Does Bankruptcy Protection Affect Asset Prices? Evidence from changes in Homestead Exemptions∗

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Abstract

Does the ability to protect an asset from unsecured creditors affect its price? This paper identifies the impact of bankruptcy protection on house prices using 139 changes in homestead exemptions. Large increases in the homestead exemption raised house prices 3% before 2005. Smaller exemption increases, to adjust for inflation, did not affect house prices. The effect disappeared after BAPCPA, a 2005 federal law designed to prevent bankruptcy abuse. The effect was bigger in inelastic locations.

∗All errors are our own.
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1 Introduction

Bankruptcy is one of the largest social insurance programs in the US. Americans discharge more debt (formally and informally) than all unemployment benefits combined.\(^1\) The sharp rise in personal bankruptcy from .3% of households annually in the 1980s to 1.5% in the early 2000s raised concern about strategic behavior and motivated the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA).\(^2\) The bill raised the costs and reduced the benefits of filing for bankruptcy.

A large literature studies strategic bankruptcy. Pattison and Hynes (2019) found that rises in homestead exemptions are followed by a rise in chapter 7 filings by debtors with home equity. Helland, Jena, Ly, and Seabury (2016) found that in states with unlimited homestead exemptions physicians invest 13% more in their homes compared to other professionals with similar income and demographics. Additionally, the response of physicians to unlimited homestead exemptions is larger in areas with higher liability risk. While the literature has found that households prefer to own assets which give them greater protection, we study whether the market price of these assets reflects this protection.

There are several advantages of using house prices to detect strategic behavior. First, studies that use formal bankruptcy filings do not capture a lot of strategic behavior since the majority of defaulting consumers do not file for bankruptcy, and most debt collection takes place outside of the courtroom (Dawsey, Hynes, and Ausubel (2013)). However, the settlement negotiated between creditors and debtors outside the courtroom is influenced by local exemption laws under the “threat-point” of bankruptcy.\(^3\) Second, changes in house prices in locations with a rise in homestead exemptions can help quantify forward looking strategic behavior via demand for assets that provide this implicit insurance.

This study uses annual house price data in 55,316 census tracts from the FHFA combined with 139 changes in homestead exemptions between 1990-2017, collected from other authors,\(^4\) legal guide books (Elias, Renauer, and Leonard (1989)), and legal statutes.\(^5\) The identifying assumption is that changes in homestead exemptions are uncorrelated with un-

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\(^1\)Lefgren, McIntyre, and Miller (2010); Auclert, Dobbie, and Goldsmith-Pinkham (2019); Pattison and Hynes (2019).
\(^2\)Gross, Kluender, Liu, Notowidigdo, and Wang (2019); Albanesi and Nosal (2018).
\(^3\)Mahoney (2015); Skeel (2003); Pattison (2017).
\(^4\)We thank Mariela Dal Borgo, Richard Hynes, Paul Goldsmith-Pinkham, and Jeffrey Traczynski for sharing their data.
\(^5\)We thank Albert Levi for helping us search statutes.
observed determinants of house prices. This assumption has been confirmed by a vast legal and economic literature (see Section 2) and by our own falsification tests.

We find that the unconditional average rise in homestead exemptions raises real house prices 0.73%, an effect which is positive, statistically significant, and small. However, when the sample is restricted to Pre-BAPCPA observations (when bankruptcy was cheaper and easier), the treatment effect rises to 1.07%, and Post-BAPCPA (when bankruptcy was more expensive and less beneficial), the effect is no longer statistically significant. Next, when the sample is restricted to “large” changes in homestead exemptions (defined to be changes greater than or equal to $50,000) the effect rises to 1.82% and is not statistically significant for small changes. Finally, big changes Pre-BAPCPA raise house prices 3.04%, whereas small changes Pre-BAPCPA and all changes Post-BAPCPA have no statistically significant effect. Together these estimates reveal evidence of strategic behavior by households to protect their assets before BAPCPA (when bankruptcy was cheaper, easier, and more financially beneficial). These estimates also indicate that BAPCPA achieved its stated goal of reducing bankruptcy abuse.

The main results are validated by dynamic regressions which find parallel pre-trends. A heterogeneity analysis finds no effect for reductions in the homestead exemption\(^6\) on house prices indicating an asymmetric effect. In addition, census-tracts in Metropolitan Statistical Areas with relatively inelastic housing supply had experienced bigger effects, consistent with standard theory. Moreover, tracts in counties with higher pre-treatment unemployment rates had smaller effects. This doesn’t mean that households in counties with higher unemployment rates don’t value bankruptcy protection, but rather that the types of households who strategically protect their assets from creditors tend to be more prosperous.

Finally, falsification tests find that changes in the homestead exemption don’t affect levels and changes in unemployment rates, income per capita, and single family building permits. There is a small drop in population levels and homeownership rates. The drop in homeownership rates suggests that the rise in house prices caused by wealthier strategic households reduced housing affordability.

\(^6\)In 1993, Minnesota reduced its homestead exemption from unlimited to $200,000. This is the only negative change in the homestead exemption in our sample.
2 Institutional Setting

This section describes the institutional setting and relevant details of the bankruptcy system in the United States. If a debtor defaults on secured debt the creditor can seize the collateral. If there is a deficiency\(^7\) and recourse is possible\(^8\) then the debtor is personally liable for the deficiency.\(^9\) If a debtor defaults on unsecured debt (e.g. credit card debt, legal judgment, student loan debt) the creditor can seize the debtor’s non-exempt assets and income. However, asset and income exemptions (i.e. wage garnishment limits) depend on local and federal laws which vary over time and space.

For example, suppose Ann is a homeowner with a house worth $200,000 and a mortgage balance of $80,000. Ann has \(Heq_{i,t} = 120,000\) in home equity. Ann lives in a state with a homestead exemption of \(H_{i,t} = 50,000\). This means that Ann currently has \(Heq_{i,t} - H_{i,t} = 70,000\) in unprotected home equity. Suppose Ann defaults on \$90,000 in credit card debt. If the unsecured creditor forces a foreclosure and \$200,000 is recovered then the mortgage lender will be paid \$80,000 first, next Ann can keep \(H_{i,t} = 50,000\) of her exempt home equity, the unsecured lender will receive the remaining \$70,000. In practice the unsecured lender may not force a foreclosure, but instead place a \$90,000 lien on the home. The lienholder will be repaid the debt plus fees and interest at a future date. Either way, the creditor and debtor both understand that Ann currently has \$70,000 of unprotected (seizable) home equity.

Homestead exemption laws vary over time and space (Figure 3). For example, if Ann lived in Delaware before 2005 or Maryland before 2010, she would have $0 in protected home equity, her creditors would know this and this would affect the settlement reached if it was negotiated out of court. On the other hand, if Ann lived in one of the eight states with unlimited homestead exemption, or any state with a homestead exemption over \(Heq_{i,t} = 120,000\) all her home equity would be protected, and her creditors would know this as well.

The homestead exemption has been studied extensively in the history, legal, and economics literature. The first homestead exemption was incorporated into statutory and constitutional law in the Republic of Texas in 1839 (London (1954)). Following the example of Texas, Mississippi passed the second homestead exemption law in 1841. Over the next few

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\(^7\)A deficiency is when the collateral is worth less than the debt balance.

\(^8\)Recourse is possible when it is legal and not restricted in the original debt contract.

\(^9\)The deficiency on the secured debt becomes unsecured debt.
years, states throughout the US enacted homestead exemption laws. The literature\textsuperscript{10} has argued that changes in homestead exemptions arise from a legislative process that depend on idiosyncratic historic and geographic\textsuperscript{11} factors, a process that does not depend on states’ economic conditions.

In addition to the history and legal literature, an empirical literature has also studied determinants of changes in bankruptcy protection.\textsuperscript{12} Severino and Brown (2017) find that lagged changes in house prices, medical expenditure, unemployment rates, state GDP, bankruptcy filings, share of democrats, and income do not predict changes in homestead exemptions. We find further evidence that economic variables don’t predict changes in homestead exemptions, over a longer sample. Other bankruptcy protection laws, including statutes of limitations on debt, Tenancy by Entirety laws,\textsuperscript{13} and wage garnishment restrictions were stable over our sample period.

3 Data

This paper estimates the impact of changes in homestead exemption laws on changes in house prices. The main outcome variable, real house price growth, is measured using the recently available Federal Housing Finance Agency (FHFA) census tract data. This dataset contains 55,316 tracts in the US. Like the S&P/CoreLogic/Case-Shiller home price indices, the FHFA series corrects for the changing quality of houses being sold at any point in time by estimating price changes with repeat-sales. The dataset only includes tracts and years with enough repeat-sales to construct the index.\textsuperscript{14}

The main treatment variable is the homestead exemption in location $i$ in year $t$ denoted $H_{i,t}$.\textsuperscript{15} We define the homestead exemption as the maximum home equity that is protected:

$$H_{i,t} \equiv \max \left\{ H_{i,t}^{\text{Local}}, \text{Married}, 1_{i,t}^{\text{Fed}}, 1_{i,t}^{\text{Married}} \right\}$$

\textsuperscript{10}Goodman (1993); Skeel (2003).
\textsuperscript{11}By 1860, there were seven states with homestead exemptions written into the constitution (in addition to statutory exemption). Six out of seven of these states were in the west. See the Turner hypothesis (London (1954)).
\textsuperscript{12}Pattison and Hynes (2019); Severino and Brown (2017).
\textsuperscript{13}Traczynski (2019).
\textsuperscript{14}For details about this new dataset see Bogin, Doerner, and Larson (2019).
\textsuperscript{15}This data was collected from other authors (Mariela Dal Borgo, Richard Hynes, Paul Goldsmith-Pinkham, and Jeffrey Traczynski), legal guide books (Elias et al. (1989)), and legal statutes.
where \( H_{i,t}^{\text{Local, Married}} \) is the local homestead exemption for married households, \( 1_{i,t}^{\text{Fed}} \) is an indicator variable equal to one if local laws allow households to use the federal exemption, and \( H_{i,t}^{\text{Married}} \) is the federal homestead exemption level for married households in that year. Hence, \( H_{i,t} \) is the maximum amount of home equity a household can legally protect in a given location at a given time. The non-homestead exemption denoted \( NH_{i,t} \) is the sum of the vehicle and wildcard exemptions, and is computed the same way as \( H_{i,t} \). The wildcard exemption lets the debtor choose which property to protect such as a vehicle, bank deposits, and art.

Data used for controls, heterogeneity analysis, and other outcome variables come from several different sources. Supply elasticity data are available at the MSA level from Saiz (2010). Employment data at the county level are from the BLS. Income data at the county level are from the BEA. Population, single family building permits, and homeownership data are from the census. The population and permit data are at the county level, whereas the homeownership rate data are at the MSA level. Median house price data at the zip code level and rent data at the MSA level are from Zillow. One must be careful in merging the datasets since the same zip code can be in more than one county. Each zip code is assigned to the county with the maximum allocation factor (e.g. if 75% of zip code \( z \) is in county \( A \) and 25% in county \( B \), then zip code \( z \) is assigned to county \( A \)). US oil price data are from the EIA. US interest rates are constructed as in Himmelberg, Mayer, and Sinai (2005) by correcting the 10 year Treasury bond rate for inflation with the Livingston Survey. Nominal variables are deflated using the CPI for all urban consumers from the BLS as in Glaeser, Gottlieb, and Gyourko (2012).

4 Estimates

4.1 Summary Statistics

Table 1 presents descriptive statistics and Figure 1 plots median homestead and non-homestead exemption levels in the US 1989-2017.\(^{16}\) A few stylized facts are immediately clear: 1 both the homestead and non-homestead exemptions grew considerably over this sample, 2 the homestead exemption grew a lot more and is currently much higher than the non-homestead exemption, 3 changes in the homestead exemption are less frequent, occur-

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\(^{16}\)Note our data on levels begins 1989 and our data on changes begins 1990.
ring 9.73% of the time whereas changes in the non-homestead exemption occur 12.68% of the
time. Negative changes in bankruptcy protection laws are rare. The only reduction in the
homestead exemption in our sample was in Minnesota in 1993, which reduced the homestead
exemption from unlimited to $200,000. The only reduction in the non-homestead exemption
in our sample was in Louisiana in 2003, which reduced the motor vehicle exemption from
$24,000 to $15,000.

4.2 Impact of Changes in Homestead Exemptions on House Prices

This section presents the main results, the impact of changes in homestead exemptions on
real house price growth. We estimate:

\[ y_{i,t} = \beta_H 1 \{ \Delta H_{i,t} > 0 \} + g(X_{i,t}) + u_{i,t} \]  

(Static)

\[ y_{i,t} = \sum_{k=-3}^{3} \eta_k 1 \{ \Delta H_{i,t} > 0 \} + g(X_{i,t}) + u_{i,t} \]  

(Dynamic)

where the main outcome variable \( y_{i,t} \) is real house price growth in tract \( i \) in year \( t \), the
main treatment variable \( 1 \{ \Delta H_{i,t} > 0 \} \) is an indicator for years when tract \( i \) experienced
a change in the homestead exemption, and \( X_{i,t} \) are controls including tract and year fixed
effects, the unemployment rate, population, and income per capita. The dynamic regression
is used for validation, to check whether pre-trends in the static model are parallel, and to
investigate persistence in the treatment. In addition to using an indicator variable for the
main treatment, we re-estimate the main equations using a continuous variable equal to
change in homestead exemptions in the appendix.

Table 2 presents the main results. Column 1 finds that an (unconditional) average
rise in homestead exemptions raises real house prices 0.73%, an effect which is positive,
statistically significant, and small. However, when the sample is restricted to Pre-BAPCPA
observations \( (t \leq 2005 \text{ when bankruptcy was cheaper and easier}) \), the treatment effect
rises to 1.07%, and Post-BAPCPA \( (t > 2005 \text{ when bankruptcy was more expensive and
less beneficial}) \), the effect is no longer statistically significant. Next, when the sample is
restricted to “large” changes in homestead exemptions (defined to be changes greater than
or equal to $50,000) the effect rises to 1.82% and is not statistically significant for small
changes mostly due to inflation adjustment. Finally, big changes Pre-BAPCPA raise house
prices 3.04%, whereas small changes Pre-BAPCPA and all changes Post-BAPCPA have no statistically significant effect. Together these estimates reveal evidence of strategic behavior by households to protect their assets before BAPCPA (when bankruptcy was cheaper, easier, and more financially beneficial). These estimates also indicate that BAPCPA achieved its stated goal of reducing bankruptcy abuse.

Next, estimates from corresponding dynamic regressions are presented in Table 3 and plotted in Figure 5. The first pattern we observe is that pre-trends are parallel in all four specifications, which is encouraging. Second, we see in columns 3 and 4, as the estimates become larger they also become more persistent.

Next Table 7 repeats the same analysis as above except using continuous changes in the homestead exemption, as opposed to an indicator, as the main treatment variable $\Delta H_{i,t}$ divided by the average big (over $50,000) change which is $115,169.33$. The results are similar to the results estimated using indicator variables for treatments above. Table 8 presents corresponding dynamic estimates which also show parallel pre-trends.

### 4.3 Treatment Effect heterogeneity

This section investigates heterogeneity in the treatment effect – that is, whether the treatments had different impacts in different locations. To study the sensitivity of the effect to various observable measures of heterogeneity $G_i$, this paper estimates:

$$y_{i,t} = \beta_{H,0} \{\Delta H_{i,t} > 0\} + \beta_{H} \{\Delta H_{i,t} > 0\} \times G_i + g(X_{i,t}) + \varepsilon_{i,t} \quad \text{(DDD)}$$

In this specification the average treatment effect (ATE) is an affine function of $G_i$

$$\text{ATE}(G_i) = \beta_{G,0} + \beta_G G_i$$

The coefficient $\beta_{G,0}$ is the estimated average treatment effect if $G_i = 0$ and $\beta_G = \frac{\partial \text{ATE}(G_i)}{\partial G_i}$ is the sensitivity of the average treatment effect to a rise in $G_i$.

For example, theory predicts that a rise in demand should have a smaller impact on house prices in elastically supplied locations where it is easier to build real estate (Figure 6). This corresponds to the hypothesis $\beta_{\text{Elasticity}} < 0$. The coefficient $\beta_{\text{Elasticity},0}$ is the estimated impact of the law change on prices in a hypothetical location where the asset (housing) is in perfectly inelastic supply.
Table 4 investigates treatment effect heterogeneity in positive versus negative changes in the homestead exemption, supply elasticity, pre-treatment unemployment rates, population, real income per capita, median real house value, home ownership rates, and single family building permits. Pre-treatment variables are set equal to their value in the year before the treatment to make sure they are unaffected by the treatment. The negative change in homestead exemption in Minnesota in 1993, had a modest effect of -0.31%, however it is not statistically significant. Consistent with theory (Figure 6) supply elasticity attenuates the treatment effect. A 1% higher supply elasticity corresponds to 0.62% smaller effect. The implied treatment effect for a hypothetical city with perfectly inelastic housing supply is 1.68%. The only other significant source of heterogeneity is the pre-treatment unemployment rate. Locations with higher pre-treatment unemployment rates had much smaller effects. This doesn’t necessarily mean that households in these locations don’t value bankruptcy protection, it only suggests that these types of households are less likely to be strategic in protecting their assets (possibly because they don’t have the same access to financial advisors and tax attorneys as households in wealthier areas).

4.4 Channels

This section explores the mechanism through which changes in homestead exemptions affect house prices. On the one hand, the effect could be driven by a rise in demand for bankruptcy protection. On the other hand, the rise in bankruptcy protection can increase entrepreneurship affecting local demand. Table 5 examines the impact of changes in the homestead exemption on alternative outcome variables including levels and first differences of: unemployment rates, population, real income per capita, single family building permits, and home ownership rates. A rise in homestead exemptions has a small negative effect on population levels (but not changes), and on home ownership rates (but not changes). Levels and changes in unemployment rates and real income per capita are not affected. Together these results indicate that changes in homestead exemptions likely have a very small, if any, impact on local demand.

4.5 Predictors of Law Changes

Table 6 examines determinants of changes in homestead exemptions using various predictors including lagged: real house price growth, unemployment rates, population, real income
per capita, homeownership rates, homestead exemption levels, and non-homestead exemption levels. The only consistent, statistically significant predictor of changes in homestead exemptions is the lagged homestead exemption level. Locations with high (or unlimited) homestead exemptions are less likely to raise them, compared to locations with low (or zero) exemptions that want to catch up.

5 Conclusion

A large body of literature studies the impact of bankruptcy protection on bankruptcy filings. These studies do not capture a lot of strategic behavior since the majority of defaulting consumers do not file for bankruptcy, and most debt collection takes place outside of the courtroom (Dawsey et al. (2013)). In contrast, we use house prices to quantify demand for bankruptcy protection.

We find that the average rise in homestead exemptions raises real house prices 0.73%, an effect which is positive, statistically significant, and small. However, when the sample is restricted to Pre-BAPCPA observations (\(t \leq 2005\), when bankruptcy was cheaper and easier), the treatment effect rises to 1.07%, and Post-BAPCPA (\(t > 2005\), when bankruptcy was more expensive and less beneficial), the effect is no longer statistically significant. Next, when the sample is restricted to “large” changes in homestead exemptions (defined to be changes greater than or equal to $50,000) the effect rises to 1.82% and is not statistically significant for small changes, mostly due to inflation adjustment. Big changes Pre-BAPCPA raise house prices 3.04%, whereas small changes Pre-BAPCPA and all changes Post-BAPCPA have no statistically significant effect. Together these estimates reveal evidence of strategic behavior by households to protect their assets before BAPCPA (when bankruptcy was cheaper, easier, and more financially beneficial). These estimates also indicate that BAPCPA achieved its stated goal of reducing bankruptcy abuse.
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A Appendix: Figures

A.1 Bankruptcy Protection Laws

Figure 1: Bankruptcy Protection Laws

Bankruptcy Protection in the US, 1989-2017

Note. This figure plots median homestead and non-homestead exemptions in the US between 1989-2017. The data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
A.2 Homestead Exemption Law Changes

Figure 2: Homestead Exemption Law Changes

Note. This figure presents all state changes in homestead exemption laws from 1990-2017. This dataset includes all 50 states and Washington DC. In 2011, New York became the first state to offer county level exemptions for three groups of counties. Beginning April 2012, the New York homestead exemptions will be updated in April every 3 years to keep pace with inflation as measured by the New York-Newark-Jersey City CPI-U. The data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
A.3 Homestead Exemption Levels

Figure 3: Homestead Exemption Levels

Note. This figure presents all homestead exemption levels from 1989-2017. The data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
A.4 Bankruptcies and Foreclosures

Figure 4: Bankruptcies and Foreclosures

Note. This figure plots the number of consumers with new bankruptcies and foreclosures per quarter in the US. The data is from the New York Fed Consumer Credit Panel/Equifax.

https://www.newyorkfed.org/microeconomics/hhdc/background.html
A.5 Pre-Trends

**Figure 5:** IMPACT OF CHANGES IN HOMESTEAD EXEMPTIONS ON REAL HOUSE PRICE GROWTH

*Note.* This figure plots point estimates $\hat{\eta}_k$ and 95% confidence intervals from the dynamic regression in Table 3. There is a vertical red line in the year of the law change. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
Figure 6: The impact of a rise in demand on house prices in cities with different supply elasticities.

Note. This figure compares the impact of a rise in housing demand on house prices in two cities with different supply elasticities. Price (P) is on the vertical axis and quantity (Q) in on the horizontal axis. Initially, the price of housing is the same in both cities. A rise in demand causes prices to rise more in the relatively inelastic city.
# Appendix: Tables

## B.1 Descriptive Statistics

### Table 1: Descriptive Statistics

| Variable         | N  | Min  | Median | Mean   | Max    | Freq Change (%) |
|------------------|----|------|--------|--------|--------|-----------------|
| $H_{i,1989}$     | 51 | 0.00 | 16,000.00 | 109,373.00 | 550,000.00 |
| $H_{i,2005}$     | 51 | 0.00 | 50,000.00 | 151,559.00 | 550,000.00 |
| $H_{i,2017}$     | 51 | 10,000.00 | 100,000.00 | 197,513.00 | 550,000.00 |
| $\Delta H_{i,t}$ if $>0$ | 138 | 400.00 | 15,000.00 | 35,110.00 | 517,700.00 | 9.73 |
| $\Delta H_{i,t}$ if $<0$ | 1  | -350,000.00 | -350,000.00 | -350,000.00 | -350,000.00 |
| $\% \Delta H_{i,t}$ if $>0$ | 136 | 1.00 | 33.30 | 84.50 | 1,603.00 |
| $NH_{i,1989}$    | 51 | 0.00 | 9,100.00 | 9,327.00 | 40,000.00 |
| $NH_{i,2005}$    | 51 | 0.00 | 18,200.00 | 18,476.00 | 60,000.00 |
| $NH_{i,2017}$    | 51 | 5,000.00 | 28,400.00 | 24,695.00 | 60,000.00 | 12.68 |
| $\Delta NH_{i,t}$ if $>0$ | 180 | 200.00 | 2,000.00 | 4,404.00 | 30,000.00 |
| $\Delta NH_{i,t}$ if $<0$ | 1  | -9,000.00 | -9,000.00 | -9,000.00 | -9,000.00 |
| $\% \Delta NH_{i,t}$ if $>0$ | 179 | 0.94 | 8.04 | 64.50 | 2,575.00 |

*Note.* This table reports descriptive statistics summarizing the homestead and non-homestead exemption in the US between 1989-2017. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper. $H_{i,t}$ is the maximum homestead exemption in census tract $i$ in year $t$. Similarly, $NH_{i,t}$ is the maximum non-homestead exemption (vehicle and wildcard) in census tract $i$ in year $t$. The percent change is undefined for two changes in $H_{i,t}$ (Delaware 2006, Maryland 2011) which followed zero homestead exemption levels. The percent change is undefined for one such change in $NH_{i,t}$ (Delaware 2006). The final column gives the frequency for all (positive and negative) changes of each type. Minnesota had a negative change in $H_{i,t}$ in 1993 and Louisiana had a negative change in $NH_{i,t}$ in 2003.
B.2 Main Estimates

Table 2: Impact of Changes in Homestead Exemptions on Real House Price Growth

| VARIABLES                      | (1)   | (2)    | (3)    | (4)   |
|--------------------------------|-------|--------|--------|-------|
| \(1\{\Delta H > 0\}\)        | 0.730*** | (0.226) |        |       |
| \(1\{\Delta H > 0\} \times \text{Pre-BAPCPA}\) | 1.066** | (0.418) |        |       |
| \(1\{\Delta H > 0\} \times \text{Post-BAPCPA}\) | 0.488 | (0.332) |        |       |
| \(1\{\Delta H \geq 50k\}\) | 1.815*** | (0.548) |        |       |
| \(1\{\Delta H < 50k\}\) | 0.411* | (0.239) |        |       |
| \(1\{\Delta \geq 50k\} \times \text{Pre-BAPCPA}\) | 3.043*** | (0.923) |        |       |
| \(1\{\Delta H < 50k\} \times \text{Pre-BAPCPA}\) | 0.395 | (0.471) |        |       |
| \(1\{\Delta \geq 50k\} \times \text{Post-BAPCPA}\) | 0.742 | (0.955) |        |       |
| \(1\{\Delta H < 50k\} \times \text{Post-BAPCPA}\) | 0.400 | (0.313) |        |       |
| N                              | 1266056 | 1266056 | 1266056 | 1266056 |
| R2                             | .339   | .34    | .34    | .34   |
| std-err                       | state  | state  | state  | state  |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note. This table reports estimates of the impact of a change in homestead exemption on real house price growth. Each column reports a separate regression estimated at the census tract year level where the dependent variable is the annual percent change of the real house price index. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. \(1\{\Delta H > 0\}\) is an indicator equal to one if census tract \(i\) had a rise in the homestead exemption that year. Pre-BAPCPA is an indicator equal to one for years up to and including 2005. Post-BAPCPA is an indicator equal to one for years after 2005. \(1\{\Delta H \geq 50k\}\) is an indicator equal to one if census tract \(i\) had a rise in the homestead exemption of at least $50,000 that year. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
## B.3 Validation: Dynamic Estimates

### Table 3: Impact of Changes in Homestead Exemptions on Real House Price Growth

| VARIABLES | (1) | (2) | (3) | (4) |
|-----------|-----|-----|-----|-----|
| $X_{t-3}$ | -0.346 | -0.765 | -1.399 | -1.674 |
|           | (0.411) | (0.560) | (1.063) | (1.607) |
| $X_{t-2}$ | -0.058 | 0.022 | -0.751 | 0.258 |
|           | (0.357) | (0.395) | (1.055) | (1.021) |
| $X_{t}$   | 1.045*** | 1.416*** | 2.201*** | 3.415*** |
|           | (0.293) | (0.523) | (0.625) | (1.152) |
| $X_{t+1}$ | 0.748 | 1.074 | 2.913*** | 3.758*** |
|           | (0.465) | (0.656) | (0.808) | (1.219) |
| $X_{t+2}$ | 0.356 | 1.025* | 2.381*** | 2.163** |
|           | (0.457) | (0.561) | (0.805) | (0.958) |
| $X_{t+3}$ | 0.016 | 0.164 | 1.547*** | 0.590 |
|           | (0.352) | (0.423) | (0.507) | (1.122) |

$X_{t-3}$ to $X_{t+3}$ are variables indicating the change in homestead exemption for each year, with $1\{\Delta H > 0\}$ indicating a rise in the homestead exemption that year and $1\{\Delta H \geq 50k\}$ indicating a rise of at least $50,000 that year. Pre-BAPCPA is an indicator equal to one for years up to and including 2005. N is the number of observations, R2 is the coefficient of determination, and std-err is the standard error. Robust standard errors in parentheses.

**Note.** This table reports estimates of the impact of a change in homestead exemption on real house price growth. Each column reports a separate regression estimated at the census tract year level where the dependent variable is the annual percent change of the real house price index. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. $1\{\Delta H > 0\}$ is an indicator equal to one if census tract $i$ had a rise in the homestead exemption that year. Pre-BAPCPA is an indicator equal to one for years up to and including 2005. $1\{\Delta H \geq 50k\}$ is an indicator equal to one if census tract $i$ had a rise in the homestead exemption of at least $50,000 that year. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
### B.4 Heterogeneity Analysis

**Table 4: Heterogeneity in the Impact of Changes in Homestead Exemptions on Real House Price Growth**

| VARIABLES                              | Column (1) | Column (2) | Column (3) | Column (4) | Column (5) | Column (6) | Column (7) | Column (8) |
|----------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1\{ΔH > 0\}                           | 0.730***   | 1.677***   | 1.833***   | 0.494*     | 0.185      | 0.311      | 2.711      | 0.750**    |
|                                        | (0.226)    | (0.538)    | (0.653)    | (0.284)    | (0.706)    | (0.374)    | (2.977)    | (0.281)    |
| 1\{ΔH < 0\}                           | -0.311     |            |            |            |            |            |            |            |
|                                        | (0.375)    |            |            |            |            |            |            |            |
| 1\{ΔH > 0\} × Elasticity              |            |            |            | -0.615***  |            |            |            |            |
|                                        |            |            |            | (0.217)    |            |            |            |            |
| 1\{ΔH > 0\} × ur_{t-1}                |            |            |            | -0.195**   |            |            |            |            |
|                                        |            |            |            | (0.094)    |            |            |            |            |
| 1\{ΔH > 0\} × pop_{t-1}               |            |            |            |            | 0.002      |            |            |            |
|                                        |            |            |            |            | (0.003)    |            |            |            |
| 1\{ΔH > 0\} × rin{pc}_{t-1}           |            |            |            |            |            | 0.026      |            |            |
|                                        |            |            |            |            |            | (0.034)    |            |            |
| 1\{ΔH > 0\} × rzhv{t}_{t-1}           |            |            |            |            |            |            | 0.000      |            |
|                                        |            |            |            |            |            |            | (0.000)    |            |
| 1\{ΔH > 0\} × hown_{t-1}              |            |            |            |            |            |            |            | -0.031     |
|                                        |            |            |            |            |            |            |            | (0.044)    |
| 1\{ΔH > 0\} × permits1_{t-1}          |            |            |            |            |            |            |            | -0.000*    |
|                                        |            |            |            |            |            |            |            | (0.000)    |

Observations: 1,266,056 1,012,642 1,258,840 1,266,530 1,266,530 932,422 1,282,709 1,256,147
R-squared: 0.339 0.374 0.324 0.330 0.317 0.382 0.329 0.341

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Note.** This table reports estimates of the impact of a change in homestead exemption on real house price growth. Each column reports a separate regression estimated at the census tract year level where the dependent variable is the annual percent change of the real house price index. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. Each column reports a separate regression in which the treatment effect is allowed to vary based on seven measures of heterogeneity: supply elasticity, pre-law unemployment rate, population, real income per capita, real Zillow House Value Index, home ownership rate, and single family building permits. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper. Elasticity data are from (Saiz (2010)), unemployment rates are from BLS, population, homeownership, and building permit data are from the Census, income per capita data are from the BEA, and House Value data are from Zillow.
## B.5 Mechanism: Alternative Outcome Variables

**Table 5: Impact of Changes in Homestead Exemptions on Alternative Outcomes**

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|------|
| R\_HPG 0(\(\Delta H > 0\)) | 0.730*** | -0.018 | -0.051 | -0.950** | 0.056 | -0.284 | 0.091* | 362.960 | 32.041 | -0.402** | -0.136 |
| (0.226) | (0.085) | (0.051) | (0.454) | (0.049) | (0.265) | (0.050) | (269.946) | (65.669) | (0.156) | (0.102) |
| Observations | 1,266,056 | 1,355,759 | 1,300,184 | 1,362,513 | 1,307,877 | 1,362,513 | 1,307,877 | 1,352,999 | 1,297,701 | 1,380,113 | 1,324,795 |
| R-squared | 0.339 | 0.810 | 0.649 | 0.991 | 0.769 | 0.919 | 0.530 | 0.770 | 0.121 | 0.941 | 0.162 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

**Note.** This table reports estimates of the impact of a change in homestead exemption on five outcome variables and their differences. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. \(R\_\text{HPG}\) denotes real house price growth. Each column reports a separate regression in which the outcome variable is the level and first difference of: unemployment rates, population, income per capita, single family building permits, and home ownership rates. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper. Unemployment rates are from BLS, population, homeownership, and building permit data are from the Census, income per capita data are from the BEA.
Table 6: Predictors of Changes in Homestead Exemptions

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
|           | $1(\Delta H > 0)$ | $1(\Delta H > 0)$ | $1(\Delta H > 0)$ | $1(\Delta H \geq 50k)$ | $1(\Delta H \geq 50k)$ | $1(\Delta H < 50k)$ | $1(\Delta H < 50k)$ | $1(\Delta H < 50k)$ |
| RHPG$_{t-1}$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
|           | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| ur$_{t-1}$ | -0.002 | -0.005* | -0.003 | -0.001 | -0.003 | -0.003 | -0.003 | -0.003 |
|           | (0.005) | (0.003) | (0.003) | (0.004) | (0.002) | (0.003) | (0.002) | (0.003) |
| pop$_{t-1}$ | 0.000 | 0.001** | -0.004* | 0.000 | 0.000 | 0.001** | 0.002* | 0.000 |
|           | (0.002) | (0.001) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.002) |
| hown$_{t-1}$ | -0.007 | -0.006 | -0.002 | -0.004 | 0.000 | -0.001 | -0.003 | -0.003 |
|           | (0.005) | (0.004) | (0.004) | (0.004) | (0.002) | (0.003) | (0.002) | (0.004) |
| Hi$_{t-1}$ | -0.007*** | -0.003*** | -0.004*** | -0.005*** | -0.003*** | -0.003*** | -0.000 | -0.001*** |
|           | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.000) | (0.001) |
| NH$_{t-1}$ | 0.000 | -0.001 | 0.001 | -0.001 | 0.001 | -0.001 | -0.002 | 0.002 |
|           | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.001) | (0.002) |
| Observations | 1,217,887 | 1,217,887 | 1,217,887 | 1,217,887 | 1,217,887 | 1,217,887 | 1,217,887 | 1,217,887 |
| R-squared | 0.279 | 0.295 | 0.308 | 0.290 | 0.282 | 0.317 | 0.269 | 0.238 |

Note. This table reports estimates of the impact of several lagged predictors on indicators for a change in homestead exemption. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. Each column reports a separate regression in which the outcome variable is an indicator equal to one if a census tract experienced a rise in its homestead exemption. The predictors are lagged: real house price growth, unemployment rates, population, real income per capita, homeownership rates, homestead exemption levels, and non-homestead exemption levels. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. Unemployment rates are from BLS, population, homeownership, and building permit data are from the Census, income per capita data are from the BEA.
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B.7 Main Estimates: Robustness

Table 7: Impact of Changes in Homestead Exemptions on Real House Price Growth

| VARIABLES                                      | (1)  | (2)  | (3)  | (4)  |
|------------------------------------------------|------|------|------|------|
| \(\Delta H\)                                  | 1.219*** |     |      |      |
| \(\Delta H \times \text{Pre-BAPCPA}\)          |      | 2.164*** |     |      |
| \(\Delta H \times \text{Post-BAPCPA}\)         |      | 0.094 |      |      |
| \(\Delta H \times 1\{\Delta H \geq 50k\}\)   |      |      | 1.203*** |     |
| \(\Delta H \times 1\{\Delta H < 50k\}\)      |      |      | 1.617 |      |
| \(\Delta H \times 1\{\Delta H \geq 50k\} \times \text{Pre-BAPCPA}\) | 2.182*** |     |      |      |
| \(\Delta H \times 1\{\Delta H < 50k\} \times \text{Pre-BAPCPA}\) |      | 1.331 |      |      |
| \(\Delta H \times 1\{\Delta H \geq 50k\} \times \text{Post-BAPCPA}\) |      | 0.008 |      |      |
| \(\Delta H \times 1\{\Delta H < 50k\} \times \text{Post-BAPCPA}\) |      | 1.611 |      |      |
| Observations                                   | 1,266,056 | 1,266,056 | 1,266,056 | 1,266,056 |
| R-squared                                      | 0.340 | 0.340 | 0.340 | 0.340 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note. This table reports estimates of the impact of a change in homestead exemption on real house price growth. Each column reports a separate regression estimated at the census tract year level where the dependent variable is the annual percent change of the real house price index. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. \(\Delta H\) is the change in the homestead exemption in a given year. \(1\{\Delta H > 0\}\) is an indicator equal to one if census tract \(i\) had a rise in the homestead exemption that year. Pre-BAPCPA is an indicator equal to one for years up to and including 2005. Post-BAPCPA is an indicator equal to one for years after 2005. \(1\{\Delta H \geq 50k\}\) is an indicator equal to one if census tract \(i\) had a rise in the homestead exemption of at least $50,000 that year. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
### Table 8: Impact of Changes in Homestead Exemptions on Real House Price Growth

| VARIABLES          | (1) $1\{\Delta H > 0\}$ | (2) $1\{\Delta H > 0\} \times \text{Pre-BAPCPA}$ | (3) $1\{\Delta H \geq 50k\}$ | (4) $1\{\Delta H \geq 50k\} \times \text{Pre-BAPCPA}$ |
|--------------------|--------------------------|-----------------------------------------------|-------------------------------|---------------------------------------------------|
| $X_{t-3}$          | 0.322                    | -0.038                                       | -0.400                        | -0.007                                            |
|                    | (1.199)                  | (1.540)                                      | (1.259)                       | (1.561)                                           |
| $X_{t-2}$          | -0.620                   | 0.211                                        | -0.747                        | 0.201                                             |
|                    | (1.096)                  | (0.581)                                      | (1.146)                       | (0.583)                                           |
| $X_t$              | 1.396***                 | 2.328***                                     | 1.384***                      | 2.329***                                           |
|                    | (0.379)                  | (0.787)                                      | (0.382)                       | (0.791)                                           |
| $X_{t+1}$          | 1.658***                 | 2.677**                                      | 1.853***                      | 2.695**                                            |
|                    | (0.394)                  | (1.051)                                      | (0.386)                       | (1.060)                                           |
| $X_{t+2}$          | 1.220**                  | 1.236*                                       | 1.504**                       | 1.127*                                             |
|                    | (0.593)                  | (0.645)                                      | (0.623)                       | (0.593)                                           |
| $X_{t+3}$          | 1.026**                  | 0.894**                                      | 1.241***                      | 0.868**                                            |
|                    | (0.451)                  | (0.364)                                      | (0.463)                       | (0.351)                                           |
| Observations       | 988,952                  | 988,952                                      | 988,952                       | 988,952                                           |
| R-squared          | 0.382                    | 0.382                                        | 0.383                         | 0.382                                             |

Note. This table reports estimates of the impact of a change in homestead exemption on real house price growth. Each column reports a separate regression estimated at the census tract year level where the dependent variable is the annual percent change of the real house price index. All specifications include census tract and year fixed effects. Standard errors, clustered at the state level, are reported in parentheses. $\Delta H$ is the change in the homestead exemption in a given year. $1\{\Delta H > 0\}$ is an indicator equal to one if census tract $i$ had a rise in the homestead exemption that year. Pre-BAPCPA is an indicator equal to one for years up to and including 2005. Post-BAPCPA is an indicator equal to one for years after 2005. $1\{\Delta H \geq 50k\}$ is an indicator equal to one if census tract $i$ had a rise in the homestead exemption of at least $50,000 that year. House price data is at the census-tract year level from the FHFA, deflated by the CPI-U. The bankruptcy law data was collected from other authors, bankruptcy guidebooks, and statutes as described in the paper.
For Online Publication: Appendix References