How Does Personal Bankruptcy Law Affect Start-ups?

Geraldo Cerqueiro  
Universidade Católica Portuguesa

M. Fabiana Penas  
Tilburg University, EBC, TILEC

Small Business, Entrepreneurship, and Economic Recovery: A focus on Job Creation and Economic Stabilization

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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

<table>
<thead>
<tr>
<th>State</th>
<th>Homestead ($000)</th>
<th>Personal ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>75,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Colorado</td>
<td>90,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Connecticut</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>D.C.</td>
<td>36,900</td>
<td>40,400</td>
</tr>
<tr>
<td>Delaware</td>
<td>0</td>
<td>50,000</td>
</tr>
<tr>
<td>Florida</td>
<td>unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Georgia</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Hawaii</td>
<td>36,900</td>
<td>40,400</td>
</tr>
<tr>
<td>Idaho</td>
<td>50,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Illinois</td>
<td>15,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Indiana</td>
<td>10,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Iowa</td>
<td>unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Median</td>
<td>45,000</td>
<td>87,500</td>
</tr>
</tbody>
</table>
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)
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 ≥ $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)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial institutions ($000)</td>
<td>61.43</td>
<td>535.55</td>
</tr>
<tr>
<td>Firm owners ($000)</td>
<td>58.09</td>
<td>1110.22</td>
</tr>
<tr>
<td>Other informal sources ($000)</td>
<td>36.98</td>
<td>1565.57</td>
</tr>
<tr>
<td>High exemptions</td>
<td>0.27</td>
<td>0.44</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>5.32</td>
<td>0.85</td>
</tr>
<tr>
<td>Median wage</td>
<td>37.47</td>
<td>4.12</td>
</tr>
<tr>
<td>% Medium banks</td>
<td>0.45</td>
<td>0.11</td>
</tr>
<tr>
<td>% Large banks</td>
<td>0.17</td>
<td>0.11</td>
</tr>
<tr>
<td>Revenues</td>
<td>148.97</td>
<td>2169.62</td>
</tr>
<tr>
<td>Credit risk</td>
<td>3.33</td>
<td>0.68</td>
</tr>
<tr>
<td>Credit risk missing</td>
<td>0.25</td>
<td>0.43</td>
</tr>
<tr>
<td>Proprietorship</td>
<td>0.40</td>
<td>0.49</td>
</tr>
<tr>
<td>Hours worked</td>
<td>42.28</td>
<td>24.08</td>
</tr>
<tr>
<td>Age</td>
<td>44.75</td>
<td>10.77</td>
</tr>
<tr>
<td>Previous experience</td>
<td>0.19</td>
<td>0.39</td>
</tr>
<tr>
<td>High school degree</td>
<td>0.35</td>
<td>0.48</td>
</tr>
<tr>
<td>College degree</td>
<td>0.44</td>
<td>0.5</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>0.18</td>
<td>0.38</td>
</tr>
<tr>
<td>Female</td>
<td>0.30</td>
<td>0.46</td>
</tr>
<tr>
<td>Minority</td>
<td>0.17</td>
<td>0.38</td>
</tr>
</tbody>
</table>
### Cross-sectional analysis (2004): Results

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

- 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.

- 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

- 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 marginals 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.