Seeking relief: Bankruptcy and health outcomes of adult women

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ABSTRACT

This study examined the impact of declaring consumer bankruptcy on the physical and mental health of adult women and if outcomes differed depending on whether the filer received automatic debt discharge under Chapter 7 compared to a debt repayment plan with Chapter 13. Sample data consisted of women from the NLSY79 cohort who completed the age 40 and 50 health modules as of the most recent wave. Results indicated a negative effect of bankruptcy on self-assessed health, whereas prior health history explained its negative relationship with depressive symptoms. Debt liquidation under Chapter 7 was associated with poor physical health relative to those who did not file and with depressive symptoms relative to Chapter 13 repayment plan filers. Poor health is an unintended consequence for women who seek financial relief through bankruptcy.

1. Introduction

During the last decades of the twentieth century and first decade of the twenty-first, the scope of social welfare programs for financially distressed middle-class and near-poverty households have been on the decline. This is the same period in which wealth inequality increased and low-income and middle-class American households experienced some of the largest debt gains in recent history (Pfeffer, Danziger, & Schoeni, 2013; Sullivan, Warren, & Westbrook, 2000). Recent work suggests that the manifestation of poor socioeconomic status and economic disadvantages in midlife is increasingly tied to declines in female life expectancy (Montez & Zajacova 2014). It is therefore important to understand whether programs to improve one's economic status are beneficial as they may have unintended consequences for their overall well being.

Consumer bankruptcy is one of the few social safety nets that offers consumer debt relief (Feibelman, 2005; Sullivan, Warren, & Westbrook, 1999). Bankruptcy is not a rare event. As of 2015 individual non-business or consumer bankruptcy filings totaled approximately 850,000, with one in eight Americans likely to file for bankruptcy during their lifetime (Gerardo & Flynn 2016). Since the late 1970s consumer bankruptcy rates steadily increased surpassing 1 million during the 1990s and peaking just after the Great Recession in 2010 (Tabb, 2006). During that same period both the female single and joint filer bankrupt population surpassed male filers (Sullivan, Warren, & Westbrook, 2000) with families composed of unmarried women with children at greatest risk for declaring (Warren, 2001). Their filing status is often tied to marital status, with single women and women in single income households overrepresented within the consumer bank-

ruptcy population (Sullivan, Warren, & Westbrook, 1999; Warren, 2002). Large shares of those who declare due to changes in family structure are women (Caputo 2008), usually after a divorce or marital separation (Fisher & Lyons, 2006). This is not surprising, given women (and women with children) are more likely to be at risk of poverty and wealth loss related to marital disruption (Addo & Lichter 2013; Holden & Smock, 1991). Despite research indicating that women might be disproportionately affected by bankruptcy-related outcomes, studies tend to group men and women together.

Declaring bankruptcy can be costly—both in the short run, with upfront fees to file, additional court fees, and attorney bills (Porter, 2012), and in the long run, either from wage garnishment, lower earnings, or as a marks on one's credit record that makes future borrowing expensive because of high interest rates (Athreya, 2001; Han & Li, 2011; Maroto, 2012). On the other hand, debt-related financial hardships decrease the availability of resources, reduce the ability to accumulate savings, have been associated with increased perceptions of stress, and may preclude future access to adequate healthcare, all of which can negatively manifest in an women's health and wellbeing (Bridges & Disney, 2010; Kalousova & Burgard, 2013, 2014; Lyons & Yilmazer, 2005). Therefore, the marginal effect of declaring, apart from debt, on one's health is an empirical question, one that I aim to answer in this paper.

Despite the size and scope of bankruptcy in the U.S. there is relatively little research on the impacts of bankruptcy for women filers and even less on health outcomes. The current study used panel data from the National Longitudinal Study of Youth's 1979 cohort (NLSY79) to assess the impact of declaring bankruptcy on the wellbeing of adult women. Analyses evaluated whether a bankruptcy declaration corre-

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sponded with poorer self-assessed and mental health outcomes relative to those who had not experienced bankruptcy after accounting for demographic, social, and economic attributes, as well as prior health status, and selection on observable and unobservable characteristics. Also of interest is whether heterogeneity related to the process of debt discharge within the bankruptcy process, i.e. total discharge of unsecured debts under Chapter 7, liquidation, versus reorganization of debts under Chapter 13, were associated with differential health outcomes among filers. This study sheds light on how indebted adult women who seek financial debt assistance within the legal system fare and whether constraints on the ability to discharge debt at once versus having to repay a portion of it over time matters for their subsequent well being.

2. Background and conceptual framework

2.1. Background on bankruptcy and bankruptcy population

When a person files for consumer bankruptcy a freeze is put into effect prohibiting creditors from continuing to contact and collect any and all outstanding debts; this is called "the automatic stay." With the assistance of a court-appointed trustee and often times a bankruptcy lawyer filers select into two very different systems, Chapter 7, debt liquidation, or Chapter 13, debt reorganization. Chapter 7 is the most common comprising almost 70% of all consumer bankruptcy cases. Filers must disclose all their outstanding debts as well as the value of all assets under perjury of law. Upon confirmation by the bankruptcy judge, a chapter 7 filer's debts are discharged after all non-exempt assets above a given threshold are liquidated with the proceeds distributed to pay back creditors. The entire process takes an average of four months and involves minimal court involvement. Chapter 7 filers seldom meet with judges, rarely use lawyers for representation, and interact primarily with court appointed trustees. Chapter 13 constitutes almost all[1] of the remaining 30% of cases. Filers retain nonexempt property and assets with outstanding secured debts such as homes and vehicles; they use future disposable income to pay down a portion of the debt based on a repayment plan agreed to with the courts and a bankruptcy trustee. All remaining debt is discharged after the repayment plan is complete. Failure to complete a plan results in a dismissal. The process relies on heavy court involvement, higher attorney fees, and lasts an average of 3–5 years. A bankruptcy filing, be it Chapter 7 or a non-discharged or dismissed Chapter 13 filing, remains on one's credit report for ten years from the filing date (discharged Chapter 13 filings for seven years).

While a bankruptcy declaration initiates protection from creditors for all filers, debt discharge and the ability to retain particular assets differs by the chapter choice. Chapter 7 provides complete debt discharge for almost all unsecured non-exempt debts (Hynes, 2004). Exceptions include education loans, child support, and oftentimes, recently acquired debts. Chapter 7 filers usually do not have a lot of assets to retain or the assets they own are exempt. The liquidation process of selling and paying back creditors is rare because many filers do not have assets of value (Athreya, 2001; Sullivan, Warren, & Westbrook, 1999; Gerardo & Flynn, 2016). Alternatively, Chapter 13 offers the opportunity to retain valuable assets and extend the time period to repay debts. For example, most homeowners who declare Chapter 13 bankruptcy do so in order catch up on mortgage payments and prevent losing their homes to foreclosure (Anthony, 2012). Filers hoping to keep their non-exempt assets will be more attracted to Chapter 13, especially if they have steady income. Filers with little to no financial assets, potentially unsteady employment prospects and lots of

unsecured debt will be more likely to file Chapter 7.

In addition to holding more total and unsecured debt than typical US households, bankrupt filers have fewer assets and lower than average household income (Bucks, 2012; Han & Li, 2011). They are more likely to have some college education, but no degree (Warren & Thorne, 2012); and, homeowners comprise a growing share of the bankruptcy population increasing from 43.9% in 1991 to 66.3% in 2007 (Porter, 2012). There is also consistent evidence from the bankruptcy literature that along with education, income, and homeownership, poor health is associated with filing (Domowitz & Sartain, 1999; Himmelstein et al., 2009; Keys, 2010; Maroto, 2012). Interviews of the bankrupt population indicate that is it quite common for filers to indicate prior health problems as a reason for their poor financial situation (Himmelstein et al., 2009). Moreover, poor health, such as health shocks and chronic conditions, also increase the probability of acquiring unsecured consumer and medical debt (Gathergood, 2012; Kim, Yoon, & Zurlo, 2012).

2.2. Conceptualizing bankruptcy as a social determinant of health

It is not conceptually obvious whether bankruptcy is beneficial or harmful for well-being. Although socioeconomic resources are theoretically considered essential determinants of later life health disparities (Link & Phelan 1995), the direction of causality, poor health to bad financial states or bad finances to poor health, is often hard to disentangle. Recent research that has attempted to address issues of endogeneity and simultanity find more support for financial strain contributing to poor health rather than vice versa (Bridges & Disney, 2010; Lyons & Yilmazer, 2005). Gathergood (2012) finds selection into poor debt based on poor mental health explains the difference between those with and without debt, while Meer, Miller, and Rosen (2003) find that what appears to be an improvement in self-rated health after a positive wealth shock actually had very little impact on health after accounting for endogenous relationships. In the case of bankruptcy where debtors may already be in poor health, the health outcomes might be even more difficult to isolate. In a 2011 study, Porter finds Chapter 13 filers reported only immediate short-term stress relief of six months to one-year. Dobbie and Song (2015) analyzed federal court data between 1992 and 2009 and found a Chapter 13 bankruptcy decreased the 5-year mortality rate by 1.2 percentage points. The authors note that their findings indicate higher mortality among dismissed filers are driving results and not necessarily better health outcomes of discharged filers. These studies suggest that both accounting for prior health status and matching filers to the proper comparison group are important for appropriately identifying the bankruptcy and health relationship; both of these are accounted for in this present study. Unfortunately, there is no information on dismissed filers in the current dataset.

Given filers have more total and unsecured debt than typical US households (Bucks, 2012) many report the desire to alleviate consumer debt to reduce stress as a major motivation for filing (Porter, 2011). This is not surprising. The amount of household debt has been associated with poor mental health and increased stress (Drentea, 2000; Drentea & Reynolds, 2012; Houle, 2014; Jacoby, 2002), and the accumulation of unsecured debt with poor health behaviors and poor mental health (Bridges & Disney, 2010; Drentea, 2000; Drentea & Lavrakas, 2000; Richardson, Elliott, & Roberts, 2013; Sweet et al., 2013). Carrying lots of debt or having to allocate income to paying down debt may mean having little to no money to spend on quality health products and services (Kalousova & Burgard, 2013, 2014). Debt can also be stigmatizing and there may be shame associated with seeking assistance (Graeber, 2014; Hyman, 2012). In addition, the societal norms regarding debt and debt-related stigma may contribute to chronic anxiety and stress exacerbating poor health conditions (Sullivan, Warren, & Westbrook, 2006). Assuming debt is correlated with poor health outcomes, filers might have better health than comparable non-filers.

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[1] There are two additional but less common kinds of consumer bankruptcy that comprise less than 1% of non-business consumer filings in a given year, Chapter 11-business reorganization, and Chapter 12- family farmer reorganization.

Table 1

Means and Standard Deviations of Health Outcomes and Selected Model Covariates as of the Age 40 Health Module.

Variable	Obs	Mean	Std. Dev.	Min	Max
Self-rated health	2533	3.62	1.01	1	5
CESD scale/depressive symptoms	2523	3.83	4.53	0	21
Declared bankruptcy	2419	0.12	0.33	0	1
Chapter 7	2419	0.07	0.26	0	1
Chapter 13	2419	0.05	0.22	0	1
Age	2536	40.74	1.01	40	48
Non-Latina Black	2536	0.30	0.46	0	1
Latina	2536	0.19	0.39	0	1
Foreign born	2536	0.07	0.25	0	1
Family Size	2536	3.40	1.54	1	11
Child in household	2536	0.76	0.42	0	1
Currently married	2535	0.58	0.49	0	1
Less than a college degree	2536	0.77	0.42	0	1
Homeowner	2446	0.58	0.49	0	1
Business owner	2453	0.08	0.28	0	1
Unemployed	2536	0.17	0.38	0	1
Work-limiting disablity	2536	0.13	0.33	0	1
Health insurance	2532	0.61	0.49	0	1
Unsecured debt	2442	4833	15,215	0	190,979
Secured debt	2334	61,288	97,087	0	1,938,600
Total debt	2331	66,313	99,047	0	1,938,600
Total Asset Value	2364	326,467	1,322,885	-317000	23,900,000
Net worth	2494	158,267	346,588	-384000	3,448,187
Family Income	2498	54,804	53,591	0	426,373

Therefore, a potential unintended consequence of debt discharge through bankruptcy may be improvements in one's health.

Alternatively, interviews of bankrupt families have revealed that the experience of financial distress and bankruptcy is gendered with women more likely to report stress, concern, and negative and physical health reactions with the process (Thorne, 2012). Much of the research on bankruptcy outcomes indicates that filers continue to struggle financially post-declaration (Maroto, 2012). Former filers were less able to acquire loans (Fisher & Lyons, 2010), had difficulty borrowing more credit, and paid more to borrow (Fisher, Filer, & Lyons, 2004; Han & Li, 2011; Gropp, Scholz, & White, 1997). Filers were also unable to accumulate savings at the same pace of nonfilers and reported experiencing finance related stress; even after 6 to 9 years post-filing their financial status had not improved (Han & Li, 2011) The punitive costs of a bankruptcy filing are also evidenced in the labor market. Bankruptcy filers reduced their labor market participation and experienced declines in their earnings (Han & Li, 2007; Maroto, 2012). Health could therefore be additional indicator of failed post-bankruptcy outcomes. For most filers, bankruptcy's promise of a fresh start is never realized leading to poorer outcomes in the labor and credit markets.

Chapter choice could also differentially influence health outcomes. While both Chapter 7 and Chapter 13 filers may face bankruptcy-related stigma, studies reveal that only a third of Chapter 13 filers complete their repayment plan and receive a debt discharge. These dismissed filers are never rid of the debt that led them to bankruptcy in the first place (Gerardo & Flynn, 2016; Porter, 2012). They now have to bear the costs of bankruptcy stigma in addition to debt-related stigma. Compared to the several months[2] Chapter 7 take to complete and receive automatic debt discharge, Chapter 13's years-long process of debt repayment can manifests as a chronic stressor, especially if disruptions in one's income make repayment difficult (Jacoby, 2002). Few studies have examined the bankruptcy and health relationship, even fewer analyze differences by chapter choice, and none have used longitudinal data that allowed for observing respondents pre and post bankruptcy filing.

3. Methods

3.1. Data

The sample data come from the National Longitudinal Study of Youth 1979 (NLSY79) cohort. The NLSY79 is an ongoing longitudinal, population based cohort survey of a nationally representative sample of young men and women who were aged 14–22 in 1979. Interviewed every year since 1979 through 1994 and then biennially ever since, the current sample consisted of 9964 eligible respondents. A health module that included measures of health and well being was administered between 1998 and 2006 as respondents turned 40. In 2008 respondents were asked to complete a follow-up health module as they turned 50. There were 8465 respondents in 2006 who completed the age 40 health module. As of the 2012 interview, 5676, of whom 2963 were women, had completed the age 50 health module. The main analytic sample consisted of women who completed both health modules by the 2012 interview, and results should only be interpreted as representative of this population.

The dependent variables consisted of two subjective health measures. Self-assessed health was measured from responses to the question: "In general, would you say your health is excellent, very good, good, fair, or poor?" Responses were coded from "Poor" to "Excellent," with higher values indicating better health. This question has been shown to be predictive of subsequent mortality at every cut point (Idler & Benyamini, 1997). Depressive Symptoms was measured using the 7-item version of the Center for Epidemiologic Studies Depression Scale (CES-D). The scale assesses the frequency of depressive symptoms during the past week. Responses ranged from 0- rarely or none of the time/1 day to 3- most or all of the time/5–7 days. The CES-D is correlated with other depression scales and shown to be a valid indicator of mental health status in community representative samples (Radloff, 1977). Originally ranging from 0–21, the scale was logged given its high concentration of zero values.

Beginning in 2004 and repeated in 2008 and 2010 the NLSY79 asked respondents questions related to bankruptcy. These included whether they had ever declared, if it was related to a business failure, the type of bankruptcy declared or what chapter, the month and year of declaration, and if they were a repeat filer. Bankruptcy filers were restricted to those who first reported a chapter 7 or 13 bankruptcy with a filing date between their age 40 and age 50 health modules.

Summary statistics for selected independent variables used in all analyses are listed in Table 1. Twelve percent of the women sampled filed for bankruptcy during the period, with 7% reporting Chapter 7 filings and the remaining 5% reporting Chapter 13. Black women composed thirty percent, Latina women eighteen percent, and non-Latina and other race/ethnic groups made up the remaining fifty-two percent of the analytic sample. As of the age 40 health module average household size was 3.4, over three-quarters of the women sampled reported having children and fifty-eight percent were currently married. Close to sixty percent were homeowners and 8.0% reported owning their own business. Seventeen percent were unemployed at the beginning of the period, thirteen percent indicated they had a work-limiting health condition, just under two thirds had health insurance, and 12.8% received some form of social welfare assistance (e.g. TANF, SSI, or SNAP).

3.2. Analytic methods

The analytic period focused on bankruptcy filings between the age 40 (1998–2006) and age 50 (2008–2012) on age 50 health modules. Statistical analyses consisted of a combination of regression-based quasi-experimental methods meant to address issues of selection in establishing a causal relationship. First, standard OLS regression models estimated the bivariate relationship between bankruptcy and health outcomes. Next, a host of additional model covariates, listed in Table 1, correlated with respondent health and bankruptcy filing were added to the model. When attempting to isolate the effect of bank-

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[2] Chapter 7 cases that involve assets are two to three years on average; however, they make up less than 10% of Chapter 7 cases (Gerardo and Flynn, 2016).

ruptcy on health using regression adjustment models, the estimates may be biased because individuals may not select into bankruptcy in a way that is unrelated to their health status. In order to minimize issues associated with reverse causality, it is also important to account for previous health conditions (Lyons & Yilmazer, 2005). Health at the age 40 health module was included as an additional regressor serving as a proxy for previous health status.

To address issues related to the potential bias due to non-random selection into bankruptcy, I also computed treatment effects of bankruptcy on health outcomes using matching methods. Propensity score matching (PSM) techniques were used to account for selection on observable characteristics. The propensity score, or predicted probability, matching technique approximates a quasi-experimental design with secondary data. It compares individuals in a "treatment group" (in this case, female respondents who declare bankruptcy) to those in a "control group" (those who have never declared) with a similar likelihood of experiencing the treatment based on pretreatment observable characteristics, in this case characteristics assessed during the age 40 health module. This method is especially favorable in the case of bankruptcy because we are comparing women who had similar propensity to declare, and we can assess whether the bankruptcy served to alleviate some health strain. The PSM method should provide more efficient estimates when comparing the filers to non-filers (Rosenbaum & Rubin, 1983). Propensity scores are estimated using a logistic regression model, where model covariates include observable characteristics that may be associated with declaring bankruptcy and health outcomes. Once the propensity scores have been estimated, radius caliper matching (Cochran & Rubin, 1973) was used to match filer to nonfilers based on their estimated propensity scores. The radius caliper matching method restricts the maximum distance between the propensity scores of the treated and untreated units. If the untreated observations propensity score does not fall within the specified distance it is not included in the analysis. Radii were set to within 0.005 for all analysis. Diagnostics found that there was sufficient common support and model covariates balanced after matching. Evidence of the matched samples by bankruptcy treatment status is listed in the Appendix A.

The estimates from the PSM may still be biased, however, if there are unobservable confounding factors that both influence the likelihood of declaring and are associated with an individual's health. The final analysis used difference-in-difference models selected on the matched sample from the PSM. This method removes the influence of unobservable individual heterogeneity due to confounders that might potentially bias the PSM results between the two health modules. In addition to estimating the overall effect of bankruptcy for each model specification, I repeat all estimations to examine heterogeneity in the types of bankruptcy filed based on chapter choice, discharge (Chapter 7 filings) versus reorganization (Chapter 13 fillings).

4. Results

The first three columns in Table 2 are from OLS models that regressed either physical (Panel A) or mental health (Panel B) on declaring bankruptcy. Model 1 assesses the bivariate relationship of bankruptcy and health, the next model added covariates assessed during the age 40 module including county-level bankruptcy filings, state unemployment rates, and zipcode-level foreclosure data. The third model added in the control for prior health status. Full model estimates containing all covariates, including debts, assets, and relationship and household characteristics are available in Appendix B. The OLS results for self-assessed health indicated a negative and significant effect of declaring bankruptcy. Despite the inclusion of additional individual, social, and economic controls in Model 2, and the lagged health measure introduced in Model 3, the estimate remained relatively unchanged and significant. Women who declared bankruptcy experience a 0.403 decline in the level of their self-assessed health at the age 50 module. This relationship is only slightly attenuated after account-

ing for background characteristics and previous health to 0.266.

Models that addressed whether health outcomes differed when comparing samples of women with similar propensities to declare bankruptcy, Model 4, indicated that declaring bankruptcy was associated with an estimated -0.245 decline in physical health (p < 0.001). This suggests that women who declared were still more likely to report poorer health at the age 50 health module compared to those who exhibited similar observable characteristics but did not file. Because there may be omitted variables that still influence the relationship and have not been taken into account in the OLS or PSM models, the results from difference-in-difference models attempt to remove any additional bias they might introduce. The results from these models, Model 5, indicated a persistent negative and significant effect of bankruptcy declaration on a woman's self-reported physical health over the period. Using the estimates in Table 2 from models (III) and (V) as bounds, a woman who declares bankruptcy is approximately a quarter of the way closer to a lower level of self-rated health, increasing her risk of mortality. As a comparison, having less than a college degree is associated with .22 decrease in the level of self-rated health (Appendix B). A bankruptcy filing is associated with a greater decline in self-rated health than the educational attainment measure, which is strongly correlated with self-rated health and predictive of subsequent mortality (Dowd & Zajacova, 2007).

In contrast to the physical health results, the relationship between depressive symptoms and mental health was sensitive to prior health status. A bankruptcy filing during the period was associated with an increased likelihood of reporting more depressive symptoms at age 50, a 19% increase based on the estimate in Model 1. This relationship remains robust after accounting for additional controls in Model 2, but dropped in magnitude to 9% and lost significance with the inclusion of depressive health history to the model. The estimate on a bankruptcy declaration remained small and not statistically significant at conventional levels in both the PSM and difference in difference models.

When disaggregating bankruptcy by chapter choice neither chapter was associated with improvements in physical or mental health. The estimates in Table 3 indicated that relative to women who did not file over the study period, both Chapter 7 and Chapter 13 filers were more likely to report poor health. The level of self-rated health of Chapter 7 filers declined from 0.379 to 0.276 after accounting for observable characteristics such as prior health status. Compared to women with similar attributes that were related to a bankruptcy declaration, Chapter 7 filers were still more likely to report poor health. In comparison, filing Chapter 13 at first appeared to have a large negative impact on health, 0.447, but after accounting for previous health the estimated relationship was reduced by almost half to 0.229. The results from the matched sample indicate that the effect of Chapter 13 on poor health remained robust after accounting for selection, but was reduced to 0.128 and no longer statistically significant after accounting for unobserved heterogeneity (Model 5). To summarize, Chapter 7 was consistently associated with poorer health; the relationship dropped in significance and slightly in magnitude after controlling for observable and unobservable characteristics. Chapter 13 filings were also negatively associated with physical health, with unobservable factors contributing to the association.

Similar to the physical health results for Chapter 7, Chapter 7 filers who received debt liquidation were more likely to report a twenty percent increase in depressive symptoms over the period; however, after controlling for observable and unobservable characteristics, Model 5, the estimated relationship declined to almost zero, 0.043, and was no longer significant. There was no significant association for Chapter 13 filers across all five specifications. Interestingly, the estimates in Model 3 through 5 indicated a negative relationship between bankruptcy and mental health. This suggests that once prior mental health history and selection were accounted for, filing for bankruptcy was associated with improved mental health among women who had a similar propensity to declare. None of these estimates,

Table 2
Summary of estimates on the relationship between bankruptcy status and physical and mental health of adult women.

Panel A.

Dependent Variable	Self-Assessed Health				
Model Specification	OLS (I)	OLS, additional controls (II)	OLS, additional controls & previous health (III)	PSM (IV)	DiD on PSM sample (V)
Declared bankruptcy	-0.403***	-0.329***	-0.266***	-0.245***	-0.217*
	(0.067)	(0.066)	(0.058)	(0.072)	(0.094)
Previous health			0.502***		
			(0.021)		
Observations	2109	2109	2109	2044	3946
R-squared	0.016	0.146	0.345		

Panel B.

Dependent Variable	Depressive Symptoms[+]				
Model Specification	OLS (I)	OLS, additional controls (II)	OLS, additional controls & previous health (III)	PSM (IV)	DiD on PSM sample (V)
Declared bankruptcy	0.177**	0.155**	0.092+	0.082	-0.003
	(0.057)	(0.058)	(0.054)	(0.063)	(0.084)
Previous health			0.381***		
			(0.020)		
Observations	2089	2089	2089	2026	3826
R-squared	0.004	0.084	0.220		

Note: [+]Sum of seven item CES-D; Robust standard errors in parentheses;
* $p < 0.05$, + $p < 0.10$.
** $p < 0.01$.
*** $p < 0.001$.

Table 3
Summary of estimates on the relationship between bankruptcy status and physical and mental health of adult women, by chapter.

Panel A

Dependent Variable	Self-assessed health					OLS, additional controls & previous health; only filers (VI)
Model Specification	OLS (I)	OLS, additional controls (II)	OLS, additional controls & previous health (III)	OLS, additional controls & previous health (III)	DiD on PSM sample (V)	
Declared Chapter 7	-0.379***	-0.321***	-0.276***	-0.211*	-0.227+	0.050
	(0.083)	(0.080)	(0.073)	(0.089)	(0.117)	
Declared Chapter 13	-0.447***	-0.343***	-0.229**	-0.245*	-0.128	(0.109)
	(0.097)	(0.099)	(0.083)	(0.105)	(0.138)	0.471***
			0.502***			(0.062)
			(0.022)			
Observations	2106	2106	2106	2041		258
R-squared	0.017	0.148	0.346	0.317		
Observations (Chap 7)					3948	
Observations (Chap 13)					3666	

Panel B.

Dependent Variable	Depressive Symptoms[+]					OLS, additional controls & previous health; only filers (VI)
Model Specification	OLS (I)	OLS, additional controls (II)	OLS, additional controls & previous health (III)		DiD on PSM sample (V)	
Declared Chapter 7	0.298***	0.278***	0.186**	0.133+	0.043	-0.228*
	(0.068)	(0.068)	(0.063)	(0.075)	(0.100)	
Declared Chapter 13	0.051	0.024	-0.013	-0.065	-0.111	(0.111)
	(0.087)	(0.088)	(0.086)	(0.093)	(0.132)	0.292***
			0.378***			(0.063)
			(0.020)			
Observations	2086	2086	2086	2023		256
R-squared	0.008	0.087	0.222			0.193
Observations (Chap 7)					3734	
Observations (Chap 13)					3334	

Note: [+]Sum of seven item CES-D; Robust standard errors in parentheses.
* $p < 0.05$, + $p < 0.10$.
** $p < 0.01$.
*** $p < 0.001$.

however, were significant at conventional levels. In addition to comparing filers to nonfilers, the OLS models by chapter were replicated for only bankruptcy filers, Model 6. Small sample sizes did not allow for replications of the PSM and diff-in-diff models. These results indicated no difference in physical health outcomes, whereas Chapter 13 filers reported fewer depressive symptoms than Chapter 7 filers. The difference of 0.228 remained significant even after accounting for prior mental health history.

Additional models were tested to assess the robustness of the main results to the different specifications. These included whether having a history of bankruptcy prior to the age 40-health module influenced the overall results. None of the 370 women with a pre-40 health bankruptcy who were added, however, declared bankruptcy during the course of the study. The addition of these women to the main analytic sample did not change the findings substantially from when they were not included. Model estimates are listed in Appendix C. Alternative specifications for the OLS and PSM models tested variations of the debt and asset variables, including matching on only net wealth, and total debt and total assets. These results were similar to those matched on secured and unsecured debts and total financial assets.

5. Discussion and conclusion

Linkages between socioeconomic status and health are well established in population health. Recent studies on women and health indicate declines in all-cause mortality among older adult women tied to socioeconomic status (Montez & Zajacova, 2014). This paper analyzed the health effects of women who try to navigate within existing structures that purport to deliver financial assistance. Financial and economic hardships can negatively influence the availability of resources and access to adequate healthcare manifesting in a women's long-term health and well being. Whereas those seeking debt assistance through bankruptcy have determined that the potential punitive effects of bankruptcy are no more costly than debt-related problems, and perhaps less costly.

The effect size of bankruptcy on self-health and depressive symptoms was significant and non-negligible with the strength of the bankruptcy and health relationship attenuated depending on the model specification, such as controlling for prior health status or unobserved individual heterogeneity. The empirical analysis led to three main conclusions that provided solid evidence of a negative impact of bankruptcy on health for women. The first conclusion was that a consumer bankruptcy had an independent and significant negative impact on physical health of older women, lowering the level of self-rated health by a quarter on average. Health improvements, however, are not an explicit or guaranteed outcome of filing for bankruptcy (Dobbie & Song, 2015; Sullivan, Warren, & Westbrook, 2000). This finding suggests that for these women poor health was an unintended consequence from filing, one that increased their risk of mortality. The second conclusion was that bankruptcy was also negatively associated with mental health. Women who reported depressive symptoms at the age 40 health modules and declared bankruptcy, however, were driving this negative association. It is also possible that financial issues prior to age 40 contributed their mental health status, unfortunately data limitations preclude analyzing this association.

The third conclusion, which stemmed from an exploration of differences within the bankruptcy system, finds that Chapter 7 filers fared worse in terms of physical health relative to those who did not file and in depressive symptoms relative to Chapter 13 filers. The conceptual framework hypothesized that given distinct structural attributes of the Chapter 13 program these filers would fare worse. Not to mention previous studies on financial strain and health have shown that persistent negative financial experiences as opposed to acute experiences have more severe impacts on individual well being

(Balmer, Pleasence, Buck, & Walker, 2006; Kahn & Pearlin, 2006). The present analysis does not examine mechanisms for the differential outcomes of Chapter 7 and Chapter 13 filers, however, the results suggest that there was something about the structure of Chapter 7 bankruptcy that is contributing to poorer health outcomes for these women. Unfortunately, much of the research on post-bankruptcy outcomes have analyzed Chapter 13 filers or not distinguished by chapter. What we do know is that ninety percent of Chapter 7 cases are no asset cases (Gerardo & Flynn, 2016). This suggest that a previous history of financial problems and failed attempts to manage one's debts could have led to a bankruptcy filing; in that case the Chapter 7 filing was not necessarily representative of a "fresh start" but a financial failing. When most Chapter 13 filers fail their repayment plans it is common to refile under Chapter 7. The data does not have information on individuals whose filings were dismissed, or if they dismissed and refiled under a different chapter. Chapter 7 filers sampled could therefore be a hybrid of first-time filers and prior Chapter 13 filers.

While neither chapter is associated with better physical or mental health estimates were stronger for Chapter 7 female filers. It may be that there is misalignment with what individuals seek when pursuing assistance and the offerings of the program. For example, a non-negligible portion of Chapter 13 filers agrees to repay 100% of their debts (Sullivan, Warren, & Westbrook, 1999). This is an indication that these filers are primarily using bankruptcy to extend the time to repay debt and retain assets. Obtaining more time to buy down one's debts, decreasing harassment, and holding onto one's assets (even if they are of little to no value) might reduce stress and lower anxiety. This specific aim frames how they assess their current post-bankruptcy situation when compared with their pre-bankruptcy state.

This study is not without limitations. There is no information on how long filers held their debts prior to declaring. Interview data of bankrupt filers suggest that they tend to struggle for one to two years on average prior to filing and that most filers have tried many ways to get rid of the debt prior to filing (Porter, 2012). Debt amounts are also measured at the household debt and not person-specific. In this case, these estimates may represent a conservative estimate and household financial issues, even if they are not one's making, can spillover to other members within the household. There is also no information on how the consumer debt was acquired. It was impossible to determine whether the debt is medical related or credit card debt. And last, there is no information on whether filers used lawyers to assistance with the process. Littwin (2012) finds that successful navigation through the bankruptcy process is positively correlated with attorney use.

Despite these limitations this study still adds to a growing literature examining the effects of bankruptcy on individual well being and more specifically women's health. If health outcomes are used as a policy evaluation metric, than consistent with prior research on bankruptcy outcomes the decision to file may not be providing a fresh start and can have negative consequences on one's health; and it is providing no relief for women with a history of mental health issues. As wealth inequality persists, it is imperative that in addition to examining strategies for wealth building (e.g. homeownership, job security, human capital accumulation, etc.), researchers and policy makers look for potential solutions beyond the legal system for handling debt-related problems as they might also provide solutions for decreasing health disparities among older women.

Acknowledgements

Appendix A. Covariate balance between treatment and control women, matched samples

	Means			P-test for equality of means
Variable	Treated	Control	%bias	
Age	40.66	40.67	-1.2	0.90
Foreign born	0.05	0.05	0.6	0.95
Hispanic	0.18	0.18	0.4	0.97
Black	0.35	0.35	0.1	1.00
Household size	3.27	3.28	-0.5	0.96
Child in household	0.79	0.78	1.5	0.89
Educational Attainment	0.86	0.87	-0.4	0.96
Health insured	0.67	0.66	2.2	0.85
Unemployed	0.13	0.14	-1.8	0.87
Work-limiting disability	0.11	0.11	-2.1	0.85
Unsecured debt (ln)	5.56	5.74	-4.3	0.71
Secured debt (ln)	8.36	8.38	-0.5	0.96
Total Asset Value (ln)	10.10	10.11	-0.2	0.98
Household Income (ln)	10.28	10.27	0.4	0.96
Never married	0.16	0.15	3.4	0.77
Divorced/separated/widowed	0.36	0.36	0.8	0.95
Homeowner	0.52	0.53	-2.9	0.80
Business owner	0.07	0.07	-1.8	0.87
Received social assistance	0.10	0.11	-3.8	0.73
Bankruptcy filing rate	53.22	53.81	-1.3	0.91
State household exemptions	118.41	115.42	0.9	0.93
State unemployment rate	57.87	58.33	-1.7	0.89

Note: Unweighted data from the Age 40 and Age 50 Health Modules of the 1979 Cohort of the National Longitudinal Study of Youth

Appendix B. Full models of OLS regressions

VARIABLES	Self-Assessed Health			Depressive Symptoms[+]		
Declared bankruptcy	-0.403***	-0.329***	-0.266***	0.177**	0.155**	0.092+
Previous health	(0.067)	(0.066)	(0.058)0.502*** (0.021)	(0.057)	(0.058)	(0.054)0.381*** (0.020)
Age		0.009 (0.028)	0.004 (0.025)		-0.031 (0.025)	-0.013 (0.022)
Foreign born		0.165+ (0.091)	0.156+ (0.084)		-0.100 (0.086)	-0.022 (0.086)
Hispanic		-0.106 (0.067)	-0.015 (0.062)		-0.158** (0.061)	-0.125* (0.057)
Black		-0.164**	-0.093+		-0.088+	-0.063
Less than a college degree		(0.056) -0.345*** (0.050)	(0.049) -0.224*** (0.044)		(0.050) 0.169*** (0.046)	(0.046) 0.126** (0.043)
Unemployed		-0.042 (0.064)	-0.042 (0.056)		0.065 (0.052)	0.036 (0.048)
Health insured		0.022	-0.040		-0.066	-0.046
Unsecured debt (ln)		(0.049)- 0.022***(0.005)	(0.042)-0.010*(0.005)		(0.043) 0.018***(0.005)	(0.039) 0.009*(0.004)
Secured debt (ln)		0.018* (0.008)	0.008 (0.007)		-0.015* (0.007)	-0.014* (0.006)
Total Asset Value (ln)		0.019* (0.009)	0.010 (0.009)		-0.022** (0.008)	-0.013+ (0.007)
Household Income (ln)		0.030* (0.015)	0.021 (0.013)		-0.022 (0.014)	-0.007 (0.012)
Never married		0.012 (0.073)	0.033 (0.066)		-0.019 (0.064)	-0.020 (0.060)
Divorced/separated/ widowed		-0.002 (0.062)	-0.004 (0.054)		-0.014 (0.055)	-0.031 (0.051)
Household size		0.021	0.013		-0.025	-0.012

		(0.019)	(0.018)		(0.018)	(0.016)
Child in household		0.135*	0.105+		0.018	0.027
		(0.064)	(0.057)		(0.059)	(0.055)
Homeowner		-0.045	-0.051		0.033	0.071
		(0.062)	(0.053)		(0.054)	(0.050)
Business owner		0.110	0.109		0.125+	0.116+
		(0.085)	(0.069)		(0.071)	(0.064)
Received social assistance		-0.371***	-0.188*		0.265***	0.141*
		(0.083)	(0.074)		(0.068)	(0.063)
Bankruptcy filing rate		-0.000	-0.001		0.001*	0.001*
		(0.001)	(0.000)		(0.000)	(0.000)
State household exemptions		-0.000	-0.000		-0.000	-0.000
		(0.000)	(0.000)		(0.000)	(0.000)
State unemployment		0.000	-0.000		-0.001	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)
Constant	3.410***	2.702*	1.259	1.282***	3.010**	1.568+
	(0.024)	(1.174)	(1.025)	(0.021)	(1.028)	(0.912)
Observations	2109	2109	2109	2089	2089	2089
R-squared	0.016	0.146	0.345	0.004	0.084	0.220

Note: [+]Sum of seven item CES-D; Robust standard errors in parentheses; *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.

Appendix C. Bankruptcy status and physical and mental health of adult women, includes women with prior bankruptcy

Panel A. Declared Bankruptcy

Model Specification	OLS (I)	OLS, additional controls (II)	OLS, additional controls & previous health (III)	PSM (IV)	DiD on PSM sample (V)
Self-assessed health	-0.373***	-0.334***	-0.279***	-0.308***	-0.216*
	(0.066)	(0.066)	(0.059)	(0.072)	(0.094)
Depressive Symptoms	0.161**	0.154**	0.094+	0.050	0.007
	(0.057)	(0.058)	(0.054)	(0.063)	(0.084)

Panel B. Chapter 7 versus Chapter 13

Model Specification	OLS (I)	OLS, additional controls (II)	OLS, additional controls & previous health (III)	PSM (IV)	DiD on PSM sample (V)
Self-assessed health					
Declared Chapter 7	-0.312***	-0.351***	-0.295***	-0.266**	-0.154+
	(0.063)	(0.073)	(0.066)	(0.089)	(0.089)
Declared Chapter 13	-0.281***	-0.288***	-0.206**	0.032	-0.028
	(0.073)	(0.084)	(0.072)	(0.087)	(0.104)
Depressive Symptoms					
Declared Chapter 7	0.219***	0.242***	0.175**	0.131+	0.026
	(0.051)	(0.062)	(0.058)	(0.074)	(0.075)
Declared Chapter 13	0.068	0.095	0.036	-0.035	-0.126
	(0.066)	(0.074)	(0.071)	(0.077)	(0.096)

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