



How Does Personal Bankruptcy Law Affect Start-ups?

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Why to protect debtors?

- Provide debtors with wealth insurance
- Preserve debtors' ex post incentives
- Encourage entrepreneurship
 - Kihlstrom and Laffont (JPE 1979)
 - Fan and White (JLawEc 2003)
- As a result, debtor protection could promote economic growth

However, debtor protection may also...

- Encourage opportunistic behavior
 - Fay, Hurst and White (AER 2002)

- Exacerbate agency problems in the credit market
 - Gropp, Scholz, and White (QJE 1997)
 - Berkowitz and White (Rand 2004)
 - Berger, Cerqueiro and Penas (2009)

- Ultimately, hamper economic development
 - Rate of survival and growth rate of entrepreneurial firms seem to depend on credit availability (Evans and Jovanovic JPE 1989, Holtz-Eakin et al. JPE 1994)

[This paper]

- Exploits the variation of personal bankruptcy law across U.S. states and through time
- To study the effect of debtor protection on the financing choices of start-ups (outside vs. inside financing)
- To explore the effect of debtor protection on start-ups entry size and survival
- Dataset used: Kauffman Firm Survey
 - Longitudinal dataset that covers 4,928 firms that began operations in 2004
 - Survey tracks these firms yearly (last follow-up wave is 2008)

Some related literature

- Literature on the effect of the legal system on credit markets has focused on:
 - Bank lending to large companies
 - Esty and Megginson (JFQA 2003); Giannetti (JFQA 2003); Bae and Ghoyal (2004); Sufi (JF 2005); Qian and Strahan (JF 2007)
 - Private equity markets
 - Lerner and Schoar (QJE 2005); Kaplan, Martel and Stromberg (JFI 2007); Bottazzi, Da Rin and Hellmann (JFI 2009)
- Some work on how the legal system affects small business credit
 - Berkowitz and White (RAND 2004); Berger, Cerqueiro and Penas (2009)
- To the best of our knowledge, no evidence on how debtor protection affects start-ups

The U.S. Personal Bankruptcy Law

- When an individual files for bankruptcy, all collection efforts by creditors terminate
- Main personal bankruptcy procedure is Chapter 7
 - Future earnings exempt from obligation to repay (“*fresh start*”)
 - Debtors must turn over any unsecured assets above a predetermined exemption level
 - Example: if home equity of a borrower is worth \$300,000 and if the homestead exemption level in her state is \$100,000 she’d have to hand over \$200,000 to creditors, if she files for bankruptcy
 - Secured debts cannot be discharged

Personal Bankruptcy Law and Exemptions

- Exemption = maximum asset value that can be shielded from creditors in that particular state

- There are two main types of exemptions:
 - Homestead exemptions: for equity in residences
 - Personal property: other personal assets
 - We consider only “liquid” assets: cash, jewelry, motor vehicles and wild card

- In 1978 the Congress gave the states the right to set their own exemption levels
 - Large cross-sectional variation as a result
 - Temporal variation

Exemptions

State	Homestead (\$000)		Personal (\$000)	
	2004	2008	2004	2008
California	75,000	75,000	16,450	16,450
Colorado	90,000	120,000	8,000	14,000
Connecticut	150,000	150,000	5,000	9,000
D.C.	36,900	40,400	12,000	11,300
Delaware	0	50,000	5,000	40,000
Florida	unlimited	unlimited	4,000	4,000
Georgia	20,000	20,000	9,200	9,200
Hawaii	36,900	40,400	12,000	11,300
Idaho	50,000	100,000	9,600	13,600
Illinois	15,000	30,000	6,400	12,800
Indiana	10,000	30,000	0	16,600
Iowa	unlimited	unlimited	10,200	20,000
Median	45,000	87,500	12,000	14,000

Why Personal Bankruptcy Law applies to firms?

- The Law applies to businesses with unlimited liability form (*proprietorships*), as owners are legally liable for the firm's debts
- Bankruptcy for the limited liability firms (*corporations*) governed by Corporate Bankruptcy Law
 - No wealth exemption in this case
 - But personal bankruptcy law could still affect these firms
 - Reduces value of all personal guarantees
 - Firm owners could transfer assets from the firm to themselves
 - Evidence suggests that exemptions increases the likelihood of being denied loans for both types of firms (Berkowitz and White, Rand 2004; Berger, Cerqueiro and Penas 2009)

Conceptual framework

- Debtor protection could affect financing of start-ups directly through:
 - Demand-side effects: Higher exemptions provide wealth insurance, so they should increase demand for bank financing by risk-averse entrepreneurs (especially by proprietorships)
 - Supply-side effects: Banks anticipate moral hazard problems and opportunistic behavior and reduce supply of credit
- ...and indirectly, through a compositional (pool) effect:
 - Higher exemptions could attract less skilled entrepreneurs (adverse selection)
 - However, banks could anticipate this and increase screening efforts and cherry-pick entrepreneurs

Dataset: Kauffman Firm Survey (KFS)

- Longitudinal representative survey of new businesses in U.S.
- Tracks annually 4,928 firms founded in 2004
- Currently there are 4 follow-up waves of the baseline survey (2005-2008)
- The survey provides detailed information on:
 - Financing activities
 - Firm characteristics
 - Up to 10 owners' characteristics
 - Intellectual property
 - Firm performance

Variables used

- Dependent variables
 - Financial institutions financing (loans and credit cards)
 - Owners financing (firm owners' debt or equity)
 - Informal financing (friends, family, employees' debt or equity)
 - Other outside financing (non-financial institutions, VC, angels, governments)

- Explanatory variables
 - State-level
 - High exemption state = 1 if exemption \geq \$160,000 (75th percentile)
 - Controls: unemployment rate, median wage
 - Firm characteristics
 - Number of employees, credit rating, unlimited liability, industry
 - Owner characteristics
 - Hours worked, age, past experience, education, gender, and race

Descriptive statistics (2004)

Variable	Mean	S.d.
Financial institutions (\$000)	61.43	535.55
Firm owners (\$000)	58.09	1110.22
Other informal sources (\$000)	36.98	1565.57
High exemptions	0.27	0.44
Unemployment rate	5.32	0.85
Median wage	37.47	4.12
% Medium banks	0.45	0.11
% Large banks	0.17	0.11
Revenues	148.97	2169.62
Credit risk	3.33	0.68
Credit risk missing	0.25	0.43
Proprietorship	0.40	0.49
Hours worked	42.28	24.08
Age	44.75	10.77
Previous experience	0.19	0.39
High school degree	0.35	0.48
College degree	0.44	0.5
Graduate degree	0.18	0.38
Female	0.30	0.46
Minority	0.17	0.38

Cross-sectional analysis (2004): Results

	Banks	Owners	Informal
High exemptions	-0.13 *	0.10 *	0.12 ***
Unemployment rate	0.03	0.02	0.03
Median wage	-0.01 *	0.01	0.01
% Medium banks	-0.76 ***	-0.22	-0.13
% Large banks	0.05	0.60 ***	0.56 ***
Revenues (log of 1 +)	0.14 ***	0.09 ***	0.03 ***
Credit risk	-0.21 ***	-0.14 ***	-0.09 ***
Credit risk missing	-0.16 **	-0.17 ***	-0.05
Proprietorship	-0.48 ***	-0.69 ***	-0.15 ***
Hours worked	0.01 ***	0.01 ***	0.01 ***
Age (log of)	0.35 ***	0.66 ***	-0.31 ***
Previous experience	0.03	0.05	-0.07
High school degree	-0.12	0.13	-0.18
College degree	-0.10	0.24	-0.22 *
Graduate degree	0.09	0.31 **	-0.06
Female	0.01	-0.05	0.04
Minority	-0.17 **	-0.01	0.11 **
Constant	1.37 **	-0.93 *	1.25 ***
R-squared	0.12	0.16	0.06

Conclusions after cross-sectional analysis:

- High exemptions induce shift from bank financing towards owner's and informal financing in equilibrium
- Two possible explanations:
 - 1. Decrease in credit supply dominates increase in credit demand.
 - Use loan level data from 2007 and 2008 to study this
 - 2. Compositional effect (unobserved firm heterogeneity).
 - Use time-variation in exemptions to estimate a firm fixed effects model

1. Demand versus supply

- Use information on loan applications
 - Only available in 2007 and 2008 waves

- Proxy for demand:
 - $Apply = 1$ if firm applied for a bank loan
 - $Needed\ loan = 1$ if firm either applied for a bank loan or was discouraged from doing so because it feared a denial

- Proxy for supply:
 - $Denied = 1$ if firm applied for a bank loan and the application was turned down

1. Demand versus supply: Findings

■ Supply:

- For all firms we find that the probability of being denied a loan **increases significantly** when moving from a low exemption state to a high exemption state

■ Demand:

- For corporations
 - We find that the probability of applying for a loan **is almost unaffected** when moving from a low exemption state to a high exemption state
- For proprietorships
 - We find that the probability of applying for a loan **increases significantly**
 - As expected, given that these are the owners whose personal wealth is at stake, and directly benefit from high exemptions

1. Demand versus supply: Findings

- These results are consistent with:
 - Exemptions negatively affecting the supply of credit for all firms
 - Exemptions positively affecting the demand of credit, only in the case of proprietorships
 - Therefore
 - For corporations supply effects should dominate
 - For proprietorships the net effect is unclear

2. Panel Analysis (2004-2008)

- From cross-sectional analysis we find that there is a reduction in bank financing when moving from low to high exemption states
- An alternative explanation for this finding is that:
 - High exemption states attract less skilled entrepreneurs and,
 - that our firm and owner controls do not fully capture this effect (unobserved firm heterogeneity)
- If this were the case, banks would not be reducing credit supply. They are simply facing worse borrowers to whom they lend less.
- To rule out that our findings are *only* due to a compositional effect: panel analysis

2. Panel Analysis (2004-2008)

- We use time-variation in exemptions to estimate a firm fixed-effects model
 - This produces within-firm estimators, so no compositional effect can be present
- Time-series variation in exemptions:
 - Massachusetts, Minnesota, Nevada and Rhode Island experienced increases larger than \$100,000
 - New York, New Mexico, South Carolina, Idaho, Washington and Delaware experienced increases ranging from \$50,000 to \$100,000

2. Panel Analysis (2004-2008): Findings

- We find a statistically significant effect of exemptions on bank financing.
 - Therefore our findings cannot be due *only* to a compositional effect
- For corporations:
 - We find that a \$100,000 increase in exemptions is associated with a **18% decrease** in the inflow of bank financing (**supply** effect dominates)
- For proprietorships:
 - We find that a \$100,000 increase in exemptions is associated with a 19% increase in the inflow of bank financing (**demand** effect dominates)

[3. Size and Survival Analysis]

- There is evidence that starting conditions of start-ups, in particular size, is a key determinant of entrepreneurial success (Geroski, Mata, and Portugal, SMJ 2010)

- If high exemptions reduce credit availability we would expect:
 - Firms in high exemption states to begin smaller

 - Firms in high exemption states to fail more often
 - May not achieve their minimum efficient scale (Audretsch and Mahmood, RIO 1994)
 - May be in a weaker position to compete (Zingales, JF 1998)

3.1. Start-up Size

- We measure size with the number of employees (excluding firm owner)
- Almost 60% of start-ups have zero employees and almost 90% have less than five
- We therefore analyse the effect of exemptions in 2004 on:
 - The likelihood of hiring employees
 - The number of employees
- Other control variables are:
 - Other state level characteristics
 - Owner characteristics

3.1. Start-up Size: Findings

- We find that:
 - In high exemption states the number of employees is significantly lower than in low exemption states
 - In high exemption states the probability that a firm will hire employees is **5 percentage points lower** than in low exemption states
- These results are consistent with a credit availability problem
- But they could also be due to exemptions increasing entry of more marginal firms

3.2. Survival

- We estimate a Cox proportional regression model using data from all surveys (2004-2008)
- The model explains survival as a function of:
 - Exemptions in 2004
 - Change in exemptions lagged one year
 - State level characteristics
 - Firm and owner characteristics

3.2. Survival: Findings

- We find that:
 - Higher exemption levels at the firm's birth decrease the probability of survival
 - For example, moving from a zero exemption state to a 100,000 exemption state **decreases** the probability of survival by **2.6 percentage points**
 - Not only the exemption level at birth matters. Changes in exemption levels also decrease the probability of survival
- The findings could also be due to exemptions increasing entry of more marginal firms

[Conclusion]

- High debtor protection is associated with lower bank financing to start-ups, that shift to higher personal and informal financing
- High debtor protection is associated also with a lower probability of hiring employees and with lower survival rates
- We find strong evidence that one of the mechanisms driving the decrease in bank financing is a reduction in the supply of credit to all start-ups