Financial Distress among the Elderly: Bankruptcy Reform and the Financial Crisis

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Introduction

Bankruptcy filings by the elderly have increased dramatically as a proportion of filings overall: figures from the Consumer Bankruptcy Project show that the percent of all bankruptcy filings that are by the elderly has increased six-fold, from 2% in 1991 to 12% in 2013-16.[1] Our figures, based on a much larger sample but covering a shorter time period, show a doubling in the proportion of filings by the elderly between 2000 and 2018, from 6% to 12% over this period.[2] Some of the increase is simply due to the aging of the U.S. population, but the share of the elderly in the U.S. population increased by only one-third over the period 2000-2018—much less than the rate of increase in the elderly share of bankruptcies.[3] Thus the data suggest that there has been a disproportionate increase in financial distress of the elderly relative to the overall U.S. population.

Similarly, foreclosure is also a sign of severe financial distress for homeowners. Although it is initiated by lenders rather than debtors, it generally occurs when homeowners in financial distress cannot afford their mortgage payments. Our data show that the share of the elderly in foreclosures also increased, from 6.8% in 2000 to 11% in 2018, or by 62%.[4] This rise again suggests a disproportionate increase in financial distress of the elderly.

In this paper, we examine the question of whether and why financial distress has increased among the elderly relative to the general population. We focus on both bankruptcy filings and the start of foreclosure as dual indicators of severe financial distress. In particular, we examine whether two events that occurred during the period can explain the increase in elderly financial distress: the 2005 bankruptcy reform and the financial crisis that started in 2008. The 2005 bankruptcy reform discouraged debtors in general from filing for bankruptcy by raising the costs of filing and by requiring some filers with above-median household incomes to follow five-year repayment plans, rather than having their debts discharged immediately. These changes

[1] Thorne et al (2018).

[2] New York Fed Consumer Credit Panel/Equifax data. See below for discussion of the data and our sample.

[3] The population that is 65-85 years old as a share of the population that is 20-85 increased from 17.3% in 2000 to 20.6% in 2018, or by 19%. Data from the Census Bureau.

[4] These figures are number of foreclosure starts affecting elderly homeowners/total foreclosure starts. The data source is the same--see discussion of our data below.

made debtors in general worse off because discharge of debt in bankruptcy became less available. It also increased foreclosures because filing for bankruptcy previously could help homeowners in financial distress to save their homes.[5] Similarly, the financial crisis that started in 2008 increased financial distress because many individuals lost their jobs, leading to increases in both bankruptcy filings and foreclosures. Home prices also fell sharply, causing additional foreclosures because some homeowners walked away from homes with underwater mortgages. But whether bankruptcy reform and the financial crisis had stronger negative effects on the elderly versus the general population is an open question. We examine whether and how both events affected bankruptcy filings and foreclosure starts of the elderly relative to the general population.

Our results show (1) that the 2005 bankruptcy reform reduced bankruptcy filing rates and raised foreclosure rates of all age groups, but the reduction for the elderly was slightly smaller than the reduction for the 45-64 age group—our comparison group—and (2) that the 2008 financial crisis caused both bankruptcy filing and foreclosure rates to rise for both age groups, but the effects on the elderly versus the 45-64 age group were not significantly different from each other. Thus our results show that the financial well-being of the elderly was negatively affected by both bankruptcy reform and the financial crisis, but neither the reform nor the financial crisis explains very much of the increase in elderly financial distress relative to other age groups. Rather, much of the increase in elderly financial distress appears to have occurred more recently.

I. Bankruptcy Filings and Foreclosure Starts of the Elderly Relative to Other Age Groups: New Data

Our data are taken from a 5 percent sample of all Equifax credit reports for U.S. individuals.[6] Individuals in the sample are followed quarterly. We define the elderly as all individuals between age 65 and 85 and the overall population as all individuals between age 20 and 85.[7] Bankruptcy filings include filings under both Chapters 7 and 13 and foreclosures indicate the start of foreclosure.[8] Individuals are dropped from the data in the quarter following a

[5] See Li, White and Zhu (2011) and White and Zhu (2010) for discussion.

[6] The data are the New York Fed Consumer Credit Panel, which is based on a 5% sample of Equifax credit reports. We take a 5% sample of the Panel, so that our sample consists of 0.25% of all credit reports. The data exclude individuals who never had a bank account or a credit card. This means that individuals with only payday loans are excluded.

[7] The data slightly underrepresent 20-24 year olds, in part because legislation prevents credit bureaus from setting up files for college-age students and also because many young people do not have credit. In the data, the share of 20-24 year olds declined from 8% to 6.7% between 2000 to 2018, while the share of this group in the population remained at around 9.5% over the period.

[8] Not all foreclosure starts end up as completed foreclosures, because homeowners may stop foreclosure by paying off their mortgage arrears, agree to a repayment plan with the lender, or make an agreement with the lender to walk away from the property--a short sale.

bankruptcy filing when we examine bankruptcy and are dropped from the data in the quarter following the start of foreclosure when we examine foreclosure. Thus only the first bankruptcy filing or first foreclosure start is considered.

Table 1a, column (1), shows bankruptcy filings by the elderly as a fraction of all bankruptcy filings over the period 2000 to 2018. The proportion of filings by the elderly more than doubled from 6% in 2000 to 14% in 2017, although it fell back to 12% in 2018. Column (2) of the table shows foreclosure starts of elderly homeowners as a fraction of all foreclosure starts over the same period. The fraction of foreclosures affecting the elderly similarly rose from 6.8% in 2000 to 11-12% in the period 2013-2018, for a slightly lower rate of increase. The table also shows that the increase in the fraction of elderly in the population, which in the Equifax data rises from 17.4% to 20.6% over the period, accounts for only a small fraction of the increases in the fraction of bankruptcy filings and foreclosures starts affecting the elderly.

Figure 1 shows a graph of these data. It shows that the elderly shares of bankruptcies and foreclosures are closely correlated with each other from 2000 to 2011, but tend to diverge starting in 2012. The elderly fraction of foreclosures peaks in 2012, while the elderly fraction of bankruptcies peaks in 2017.

Table 1b examines the extent to which rising debt levels of the elderly are correlated with the increase in elderly financial distress. Here, as a comparison group for the elderly, we use all individuals who are age 45-64—the "near-elderly." We use the near-elderly as a comparison group for the elderly because their financial situation is closest to that of the elderly. Like the elderly, the near-elderly tend to have declining debt levels over time, while younger individuals tend to be accumulating debt over time.

Column (1) shows average bankcard (credit and debit card) debt of the elderly relative to the near-elderly. Relative bankcard debt levels of the elderly increased over the period, from 50% in 2000 to 66% in 2018, or by one-third. This reflects the fact that the near-elderly reduced their bankcard debt over the period, while that of the elderly remained constant. Column (2) shows the sum of mortgage plus home equity debt for the elderly relative to the near-elderly. It is based on average debt levels of this type for all individuals, including non-homeowners. Mortgage/home equity debt levels of the elderly relative to the near-elderly increased even more than relative bankcard debt levels over the period, rising from 50% in 2000 to 78% in 2018, or by 56%. Thus the relative increase in debt levels of the elderly are a likely factor in explaining the increase in elderly financial distress. However, the rise in the proportion of bankruptcy filings and foreclosure starts of the elderly is larger than the increase in relative debt levels, suggesting that marginal increases in debt led to large increases in elderly financial distress. Figure 2 shows the debt data as a graph.

Overall, these figures suggest that, since 2000, there has been an increase in financial distress of the elderly relative to the non-elderly population. In the next two sections, we examine two possible causes of the increase in elderly financial distress--the bankruptcy reform of 2005 and the financial crisis of 2008--and test whether and to what extent they can explain the increase.

I. Background and hypotheses

Prior to 2005, U.S. bankruptcy law was very favorable to debtors. All debtors were allowed to file for bankruptcy under Chapter 7, under which all of their unsecured debts were discharged. Debts that were discharged in bankruptcy included credit card debt, unsecured installment debt, medical debt, past due rent and utility bills, and student loans. (Secured debts such as car loans were not discharged in bankruptcy unless the debtor gave up the collateral for the loan.) Future income was entirely exempt from the obligation to repay and debtors were only required to repay from their assets if the assets exceeded an exemption level set by their state of residence. States had varying exemption levels for assets, ranging from very low to unlimited for equity in owner-occupied homes. In states such as Florida and Texas with high exemptions for home equity, debtors who were homeowners could benefit financially from filing for bankruptcy even if they had both high incomes and high assets. Prior to 2005, a high fraction of US households could gain financially from filing for bankruptcy.[9]

There was also a separate bankruptcy procedure, Chapter 13, under which debtors could propose a plan to repay part of their debt from future earnings over 3 to 5 years. Prior to 2005, debtors had the right to choose between filing under Chapter 7 or Chapter 13 and they were not obligated to repay more in Chapter 13 than the value of assets they would have been obliged to give up in Chapter 7. Thus most debtors could file under Chapter 13 and propose a plan to repay only a token amount of debt. Chapter 13 also allowed some types of debts that were not dischargeable in Chapter 7 to be repaid over time under the plan, such as past tax obligations.

Filing for bankruptcy prior to 2005 also could help debtors to save their homes from foreclosure. Filing under Chapter 7 indirectly helped debtors keep their homes, because having unsecured debt discharged increased their ability to pay their mortgage arrears. Filing under Chapter 13 helped debtors more directly, both because unsecured debt was discharged and because debtors could stop foreclosure and spread out repayment of mortgage arrears over the period of their repayment plans. In addition, second mortgages could be discharged in Chapter 13 if they were completely underwater. Filing under Chapter 13 also helped debtors to avoid repossession of their cars and underwater car loans could be reduced to the market value of the car. [10]

The 2005 bankruptcy reform made bankruptcy much less favorable to debtors in general. First, the blanket exemption of future income from the obligation to repay was abolished for debtors with family incomes above the median level in their states. These debtors are now obliged to take a "means test" that determines whether they must file under Chapter 13 and, if

[9] See White (1998) for calculations showing that up to one-third of U.S. households could benefit financially from filing for bankruptcy under the pre-reform bankruptcy law.

[10] For discussion of how bankruptcy helps homeowners, see White and Zhu (2010) and Li, Tewari, and White (2019). For general discussion of bankruptcy law and the 2005 bankruptcy reform, see White (2011).

so, provides a formula that determines how much of their future income must be used to repay. The formula is based on IRS procedures for collecting from delinquent taxpayers, although with additional expenses allowed. The adoption of the means test makes filing for bankruptcy particularly unfavorable for debtors with above-median incomes. Second, the costs of filing for bankruptcy rose, because lawyers now have more responsibility to prevent fraud and because there are new requirements for debtors to take and pay for credit counselling and debt management courses. These changes discouraged many debtors from filing even if they had below-median income levels.[11] Third, bankruptcy reform made some types of debts non-dischargeable in bankruptcy. Student loans are no longer discharged and car loans can no longer be reduced in bankruptcy to the market value of the vehicle. [12]

The result of these changes is that after 2005, filing for bankruptcy became both less beneficial to debtors in general and less useful as a means for debtors to save their homes. As a result, we predict both a fall in bankruptcy filing rates after 2005 and a rise in foreclosure rates after 2005.

How do these predictions differ for the elderly relative to the non-elderly? This depends on the net effect of a number of changes made by bankruptcy reform. Average levels of debt of all types fall rapidly with age starting around the age of 45. This means that elderly debtors gain less than the non-elderly from filing for bankruptcy and, as a result, are predicted to be harmed less by bankruptcy reform. In addition, social security income is not counted in the means test that determines whether debtors must file under Chapter 13. Because only the elderly have social security income, this also means that they are harmed less than the non-elderly by bankruptcy reform, because they are more likely to still qualify for Chapter 7. Finally, a uniform new asset exemption of $1 million for retirement accounts such as 401(k) plans was instituted under the 2005 bankruptcy reform. Because the elderly tend to have the largest amount of assets in retirement accounts, this new exemption made bankruptcy more attractive for the elderly relative to the non-elderly. However, many states already had high exemptions for retirement assets in bankruptcy, so that few elderly individuals had sufficiently large retirement accounts to be affected by the increase in the exemption. Thus the other factors are predicted to be more important and, overall, the reform is predicted to increase the proportion of bankruptcy filers who are elderly, because it discouraged the elderly from filing less strongly than it discouraged younger debtors.

Now turn to how foreclosure rates are predicted to respond after versus before 2005 for the elderly versus the non-elderly. Because homeowners use bankruptcy to avoid foreclosure and bankruptcy became less attractive after the reform, we predict a rise in foreclosure rates after 2005. However, as discussed above, the elderly have less mortgage debt on average than the non-elderly and the reform discouraged them from filing by less than it discouraged the non-

[11] Since the 2005 bankruptcy reform, bankruptcy filings have peaked in March of each year, suggesting that many filers are deterred by the high costs of filing and delay until they receive their tax refunds. US Courts (2018).
[12] Federal government student loans became non-dischargeable except in cases of "undue hardship" in 1997 and the 2005 bankruptcy reform also made private educational loans non-dischargeable. (Need reference.)

elderly. Both of these factors imply that the foreclosure rate for the elderly is predicted to rise by less than that of the non-elderly following the 2005 reform.[13]

Now turn to the financial crisis. Personal bankruptcy filings fell sharply after the 2005 bankruptcy reform—from 2 million in 2005 to 775,000 in 2007—before rising again after the start of the financial crisis in 2008—filings peaked at 1.5 million in 2010. Similarly, foreclosures rose quickly after the financial crisis began. The increase in bankruptcies and foreclosures reflects both the decline in debtors' incomes due to widespread job loss and the fall in housing prices that caused some homeowners to walk away from their homes even if they were not in financial distress, since their mortgages were underwater after housing prices declined. How do we predict that the financial crisis affected the elderly relative to the non-elderly? The elderly receive social security income that was unaffected by the financial crisis and were also less likely to lose their jobs because they were less likely to work in the first place. This implies that the elderly were harmed less by the financial crisis and therefore that the increase in bankruptcy filings following the crisis is predicted to be smaller for the elderly than the non-elderly. Similarly, elderly homeowners are less likely to have mortgages and have less mortgage debt than homeowners in general. This means that they are less likely to default on their mortgages after the financial crisis, both because they were less likely to be in financial distressed and because they were less likely to have underwater mortgages after the crisis—making them less likely to default.[14]

Thus, the 2005 bankruptcy reform is predicted to reduce bankruptcy filings and increase foreclosure starts for all age groups, but the changes for the elderly are predicted to be smaller than for the non-elderly. Thus we predict an increase in the proportion of bankruptcy filers who are elderly, but a reduction in the proportion of foreclosure starts that affect the elderly following bankruptcy reform. The 2008 financial crisis is predicted to increase both bankruptcies and foreclosures for all age groups, but again to have a smaller effect on the elderly than other age groups. Thus we predict a reduction in the proportion of both bankruptcies and foreclosures affecting the elderly after the financial crisis. We test these predictions in the next sections.

II. Summary statistics

We estimate separate models explaining bankruptcy filings and foreclosure starts over the period of the 2005 bankruptcy reform and the 2008 financial crisis, using the data discussed above. Because we use the near-elderly as our comparison group for the elderly, we drop all observations of individuals whose age is over 85 or less than 45.

[13] For discussion of foreclosure, incentives for mortgage default, and the effect of the financial crisis, see Gerardi et al (2007), Mayer et al (2009), Elul et al (2010), Jiang et al (2010) and Demyanyk and Van Hemert (2011).

[14] We have argued separately that the 2005 bankruptcy reform in part caused the financial crisis by making bankruptcy less favorable to debtors and therefore causing mortgage defaults to rise even before the onset of the financial crisis. See Li, White and Zhu (2011).

Bankruptcy reform went into effect in the fourth quarter of 2005.[15] For the regressions explaining bankruptcy filings, our time period extends from approximately two years before to 1½ years after the reform, from 2003Q3 to 2007Q4. We drop the period 2005Q2 through 2006Q1, because there was a rush to file for bankruptcy just before the reform went into effect and there were very few filings in the immediate period after the reform. We end the time period after bankruptcy reform at the end of 2007 in order to avoid including the beginning of the financial crisis in the bankruptcy reform regressions. Turning to the regressions explaining bankruptcy filings during the financial crisis, we date the crisis to the first quarter of 2008 and our sample period extends from 2006Q3 to 2009Q4. We start the sample period for the financial crisis at 2006Q3 in order to avoid including the time period of bankruptcy reform in the regression. Thus we use relatively short time periods around both the reform and the financial crisis. The number of observations in samples explaining bankruptcy filings before/after bankruptcy reform and before/after the financial crisis are 4.3 million and 3.9 million, respectively. The number of distinct individuals in the two samples is approximately 340,000 and 310,000, respectively.

We also estimate foreclosure start regressions using the same two time periods. For these regressions, the sample is restricted to individuals who have positive mortgage debt, resulting in a sample size of around 1.8 million observations for both time periods.

We first calculate raw difference-in-difference terms. Table 2a, top panel, gives annual bankruptcy filing rates before versus after the 2005 bankruptcy reform for the elderly versus the near-elderly. The filing rate for the elderly in the pre-reform period is around 0.35% per year, while the filing rate for the near-elderly is more than twice as high at 0.86% per year. Thus the elderly have a much lower bankruptcy filing rate than the near-elderly, presumably because the elderly have less debt. Filing rates fell sharply after bankruptcy reform for both groups, but, as predicted, the reduction in the filing rate for the elderly: -0.19 percentage points or -47%, -was smaller than the reduction in the filing rate for the near-elderly: -0.52 percentage points or 60%. Because the reduction for the elderly was smaller than the reduction for the near-elderly, the difference-in-difference is +0.33 percentage points, which is as large as the pre-reform bankruptcy filing rate of the elderly. The fact that the diff-in-diff is positive is in line with our prediction that the 2005 bankruptcy reform caused the proportion of bankruptcy filings by the elderly to increase.

Table 2a, lower panel, does the same calculation for foreclosure rates before versus after the 2005 bankruptcy reform. It shows that foreclosure rates rose for both groups after the reform, but by less than the increase in bankruptcy filing rates. The increase in foreclosure rates for the elderly is 0.068 percentage points or 17%, while the increase for the near-elderly is 0.14 percentage points or 26%. This makes the difference-in-difference negative, or -0.08

[15] The reform was the "Bankruptcy Abuse Prevention and Consumer Protection Act of 2005," (Pub.L. 109-8, 119 Stat. 23, enacted April 20, 2005). It went into effect in October 2005.

percentage points. This result is again consistent with our prediction that bankruptcy reform caused the proportion of foreclosure starts affecting the elderly to fall.

Now turn to the financial crisis. Table 2b, top panel, shows the change in bankruptcy rates for the elderly and near-elderly before versus after the financial crisis. Bankruptcy rates increased sharply for both groups following the crisis, by 0.08 percentage points or 48% for the elderly and 0.3 percentage points or 75% for the near-elderly. This means that the diff-in-diff is negative, because the increase for the elderly was smaller. This again supports our prediction that the financial crisis caused the proportion of foreclosure starts affecting the elderly to fall. The diff-in-diff figure of -0.2 percentage points is again large—higher than the bankruptcy filing rate of the elderly before the crisis.

Finally, table 2b, bottom panel, shows the change in foreclosure rates for the elderly and near-elderly before versus after the financial crisis. The foreclosure rate of the elderly increased by 0.35 percentage points or 74% after the crisis and that of the near-elderly rose by 0.8 percentage points or 108%. The fact that the foreclosure rate of the near-elderly rose by more than that of the elderly makes the diff-in-diff term negative, which is again consistent with our predictions. This diff-in-diff term is also quantitatively large—about equal to the pre-crisis foreclosure rate for the elderly. It implies that the proportion of foreclosures affecting the elderly fell after the financial crisis.

The fact that bankruptcy reform caused larger changes in bankruptcy filing rates than in foreclosure rates is not surprising, since the main effects of the reform were changes in the rules of bankruptcy. Similarly, the fact that the financial crisis led to larger increases in foreclosure rates than in bankruptcy filing rates is also not surprising, since the financial crisis started as a housing crisis. Thus the direct effects of both changes were larger than the indirect effects. But the large size of both the differences and the diff-in-diffs is important and suggest that both bankruptcy reform and the financial crisis had negative large effects on the financial well-being of both the elderly and the near-elderly. Next, we run probit regressions that repeat the calculations, but with individual-level controls.

III. Specification and Regression Results

Our basic specification is a difference-in-difference regression. Define ***Y_it*** as a dummy variable equal to 1 if individual ***i*** files for bankruptcy in quarter ***t*** and 0 otherwise. Define ***Post_t*** as equal to 1 in the period after bankruptcy reform and zero otherwise, and ***Elder_i*** as equal to 1 for individuals who are age 65-85 and 0 for individuals who are age 45-64. ***Z_it*** is a vector of control variables. They include individual ***i***'s bank card debt, auto loan debt and mortgage

debt, and individual ***i***'s risk score in categories, with the highest risk category omitted.[16] All of the control variables are lagged one quarter and all debt variables are deflated to 2004 dollars. We also include dummies for individuals' age in years and we include fixed effects for state. ***ε_it*** is the error term.

We estimate the following model:

$$Y\_it = a + b(Post\_t) + c(Elder\_i*Post\_t) + d(Z\_it) + \varepsilon\_it$$

The difference-in-difference term is ***c***. Errors are clustered at the zipcode level. We use probit for all regressions. The time period is as discussed in the previous section.

We also run regressions explaining foreclosure starts before versus after the 2005 bankruptcy reform. The specification is the same as shown above, except that ***Y_it*** becomes a dummy equal to 1 if foreclosure started for individual ***i*** in quarter ***t***.

We use the same specification for regressions explaining both bankruptcy filings and foreclosure starts before versus after the 2008 financial crisis. The time period is the same as in the previous section. Table 3 shows summary statistics for all four samples.

Table 4 shows the results for the regressions explaining bankruptcy filings and foreclosure starts before versus after the 2005 bankruptcy reform. *p*-values are in parentheses. Column (1) shows the results for bankruptcy filings. The ***Post*** variable is negative and significant, reflecting the drop in bankruptcy filings by both the elderly and the near-elderly after the reform. The diff-in-diff term, ***Elderly*Post***, remains positive as predicted and is marginally statistically significant (p = .067). Together the ***Post*** and the ***Elderly*Post*** terms imply that bankruptcy reform caused the filing rate of the elderly to fall by (-0.000152 + 0.0000279), or by -0.012 percentage points, while it caused the filing rate of the near-elderly to fall by -0.000152 or by -.015 percentage points. Because the ***Elderly*Post*** term is positive, the drop in bankruptcy filing rates of the elderly is smaller. However the difference and diff-indiff terms are much smaller than in table 2: correcting for age and debt levels means that the drop in bankruptcy filings is 3.4% for the elderly and 1.8% for the near-elderly, compared to -47% and -60% in table 2. Thus bankruptcy reform negatively affected both the elderly and the near-elderly by reducing the availability of debt relief; as predicted the reduction for the elderly was smaller in absolute terms, but the size of the effects on both groups was relatively small.

The debt variables other than lagged mortgage debt all have the expected positive signs and are highly significant. (The mortgage debt coefficient is negative, but not significant.) The risk

[16] The risk score categories are category 1 less than 579, category 2 between 580 and 669, category 3 between 670 and 739, category 4 between 740 and 799, and category 5 above 800. Category 1 is omitted.

category variables, not shown, are highly significant, with higher risk scores implying significantly lower probability of filing for bankruptcy.

The second column of table 4 shows the results of the model explaining the effect of bankruptcy reform on the number of foreclosure starts. Here, the ***Post*** variable is again positive as expected and significant, but the diff-in-diff coefficient is positive rather than negative as expected and insignificant. Thus bankruptcy reform raised foreclosure starts for both the elderly and the near-elderly, but there is no significant difference between its effect on the two groups.

Turn now to the results of the financial crisis regressions, shown in table 5. Column 1 shows the results of the regression explaining bankruptcy filings. The ***Post*** variable is positive as expected and significant, although it is again much smaller than in table 2. The diff-in-diff term is also negative as expected, and is marginally significant (p = .08). This reflects the fact that the increase in bankruptcy filing rates after the financial crisis was smaller for the elderly than the near-elderly. After the financial crisis, bankruptcy filing rates increased for the elderly by 0.005 percentage points or 2.8% and for the near-elderly by 0.007 percentage points or 2%. Because the absolute increase was smaller for the elderly, the proportion of bankruptcy filings by the elderly went down.

Column 2 of table 5 shows the results of the foreclosure start regression. Here the Post term is positive and significant, while the diff-in-diff term is negative as expected, but insignificant. Thus the model confirms that the financial crisis pushed up foreclosure rates of both the elderly and the near-elderly, but did not affect them differently.

Our regression results show that the negative effect of bankruptcy reform on the probability of filing for bankruptcy was significantly smaller for the elderly and the positive effect of the financial crisis on the probability of filing for bankruptcy was also significantly smaller for the elderly than the near-elderly. But both diff-in-diffs are small. Overall we do not find that bankruptcy reform or the financial crisis are important as explanations of the increasing financial distress of the elderly, because both of these events had smaller negative effects on the elderly than on the near-elderly age group. We also find that while both bankruptcy reform and the financial crisis caused foreclosure rates to rise, neither had significantly different effects on the elderly relative to the near-elderly.

One possible explanation for the small size of the diff-in-diff coefficients in both regressions is that financial distress that is due to events such as bankruptcy reform or the financial crisis becomes worse over time as debt gradually builds up, but only leads to bankruptcy or foreclosure after several years during which consumers attempt unsuccessfully to repay. Thus our time periods might be too short to capture the full effects of bankruptcy reform or the financial crisis, leading to small and/or insignificant coefficients for the Post and Post*Elderly terms. To test this, we reran our models using the entire time period from 2000Q1 to 2018Q4. To capture the effect of bankruptcy reform, we use an interaction between being elderly and the post-bankruptcy reform period and, to capture the effect of the financial crisis, we use a

separate interaction between being elderly and the post-financial crisis period. We also drop the ***Post*** variable and introduce quarterly fixed effects. We again drop the period around bankruptcy reform from 2005Q3 to 2006Q1. Otherwise the specification remains the same. We predict that if the reform and the crisis become worse over several years before leading to bankruptcy or foreclosure, then the coefficients of the interaction terms will be larger and more significant than in the shorter period regressions.

The results are shown in Table 6. Both diff-in-diff terms in column (1) have the same signs as in tables 4 and 5, but become larger and more significant. The Elderly*Post Reform interaction increases four-fold in size, from 0.000028 in table 4 to 0.00011 in table 6, indicating a larger difference between the drop in bankruptcy filings by the elderly relative to the near-elderly after the reform. Similarly, the Elderly*Post-crisis term also increases four-fold, from -0.0000233 in table 5 to -0.000096 in table 6, and the *p*-value becomes more significant. But the differences between the impact of bankruptcy reform and the financial crisis on the elderly versus the near-elderly remains small. The interaction terms in the regression explaining foreclosure starts in column (2) remain insignificant. Thus the longer-term results also imply that there is no significant difference between the impact of bankruptcy reform or the financial crisis on foreclosure rates of the elderly relative to the near-elderly.

IV. Conclusion

Our results suggest that both bankruptcy reform and the financial crisis had large effects on the number of bankruptcy filings and foreclosure starts, both of which are important indicators of financial distress. Bankruptcy reform caused the number of bankruptcy filings to fall, which means that fewer debtors used bankruptcy to obtain relief from financial distress. In line with our predictions, the decline for the elderly was smaller than for our comparison group, the near-elderly, which means that the proportion of filings by the elderly increased. But the differences are quantitatively small. The 2008 financial crisis caused bankruptcy filings to rise for both the elderly and the near-elderly, indicating an increase in financial distress for both groups. In line with our predictions, the increase in filings by the elderly was smaller than the increase for the near-elderly, so that the proportion of filings by the elderly fell. However the differences are quantitatively small. Both bankruptcy reform and the financial crisis also increased the number of foreclosure starts affected the elderly and the near-elderly, but we did not find significantly differently effects on the two groups.

Overall, our findings suggest that neither bankruptcy reform nor the financial crisis can explain the increase in the relative financial distress of the elderly, either because—for bankruptcy filings--they affected the elderly less than the near-elderly or the differences were small or because—in the case of foreclosure starts—they did not affect the two groups differently. We think that the reason for our negative results is that the increase in financial distress among the elderly relative to younger age groups appears to have accelerated since 2010, relative to the pre-2010 period. (See figure 1.) Future research should probably focus on causes of elderly financial distress during the more recent period.

References

Demyanyk, Yuliya, and Otto Van Hemert. 2011. "Understanding the Subprime Mortgage Crisis." *Review of Financial Studies*, 24(6): 1848–80.

Elul, Ronel, Nicholas S. Souleles, Souphala Chomsisengphet, Dennis Glennon, and Robert Hunt. 2010. "What Triggers Mortgage Default?" *American Economic Review*, 100(2): 490–94.

Fay, Scott, Erik Hurst, and Michelle J. White, "The Household Bankruptcy Decision," *American Economic Review,* vol. 92:3, June 2002, pp. 708-718.

Gerardi, Kristopher, Adam Hale Shapiro, and Paul S. Willen. 2007. "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures." Federal Reserve Bank of Boston Working Paper 07-15.

Jiang, Wei, Ashlyn Aiko Nelson, and Edward Vytlacil. 2010. "Liar's Loan? Effects of Origination Channel and Information Falsification on Mortgage Delinquency." www.columbia.edu/~wj2006/ liars_loan.pdf.

Mayer, Christopher, Karen Pence, and Shane M. Sherlund. "The Rise in Mortgage Defaults." *Journal of Economic Perspectives*, 2009, 23(1): 27–50.

Li, Wenli, Ishani Tewari and Michelle J. White, "Using Bankruptcy to Reduce Foreclosures: Does Strip-Down of Mortgages Affect the Mortgage Market?" *Journal of Financial Services Research*, February 2019, 55(1), pp 59–87.

Li, Wenli, Michelle J. White and Ning Zhu, "Did Bankruptcy Reform Cause Mortgage Defaults to Rise?" *American Economic Journal: Economic Policy,* 3: 123-147 (2011).

Thorne, Deborah, Pamela Foohey, Robert M. Lawless and Katherine Porter, "Graying of U.S. Bankruptcy: Fallout from Life in a Risk Society," ssrn.com/abstract=3326574 (2018).

U.S. Courts (2018), "Just the Facts: Consumer Bankruptcy Filings 2006-2017," www.uscourts.gov/news/2018/03/07/justacts-consumer-bankruptcy-filings-2006-2017

White, Michelle J., "Why Don't More Households File for Bankruptcy?" *Journal of Law, Economics, and Organization,* vol. 14:2, pp. 205-231, October 1998.

White, Michelle J., and Ning Zhu. 2010. "Saving Your Home in Chapter 13 Bankruptcy." *Journal of Legal Studies*, 39(1): 33-61.

White, Michelle J., "Corporate and Personal Bankruptcy Law," *Annual Review of Law and Social Science,* vol. 7, 2011.

Table 1a: Bankruptcy Filings and Foreclosure Starts for the Elderly (>=65) Relative to the Non-Elderly

	Bankruptcy filings by the elderly as a fraction of all bankruptcy filings	Foreclosures of the elderly as a fraction of all foreclosures	Population share of the elderly
2000	.060	.068	.174
2001	.060	.062	.173
2002	.061	.063	.172
2003	.065	.079	.171
2004	.076	.079	.171
2005	.069	.074	.171
2006	.088	.086	.170
2007	.087	.072	.170
2008	.072	.066	.170
2009	.081	.078	.173
2010	.086	.085	.175
2011	.097	.097	.177
2012	.094	.129	.184
2013	.102	.116	.188
2014	.111	.112	.193
2015	.107	.119	.197
2016	.118	.111	.202
2017	.135	.107	.206
2018	.118	.112	--

Data source: Equifax credit reports; see discussion in section III.

Table 1b: Debt Levels of the Elderly Relative to the Near-Elderly

	Bankcard debt of the elderly relative to the near-elderly	Mortgage and home equity debt of the elderly relative to the near-elderly
2000	.497	.503
2001	.488	.491
2002	.486	.494
2003	.493	.483
2004	.492	.457
2005	.498	.437
2006	.512	.441
2007	.518	.435
2008	.529	.452
2009	.538	.493
2010	.563	.535
2011	.595	.587
2012	.627	.645
2013	.651	.683
2014	.661	.710
2015	.666	.745
2016	.664	.765
2017	.659	.778
2018	.656	.781

Table 2a: Annual bankruptcy filing and foreclosure rates for the elderly versus the near-elderly, before versus after the 2005 bankruptcy reform (2003Q3-2005Q1, 2006Q2-2007Q4)

Bankruptcy filing rates:

	Before reform	After reform	Difference
Elderly (65-85)	0.00348	0.00162	-0.00186 (-47%)
Near-elderly (45-64)	0.00863	0.00347	-0.00516 (-60%)
Diff-in-diff			0.00330

Foreclosure rates:

	Before reform	After reform	Difference
Elderly (65-85)	0.00412	0.00481	0.000684 (17%)
Near-elderly (45-64)	0.00547	0.00691	0.00144 (26%)
Diff-in-diff			-0.000760

Table 2b: Annual bankruptcy filing rates and foreclosure rates for the elderly versus the near-elderly, before versus after the 2008 financial crisis (2006Q3-2009Q4)

Bankruptcy filing rates:

	Before crisis	After crisis	Difference
Elderly (65-85)	0.00175	0.00259	0.000840 (48%)
Near-elderly (45-64)	0.00377	0.0066	0.00283 (75%)
Diff-in-diff			-0.00199

Foreclosure rates:

	Before crisis	After crisis	Difference
Elderly (65-85)	0.00480	0.00834	0.00354 (74%)
Near-elderly (45-64)	0.00763	0.0159	0.00827 (108%)
Diff-in-diff			-0.00470

Table 3:
Summary Statistics

	Bankruptcy reform sample		Financial crisis sample	
	Bankruptcy filing rates	Foreclosure start rates	Bankruptcy filing rates	Foreclosure start rates
Bankruptcy filing rate (annual)	0.00484	0.00572	0.00436	0.00600
Foreclosure start rate (annual)	0.00684	0.00588	0.00868	0.0113
Fraction of individuals >= 65	0.318	0.186	0.3217	0.199
Bankcard debt ($000)	3.90	6.16	3.82	6.11
Auto loan ($000)	2.15	3.44	1.99	3.12
Mortgage ($000)	52.5	128	58.9	141
Age	60	57	60	57
Risk category 1	.114	.0723	.115	.0783
Risk category 2	.164	.128	.161	.116
Risk category 3	.180	.203	.166	.178
Risk category 4	.324	.346	.293	.312
Risk category 5	.217	.251	.263	.315
N	4.3 million	1.8 million	3.9 million	1.7 million
Time period	2003Q3-2005Q1, 2006Q2-2007Q4	2006Q3-2009Q4	2003Q3-2005Q1, 2006Q2-2007Q4	2006Q3-2009Q4

Table 4: Results of probit regressions explaining annual bankruptcy filings and foreclosure starts, before versus after the 2005 bankruptcy reform

(Figures are marginal effects, with *p* values in parentheses.)

	Bankruptcy filings (1)	Foreclosure starts, (2)
Post Reform	-0.000152 (0.000)	6.72e-06 (0.000)
Elderly*Post Reform	2.79e-05 (0.067)	3.04e-07 (0.920)
Lagged bankcard debt ($000)	1.13e-05 (0.000)	-6.01e-07 (0.000)
Lagged auto loan ($000)	9.49e-07 (0.000)	-1.47e-07 (0.191)
Lagged mortgage debt ($000)	-7.72e-09 (0.753)	1.10e-07 (0.000)
Risk categories	X	X
Age fixed effects	X	X
State fixed effects	X	X
N	4.3 million	1.7 million
Time period	1999Q1-2005Q2, 2006Q2-2018Q4	1999Q1-2005Q2, 2006Q2-2018Q4

Table 5: Results of probit regressions explaining annual bankruptcy filings and foreclosure starts, before versus after the 2008 financial crisis (2006Q3-2009Q4)

(Figures are marginal effects, with *p* values in parentheses.)

	Bankruptcy filings (1)	Foreclosure starts (2)
Post Crisis	7.38e-05 (0.000)	3.46e-05 (0.000)
Elderly*Post Crisis	-2.33e-05 (0.082)	-5.71e-06 (0.338)
Lagged bankcard debt ($000)	1.16e-05 (0.000)	-1.03e-06 (0.000)
Lagged auto loan ($000)	1.71e-06 (0.000)	-4.48e-07 (0.019)
Lagged mortgage debt ($000)	1.21e-07 (0.000)	2.90e-07 (0.000)
Risk categories	X	X
Age fixed effects	X	X
State fixed effects	X	X
N	3.9 million	1.8 million
Time period	2006Q3-2009Q4	2006Q3-2009Q4

Table 6: Results of probit regressions explaining annual bankruptcy filings and foreclosure starts before versus after the 2005 bankruptcy reform

(Figures are marginal effects, with *p* values in parentheses.)

	Bankruptcy filings (1)	Foreclosure starts (2)
Elderly*Post Reform	0.000112 (0.052)	-7.6e-05 (0.279)
Elderly*Post Crisis	-9.64e-05 (0.059)	8.56e-06 (0.606)
Lagged bankcard debt ($000)	6.08e-05 (0.000)	-4.08e-06 (0.000)
Lagged auto loan ($000)	6.00e-06 (0.000)	-3.47e-06 (0.000)
Lagged mortgage debt ($000)	7.4e-07 (0.000)	9.16e-07 (0.000)
Risk categories	X	X
Age fixed effects	X	X
Quarter fixed effects	X	X
State fixed effects	X	X
N	20.6 million	8.2 million
Time period	2000Q1-2005Q2, 2006Q2-2018Q4	2000Q1-2005Q2, 2006Q2-2018Q4

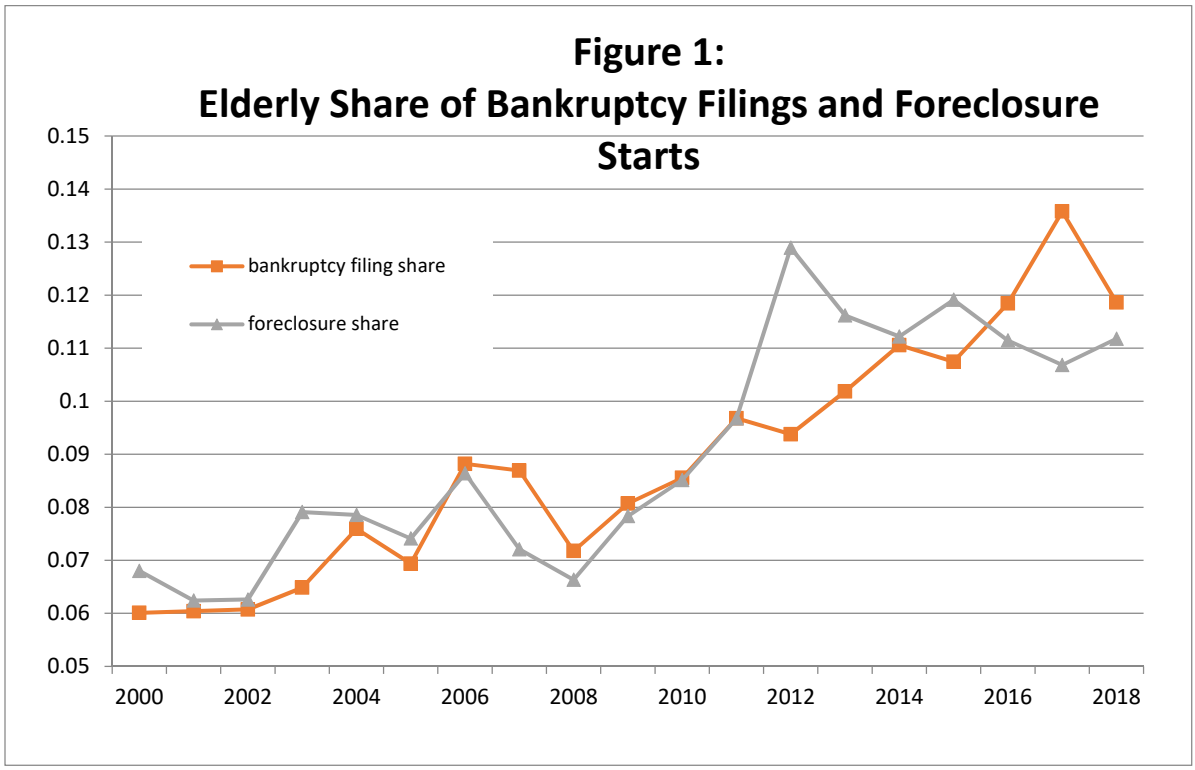
Figure 1:
Elderly Share of Bankruptcy Filings and Foreclosure Starts
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
bankruptcy filing share
foreclosure share
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

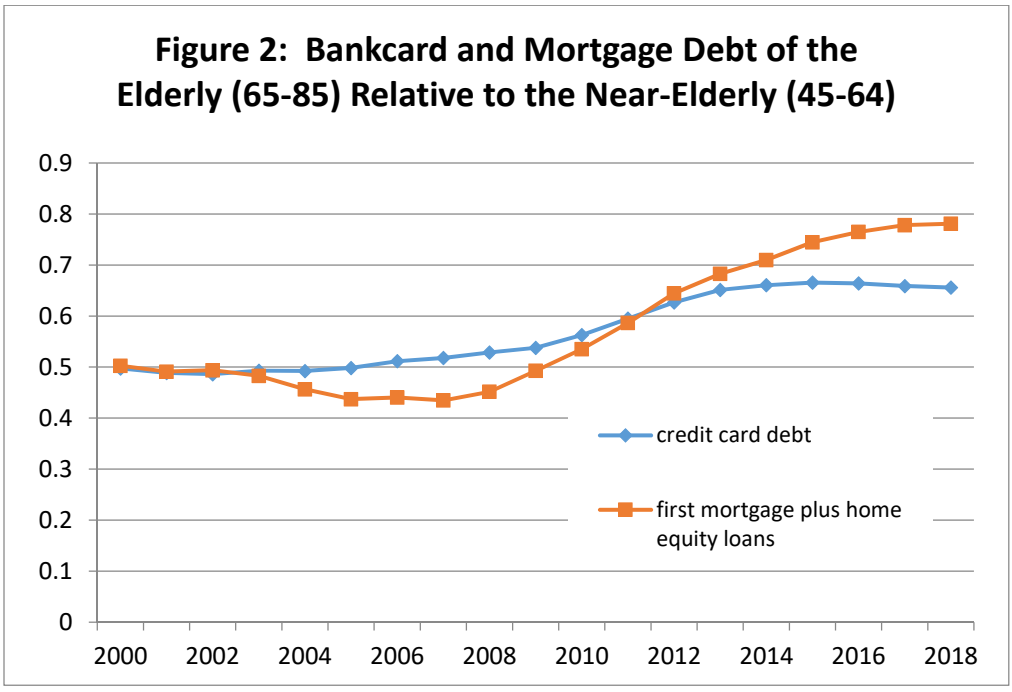
Figure 2: Bankcard and Mortgage Debt of the Elderly (65-85) Relative to the Near-Elderly (45-64)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
credit card debt
first mortgage plus home equity loans
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018