Running Up the Tab: Personal Bankruptcy, Moral Hazard, and Shadow Debt

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Bankruptcy and Moral Hazard

- Bankruptcy is a form of insurance
- Downside protection but also potential for moral hazard
- Classic trade-off: UI, health insurance, flood insurance, etc.
- Widespread policy concern: B**AP**CPA
- ~10% of U.S. households have filed for bankruptcy (Keys, 2018)
- Important to bankruptcy system design, understand credit market functioning

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- Research Question: Does the option to delay bankruptcy increase [socially inefficient] indebtedness?
  - Yes. An exogenous delay in filing of 1 month is associated with an increase of approximately $4k in unsecured debt and a commensurate amount in shadow debt (debt that does not appear to be visible on a credit report).

Counterfactual and Concepts

- The answer is not obvious given that delayed filers may use the delay to sell assets, renegotiate debt contracts, or increase labor income (improve debt servicing capacity).
- Is this moral hazard?
  1. **Classical moral hazard**: consumer knows they will enter bankruptcy and intentionally runs up debt while planning to stiff creditors
  2. **Gambling for resurrection**: consumer puts off default as long as possible by running up essential debt in hopes that they can avoid bankruptcy
     - If borrowers are unlikely to avoid default, this is still moral hazard: consumers take risky actions that lenders would prefer that they don't take
     - In our data: exogenous shocks to bankruptcy timing have no observable effect on the likelihood of ultimately filing
     - BOTH of these are moral hazard. The only difference is intentions of consumer, which is difficult (impossible?) to distinguish.
- Regardless of motivations, moral hazard debt has deadweight costs borne by those who do not default.

Outline

- Literature
- Data
- Model
- Identification Strategy
- Empirical Results
- Conclusion

Strategic Filing vs. Strategic Debt

- Nearly all prior work has examined strategic *filing* behavior: Domowitz and Sartain (1999), Fay, Hurst, and White (2002), Gross and Souleles (2002), Indarte (2020)
  - Indarte (2020): $1,000 increase in relief generosity causes 0.2% increase in bankruptcy filing rate.

→ Moral hazard on extensive margin appears to be fairly small.

- But this is very different from asking how borrowers behave in the run-up to bankruptcy *conditional* on distress.

- Closest paper: Severino and Brown (2017) bankruptcy generosity increases total debt but no effect on default probability.
- See also Gropp, Scholz, and White (1997) (re)distributional effects of bankruptcy generosity

Our data source

- Scrape completed bankruptcy filing schedules from PACER for BK districts of Utah, Minnesota, Florida North, and Florida South between 2004-2018
  - Detailed information about assets, liabilities Example, employment status, historic and current income, projected expenses, family situation
- ~15% of cases unable to process PDF (the form is handwritten or PDF is an unreadable image or schedules are missing).
- Final sample ~545,000 bankruptcy filings with 15+ million individual debt claims
- Merged by hand (using unique "cells" and first mortgage amounts) to credit-bureau data CB Merge

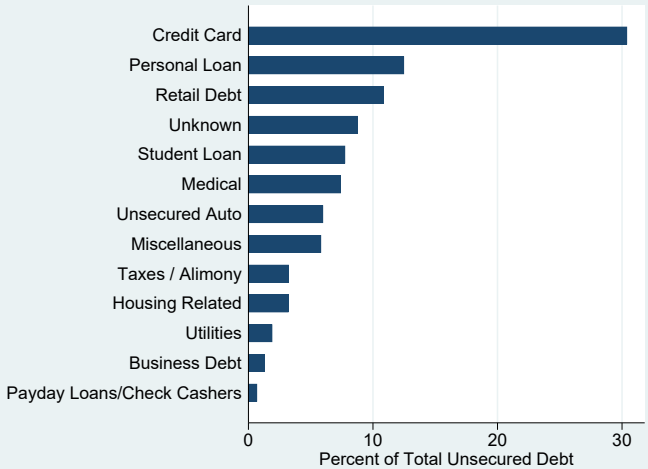
Measuring Shadow Debt

- Shadow debt $\equiv$ Total unsecured debt on bankruptcy filing - total unsecured debt on credit report.

?! Isn't that the whole point of a credit registry?

- Many creditors and collection agencies do not report to credit bureau (e.g., dental offices).
- Key component: **non-payment of goods and services**
- Shadow debt is large: **$41,680** ($27,750) for mean (median) filer
  - 7% of total debt
- Shadow debt in **formal** settings like credit cards, student loans, and personal loans is surprisingly large (about $30k, on average)

Categories of Unsecured Debt



- Using an augmented LDA (Latent Dirchlet Analysis), we categorize 92% of all loans based on keywords in the loan descriptions.
- We map these categories into the debt categories supplied by a credit report:
  1. Credit card/retail debt
  2. Student loans
  3. Personal loans
  4. Uncategorized (informal debt)

Summary Statistics

Variable	Mean	Std. Dev.	25th	50th	75th
Monthly Income ($)	2,973.3	1,682.3	1,786.8	2,700	3,902.2
Monthly Garnishable Wages ($)	727.03	442.81	446.7	675	975.55
Total Assets ($)	133,738.0	207,304.2	10,380.9	84,265.3	197,556.9
Total Debt ($)	238,809.2	673,127.3	52,545.6	148,959.6	282,618.1
Unsecured Debt ($)	96,502.3	570,631.5	24,502	44,835.5	82,656.4
Unsecured Debt Share	0.53	0.36	0.19	0.46	0.94
Chapter 7 Indicator	0.74	0.44	0	1	1

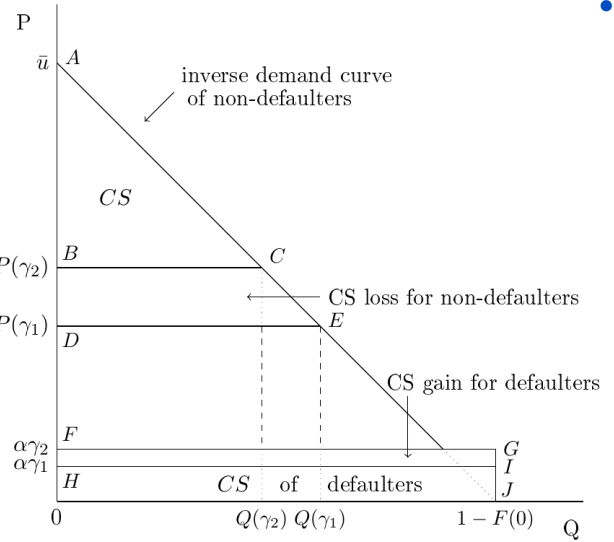
Setup

- Buyers know their type (defaulter $D \in \{0,1\}$), but sellers only know $\alpha \not\vdash Pr(D)$.
- Non-defaulters pay a price P for the good; defaulters pay 0.
- Buyer's utility U_i from purchasing the widget at price P is given by

$$U_i = u_i - (1 - D_i)P$$

  where $u_i \in [\underline{u}, \overline{u}]$ is the idiosyncratic flow utility from consuming the good (distributed $F(\cdot)$).
- Assume that defaulters are time constrained so that only a portion $\gamma \not\vdash$ are able to purchase the good.

Welfare Implications



- Assume competitive, profit-maximizing behavior. Then, equilibrium prices are given by

$$P = \frac{C}{\beta(P)}$$

where $\beta(P)$ is the share of total demand $Q(P)$ from non-defaulter buyers who know they will pay full price P.

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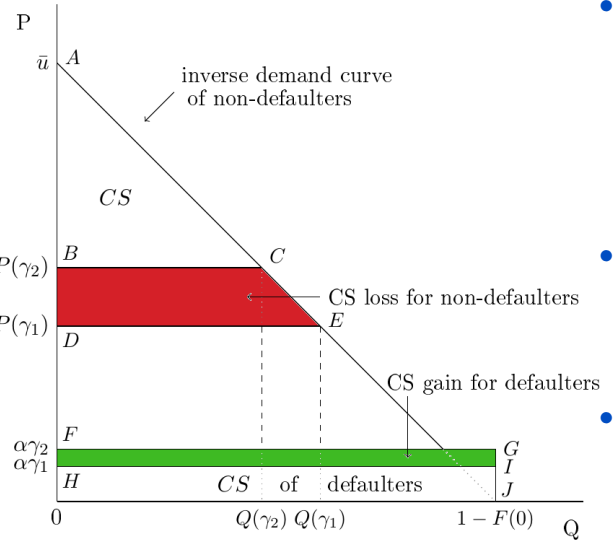

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where $\beta(P)$ is the share of total demand $Q(P)$ from non-defaulter buyers who know they will pay full price P.

- An **increase** in γ leads to a **decrease** in consumer surplus if:

$$\frac{\alpha\bar{u}^2}{2(\bar{u}-\underline{u})} < \frac{1-\alpha}{\bar{u}-\underline{u}}\left[\bar{u}\frac{\partial P}{\partial \gamma} - P\frac{\partial P}{\partial \gamma}\right],$$

- that is, if the fraction of defaulting buyers is low enough.

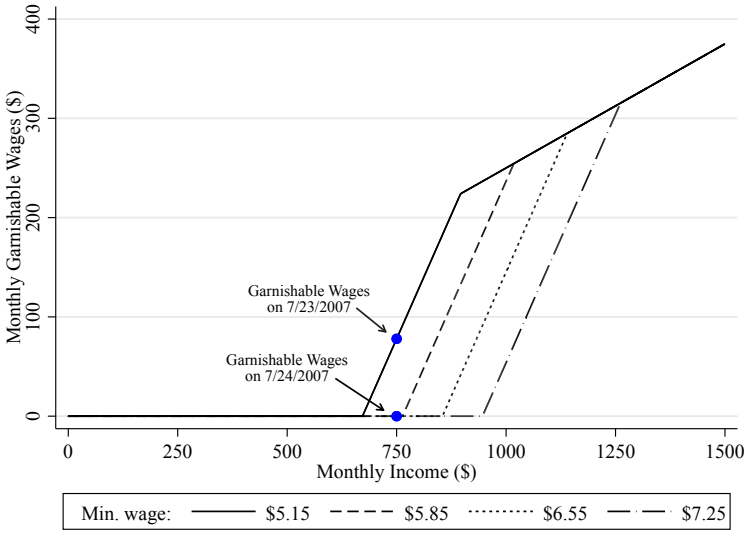
$$\alpha < \frac{2(\bar{u}-P)\frac{\partial P}{\partial \gamma}}{\bar{u}^2 + 2(\bar{u}-P)\frac{\partial P}{\partial \gamma}}$$

Identification Strategy

- Identification strategy: exogenous changes to wage garnishment affect how fast people file for bankruptcy.
  - Wage garnishment: creditors taking money directly from delinquent borrower's wages
- Idea: Higher garnishment $\Rightarrow$ Less take-home pay $\Rightarrow$ File for bankruptcy sooner
- Exogenous variation in garnishment: Federal changes to minimum wage
  - These minimum wage changes do not appear to change the composition of filers, and
  - the magnitudes of the response are very difficult to ascribe to either
    - an increase in income qualifying filers for more debt, or
    - a mechanical reduction in the amount of wage garnishment being used to pay down debt.

How Min. Wage Affects Garnishment

Details and Equations



Details and Equations

Empirical Strategy

- Treated group: filers in middle income range whose wage garnishment is affected by minimum wage changes
- Control groups:
  - Filers with income below lowest threshold, and
  - Filers with income above highest threshold

- First stage: effect of minimum wage changes on delay in entering bankruptcy
- Second stage: effect of instrumented bankruptcy delay on debt discharged in bankruptcy

Measuring Delay to Bankruptcy

- Use credit bureau data to identify first transition into 90 days past due
- Define time to bankruptcy as months from first 90-day delinquency to bankruptcy filing
  - Robustness: 120-day delinquency, or last transition to 90-day delinquency
- Filers delay a long time before entering bankruptcy:
  - Average time to file: 22.3 months
  - Median time to file: 15.3 months

First-Stage Specification

$$\begin{aligned} \textit{Months to File}_{ist} &= \pi_1 \cdot \textit{Treatment}_i \times \textit{Garnishable Wages}_{ist} + \pi_2 \cdot \textit{Treatment}_i \\ &\quad + \pi_3 \cdot \textit{Garnishable Wages}_i + \pi_4 \cdot \textit{Treat}_i \times \textit{Income}_i + X_i' \pi_5 + \quad_s + \varphi_t + v_{ist} \end{aligned}$$

- π_1 identifies effect of change in wage garnishment on treated individuals
  - Holding income constant (π_4)
- Outside of treated region, garnishable wage and income are collinear
- Filer controls X_i include marital status, number of dependents, home ownership, business ownership, retired status, disabled status, employed status
- Fixed effects: Banrkuptcy district, year, income quartiles, and income by year
- S.E. double clustered by month and 3-digit zipcode

First-Stage Effect of Wage Changes on Filing

	(1)	(2)	(3)	(4)
Treatment ×	-1.12***	-0.78**	-1.03**	-1.19***
Garnishable Wages	(0.37)	(0.38)	(0.45)	(0.38)
Filer Controls	✓	✓	✓	✓
Year FEs	✓		✓	✓
District FEs	✓		✓	✓
District × Year FEs		✓		
Income × Year Controls			✓	
Income Quartile Controls				✓
Partial F-Stat	9.00	4.31	5.20	9.68
R^2	0.60	0.61	0.60	0.60
Observations	47,960	47,960	47,960	47,960

- Economic magnitude: \$100 increase in garnishable wages $\Rightarrow$ 1 month reduction in time to bankruptcy

Selection & Mechanical Effect Concerns

- Exclusion restriction: conditional on income, changes to the minimum wage do not effect filer debt levels directly, but only the timing of filing.
- One possible threat: Selection into bankruptcy
  - E.g. When wage garnishment falls, only high-debt people continue to file for bankruptcy
- Tests (in paper): Wage garnishment changes not associated with
  - % of people who file for bankruptcy
  - Debt levels of people who are 90 days delinquent but don't file for bankruptcy
  - Income distribution of bankruptcy filers
- Second stage results are more than twice the size of the direct change in garnished wages

Reduced-Form Effects on Unsecured Debt Share

	(1)	(2)	(3)	(4)
Treatment ×	-0.0027*	-0.0033**	-0.0067***	-0.0046***
Garnishable Wages	(0.0014)	(0.0013)	(0.0018)	(0.0014)
Filer Controls	✓	✓	✓	✓
Year FEs	✓		✓	✓
District FEs	✓		✓	✓
District × Year FEs		✓		
Income × Year Controls			✓	
Income Quartile Controls				✓
R^2	0.75	0.75	0.75	0.75
Observations	554,942	554,942	554,942	554,942

→ policy induces 0.5% increase in unsecured debt share, an increase of $1,200

2SLS Effect of Delayed Filing on Unsecured Debt Share

	(1)	(2)	(3)	(4)	(5)
Estimator	OLS	2SLS	2SLS	2SLS	2SLS
Months to File	-0.0002***	0.0079**	0.0109*	0.0119**	0.0074**
	(0.0001)	(0.0038)	(0.0064)	(0.0057)	(0.0036)
Filer Controls	✓	✓	✓	✓	✓
Year FEs	✓	✓		✓	✓
District FEs	✓	✓		✓	✓
District × Year FEs			✓		
Income × Year Controls				✓	
Income Quartile Controls					✓
R^2	0.60	0.48	0.40	0.38	0.48
Observations	47,960	47,960	47,960	47,960	47,960

→ delaying filing one month ⇒ +1% in unsecured debt share, an increase of $4,000

What Kind of Debt do Delaying Filers Incur? Shadow Debt

	(1)	(2)	(3)	(4)	(5)
Estimator	OLS	2SLS	2SLS	2SLS	2SLS
Months to File	0.0009***	0.018**	0.024*	0.017*	0.016**
	(0.0001)	(0.008)	(0.013)	(0.009)	(0.007)
Filer Controls	✓	✓	✓	✓	✓
Year FEs	✓	✓		✓	✓
District FEs	✓	✓		✓	✓
District × Year FEs			✓		
Income × Year Controls				✓	
Income Quartile Controls					✓
R^2	0.51	0.40	0.35	0.41	0.42
Observations	47,960	47,960	47,960	47,960	47,960

→ delaying filing one month ⇒ +1.7% in shadow debt share, an increase of $6,300

- We cannot reject the hypothesis that the increase in shadow debt is no more than the increase in unsecured debt.

2SLS Effect of Delayed Filing on Shadow Debt Category Shares

	(1) Credit Card/ Retail	(2) Student Loans	(3) Personal Loans	(4) Informal Debt
Months to File	0.0023	-0.0018	0.0007	0.0171**
	(0.0049)	(0.0032)	(0.0028)	(0.0081)
Filer Controls	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
District FEs	✓	✓	✓	✓
R^2	0.50	0.49	0.50	0.39
Observations	47,960	47,960	47,960	47,960

- No significant increase in the formal categories reported by the credit bureau (credit card/retail, student loans, personal loans)
  - these formal categories are also those most likely to have increased if we were picking up a mechanical income effect.
- Significant increase in "missing" informal debt.

Conclusion

- Bankruptcy filers that can file more slowly incur more unsecured debt before filing
- Model illustrating scope for moral hazard, externality on prices, welfare effects
  - Ability to delay bankruptcy leads to moral hazard debt
- Shadow debt is a large component of the balance sheet for bankruptcy filers, and we see the largest effect for informal shadow debt
- Policies helping identify distressed borrower and nudge filing sooner may improve welfare.

Wage Garnishment back

- Wage garnishment limits:

$$Garnishable\ Wages_{it} = \begin{cases} 0.25 \cdot Income_i, & \text{if } Income_i > 5.8 \cdot 30 \cdot MinWage_t \\ Income_i - 4.35 \cdot 30 \cdot MinWage_t & \text{if } 5.8 \cdot 30 \cdot MinWage_t > Income_i > 4.35 \cdot 30 \cdot MinWage_t \\ 0 & \text{if } 4.35 \cdot 30 \cdot MinWage_t > Income_i \end{cases}$$

- Federal minimum wage changes:
  - 7/24/2007: \$5.15 $\rightarrow$ \$5.85
  - 7/24/2008: \$5.85 $\rightarrow$ \$6.55
  - 7/24/2009: \$6.55 $\rightarrow$ \$7.25

Credit-bureau data back

- Measure public information on liabilities and timing of distress
- Cannot use personal information for the merge
- Instead: zip code + bankruptcy filing month + bankruptcy chapter (7 or 13)
- When doesn't uniquely identify a match, use other characteristics:
  - Mortgage origination month
  - First mortgage balance
  -
- Of 188,975 bankruptcy filings in the CB data, we can uniquely match 55,357
  - 2 of 3 FL districts, imaged PDFs, non-unique matches

☐ Yes

■ Other. Specify Medical bill

4.9

Lifewatch, Inc
Nonpriority Creditor's Name
2731 Paysphere Cir
Chicago, IL 60674-0027
Number Street City State Zip Code

Who incurred the debt? Check one.

■ Debtor 1 only
☐ Debtor 2 only
☐ Debtor 1 and Debtor 2 only
☐ At least one of the debtors and another
☐ **Check if this claim is for a community debt**

Is the claim subject to offset?

■ No
☐ Yes

Last 4 digits of account number 6934

When was the debt incurred? 2016

As of the date you file, the claim is: Check all that apply

☐ Contingent
☐ Unliquidated
☐ Disputed

Type of NONPRIORITY unsecured claim:

☐ Student loans
☐ Obligations arising out of a separation agreement or divorce that you did not report as priority claims
☐ Debts to pension or profit-sharing plans, and other similar debts
■ Other. Specify Medical bill

$40.00

4.10

Mercy Hospital
Nonpriority Creditor's Name
P.O. Box 504682
St. Louis, MO 63150-4682
Number Street City State Zip Code

Who incurred the debt? Check one.

☐ Debtor 1 only
☐ Debtor 2 only
■ Debtor 1 and Debtor 2 only
☐ At least one of the debtors and another

Last 4 digits of account number

When was the debt incurred? 2016

As of the date you file, the claim is: Check all that apply

☐ Contingent
☐ Unliquidated
☐ Disputed

Type of NONPRIORITY unsecured claim:

$500.00