahrend, Antoine Goujard. 2012. International Capital Mobility and Financial Fragility - Part 3: How Do Structural Policies Affect Financial Crisis Risk? Evidence from Past Crises Across OECD and Emerging Economies. *SSRN Electronic Journal* . [Crossref]

512. Joshua Goodman, Adam J. Levitin. 2012. Bankruptcy Law and the Cost of Credit: The Impact of Cramdown on Mortgage Interest Rates. *SSRN Electronic Journal* . [Crossref]

513. Martin Feldkircher. 2012. The Determinants of Vulnerability to the Global Financial Crisis 2008 to 2009: Credit Growth and Other Sources of Risk. *SSRN Electronic Journal* . [Crossref]

514. Michel Freyssenet, Bruno Jetin. 2011. Conséquence de la crise financière ou crise d'une forme de capitalisme : la faillite des Big Three. *Revue de la régulation* :9. . [Crossref]

515. Song Han, Benjamin J. Keys, Geng Li. 2011. Credit Supply to Personal Bankruptcy Filers: Evidence from Credit Card Mailings. *SSRN Electronic Journal* . [Crossref]

516. Atif R. Mian, Kamalesh Rao, Amir Sufi. 2011. Household Balance Sheets, Consumption, and the Economic Slump. *SSRN Electronic Journal* . [Crossref]

517. Atif R. Mian, Amir Sufi. 2011. What Explains High Unemployment? The Aggregate Demand Channel. *SSRN Electronic Journal* . [Crossref]

518. Elena Loutskina, Philip E. Strahan. 2011. Financial Integration, Housing and Economic Volatility. *SSRN Electronic Journal* . [Crossref]

519. Anand M. Goel, Fenghua Song, Anjan V. Thakor. 2009. Correlated Leverage and Its Ramifications. *SSRN Electronic Journal* . [Crossref]