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House Prices and Marital Stability

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Abstract

We investigate the effect of house price changes on MSA-level divorce rates using data for 1991-2010 from the Current Population Survey and the Federal Housing Finance Agency. Our findings suggest that changing house prices significantly affect divorce rates, and that these effects are asymmetric with respect to housing gains versus losses. In addition, we find differential effects for groups that are more likely to be homeowners versus renters. Some of this evidence is consistent with homeowners being locked into their homes by increased transactions costs in down markets.

I. Introduction

By August 2010, house prices in the US had fallen 29% in nominal terms from their peak in April 2006.[1] These dramatic changes in prices, illustrated in Figure 1, have led economists to renew their focus on the effect of housing wealth shocks on a number of outcomes, including consumption (e.g. Campbell and Cocco, 2007; Bostic, Gabriel and Painter, 2009), debt accumulation (e.g. Mian and Sufi, 2010), and labor supply (e.g. Coile and Levine, 2009; Farnham and Sevak, 2010). However, aside from anecdotal evidence in the popular press, there has been little research on the effect of house-price changes on divorce.[2]

House-price increases could affect marital stability through a variety of mechanisms. In some cases, these mechanisms will differ for renters and owners. During periods of rising house prices, the equity gains experienced by owners facilitate making down payments on separate homes and so could increase divorce probabilities. At the same time, increases in house prices mean that both owners and renters experience higher costs of living separately, which could reduce divorce probabilities. House-price gains may reduce financial stress—and therefore divorce probabilities—for owners; yet house-price gains are likely to lead to increased financial stress for renters.

While the effects of house-price decreases on divorce could simply be the opposite of the effects of gains described above, one might expect the effects of gains and losses on divorce to be asymmetric. An existing literature documents the existence of nominal loss aversion in housing markets—owners are less inclined to sell during downturns. In addition, equity constraints for families that have "underwater mortgages" could limit their ability to sell their

[1] Case-Shiller Composite-20 Index.
[2] See, for example, "When Home Prices, IRAs and Marriages Go South: Divorcing During a Downturn," *Wall Street Journal*, August 29, 2010.

home. Then the decision to divorce—which is often made simultaneously with the decision to sell one's home—could be strongly declining in losses even if it varies little due to gains.

To investigate the different effects of house-price changes on the share of the population that is divorced, we use MSA-level data for 1991-2010 from the Current Population Survey and the Federal Housing Finance Agency. Our findings suggest that changing house prices significantly affect the divorce share, and that these effects are asymmetric with respect to housing gains versus losses. In addition, we find differential effects for groups that are more likely to be homeowners versus renters. Some of this evidence is consistent with homeowners being locked into their homes by increased transactions costs in down markets.

These findings are policy relevant for a number of reasons. The effects of house prices on marital stability may either exacerbate or dampen the financial and welfare costs imposed on households by economic downturns. In addition, where children are involved, externalities of marital dissolution may be substantial. Given the high level of current interest in policy to shore up housing markets, it is worth better understanding the broader consequences of such policy.

II. Background

A. Housing Wealth Effects

Housing wealth is different from other forms of wealth. As house prices rise, the user cost of housing faced by a household rises along with the value of its housing asset. Dougherty and Van Order (1982) note that if individuals were infinitely-lived and planned to stay in their current home, housing capital gains would have no effect on household wealth. This is because household assets and liabilities would rise by equal amounts and hence cause no wealth effect on

consumption. However, as others have noted (e.g. Skinner, 1989; Morris, 2006), finitely-lived households who experience housing capital gains experience real wealth gains as a result.

Several papers estimate the marginal propensity to consume out of changes in housing wealth (e.g. Bhatia, 1987; Engelhardt, 1996; Skinner, 1996; Disney, et al., 2003; Belsky and Prakken, 2004; Lehnart, 2004; Case, et al., 2005; Juster, et al., 2006; Morris, 2006; Campbell and Cocco, 2007; and Bostic, et al., 2009, Mian and Sufi, 2010). While findings vary, these papers tend to find a marginal propensity to consume out of housing wealth in the neighborhood of 0.06. Among these studies, Campbell and Cocco (2007) find that the elderly respond to shocks in housing wealth and working age individuals do not. Bostic et al. (2009) estimate a small elasticity of consumption with respect to housing price shocks, but find larger effects for households that they identify as credit-constrained.

Recent studies have provided evidence on other outcomes of house-price changes. Mian and Sufi (2010), using an instrumental variables strategy, find that increases in home equity lead to greater borrowing and to a higher level of defaults when house prices subsequently fall. Coile and Levine (2010) use the Current Population Survey and find no effect of house prices on retirement, while Farnham and Sevak (2010) find mixed effects on retirement plans using the Health and Retirement Study.

B. Predicted Effects of House-Price Changes on Divorce

In the standard economic framework, individuals enter marriage if the expected utility from doing so exceeds the expected utility from the single state (Becker, 1991). For married couples, unanticipated changes in income, wealth, health or other factors can alter the expected

utility in both the married and divorced state and as a result affect probabilities of marital dissolution (e.g. Becker, Landes, and Michael, 1977).

While a number of papers in the literature have tested whether unexpected earnings shocks affect marital dissolution (e.g. Weiss and Willis, 1997; Charles and Stephens, 2004), there has been little empirical work on the effect of unexpected changes in wealth (either housing wealth or other forms of wealth) on divorce risk. Hankins and Hoekstra (forthcoming) find that lottery winnings do not affect the probability of divorce. Rainer and Smith (2008) find that negative house-price shocks increase divorce rates in the U.K., and that this effect is particularly strong for young couples and couples with children.[3]

House-price changes could affect marital stability through a mix of wealth effects and changing transactions costs. These effects could differ for owners and renters. Consider the effect of a house-price increase on renters. To the extent that house prices and rents are positively correlated, an increase in house prices represents a negative financial shock for renters. The negative financial shock could increase financial stress for the couple, potentially raising the risk of divorce; but the rent increase would raise the cost of living apart, which should lower the risk of divorce. Assuming the second effect dominates, we would expect an increase in house prices to cause a decrease in divorce risk for renters. Conversely a decrease in house prices should cause an increase in divorce risk for renters.

Now consider the effect of a house-price increase on owners. An increase in house prices represents a positive wealth shock for owners, and it raises the cost of living apart. Both of these effects should lower the divorce risk for the couple. However, an increase in house prices may

[3] A large literature examines the effects of unilateral divorce laws on divorce probabilities. See Wolfers (2006) for a review of the existing literature and evidence that suggests that unilateral divorce laws had a temporary significant effect on divorce rates but no long run effects. We do not analyze unilateral divorce laws in this paper, since by the beginning of our sample period (1991), only one state (New York) did not have unilateral divorce laws in place.

lower transactions costs (if houses are easier to sell in up markets) and it should make it easier to obtain the equity to make down payments on separate residences. These last two effects should raise the divorce risk for the couple. While the overall effect of a house-price increase on owners is theoretically ambiguous, we expect a house-price increase to raise the divorce risk for owners, relative to its effect on renters.

While we may see a symmetric response of renter divorce risks to house-price changes, there are several reasons to expect an asymmetric response of owner divorce risks to house-price changes. First, in a housing downturn, some owners may see the value of their house fall below the value of their mortgage.[4] This can restrict housing mobility for two reasons: 1) unless the household has additional wealth in non-housing assets, it will not have the equity to make a down payment on a new home; and 2) the bank holding their mortgage may refuse to allow them to sell. Such housing equity constraints have been shown in previous research to be an impediment to residential mobility (e.g. Genesove and Mayer, 1997; Henley, 1998; Chan, 2001; and Ferreira, Gyourko, and Tracy, 2010). Second, couples may be averse to selling their homes when prices are declining if they exhibit loss aversion (Kahneman and Tversky, 1979). If a couple is averse to realizing a capital loss on their home, they may hold out for a price higher than market value of the home, thus remaining "locked-in" to the home while awaiting a buyer. Empirical evidence in support of nominal loss aversion restricting residential mobility includes Chan (2001), Genesove and Mayer (2001), and Engelhardt (2003). Third, empirical evidence (e.g. Genesove and Mayer, 1997) suggests that houses take longer to sell during downturns. This may be a result, in part, of equity constraints or nominal loss aversion causing the housing market to freeze up. The additional length of time-to-sale can be viewed as a further transaction

[4] As of 2010, about 20% of residential property owners were underwater with their mortgages (Krainer and LeRoy, 2010).

cost of selling one's marital home, which should raise the cost of divorce and therefore lower its probability. Work by Goodman (1993) notes that buyers wait out slow times in the housing market due to the low probability of finding a good housing match when sellers are few. If buyers and sellers prefer to coordinate on "hot" periods in the housing market, then even sellers who don't face equity constraints or nominal loss aversion may be reluctant to sell during a down market. Thus couples considering divorce may choose to remain together until the housing market picks up and their house can be more easily sold. This can lower divorce risk in two ways. First it extends the length of marriages. Second it imposes a waiting period on the couple. It is possible that by being forced to stay together, some couples will reconcile their differences and remain married.

Equity constraints, nominal loss aversion, and related transactions costs suggest a nonlinear relationship between house values and willingness to sell which, in turn, suggests an asymmetric response of residential mobility to house-price changes. Since divorce and residential mobility tend to be simultaneous choices of households, we expect that there will also be an asymmetric response of divorce risks to house-price changes. These issues, combined with increased financial stress from a negative wealth shock and the additional equity needs of a splitting household that needs separate down payments for separate homes, suggest that house-price decreases could have strong negative effects on divorce risks of homeowners.

The theory provides several testable hypotheses. For renters, house-price changes should have a negative (and symmetric) effect on the risk of divorce, assuming changes in the cost of living apart dominate any changes in financial stress in the household. For owners, increases in house prices have a theoretically ambiguous overall effect on divorce risk, but should increase the divorce risk of owners relative to renters, because owners in rising markets experience equity

gains that facilitate down payments on separate homes. In falling markets, we expect the asymmetric mobility response documented in the existing literature to play a dominant role, so divorce risk of owners should fall in absolute terms and relative to renters. We discuss our methods for testing these hypotheses in the next section.

II. Data and methods

We use annual data from the Current Population Survey March Supplement (CPS) from 1991-2010. The CPS provides individual-level data on marital status, homeownership status, unemployment status, age, education, income, number of children, immigration status, race, and ethnicity. Limiting our sample to "ever-married" individuals, we aggregate the individual-level CPS data by MSA, 5-year age groups, sex, and year to create MSA-age-sex-year cells.[5] While the number of MSAs in the sample varies over time, observations from 2010 are from 164 MSAs which have age-sex cells with at least 10 observations.

We match these data to MSA-level house-price data. The Federal Housing Finance Agency (FHFA)[6] provides quarterly house price indices calculated using data from Fannie Mae and Freddie Mac. The House Price Index (HPI) is a weighted average across homes with repeat sales over time (based on Case and Shiller (1989)). Because the index is calculated from changes in the prices of houses with repeat sales, it is considered a "constant quality" index.[7] In order to measure the effect of changes in MSA-level house prices on divorce shares of different age-sex groups within an MSA, we estimate the following model:

[5] We don't analyze the individual-level data due to the high correlation between divorce and residential mobility. The CPS does not track individuals who move. As a result, attempts to exploit the panel aspect of the CPS would be plagued by non-random sample attrition.
[6] Formerly the Office of Federal Housing Enterprise Oversight (OFHEO).
[7] In contrast, an index that calculates a change in prices from average prices of all houses in different years would partly reflect changes in the stock of housing from new construction. However since the HPI cannot control for home improvements, it cannot perfectly control for quality.

(1) $$DIVORCE_{ijkt} = \beta_0 + \beta_1 \Delta HPI_{it} + X_{ijkt}\delta + \eta_{ijk} + \gamma_t + u_{ijkt},$$

where *i* indexes the MSA, *j* indexes the age cohort, *k* indexes gender, and *t* indexes year. *DIVORCE* is the share of a given MSA-age-sex-year cell that reports being currently divorced, and *ΔHPI* is the one-year percent change in house price in the MSA.[8] The mean of *ΔHPI* over the period is 4% and it ranges from -37% to 34%. *X* is a vector of variables that controls for the composition of the MSA-age-sex-year cell. In *X*, we include mean income, and the proportion of the cell that owns their home, is unemployed, has children, has achieved various levels of education, is foreign born, or is Hispanic, Asian, or Black. η represents an MSA-age-sex fixed effect, while γ represents a year fixed effect. *u* is an *iid* error term. Our use of the MSA-age-sex fixed effect means that we are identifying the effect of *ΔHPI* on divorce rates using variation in *ΔHPI* within MSA-age-sex cells over time.

One potential empirical challenge comes from local and national economic conditions that often drive changes in house prices and may also directly affect divorce shares. To account for local variation in economic conditions over time, we control for MSA-level unemployment rates. Year fixed effects help to absorb any national changes in macroeconomic conditions. Summary statistics for our data are presented in Table 1.

Equation (1) represents the baseline specification in our analysis. To accommodate a possible asymmetric response to gains and losses, we also estimate a variant of this baseline specification where house-price increases and house-price decreases enter as separate variables. In addition, because we predict different effects of house-price changes on homeowners and renters, we estimate another variant of Equation (1) that allows the effects of house-price increases and decreases to vary by homeownership status. Because current homeownership is

[8] Results are robust to calculating the house-price change over longer periods of time.

clearly endogenous to divorce decisions, we use education level as a proxy for homeownership in that specification.[9] We interact the change in house price with variables representing the educational level of the population (proportion high school graduates, and proportion college graduates or more, with proportion high school dropouts as the omitted category).

Based on our hypotheses in the previous section, we expect increases in house prices to lower the divorce share of cells with the lowest levels of educational attainment (i.e. cells with a high proportion of renters). Conversely, decreases in house prices should raise the divorce share of cells with the lowest levels of educational attainment. This is due to changes in the cost of living separately, experienced by both owners and renters. While we do not have a clear prediction on the effect of house-price increases on the divorce share of the highest levels of educational attainment (mostly owners), we do expect house-price increases to increase the divorce risk in these cells relative to the effect on low-education cells. This is because house-price increases give homeowners additional equity with which to make down payments on separate homes. We expect decreases in house prices to decrease the divorce share of the most highly educated cells (mostly owners). This is due to the significant transactions costs associated with selling a home during a housing downturn.

Finally, we estimate a version of our regression where we interact the change in house price variable with a variable that measures the percentage of the population that has children at home. Couples with children have significantly lower divorce hazards than couples without children. As a result we may find differential effects of house prices on their divorce shares.

[9] High school dropouts in our sample are significantly less likely to be homeowners than those with a college degree or higher (58% versus 80%). Cells with the lowest levels of education are likely to have the most renters.

IV. Findings

We provide results from the estimation of equation (1) in Table 2. We first estimate the overall effect of house-price changes on divorce shares (Column 1), and then allow for an asymmetric response to gains and losses (Column 2). The coefficient on ΔHPI in Column 1 is 0.046 and statistically significant. This suggests that a 10% increase in house prices within an MSA leads to an increase of 0.0046 in the local divorce share. Given the average divorce share of 0.134 in the sample, this amounts to a 3.4% increase in the divorce share. Results in Column 2 show a positive significant effect of increases in HPI on divorce shares, but no effect of decreases in HPI. This is contrary to our expectation that decreases in house prices would have greater effects on divorce shares than increases.

Table 3 gives results for a specification that allows for both asymmetric responses to gains and losses and interactions of gains and losses with educational category (percent high school graduates and percent college or higher) in the cell. As discussed above, we use education as a proxy for homeowner versus renter status. This is our preferred specification.

Consistent with our prediction that falling house prices will reduce divorce shares for homeowners, we find that cells with a greater share of college educated individuals experience a significant *reduction* in divorce shares when house prices decline. Consistent with our prediction that falling house prices will increase divorce shares for renters, we find that cells with a greater share of high-school dropouts experience a significant *increase* in divorce shares. The estimated coefficient of 0.298 (significant at the ten percent level) on *Percent Decrease in MSA House Price Index* implies that the estimated effect of a 10% decrease in house prices on a hypothetical cell composed exclusively of high school dropouts would be a 0.0298 percentage point increase in the divorce share. Given that 14.6% of ever-married high school dropouts are divorced, this

translates into a 20.4% increase in the divorce share of such a cell. The estimated coefficient for a hypothetical cell composed entirely of college graduates would be -0.338 (0.298 + -0.636), implying that the estimated effect of the same 10% decrease in house prices would be a 0.0338 percentage point decrease in their mean divorce share of 11.6% -- a decrease of 29.1%. These estimates are consistent with our prediction that falling house prices increase divorce risk for renters but decrease the divorce risk for owners. Two of the six point estimates in Table 3 are of signs inconsistent with our predictions (*Percent Increase* and on *Increase*(Percent College Grad or higher)*, but both are small in magnitude and not statistically different from zero. All remaining point estimates in Table 3 are of the predicted sign, but are not statistically different from zero.

We present results in Table 4 from a specification where we interact the house price variables with the share of households with children (under 18) at home. For households with children, we find essentially no effect of an increase in housing prices on divorce, but a large and significant negative effect of a decrease in housing prices. These results are consistent with the possibility that households with children are more likely to be owners, or with the possibility that those owners with children are more likely to exhibit loss aversion in terms of selling a house during a time of falling prices.

V. Discussion

Our findings suggest that house prices have a significant effect on divorce shares, and that these effects are different for groups that are more likely to be homeowners versus renters. We find an asymmetry in the response of divorce shares to house prices—in our preferred specification house-price decreases have a large and statistically significant effect on divorce

shares of highly educated cells (mostly owners) while house-price increases do not. This evidence is consistent with homeowners being locked into their homes by equity constraints, nominal loss aversion, or other increased transactions costs in down markets.

Interestingly, our findings differ substantially from those in the one other study examining the effect of house-price changes on marital stability (Rainer and Smith, 2008). Rainer and Smith use British micro data to show that house-price changes have an asymmetric effect on homeowner divorce, and that price decreases have the largest effect on homeowners. However, they find that price decreases lead to *greater* marital dissolution among homeowners, while we find the opposite. This points to one avenue for future research, which is to exploit US micro datasets, such as the PSID, to better elucidate the effect of house price changes on marital stability.

If housing lock-in lowers divorce probabilities this presents an interesting conundrum to policy makers. Policies to speed the foreclosure process are seen as key to restoring certainty and therefore liquidity to the housing market. Yet such policies, by relieving housing lock-in, may then increase divorce rates among foreclosed-upon couples. To the extent that social capital is lost (Ferreira, Gyourko, and Tracy, 2010), or children suffer worse outcomes from living with single parents, efficiency gains in the housing market may be offset by welfare losses in these other areas. On the other hand, if couples are locked into a marriage that is not healthy, there may be benefits to children from speeding up the foreclosure process.

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Table 1
Summary Statistics

	Mean	SD
% Divorced	0.134	0.094
%ΔHPI	0.042	0.064
% Homeowner	0.736	0.162
% Unemployed	0.032	0.044
MSA Unemployment Rate	0.046	0.025
% HS Grad	0.501	0.139
% College Grad	0.359	0.156
% with Kids under 5	0.143	0.171
# of cell-years	32,888	

Table 2
Estimated Effect of Changes in Home Prices on Divorce Shares

	(A) All Changes	(B) Increases vs. Decreases
Percent Change in MSA House Price Index	0.046***	--
	(0.009)	
Percent Increase in MSA House Price Index	--	0.052***
		(0.012)
Percent Decrease in MSA House Price Index	--	-0.031
		(0.022)
Mean of Y	0.134	0.134
N	32,888	32,888

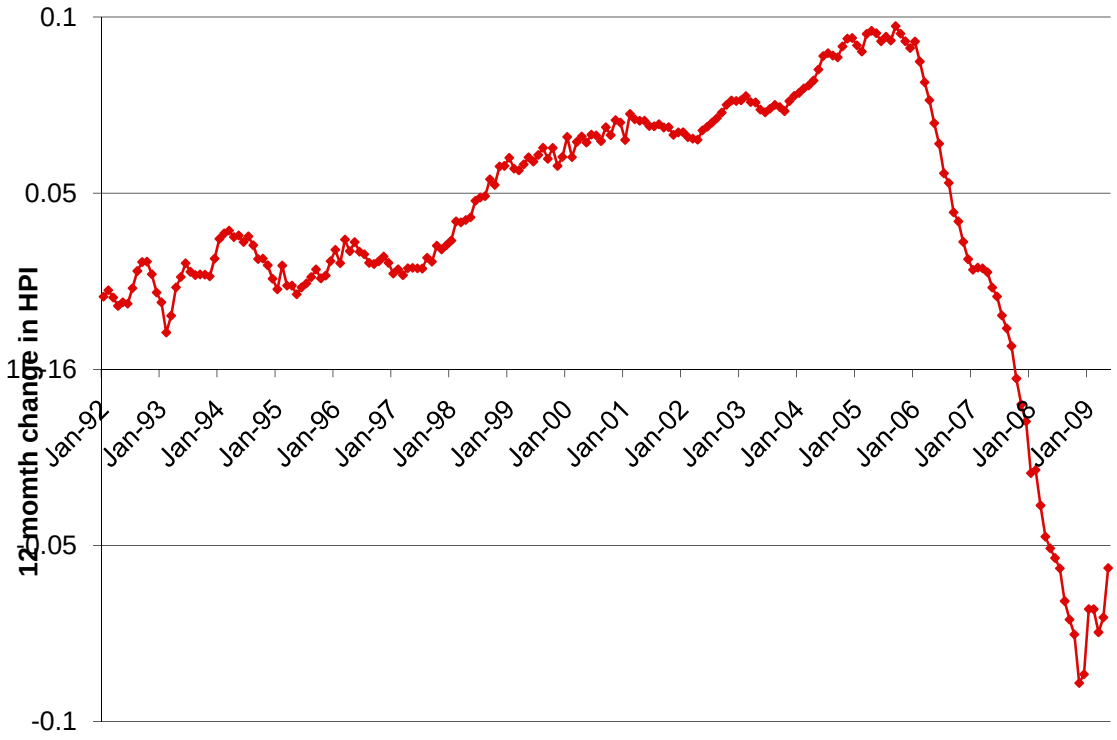
Table 3
Effects of Changes in House Prices on Divorce Shares, with Interactions by Education Level

Percent Increase in MSA House Price Index	0.045
	(0.077)
Percent Decrease in MSA House Price Index	0.298*
	(0.158)
Increase*(Percent High School Grad)	0.056
	(0.099)
Decrease*(Percent High School Grad)	-0.213
	(0.209)
Increase*(Percent College Grad or higher)	-0.060
	(0.092)
Decrease*(percent College Grad or higher)	-0.636***
	(0.197)
N	32,888

Table 4
Effects of Changes in House Prices on Divorce Shares, with Interactions by Presence of Children

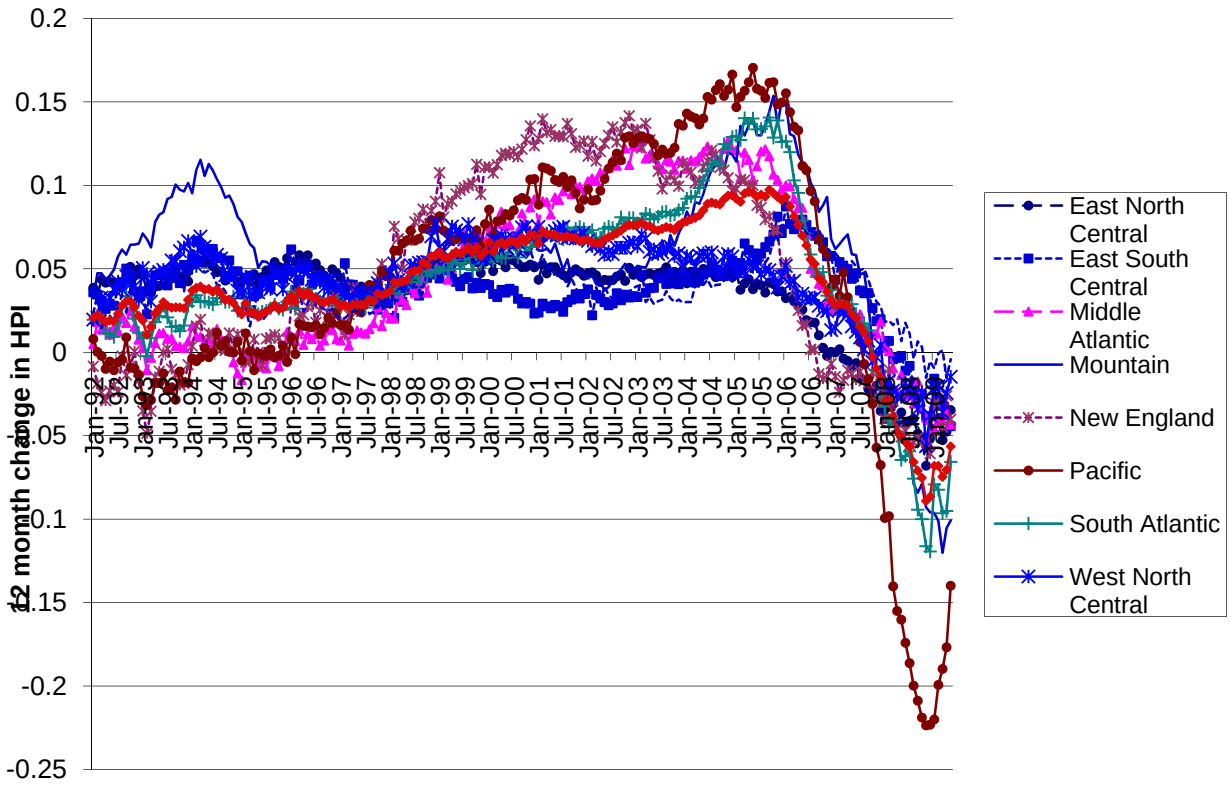
Percent Increase in MSA House Price Index	0.142***
	(0.024)
Percent Decrease in MSA House Price Index	0.398***
	(0.046)
Increase*(Percent with children at home)	-0.180***
	(0.042)
Decrease*(Percent with children at home)	-0.839***
	(0.080)
N	32,888

Figure 1: 12-month Change in U.S. House Prices
1992-2009, Quarterly Data



Source: House Price Index (HPI) Data, U.S. Federal Housing Finance Agency (FHFA) (formerly OFHEO).

Figure 2: 12 Month Change in Regional House Prices
1992-2009



Source: See notes for Figure 1.