



## Beyond bankruptcy: Does the US bankruptcy code provide a fresh start to entrepreneurs?



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### ABSTRACT

This paper assesses the extent to which the US bankruptcy system is effective in providing small businesses a “fresh start” after a bankruptcy filing. I use data from the 1993, 1998 and 2003 National Survey of Small Business Finances to explore how firms fare after a bankruptcy filing. On the positive side, previously bankrupt firms are not any more burdened than the average small firm by problems relating to profitability, cash flow, health insurance costs, or taxes. Further, the fact that these firms are surviving several years after the filing is itself a testament to the efficient functioning of the US bankruptcy system. It suggests that the bankruptcy system goes a long way toward helping businesses recover after a bankruptcy filing.

However, the one area of concern that persists after a filing is financing or credit access. In general, these firms have a nearly 24 percentage point higher likelihood of being denied a loan and are charged interest rates that are more than 1 percentage point higher than those charged to other businesses. A bankruptcy affects all types of financing, even trade credit, which is a significant form of lending between businesses. In fact, it appears that firms with a bankruptcy record are rationed out of the market, with all types of loans being denied at significantly higher rates than other firms. Further, my results show that bankruptcy leads to a class of discouraged borrowers who are significantly less likely to even apply for a loan.

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### 1. Introduction

The fundamental philosophy of the US bankruptcy system has not changed for more than a century. The philosophy, first codified in the 1978 law, has guided bankruptcy regulation since the early nineteenth century and centers around the idea of a “fresh start” after bankruptcy.<sup>1</sup> A “fresh start” enables individuals to get rid of their old, unsecured debt through the bankruptcy process and provides them a “new opportunity in life”, as highlighted by the Supreme Court in its ruling in *Local Loan Co. vs. Hunt* (1934). More practically, it allows individuals a financial fresh start by releasing the debtor from past financial obligations. Hence, implicit in the notion of a fresh start is the prospect for a better financial future for debtors since the discharge of debt enables them to enjoy the rewards from any future work effort. This paper assesses whether bankruptcy law has in fact achieved this objective when viewed from the perspective of small business owners. How do once-bank-

rupt entrepreneurs fare in a post-bankruptcy world? What does a “fresh start” look like?

For reasons stated above, in principle, bankruptcy should enable entrepreneurs to start off with a clean slate. In practice, this is rarely true for several reasons. A bulletin issued by the Maryland State Bar Association (2005) suggests that credit reports of bankrupt filers often inaccurately continue to report the discharged debts as open with balances or missed and late payments.<sup>2</sup> This adversely affects the borrower’s ability to take future loans or even obtain insurance. In addition, the bankruptcy filing itself appears on the debtor’s credit record for 10 years (Fair Credit Reporting Act; *FCRA Section 605 (a)(1)*). Also, the 10 year rule only applies to credit bureaus. If any creditor deals with an individual who had filed for bankruptcy within that 10 year window, the creditors can continue to use the information about the filing even after it is removed from the credit report. Therefore, there are several reasons why, despite the debt discharge, a bankruptcy filing may not lead to a financial fresh start for debtors.

These effects have been documented in the empirical literature, but there has been no attempt to distinguish consumer and

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<sup>1</sup> Report of the Commission on the Bankruptcy Laws of the United States H.R. DOC. NO. 93-137, pt. 1, at 71, 79–80 (1973).

<sup>2</sup> [http://www.msba.org/departments/commpubl/publications/bar\\_bult/2005/april05/freshstart.asp](http://www.msba.org/departments/commpubl/publications/bar_bult/2005/april05/freshstart.asp).

business bankruptcies. When looking at consumer bankruptcy cases, research by Musto (2004), Cohen-Cole et al. (2009) and Fisher et al. (2004) shows that having the bankruptcy on file reduces access to credit for previously bankrupt households. Porter and Thorne (2006) surveyed households about their financial situation after a bankruptcy. They found that nearly 25% of households had problems paying routine bills nearly a year after the filing, while more than 30% reported an overall financial situation that was worse or the same as when they had filed for bankruptcy.

Given these costs and benefits of filing for bankruptcy, there is a surprising dearth of literature on how business owners actually fare post-bankruptcy. What impact does the filing have on access to credit and interest rates? What happens to wages and employment? This paper aims to fill this void in the literature. Results using data from the National Survey of Small Business Finances (NSSBF) for the years 1993, 1998 and 2003 suggest that firms with a bankruptcy on their record are more likely to report problems relating to financing. Further, such firms are likely to be relatively low-paying, with significantly lower wage to employment ratios. On the positive side, they are not significantly more likely to report problems relating to profitability or cash flows. The most interesting results, and those which pertain directly to the notion of a “fresh start”, deal with access to credit issues. If the bankruptcy system really did wipe the slate clean, then in principle, there should be little to distinguish between firms with and without a bankruptcy filing (controlling for demographic characteristics like firm age and size). However, results suggest that access to credit is a significant constraint for businesses with a bankruptcy filing on their record. Not only are they charged interest rates that are more than 1 percentage point higher than for businesses without a bankruptcy history, but they are also significantly more likely to be denied loans. This is true even of trade credit, which is an informal credit system within businesses wherein one firm allows another to make purchases without immediate cash payment. Further, it appears that bankruptcy leads to a class of discouraged borrowers who are significantly less likely to even apply for a loan. Finally, results suggest that owners of previously bankrupt firms are less likely to own credit cards, and are more likely to look for outside financing from venture capitalists.

These results are robust to the inclusion of several controls. There are also interesting differences in credit access across minority owned businesses. In particular, while Black-owned and Hispanic-owned businesses are charged higher interest rates and are more likely to be denied loans, Asian-owned businesses are charged interest rates not significantly different than the average business, and face loan denial rates that are only marginally higher than the average. The results for Black-owned businesses reflect those found in the literature. Blanchflower et al. (2003), Munnell et al. (1996), Chen and Cole (1988) and Craig et al. (2006) have shown that Black-owned firms face higher interest rates and loan denial rates in credit markets.

To summarize, the analysis finds that the bankruptcy system is partly successful in getting small businesses back on their feet. In the data, approximately 2–2.6% of business owners and approximately 1% of firms reported a bankruptcy on record every year. The fact that these business owners were able to continue to operate a business and showed up in the data – some of them profitably suggests that the bankruptcy system helps at least some businesses to recover and resume operations after a bankruptcy filing, thus enabling a “fresh start”. However, whether the bankruptcy system is economically efficient in that it provides the best possible outcome for firms entering bankruptcy is tougher to judge from the data. As defined by the literature (see for example, Blazy et al., 2008; Cornelli and Felli, 1997), the bankruptcy system is ex-post efficient when only economically efficient but financially distressed firms are allowed to continue operating after bankruptcy.

When an economically efficient firm enters bankruptcy, the best outcome is for it to continue operating since its capital has no higher value use. On the other hand, when an economically inefficient firm enters bankruptcy, the best outcome is for its assets to be liquidated, thereby releasing its capital to move to higher value uses. However, in practice and particularly with the NSSBF data, it is difficult to tell with certainty which type of firm enters bankruptcy. Therefore any bankruptcy system that incorporates a reorganization procedure, such as the US bankruptcy system, is likely to make Type-I and Type-II errors. Some economically inefficient failing firms (which should have been liquidated) mistakenly may be categorized as efficient and allowed to reorganize. This is an example of a Type-I error. Conversely, Type-II errors occur when some economically efficient but failing firms may liquidate in bankruptcy because they are mistakenly categorized as inefficient.

Another reason why it is difficult to distinguish between Type-I and Type-II errors is that of necessity, the sample includes only businesses that survived the bankruptcy filing. Therefore, the results exhibit a survivorship bias to the extent that businesses that did not recover after the bankruptcy are excluded. If these excluded businesses were, for instance, 99% of businesses, then it would be hard to conclude that the bankruptcy system was in fact putting businesses back on their feet. While there is little data on post-bankruptcy survival rates, a paper by Baird and Morrison (2005) focusing on Chapter 11 bankruptcies finds that nearly 70% of such businesses survived the bankruptcy and moved onto found new firms. This conclusion was also reached in a separate paper by Warren and Westbrook (2009). In that paper, the authors studied chapter 11 bankruptcies in 1994 and 2002. They cite statistics showing that nearly half the cases did not even propose a reorganization plan. This probably meant that these businesses were so badly off that reorganization was unlikely. Of the remaining who proposed a plan, more than 70% confirmed the plan. This meant that more than 70% could “successfully” file for the reorganization and continue to operate their business. Therefore, while it is likely that the NSSBF data include most businesses that could survive the bankruptcy process, this is not testable given the sample used.

As far as the implication of this survivor bias to my results is concerned, there are two possibilities. Firms that do not survive the bankruptcy process are either completely unviable or were simply unable to obtain financing at reasonable interest rates. On the one hand, this strengthens the result that bankruptcy does not provide a financial fresh start to struggling, economically inefficient businesses. On the other hand, it suggests that the results for profitability and other indicators are not representative of all firms that undergo a bankruptcy, since clearly firms that do not survive are by definition unprofitable. Therefore, on average, the results represent the best possible outcomes for firms that go through a bankruptcy filing. To the extent that they survive, they continue to face financing constraints, but despite that, they can be profitable and generate average incomes for their employees. Moreover, it is unclear what to interpret about the bankruptcy system for firms that do not reappear in the data. To the extent that they reflect the owner's unwillingness to re-enter the business arena, or other personal circumstances, it would be incorrect to view this as a failure of the bankruptcy system. Headd (2003) discusses the many reasons why firm closures may occur. While the data cover years prior to 2005, one could question whether the analysis would yield different conclusions following the bankruptcy reform of 2005. In 2005, Congress passed the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) with the primary intention of making it harder for individuals to file a Chapter 7 bankruptcy. The reform introduced a means-test for Chapter 7 essentially preventing relatively above average income individuals to wipe off their debt by filing under this Chapter. Instead, such individuals would be able to file under Chapter 13 which allows

debt discharge only after the individual has made some repayments. It can plausibly be argued that the passage of BAPCPA would have a marginal impact on the conclusions. While it influences the choice of Chapter for a failing business by pushing relatively more individuals towards Chapter 13, it might have little influence on the outcome. Businesses that are forced to reorganize and repay a portion of their debt are as likely to face problems of credit access and firm survival as businesses that file under Chapter 7. As noted in the previous paragraph, the bankruptcy filing may simply be the culmination of a long period of delinquent payments, and creditors are likely to already factor this in when deciding on extending or making loans. Further there is little empirical evidence to suggest that businesses that reorganize are more or less likely to survive over the longer run than businesses that shut down and restart. Finally, analysis of the 2005 law by Lawless (2007) and Carlson and Hayes (2005) suggests that the law imposed harsher conditions on small businesses seeking relief in bankruptcy courts. For one, the law imposed significantly increased disclosure and reporting requirements on these businesses. Further, the law expanded the grounds for dismissal or conversion of a chapter 11 case. Lawless (2007) argues that these changes could potentially increase the costs for small businesses filing bankruptcy, which in turn would cause them to delay filing bankruptcy and to arrive at the bankruptcy courts in worse financial shape than before the 2005 law. Therefore, while this is clearly a promising area for future study, I suspect that the broad conclusions of this paper would be largely unchanged.

The next section provides an overview of the US personal bankruptcy system and how it applies to small businesses. Section 3 motivates the analysis using a Stiglitz and Weiss (1981) credit rationing model with observationally distinguishable borrowers. Section 4 presents the data and Section 5 discusses results from the empirical estimation. Section 6 concludes.

## 2. Bankruptcy law for small businesses

Under Title 11 of the modern bankruptcy code, businesses can file for bankruptcy under Chapters 7, 11 and 13.<sup>3</sup> Chapter 7 bankruptcy is a liquidation procedure most frequently used by individual debtors and small businesses.<sup>4</sup> To qualify for relief under Chapter 7, a debtor may be an individual, a partnership, a corporation or any other business entity. The advantage is that debtors can protect their “exempt” assets from being used to repay debts. These exemptions relate to different types of assets, but the most important is the so-called “homestead exemption” for equity in an owner-occupied home. Bankruptcy exemption levels are set by the states (since the Federal Bankruptcy Code of 1978) and vary widely across states and over time. In seven states, the homestead exemptions are unlimited.<sup>5</sup> In other states, such as Maryland and Delaware, they are zero. All other states lie somewhere in between. There are also personal property exemptions for items like motor vehicles, jewelry, and so on.

Chapter 7 also allows a discharge of debts to give an honest individual debtor a “fresh start”.<sup>6</sup> The debtor has no future liability for discharged debts and this enables the debtor to start a business afresh without being saddled with pre-bankruptcy debts. However,

<sup>3</sup> Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, Pub. L. No. 109-8, 119 Stat. 23 (codified in scattered sections of 11 U.S.C.) (effective Oct. 2005).

<sup>4</sup> About 70% of all filings occur under Chapter 7 (American Bankruptcy Institute data). The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 made several changes to the law, such as a means-test for eligibility, credit counseling requirements and restrictions on the use of the homestead exemption. For specific details relating to these changes, see <http://www.uscourts.gov/FederalCourts/Bankruptcy/BankruptcyBasics/Chapter7.aspx>.

<sup>5</sup> These states are Arkansas, Florida, Iowa, Kansas, Minnesota, Oklahoma and Texas.

<sup>6</sup> Partnerships and corporations do not receive a discharge. The 2005 law made it tougher for debtors to file under this Chapter.

the discharge of debts is only available to individuals, and not partnerships or corporations. That could be a possible reason for why the majority of businesses in the sample are organized as sole proprietorships. Chapter 7 provides relief through liquidation of the business. However, for certain debtors who prefer to remain in business and avoid liquidation, another option is to file for business bankruptcy under Chapter 11. Chapter 11 is typically used to reorganize a business which may be a sole proprietorship, a partnership or a corporation. The debtor has to come up with a repayment plan that must be approved by the creditors. The repayment plan allows for some adjustment of debt, either a reduction in debts or a longer time period for repayment of debt. However, the amount of debt discharged approaches that under Chapter 7.

Chapter 13 is a personal bankruptcy chapter that allows individuals, including sole proprietors and unincorporated businesses, to apply for relief as long as their unsecured debts are less than \$360,475 and their secured debts are less than \$1,081,400. This chapter also requires the debtor to come up with a repayment plan. As a general rule, the discharge releases the debtor from all debts provided for by the plan. Also, the discharge is somewhat broader than in a Chapter 7 case.

Given the protections that the bankruptcy system affords to entrepreneurs, it is not surprising that it has implications for entrepreneurial activity. For example, Fan and White (2003) and Mathur (2009) exploit the variation in the homestead exemptions (the largest type of exemption) across states and find that the predicted probabilities of starting and owning a business are higher in states with more generous exemptions. Further, Mathur (2009) also suggests that entrepreneurs are more likely to start businesses in states whose neighbors have less generous exemptions. Using cross-country data, Armour and Cumming (2008) show that more “forgiving” bankruptcy laws are associated with higher levels of entrepreneurship, as measured by self-employment rates. Therefore, the bankruptcy system is a significant predictor of entrepreneurial activity. At the same time, however, bankruptcy systems that are too pro-debtor impose costs on borrowers. Credit markets react adversely to these generous provisions by raising the cost of credit or reducing the availability of credit. For example, Gropp et al. (1997) and Berkowitz and White (2004) show that the existence of generous homestead and personal property exemptions across states could have a negative impact on low-income households and small businesses by reducing the availability and amount of credit, and raising interest rates. Lin and White (2001) similarly show that applicants for mortgages are 2 percentage points more likely to be turned down for mortgages and 5 percentage points more likely to be turned down for home improvement loans if they live in states with unlimited rather than low homestead exemptions. A paper by Blanchflower et al. (2003) finds that interest rates charged and the probability of loan denial are generally higher for business owners with poor credit records, which includes firms (and owners) with any bankruptcy filing, delinquency, or judgment against the owner or firm, as well as firms with adverse profits and sales performance. However, the paper makes no attempt to specifically identify the effects of bankruptcy on credit access. In fact, these results are incidental to their main analysis which focuses on racial discrimination in the small business credit market. There is little exploration of other firm-level characteristics for such businesses, such as the impact on wages, employment and their ability to raise capital from external sources.

Hence the literature clearly suggests costs and benefits of bankruptcy regulations on entrepreneurship.

## 3. Theory

The motivation for the empirical analysis derives from the credit rationing model discussed in Stiglitz and Weiss (S-W, 1981). The

basic insight of the paper is that equilibrium in credit markets may not necessarily imply supply equaling demand. Credit rationing may arise even in equilibrium if the price (in this case, the interest rate) affects the nature of the transaction. For example, if the interest rate is set high, then adverse selection would lead to only the most risky borrowers obtaining loans at the elevated rate. The risky borrowers are those who are willing to borrow at high interest rates because they perceive their probability of repaying the loan to be low. This affects the return to the lender. Second, raising the interest rate decreases the return on projects which succeed. Therefore higher interest rates induce firms to undertake projects with lower probabilities of success but higher payoffs when successful. Since the bank cannot directly control the actions of the borrower, the objective function facing the bank is to design the loan contract in such a manner that it attracts low-risk borrowers and successful investments. The expected returns to the bank (shown as  $\rho$  in the figure below) therefore resemble a typical concave profit function where expected returns increase but at a decreasing rate as interest rates increase. The bank-optimal interest rate is defined as that rate which maximizes the expected returns from lending. In the figure below, that bank-optimal rate is defined at  $r^*$  where the bank attains a maximum return per dollar loaned of  $\rho^*$ .

Both the demand for loans and the supply of loans are functions of the interest rate, with the supply being determined by the expected return at  $r^*$ . Clearly, at the optimal interest rate it is conceivable that the demand for funds exceeds the supply of funds. This is shown in Fig. 2. The upper right quadrant shows the loan demand curve as well as the loan supply curve. The loan demand curve,  $L_d$ , depends upon the interest rate charged by banks and is a decreasing function of the interest rate,  $r$ . Loan supply, shown in the lower right hand quadrant, depends in turn on the expected return to the bank per dollar loaned,  $\rho$ . This relationship is similar to the curve in Fig. 1. The lower left quadrant shows the relationship between the return,  $\rho$ , and the supply of loanable funds, which is generally positive. The upper right quadrant also plots out the loan supply curve as a function of the interest rate, given that the interest rate determines the return on each loan and in turn determines the interest rate on deposits that banks can offer to attract loanable funds.

Fig. 2 depicts a credit rationing equilibrium, since at the bank-optimal interest rate,  $r^*$ , the demand for loans exceeds the supply of loans. The extent of credit rationing is depicted by  $z$ , the gap between  $L_s$  and  $L_d$  at  $r^*$ . Traditional analysis would argue that at  $r^*$ , since the demand for loans exceeds the supply, borrowers would bid up the price of loans or the interest rate until demand equals supply. However, in this case even if borrowers want to bid up the interest rate to  $r_m$ , the bank would be unwilling to make these loans since in the bank's judgment such a loan is likely to be a worse risk, yielding a lower return on the dollar, than the average loan at interest rate  $r^*$ . At  $r^*$ , the bank earns higher profits than at  $r_m$ , since at the lower interest rate  $r^*$ , it can attract at least all the borrowers it could attract at  $r_m$ , while also earning a higher return per dollar loaned of  $\rho^*$ . This causes the bank to deny loans even though there is excess demand at interest rate  $r^*$ . Consequently, credit is naturally rationed in the model.

An extension of this model also discussed in Stiglitz and Weiss (1981), which is relevant for this analysis, applies to observationally distinguishable borrowers. In practice, banks can distinguish between classes of borrowers on the basis of some observable characteristics, such as their credit scores, whether they are new borrowers or borrowers with a proven performance record and long-term relationships with the bank. Bank lending is affected because the repayment probabilities on loans differ and the bank can separate out borrowers into high or low risk borrowers. This also allows banks to set class specific interest rates that take into ac-

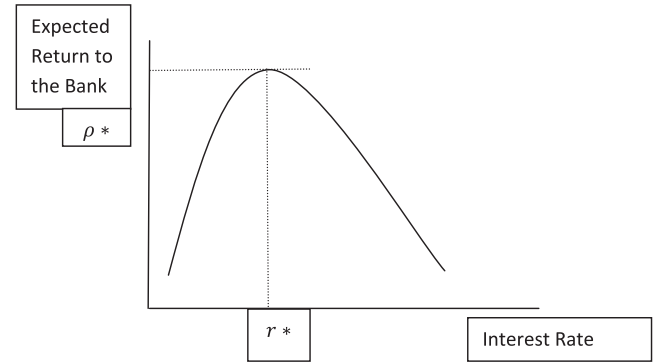


Fig. 1. Expected return on loans.

count the inherent risk of lending to the different classes of borrowers.<sup>7</sup>

For sake of simplicity, we present the S–W model with two classes of borrowers,  $i$  and  $j$ . The bank is able to identify which risk class any particular borrower belongs to ( $i$  or  $j$ ), but not the actual riskiness of the project. The two borrower classes have different expected return schedules ( $\rho_i$  and  $\rho_j$ ) due to different risk characteristics, and therefore different bank-optimal interest rates denoted respectively by  $r_i^*$  and  $r_j^*$  (Fig. 3). Suppose that  $\max \rho(r_i) > \max \rho(r_j)$ , so that the maximum return  $\rho$  possible from lending to group  $i$  exceeds the maximum return possible from lending to group  $j$ . Finally, suppose that banks have a cost of loanable funds equal to  $\rho^*$  and there is competition amongst banks for depositors and borrowers.

This situation is shown in Fig. 3. Since banks compete with each other for borrowers, there are two propositions that follow. *Proposition 1*: Type  $j$  borrowers will only receive loans if credit is not rationed to type  $i$  borrowers. *Proposition 2*: The expected return from lending to the two groups,  $i$  and  $j$ , will equal the cost of loanable funds,  $\rho^*$ .

Both these propositions follow directly from the assumptions stated above. First, banks will only lend to borrowers for whom the expected return  $\rho$  is higher than  $\rho^*$ . Second, for a given supply of loanable funds, the bank will always prefer to lend to type  $i$  borrowers first, since the maximum return on the loan to  $i$  is more than to  $j$ . Therefore, in order to maximize profits, banks would always be willing to substitute a loan to  $i$  for a loan to  $j$ . This proves Proposition 1 that type  $j$  borrowers will only receive loans if type  $i$  are not credit rationed.

Proposition 2 follows from an analysis of equilibrium interest rates for the two types of borrowers in this market. In Fig. 3, the bank-optimal interest rate for type  $i$  borrowers is  $r_i^*$ . However, since banks have to compete for type  $i$  borrowers with other banks, they would be willing to lower the interest rate offered to these borrowers all the way down to  $\tilde{r}_i$ , the minimum rate required to meet the cost of obtaining loans,  $\rho^*$ . At this equilibrium interest rate,  $\tilde{r}_i$ , all type  $i$  borrowers wishing to obtain loans would be able to obtain loans. Once their loan demands have been met, then some type  $j$  borrowers, though not necessarily all, will receive loans. However, their loans will be at a higher interest rate of  $r_j^*$ .<sup>8</sup>

<sup>7</sup> Kane and Malkiel (1965) show that relationships between borrowers and lenders can help overcome rationing. Peterson and Rajan (1994) find that such relationships increase the availability of credit to small firms. Berger and Udell (1995) find that small firms with longer banking relationships borrow at lower rates.

<sup>8</sup> Note that it is possible that if the supply of funds is large enough, then type  $j$  borrowers may not be rationed at all, though they will still get loans at a higher interest rate. However, this does not violate the basic proposition which is that type  $j$  will only get loans if type  $i$  are not credit rationed.

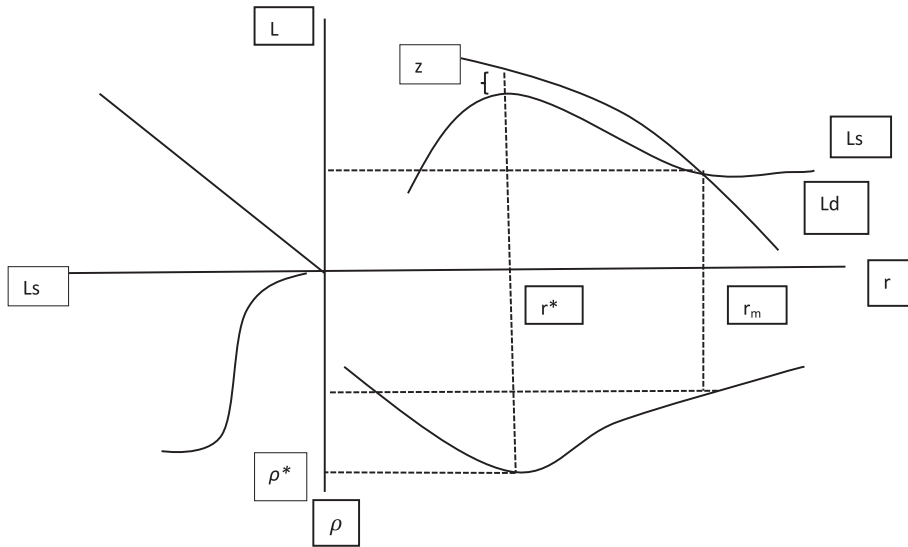


Fig. 2. Credit rationing equilibrium in the S-W model.

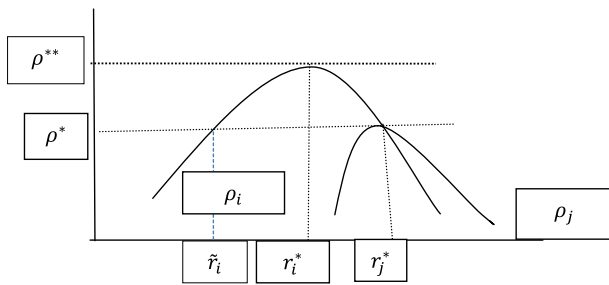


Fig. 3. Observationally distinguishable borrowers.

across the two groups and will, in turn, equal the cost of loanable funds,  $\rho^*$ . This is illustrated in the example below.

It is also possible to show, in this simple model, that some groups may not receive loans at all at any interest rate if the maximum return possible from lending to them is lower than the cost of loanable funds. In Fig. 3, suppose that the cost of loanable funds increases to  $\rho^{**}$ . In this case, no type  $j$  borrower will obtain a loan since the maximum possible return on the loan,  $\rho^*$ , is lower than the cost of the loan to the bank. Some, but not necessarily all, type  $i$  borrowers will be able to obtain a loan at  $r_i^*$ . This situation is termed “redlining” since an entire class of borrowers is completely left out of the credit market.

In the context of this paper, we can imagine type  $j$  borrowers as all businesses with a bankruptcy on record and type  $i$  borrowers as all businesses without a bankruptcy. For example, in the 2003 Survey of Small Business Finances, nearly 3% of businesses reported a bankruptcy on record (Table 1). Since a bank is able to clearly distinguish between borrowers with and without a bankruptcy on

The loan demand and supply curve associated with this scenario is shown in the Appendix (Fig. 4).

Hence it follows that in equilibrium, for all  $ij$  receiving loans,  $\rho_i(\tilde{r}_i) = \rho_j(r_j^*) = \rho^*$ . In other words, at the equilibrium interest rates for the two groups, the expected return will be equalized

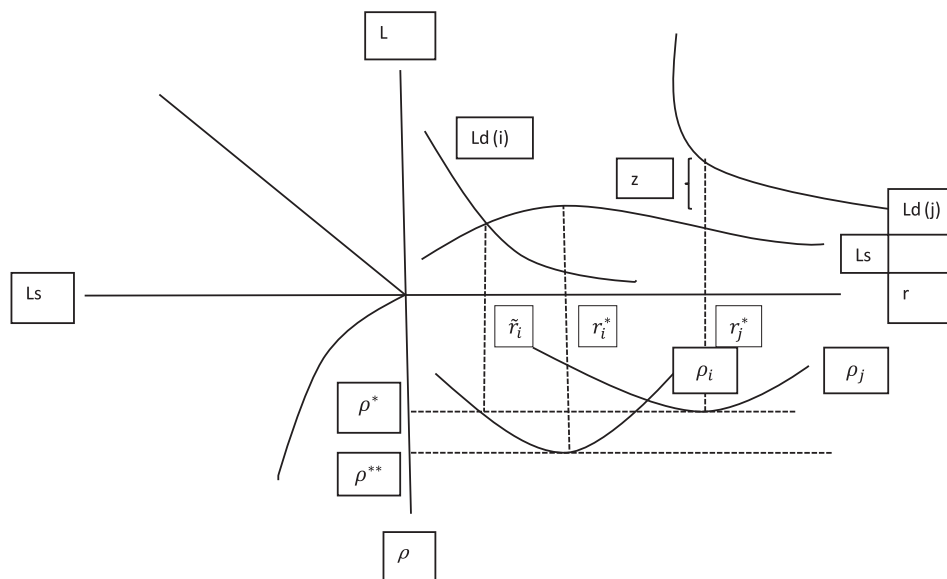


Fig. 4. S-W equilibrium in a market with observably distinguishable borrowers.

**Table 1**  
Descriptive statistics.

Variable	Mean (SD)	Obs.	Mean (SD)	Obs.	Mean (SD)	Obs.
	1993		1998		2003	
Financing problem	0.137(0.344)	4637	0.067(0.251)	3561	0.059(0.236)	4240
Labor cost problem	0.217(0.412)	4637	0.038(0.193)	3561	0.013(0.115)	4240
Tax problem	0.102(0.303)	4637	0.068(0.252)	3561	0.053(0.225)	4240
Profits problem	0.096(0.295)	4388	0.074(0.262)	3561	0.206(0.404)	4072
Owner bankruptcy	0.026(0.161)	4637	0.018(0.135)	3561	0.024(0.153)	4240
Firm bankruptcy	...	0	0.002(0.045)	3561	0.009(0.095)	4240
Owner delinquent	0.134(0.341)	4637	0.123(0.329)	3561	0.121(0.326)	4240
Firm delinquent	0.190(0.392)	4637	0.134(0.341)	3561	0.156(0.363)	4240
Interest rate on loan (%)	8.767(2.460)	1695	9.439(2.304)	784	6.502(3.138)	1761
Loan denied	0.155(0.362)	2007	0.172(0.378)	962	0.071(0.258)	1897
Loan amount granted	326590.7(2101104)	1695	181162.7(766639.8)	796	326433.9(1686740)	1761
Black	0.029(0.168)	4637	0.041(0.199)	3561	0.038(0.192)	4240
Hispanic	0.042(0.202)	4637	0.055(0.229)	3561	0.043(0.203)	4240
Asian	0.035(0.185)	4637	0.042(0.201)	3561	0.043(0.204)	4240
Sole proprietorship	0.322(0.467)	4637	0.411(0.492)	3561	0.302(0.459)	4240
Partnership	0.073(0.259)	4637	0.057(0.232)	3561	0.051(0.219)	4240
S-Corp	0.237(0.425)	4637	0.233(0.423)	3561	0.365(0.481)	4240
C-Corp	0.368(0.482)	4637	0.255(0.436)	3561	0.223(0.416)	4240
Venture cap equity	0.003(0.051)	4637	0	3561	0.001(0.031)	4240
Owner equity	0.201(0.400)	4637	0.064(0.245)	3561	0.024(0.152)	4240
Angel investments	0.007(0.084)	4637	0.001(0.037)	3561	0.032(0.175)	4240
Commercial banks	0.967(0.177)	4637	0.957(0.202)	3561	0.929(0.256)	4240
Finance comp.	0.006(0.074)	4637	0.009(0.097)	3561	0.029(0.169)	4240
Government	0	4637	0.0003(0.016)	3561	0.001(0.026)	4240
Family firms	0.001(0.029)	4637	0.001(0.029)	3561	0.005(0.068)	4240
Age	49.405(11.450)	4637	50.111(11.198)	3561	51.620(11.412)	4156
College educated	0.466(0.498)	4637	0.484(0.499)	3561	0.501(0.500)	4240
Male	0.739(0.439)	4637	0.720(0.449)	3561	0.261(0.439)	4240
Experience	18.883(11.067)	4637	18.175(11.462)	3561	19.721(11.685)	4156
Firm age	14.283(12.131)	4637	13.341(11.084)	3561	14.350(11.132)	4240
Employment	8.494(22.899)	4637	8.574(23.225)	3561	8.578(21.217)	4240
Profit/asset	0.676(5.571)	4633	15.681(443.860)	3492	2.233(65.772)	4164
Debt/asset	0.628(0.966)	4633	2.607(28.855)	3492	1.473(12.489)	4167
Home equity	...	0	147241.7(267055)	3156	255866.5(758383.9)	0
Manufacturing	0.080(0.272)	4637	0.083(0.276)	3561	0.072(0.257)	4240
Finance	0.070(0.256)	4637	0.064(0.246)	3561	0.072(0.258)	4240
Services	0.377(0.484)	4637	0.432(0.495)	3561	0.457(0.498)	4240
Urban	0.788(0.408)	4637	0.798(0.400)	3561	0.175(0.380)	4240
Credit score	...	0	0.315(0.464)	3561	0.283(0.450)	4240
Length of relationship with lending bank (months)	...	0	...	0	96.32(112.53)	1761

their records, it is possible to apply this model to the small business credit market. The implication from the model is that lending to this group of poor creditworthy borrowers (type  $j$  in this model) may be unprofitable for banks due to the much lower probability of repayment. Credit markets then price in the risk of lending to these businesses by rationing some of these borrowers and charging the remaining higher interest rates.

This theoretical model fits neatly in with the empirical results from my analysis. In my data, creditors are able to distinguish the high risk borrowers (type  $j$ ) from the low risk borrowers (type  $i$ ) on the basis of whether there is a bankruptcy on their credit record. For borrowers with a bankruptcy on record, the results suggest that there are financing constraints very similar to those suggested in the Stiglitz–Weiss model. For example, as Table 2 shows, loan denial rates (or in terms of the model, credit rationing) are much higher for businesses with a bankruptcy on record. Further, interest rates charged are much higher than for businesses without a bankruptcy on record.

In the empirical regressions reported later in the text, these effects are shown to persist even after controlling for other explanatory variables. A bankruptcy on a firm's credit record negatively affects the firm's ability to obtain loans, especially at reasonable interest rates. In general, these firms have a nearly 24 percentage point higher likelihood of being denied a loan and are charged interest rates that are more than 1 percentage point higher than those charged to other businesses. A bankruptcy affects all types of financing, even trade credit, which is a significant form of lend-

ing between businesses. In fact, it appears that firms with a bankruptcy record are rationed out of the market, with all types of loans being denied at significantly higher rates than other firms. This fits in with the predictions of the Stiglitz and Weiss (1981) credit rationing model. When banks and other creditors can distinguish between borrowers on the basis of their repayment probability, non-creditworthy borrowers are likely to be rationed out.

#### 4. Data

The analysis makes use of data from the National Survey of Small Business Finances (NSSBF). The Survey collects information on small businesses (those with fewer than 500 employees) for the United States. This paper uses data from the years 1993, 1998 and 2003. While the analysis uses 3 years of data spanning a period of 10 years, there have been no substantial changes in the bankruptcy code over this period. The basic features of the bankruptcy code have remained fairly stable over the period studied though certain details, such as the level of assets that qualify for exemption, may have changed. Further, it is not possible to distinguish a Chapter 7 bankruptcy from a Chapter 11 or a Chapter 13 bankruptcy in the data.<sup>9</sup> However, since the purpose of the analysis is to study how the bankruptcy code serves debtors in general, rather

<sup>9</sup> To some extent, it is likely that all owner bankruptcies are either Chapter 7 or Chapter 13, while all business bankruptcies are Chapter 11. However, some business bankruptcies could be Chapter 7 or Chapter 13 as well.

**Table 2**  
Descriptive statistics, by bankruptcy status.

	Cumulative bankruptcy = 0 Mean	Cumulative bankruptcy = 1 Mean	t-Test of mean difference (absolute values)
<i>Problems Facing Firms</i>			
Financing problem	0.082	0.213	5.69
Labor cost	0.083	0.057	1.45
Taxes	0.058	0.056	0.08
Profits	0.126	0.163	1.43
Health insurance	0.109	0.125	0.69
Government regulations	0.047	0.015	2.67
<i>Problems obtaining credit</i>			
Interest rate on loan (%)	7.899	9.070	2.74
Loan amount granted (\$)	291,927	399,594	0.45
Loan denied	0.147	0.489	5.89
Interest rate on credit card	12.593	12.786	0.26
Own a credit card?	0.447	0.406	1.12
Denied trade credit?	0.051	0.134	4.38
<i>Firm survival</i>			
Profit/asset	6.171	0.294	0.40
Debt/asset	1.572	1.630	0.06
Employment	8.597	6.786	1.41
Firm age	14.074	11.439	4.03
Firm size < 20	0.908	0.941	2.74
20–49	0.053	0.039	1.32
50–99	0.017	0.008	2.81
<i>Demographics</i>			
Male	0.551	0.578	0.73
Age	50.500	49.295	1.84
Asian	0.041	0.022	1.88
Black	0.035	0.098	4.45
Hispanic	0.046	0.068	1.46
Attended college	0.487	0.420	1.78
<i>Type of business</i>			
Sole proprietorship	0.448	0.522	1.99
Partnership	0.064	0.083	0.98
C-Corp	0.208	0.171	1.27
S-Corp	0.239	0.191	1.51
<i>Regional variation</i>			
New England	0.087	0.091	0.17
Middle Atlantic	0.109	0.104	0.24
East North Central	0.148	0.093	1.94
West North Central	0.067	0.046	1.42
South Atlantic	0.147	0.143	0.13
East South Central	0.092	0.093	0.05
West South Central	0.117	0.139	0.97
Mountain	0.075	0.089	0.82
Pacific	0.156	0.201	1.70

than whether certain bankruptcy Chapters work better than others, this is not a complication for the analysis.

One disadvantage of the data is that the exact year in which the bankruptcy filing happened is not known. It is likely that the consequences of a bankruptcy filing are worse in the period immediately following the filing and are likely to get mitigated over time. This is particularly true of measures like profitability and employment, which are likely to be significantly adversely affected at the time of filing. However, other indicators such as financing problems are likely to show up in the long-term as well, particularly since the filing stays on the owner and the firm's credit record for at least a 7 year period. In general, the estimates should be taken as being conservative since there are likely to be at least a few bankruptcies that occurred even 5–7 years prior to the year sampled, and thus may be capturing (on average) the long-term impacts which are likely to be weaker than the short-term impacts.

The 1993 survey was conducted for the Federal Reserve Board and the US Small Business Administration to collect information

on the availability of credit to small and minority owned businesses. The data contain 4637 firms with less than 500 employees. These represent (appropriately weighted) about 4.99 million small businesses.<sup>10</sup> Of these, 2.6% involved firms where the owner had filed a bankruptcy at some point in the previous 7 years (Table 1). This survey did not collect information on firm bankruptcies. In terms of the credit market, the average interest rate on loans was 8.77% and the loan denial rate was 15.5%.

The 1998 survey contains 3561 firms that were in operation in December 1998, representing 5.3 million businesses. Like the 1993 survey, this survey oversampled minorities. Starting in 1998, the NSSBF incorporated additional questions relevant to determine the creditworthiness of the firm (and in the case of unincorporated enterprises, the owner). There were questions on whether the firm/owner had ever filed for bankruptcy or been delinquent, the Dunn and Bradstreet credit score of the firm as well as questions relating to the owner's housing and non-housing wealth.<sup>11</sup> Approximately 1.8% of owners and another 0.2% of firms reported a bankruptcy filing. In terms of credit market conditions, the average interest rate on loans was 0.67% percentage point higher than 1993 and loan denial rates were 1.7 percentage points higher than 1993. Hence it appears that there was a tightening in credit markets in this period.

The 2003 survey, which sampled 4240 firms (representing 6.3 million small businesses nationwide), improved further by asking questions relating to the relationship between the firm and the lending institution. The 2003 survey therefore has exhaustive information on the credit, wealth and demographic characteristics of both the firm and the owner. On average, about 2.4% of the owners and 0.9% of firms reported a bankruptcy on record. The data also suggest an easing of credit market conditions in 2003 relative to the earlier periods. The average interest rate on loans dropped by nearly 3 percentage points relative to 1998 and the loan denial rates dropped by 10 percentage points relative to 1998. This is interesting since it reflects the generally easy credit market conditions of that period which have been blamed for the subsequent financial crisis. This suggests that small businesses also benefited from these policies by paying lower interest rates and getting a higher fraction of loans approved.

Table 1 provides weighted sample means for all the data, by year. In terms of problems facing small businesses, 10.5% reported financing as a major problem in 1993, but only about 6% reported it as a problem in 2003. Labor cost issues became less important in 2003 than in 1993. However, more firms reported profitability as a problem in 2003. An equal percent reported taxes and government regulations as a major issue across all 3 years.

The estimates indicate that on average, 1.8–2.6% of the owners reported a bankruptcy filing while about 0.2–0.9% reported a prior firm bankruptcy. From these, it is possible to construct a dummy variable titled *cumulative bankruptcy* which equals 1 when either the firm or the owner has reported a bankruptcy. Another variable that is included in my estimation is whether the owner or the firm reported a recent delinquency i.e. a delinquency in the 3 year period preceding the survey. The specific question that is asked in the survey is "In the previous 3 years, has the owner (or the firm) been 60 or more days delinquent on personal (or business obligations)?" The data show a fairly large number of delinquencies in each year. In 1993, about 13.4% of owners and 19% of firms reported a delinquency. For 1998, the corresponding numbers were

<sup>10</sup> The weights are obtained from the NSSBF data itself. They account for sample design, eligibility and nonresponse, and are constructed so that they make the NSSBF sample representative of the target population of small businesses.

<sup>11</sup> The typical questions asked were (1) Within the past seven years, has the firm or the owner declared bankruptcy? (2) Within the past three years, on how many different personal obligations has the owner(the firm) been 60 or more days delinquent?

12.3% and 13.4%, and for 2003, 12.1% and 15.6%. The number of delinquencies declined somewhat between 1993 and 1998, and this could be a further consequence of the lower interest rates at which credit was available in the early part of this decade.

An interesting issue that arises when studying the delinquency variable is whether this variable is in fact capturing firms that are able to avoid filing for bankruptcy through negotiations with their creditors. Generally, firms that are delinquent on their loan obligations for more than a 60-day period have a high probability of default.<sup>12</sup> Yet the reported number of bankruptcies is significantly lower than the reported number of delinquencies. Therefore, it is possible that some of these firms negotiated loan arrangements with their creditors that enabled them to avoid bankruptcy. For example, in 2009 and 2010 commercial loan workouts have become fairly common for homeowners faced with foreclosures. These are special arrangements between banks and homeowners that change the payment arrangements on mortgages by either lowering the rate, or extending the period of repayment or even lowering the principal balance.<sup>13</sup> Banks may allow these arrangements rather than deal with an outright default. In the case of small business loans, creditors may prefer to renegotiate the terms of repayment directly rather than have the firm file for bankruptcy. As is clear from the earlier discussion, creditors, particularly unsecured creditors, have little control over the firm once the firm files for bankruptcy. This may make them more willing to renegotiate a loan if they believe that a bankruptcy would not yield a favorable outcome. Therefore it is of equal interest to us to study the consequences of a delinquency on firm activities. As pointed out earlier, a bankruptcy may simply reflect the final stage of extended periods of non-payment. These delinquencies are likely to spoil a firm's credit record even before the filing actually happens. Therefore the credit market effects of bankruptcies and delinquencies should be fairly similar.

The coefficients on the delinquency variable are interesting since the delinquency happened in a relatively recent period (i.e. a 3 year period preceding the sample year), and it represents the short-term consequences of a worsening of a firm's credit records. The bankruptcy variable, on the other hand, may more closely reflect the long-term record since it is likely to have at least some firms that filed for bankruptcy even 7 years prior to the sampled year. Therefore, the short-term consequences of a bankruptcy are likely to be better captured by the delinquency variable. Of course, this is speculation and not founded on any empirical arguments. These results are presented in the next section.

In terms of the composition of firms, the average employment size of the firm across all 3 years was about 8 (which typically includes the owner), and the average age of the firm was about 14 years. Nearly 3–4% of firms are Black-owned, a similar percent are Asian-owned and a marginally higher number are Hispanic-owned businesses.

The most common form of business organization is a sole proprietorship with more than 30% of businesses organized as such. Finally, more than 95% of businesses reported taking a loan from a commercial bank, and a significantly lower number from finance companies, family firms and government organizations.

Distinguishing between firms with and without a bankruptcy on record yields interesting insights into the loan market for small businesses. Table 2 shows that bankrupt firms and owners are nearly 3 times as likely to report financing problems, and marginally more likely to report health insurance cost problems and profitability issues. This is interesting since they are just as likely or

even less likely to report other types of issues, such as labor costs, taxes and government regulations.

In terms of credit access, businesses with a bankruptcy were significantly worse off when compared to businesses without a bankruptcy. The interest rate on approved loans was over 1 percentage point higher and the loan denial rate was over 34 percentage points higher than for other businesses. This fits in with the *Stiglitz and Weiss (1981)* credit rationing theory model that these businesses probably operate along a different repayment or expected return schedule which incorporates the much higher risk associated with lending to this group. Therefore credit rationing causes higher interest rates and higher loan denial rates. About 13.4% of these businesses reported problems obtaining trade credit as opposed to 5% for other businesses. Their profit to asset ratios were also considerably lower and their debt to asset ratios were marginally higher than for businesses with good credit records.<sup>14</sup> The one outlier in this table is that firms with a bankruptcy on record reported a higher value of loan amounts granted. This is most likely a function of the limited number of observations for this variable for businesses with a bankruptcy on record.

To test whether these differences were statistically significant, each of these variables was regressed on the dummy for whether the firm or the owner had a bankruptcy on record.<sup>15</sup> The third column in Table 2 reports the *t*-statistic of the coefficient on the bankruptcy variable. As we can see, the *t*-statistic for a lot of variables relating to credit access such as financing problems, interest rate on loans, probability of loan denial, trade credit denial is statistically significant. Within demographic and firm type variables, significant differences existed in age of owner, race or ethnicity of owner, whether the owner had attended college and whether the business was operated as a sole proprietorship.

Fig. 5 shows the kernel distribution of interest rates across firms with and without a bankruptcy on record. As is clear, on average, non-bankrupt businesses are charged lower interest rates, while the distribution for previously bankrupt businesses is mean-shifted to the right. The mean for the group is over 1 percentage point higher than for other businesses. As mentioned in the discussion of Table 2, these mean differences are statistically significant with a *t*-value of 2.74. Also, the distribution for these businesses lies above that for other businesses along the right tail, implying that bankrupt businesses are more concentrated along the high interest rate margin.

Fig. 6 shows these distributions for the sample of businesses with and without a prior delinquency. Again, the distribution for previously delinquent businesses is marginally to the right of the distribution for non-delinquents, though the difference in this case is less than a percentage point. This difference is not statistically significant. The *t*-test of the difference in means shows a *t*-value of 0.95.

In effect, the bankruptcy procedure provides failed entrepreneurs the ability to get back on their feet by reducing or eliminating their pre-bankruptcy debts. While the analysis uses 3 years of data spanning a period of 10 years, there have been no substantial changes in the bankruptcy code over this period. The basic features of the bankruptcy code have remained fairly stable over the period studied though certain details, such as the level of assets that qualify for exemption, may have changed. Further, it is not possible to distinguish a Chapter 7 bankruptcy from a Chapter 11 or a Chapter 13 bankruptcy in the data.<sup>16</sup> However, since the purpose of the

<sup>12</sup> Some studies suggest that for loans that are 60 or more days delinquent, the default rate is approximately 27%.

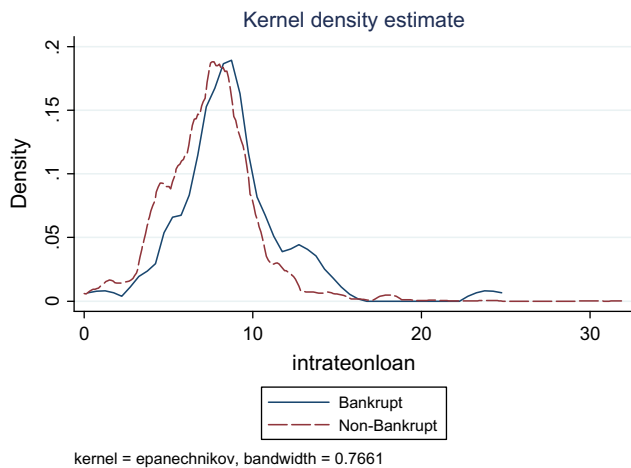
<sup>13</sup> <http://www.articlesbase.com/real-estate-articles/commercial-loan-workouts-can-help-delinquent-borrowers-2108140.html>.

<sup>14</sup> The profit to asset ratios found are not in line with typical small business profit to asset ratios reported in other papers. This is likely due to a reporting problem in the survey data.

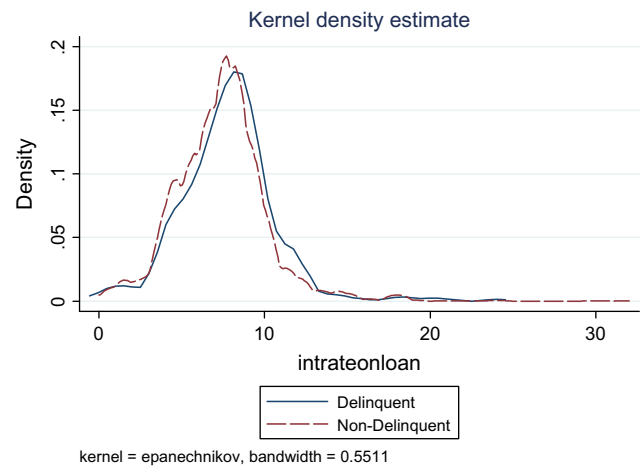
<sup>15</sup> The regressions included a constant and were weighted.

<sup>16</sup> To some extent, it is likely that all owner bankruptcies are either Chapter 7 or Chapter 13, while all business bankruptcies are Chapter 11. However, some business bankruptcies could be Chapter 7 or Chapter 13 as well.





**Fig. 5.** Distribution of interest rates across businesses with and without a bankruptcy on record.



**Fig. 6.** Distribution of interest rates across businesses with and without a prior delinquency.

analysis is to study how the bankruptcy code serves debtors in general, rather than whether certain bankruptcy Chapters work better than others, this is not a complication for my analysis.

## 5. Empirical results

The data is pooled across all 3 years, 1993, 1998 and 2003. All regressions are weighted using weights provided in the NSSBF data and include time and region dummies. Unfortunately, the NSSBF does not provide data on the state in which the firm is located, only the region. Therefore, it is not possible to control for state-level factors that might be important in these regressions. This concern is addressed by including region dummies to account for all the unobservables. Note that throughout this section, the cumulative bankruptcy variable equals 1 if *either* the owner or the firm reported a bankruptcy. The cumulative delinquency variable equals 1 if either the firm or the owner reported a delinquency.

Before the presentation of the results, it is helpful to reiterate that the estimates below are subject to the following assumptions: (A1) The estimates pool together the impact of different bankruptcy chapters into one. In other words, while in practice, the impact of a Chapter 7 bankruptcy may be very different than that of Chapter 11 or Chapter 13, the data are unable to separate out the effects across firms. (A2) The estimates pool together the impact of time since the bankruptcy filing across firms. In other words, while firms may respond differently to a bankruptcy filing in the period immediately following the filing as opposed to 5–6 years later, the data are unable to distinguish between firms on that basis. Given these assumptions, the primary hypothesis (H1) to be tested is whether firms with a bankruptcy on record are more likely to be subject to financing constraints, in terms of facing a higher interest rate on loans or being rationed out of the credit market altogether. A secondary hypothesis (H2) to be tested is whether the demographic characteristics of the firm are important to firm profitability and financing. These refer to characteristics such as the firm's age and ethnicity of the owners.

The first column of Table 3 reports the results of estimating a probit model of whether a firm reported financing problems as a function of the firm's and the owner's credit history, gender and race differences, firm age and profitability, and industry, region and time dummies.<sup>17</sup> The probit estimates are the derivatives or

the marginal effects (rather than the coefficients) that can be interpreted as the effect on the probability of reporting financial problems of an infinitesimal change in the independent continuous variable and a discrete change in the probability of dummy variables.<sup>18</sup> For instance, my results show that businesses with a bankruptcy record (either of the firm or the owner) are 8.7 percentage points more likely to report financial problems than all other businesses. Given the average probability of bankruptcy in the sample (of 2.2), this implies that such firms are nearly 4% more likely to report financial problems than other firms.<sup>19</sup> Note that if the bankruptcy variable is separated into personal or firm bankruptcy, the coefficients on the two variables are still significant and positive. Personal bankruptcy increases the probability of reporting financial problems by 5 percentage points, while a firm bankruptcy has an even larger impact of 13.2 percentage points. The cumulative bankruptcy variable that is constructed is approximately the average effect of the two variables.

Firms with a delinquency (either of the firm or the owner) are 7.3 percentage points more likely to report financial problems than those without a delinquency. My results suggest therefore that while the bankruptcy system enables firms to survive and continue to remain in business (either within the same firm or by starting a new business), the bankruptcy has long lasting impacts on credit access and financial conditions. This could be due to the fact that the bankruptcy appears on the firm's credit record for a long period (6 or 7 years) of time, even though debt discharge is usually automatic.

Focusing on some of the other variables, Black-owned businesses are nearly 11 percentage points more likely to report financing problems, and Hispanic-owned businesses are nearly 2 percentage points more likely to report financing problems. It is interesting that Asian owned businesses fare better than other minority owned businesses in that they are not any more likely than other businesses to report financing problems. In fact, the success of Asian owned businesses in the US is a well-documented fact. A recent article by Robb and Fairlie (2008) uses confidential and restricted-access data from the Characteristics of Business Owners survey. The paper finds that Asian-owned businesses

<sup>18</sup> Double clustering the standard errors across regions and time made no difference to the results shown in the tables.

<sup>19</sup> Note that this is the standard way of transforming the percentage point marginal effect into a percentage increase. In other words, you need to divide the marginal effect by the average probability of bankruptcy in the sample.

<sup>17</sup> It is worth pointing out here that reported or declared variables may be biased by the subjective beliefs of the owner and may not reflect actual circumstances accurately.

may even outperform white-owned businesses due to their much higher human capital investment and substantial start-up capital.

In terms of other firm variables, the age of the firm is a significant predictor of financing problems. The older the firm, the less likely it is to report financing issues. This may be endogenous since survival itself may be a function of the firm's ability to obtain financing. Further, as we may expect, firms with higher profit-to-asset ratios and lower debt-to-asset ratios are less likely to report financing issues.

The other regressions in this table apply the same model but use different reported problems as the dependent variables. Column (2) presents results from a probit regression for the probability that firms report profitability (or sales) problems. Surprisingly, firms with a bankruptcy record are not more likely to report profitability problems than other firms. This may be a long-term effect, since the results for the short-term are more likely to mimic those for recently delinquent firms and owners. As the table shows, these firms are more likely to report profitability issues.

In terms of other explanatory variables, demographic and other characteristics of the firm and the owner seem to matter more for profitability. Older owners and owners with at least a college education are more likely to report profitability issues. Further, all minority-owned businesses are significantly more likely to report profitability issues. Older firms and firms within manufacturing are also more likely to report profitability problems. Note that the question relating to profitability is somewhat loosely worded. For example, in 2003, it lists one possible problem facing firms currently as "Poor sales or profitability (would like to improve sales or increase profitability)". In 1993, the wording changes to "What do you think will be the most important issue facing the firm in the next 12 months?" One response is "Profits, Cash Flow, Expansion, Sales". Therefore, it is unclear whether firms are in fact incurring losses or whether they simply would like to be more profitable than they are now. This could explain why Asian owned businesses are more likely to report these as "issues" rather than Hispanic- or Black-owned businesses since they may be looking to expand faster than other businesses, and so view that as an important issue for the business. In fact, if this regression is run for only the years 1993 and 1998, both years in which the profits were clearly deemed to be a problem, the coefficients on college-educated and Asian-owned business become insignificant, while the coefficient on the bankruptcy variable remains insignificant. This suggests that business owners are interpreting this variable somewhat differently in 2003 than in the other years.

To probe the profitability question further a regression using the profit to asset ratio as the dependent variable was run. In this case, neither the bankruptcy variable nor the delinquency variable were significant, suggesting that there were no significant differences across bankrupt and non-bankrupt firms in these numbers.

Column (3) of Table 3 reports results for a similar model explaining the likelihood of reporting labor costs as a problem. In this case, previously bankrupt firms are 2 percentage points less likely to report costs of labor as an important problem facing businesses. Previously delinquent businesses as well as Black-owned businesses are significantly more likely to report these as issues. Finally, smaller firms (with fewer than 20 employees) and sole proprietorships are less likely to report these as issues. This is not surprising since, by definition, they have relatively few employees and are less likely to pay high wages and benefits. For example, a study by Popkin and Company (2005) shows that employees of small businesses have access to fewer benefits than employees of large businesses. In fact, the next column shows the likelihood of reporting health insurance costs as a problem, and firms with between 20 and 50 employees are more likely to report these as a problem, while the results for smaller firms (with less than 20 employees) are insignificant. Older firms and firms in manufactur-

ing are also more likely to report these as problems. On average, firms with a bankruptcy record are no more likely to report health insurance costs as a problem.

The cash flow probit regressions look similar to the profitability regressions mentioned earlier. A firm with a bankruptcy record is no more likely to report cash flow problems than firms without a bankruptcy. However, firms with a delinquency in the previous 3 year period are more likely to report cash flow problems. Again, it is likely that the bankruptcy variable is capturing a longer term impact while the delinquency variable is showing what the impact is likely to have been a couple of years after a bankruptcy filing. Therefore, the results for both variables are interesting and might give us a better idea of the actual economic impact of a filing. Within ethnic groups, Black-owned businesses are 2.5 percentage points more likely to report cash flow problems. S-corporations are also 5.8 percentage points more likely to report such problems while sole proprietorships are only 4 percentage points more likely to report such problems.<sup>20</sup>

In results not shown here, a dummy variable for whether the firm was listed as a c-corporation was interacted with the cumulative bankruptcy variable. This new variable was positive and significant in the financial problems regression, marginally significant (at 10%) and negative in the profitability regression but insignificant in the other regressions relating to problems facing businesses.

To see how bankruptcy affects other firm characteristics, linear regression models with employment and wages as the dependent variables are presented. Table 4 shows the output from these regressions. Column (1) of the table uses an OLS regression of total employment on all the explanatory variables. In this case, neither the cumulative bankruptcy nor the cumulative delinquency variable is significant. One possible explanation is that the data pools together firms that have just experienced a bankruptcy as well as firms that have been out of the bankruptcy for a long time. At best, we can conclude that it may be possible for firms to grow and become big even after a bankruptcy filing. However, Column (2) of this table shows that such firms are less likely to be well paying. On average, total wages per worker were lower by \$2619 for bankrupt firms than those without a bankruptcy. In terms of other characteristics affecting wages, Black-owned and Asian-owned businesses paid significantly lower wages per worker than other businesses. Surprisingly, the results for Hispanic-owned businesses were not significant. Smaller firms, with fewer than 20 employees, paid wages more than \$5000 lower than other firms. Sole proprietorships, firms with higher debt to asset ratios and firms within manufacturing were less well paying than other firms. Finally, firms located in urban areas paid higher wages than those in rural areas.

Table 5 gets to the crux of the results relating to access to credit issues for small firms with a bankruptcy record. The probit model in Column (1) regresses the probability of loan denial on firm and owner characteristics. The typical question in the survey asks whether the owner had been denied a loan on their most recent loan application. Results show that the cumulative bankruptcy variable is highly significant at 1% with a sizable coefficient. Having a bankruptcy on the record leads to nearly a 24 percentage point increase in the probability of loan denial.<sup>21</sup> This confirms my earlier

<sup>20</sup> An S corporation is a corporation that does not pay any federal income taxes. Instead, the corporation's income or losses are divided among and passed through to its shareholders. The shareholders must then report the income or loss on their own individual income tax returns. If the corporation is a C corporation, both the corporation's profits, and the shareholders' dividends, are taxed.

<sup>21</sup> In order to put this in terms of a percent increase, one needs to divide this increase by the average probability of bankruptcy in the sample of 2.2. This implies a nearly 11% increase in the probability of loan denial for previously bankrupt businesses or owners.

**Table 3**  
Effect of bankruptcies on firms: types of problems reported.

	Financial	Profit	Labor Cost	HealthIns	CashFlow
Cum.Bankruptcy	0.087*** (0.026)	0.011 (0.025)	-0.021* (0.009)	0.005 (0.016)	0.004 (0.017)
Cum.Delinquency	0.074*** (0.009)	0.031*** (0.010)	0.011** (0.006)	0.012** (0.005)	0.029*** (0.008)
Male	-0.005 (0.006)	0.001 (0.009)	-0.002 (0.005)	0.001 (0.005)	-0.002 (0.006)
Age	-0.0002 (0.0003)	0.001*** (0.0004)	-0.0004* (0.0002)	-0.001*** (0.0002)	0.0002 (0.0002)
College	-0.006 (0.006)	0.016** (0.008)	-0.017*** (0.004)	-0.019*** (0.005)	0.018*** (0.006)
Black	0.110*** (0.019)	0.057*** (0.021)	-0.006 (0.007)	0.002 (0.007)	0.025** (0.012)
Asian	0.021 (0.015)	0.051** (0.022)	0.015 (0.010)	0.005 (0.012)	-0.013 (0.011)
Hispanic	0.020* (0.012)	0.044** (0.020)	0.015 (0.009)	0.018* (0.010)	0.005 (0.012)
Firm Age	-0.002*** (0.0003)	-0.001*** (0.0004)	0.0001 (0.0002)	0.0004* (0.0002)	-0.001*** (0.0003)
Smallfirm20	0.001 (0.011)	0.002 (0.015)	-0.036*** (0.009)	0.004 (0.007)	0.003 (0.010)
Smallfirm50	-0.001 (0.013)	-0.022 (0.016)	0.005 (0.008)	0.026** (0.012)	-0.007 (0.011)
S-Corp	-0.003 (0.019)	-0.017 (0.021)	-0.012 (0.013)	-0.004 (0.022)	0.058** (0.026)
C-Corp	0.002 (0.019)	0.022 (0.024)	-0.012 (0.013)	-0.008 (0.021)	0.057** (0.027)
Partnership	0.009 (0.023)	0.002 (0.026)	-0.033*** (0.007)	-0.022 (0.017)	0.054* (0.033)
Sole Prop	-0.009 (0.019)	0.023 (0.022)	-0.036** (0.014)	-0.018 (0.022)	0.043** (0.020)
Profit/Asset	-0.0003** (0.0002)	-0.00001 (0.00002)	-0.000003 (0.00002)	-0.0006 (0.0001)	-0.0001 (0.0001)
Debt/Asset	0.0003* (0.0002)	-0.00009 (0.0002)	-0.0004 (0.0003)	-0.00005 (0.0002)	0.0002** (0.0001)
Urban	-0.001 (0.008)	-0.014 (0.010)	-0.009* (0.005)	-0.004 (0.006)	0.002 (0.007)
Manufacturing	0.002 (0.010)	0.035** (0.016)	0.001 (0.006)	0.015* (0.008)	0.027** (0.012)
Services	-0.030*** (0.006)	0.016* (0.008)	-0.015*** (0.004)	0.006 (0.005)	0.020*** (0.006)
Observations	12,205	12,205	12,205	12,205	12,205

Note: The dependent variable in (1) is the probability that the firm reported financing problems. In (2), the probability that the firm reported profit problems. In (3), the probability that the firm reported labor cost problems. In (4), the probability that the firm reported the provision of health insurance as a problem. In (5), the probability that the firm reported cash flow problems. Cumulative Bankruptcy is a dummy variable equal to 1 if either the firm or the owner had filed bankruptcy. Cumulative Delinquency is a dummy variable equal to 1 if the owner or the firm had been delinquent at some point in the recent period. The probit estimates are the marginal effects and not the coefficients. All specifications include region dummies and time dummies.

Robust standard errors in parentheses.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

results on financing being a major issue for previously bankrupt businesses. Firms that have been recently delinquent on their loan obligations are also nearly 16 percentage points more likely to be denied a loan.

Results for other variables are interesting as well. Owners with a college education and firms that have been in operation for longer are less likely to be denied loans. Within minority businesses, Black-owned and Hispanic-owned businesses are nearly 25 percentage points and 9 percentage points more likely, respectively, to be denied a loan.<sup>22</sup> In their paper, Blanchflower et al. (2003) report that being Black-owned raises the probability of loan denial from anywhere between 22 percentage points to 46 percentage points. Therefore, the estimate lies within their range of estimates.

<sup>22</sup> For example, according to the CBO, almost 20% of nonminority firms obtain debt capital from commercial banks, but only 12.6% of Blacks do. Further, another report by JACA Inc. points out that Blacks had a lower percentage of commercial bank provided debt in their firms' capital structure because while non-minorities had an 84% financial application success rate, Blacks were successful only 66% of the time.

Any difference is likely to be a function of the fact that their data are not pooled and they only use data from 1993 and 1998. The estimated marginal effects for Asians are only marginally significant at 10%. Further, firms with fewer than 20 employees and those with fewer than 50 employees are significantly more likely to report such problems relative to larger firms. Finally, as we may expect, more profitable firms are less likely and those with higher debt to asset ratios are more likely to report loan denial problems.

The next regression uses the interest rate on the most recent loan as the dependent variable. Since the interest rate on the loan is likely to incorporate the lender's risk assessment of the borrower, it would be interesting to see if the bankruptcy record has any effect on the interest rate charged. As expected, lenders incorporate the information about the bankruptcy and factor in the higher risk profile of this group of borrowers when making lending decisions. The interest rate charged is more than 1 percentage point higher for this group than for businesses without a bankruptcy record. Firms with a delinquency record however do not face similarly high interest rates. It is possible that these firms

**Table 4**  
Effect of bankruptcy on firm employment and wages.

	Employment	Wage/employment
Cum.Bankruptcy	0.079 (0.650)	-2619.003** (1069.739)
Cum.Delinquency	-0.017 (0.359)	-732.504 (644.463)
Male	0.842*** (0.278)	263.483 (739.893)
Age	-0.032* (0.019)	-26.684 (47.249)
College	1.923*** (0.284)	2326.463*** (794.153)
Black	-0.683 (0.449)	-2606.743*** (877.287)
Asian	-0.087 (0.583)	-2198.779** (994.881)
Hispanic	-0.223 (0.448)	-491.227 (958.821)
Firm Age	0.241*** (0.034)	152.936** (60.512)
SmallFrm20		-5321.411*** (1478.154)
SmallFrm50		519.322 (1491.492)
S-Corp	2.317*** (0.748)	1533.646 (2206.532)
C-Corp	3.915*** (0.815)	2931.262 (2245.210)
Partnership	-1.996* (1.021)	-3450.542 (2704.784)
Sole Prop	-6.887*** (0.693)	-6691.460*** (2136.222)
Profit/Asset	-0.001*** (0.0001)	3.288 (2.627)
Debt/Asset	-0.007 (0.004)	-66.694*** (17.134)
Urban	0.400 (0.315)	1627.198** (724.131)
Manufacturing	5.481*** (0.619)	-2564.684*** (864.045)
Services	-1.452*** (0.266)	-513.702 (852.037)
Constant	6.754*** (1.180)	17354.054*** (3027.447)
Observations	12,205	8713
R-squared	0.075	0.032

Note: All specifications include region and time dummies. Robust standard errors in parentheses.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

are simply rationed out of the credit market or the ones that do get loans are ones that have been able to repair their credit record following the delinquency.

Again, Black-owned and Hispanic-owned businesses are credit constrained to the extent that the interest rates charged are higher by more than 1 percentage point for these businesses. The results for Asian owned businesses are not significant. Therefore, it appears that in general Asian-owned businesses do not face as many credit access issues as Black-owned and Hispanic-owned businesses do. This result also matches that in Blanchflower et al. (2003).

Smaller firms, with fewer than 20 or fewer than 50 employees, obtain interest rates that are approximately 0.7 and 0.4 percentage points higher than the average. Further, unincorporated businesses, such as partnerships and sole proprietorships, are charged higher interest rates than the average business. This could also be a reflection of the more lenient bankruptcy rules of Chapter 7 under which these businesses are more likely to file. Finally, more profitable businesses are likely to be charged lower interest rates.

Column (3) in Table 5 regresses the loan amount granted on the bankruptcy and other explanatory variables. However, the results show no significant effects of bankruptcies or even delinquencies on the loan amounts for approved loans. Therefore, it appears that the rationing happens either through loan denials or through higher interest rates, but not through differences in loan amounts approved. Some other interesting observations from this table are that owners with a college education are more likely to get bigger loans, while smaller firms are less likely to get large loan amounts.

Column (4) in this table studies the issue of discouraged borrowers. One of the survey questions in the NSSBF data asks business owners whether in the last 3 years, there were periods when they needed credit but did not apply for a loan. A probit model of the probability that the respondent answered yes to this survey question was estimated. Results show that firms with a bankruptcy record are 34 percentage points more likely to answer yes. In other words, they are significantly more likely to report saying that they did not apply for a loan even though they needed the financing. The estimates are approximately similar for those with a prior delinquency.

Black-owned and Hispanic-owned businesses were again more likely to report a yes, with the estimates for Black-owned businesses over 25 percentage points higher than for other businesses. These estimates are in line with those obtained by Blanchflower et al. (2003). Firms with fewer than 20 employees were also less likely to apply for loans.

To summarize, the results from Table 5 show that credit access is a particularly significant concern for businesses with a bankruptcy record on their record. Not only are they more likely to be denied loans, they are more likely to be charged higher interest rates on loans granted. Further, the long-term consequence of this constraint is that these firms are less likely to even apply for loans—in effect, creating a class of discouraged borrowers.

Table 6 explores whether bankruptcy affects other types of credit as well. My results show that firms with a bankruptcy on their record are nearly 3.8 percentage points more likely to be denied trade credit. Firms which have been delinquent in the past are nearly 10 percentage points more likely to be denied trade credit. Results for other variables are similar to those obtained for the other credit access variables. On average, Black-owned and Hispanic-owned businesses are more likely to be denied trade credit. Older firms and firms with higher profitability are less likely to be denied trade credit.

Columns (2) and (3) of this table explore whether the business owner is more or less likely to own a credit card and whether they are charged a higher interest rate on the card. The survey asks questions on two types of credit cards, one for personal use and the other for business use. This is an interesting variable to consider since, according to the National Small Business Association Survey (2008), credit cards are now the most common form of financing for small businesses. Nearly 44% of small-business owners identified credit cards as a source of financing that their company had used in the previous 12 months—more than any other source of financing, including business earnings.

Results shown here use the owner's personal credit card as the dependent variable. However, results are similar for business credit cards as well. Results show that previously bankrupt owners are significantly less likely to own personal (and business) credit cards. This suggests that business owners face rationing in obtaining this type of credit as well. In a recent Kauffman Firm Survey (Scott, 2009), it was found that access to business credit cards was an important form of financing for young and small businesses.<sup>23</sup> This

<sup>23</sup> The KFF study reported that between 2007 and 2008, about 92% of small business loans were micro business loans (loans of less than \$100,000), most of which came in the form of business credit cards.

**Table 5**  
Effect of bankruptcy on access to credit.

	Prob (loan denied)	Interest rate	Loan amount	Prob (not apply for loan)
Cum.Bankruptcy	0.241*** (0.065)	1.041*** (0.379)	0.018 (0.022)	0.342*** (0.042)
Cum.Delinquency	0.160*** (0.019)	0.125 (0.100)	−0.007 (0.006)	0.311*** (0.014)
Male	−0.015 (0.015)	0.210** (0.100)	−0.0005 (0.006)	0.005 (0.011)
Age	−0.00007 (0.001)	−0.014*** (0.005)	0.0001 (0.0003)	−0.003*** (0.0005)
College	−0.042*** (0.013)	−0.444*** (0.086)	0.019*** (0.005)	−0.033*** (0.010)
Black	0.252*** (0.046)	1.554*** (0.288)	−0.003 (0.017)	0.252*** (0.027)
Asian	0.053* (0.035)	0.092 (0.230)	0.006 (0.013)	0.006 (0.021)
Hispanic	0.088*** (0.033)	1.103*** (0.212)	−0.008 (0.012)	0.087*** (0.022)
Firm Age	−0.004*** (0.001)	−0.016*** (0.004)	0.0005* (0.0002)	−0.004** (0.001)
SmallFrm20	0.083*** (0.016)	0.745*** (0.166)	−0.132*** (0.010)	0.061*** (0.015)
SmallFrm50	0.075** (0.035)	0.376* (0.204)	−0.099*** (0.012)	0.024 (0.024)
S-Corp	0.003 (0.038)	0.128 (0.224)	−0.004 (0.013)	0.029 (0.028)
C-Corp	−0.026 (0.036)	0.112 (0.230)	−0.007 (0.013)	0.033 (0.029)
Partnership	−0.049 (0.033)	0.628** (0.270)	0.011 (0.016)	−0.016 (0.030)
Sole Prop	0.008 (0.039)	0.818*** (0.226)	−0.016 (0.013)	0.017 (0.026)
Profit/asset	−0.00007* (0.00003)	−0.0004* (0.0002)	−0.000004 (0.00001)	−0.001* (0.0003)
Debt/asset	0.002* (0.001)	0.016 (0.010)	0.0002 (0.001)	0.0005 (0.0004)
Urban	0.020 (0.014)	0.004 (0.097)	0.003 (0.006)	0.017 (0.011)
Manufacturing	0.024 (0.025)	0.313** (0.144)	−0.002 (0.008)	0.018 (0.017)
Services	0.007 (0.015)	0.435*** (0.091)	−0.017*** (0.005)	−0.010 (0.010)
Constant		8.583*** (0.364)	0.137*** (0.021)	
Observations	4788	4172	4184	12,205
R-squared		0.247	0.065	

Note: All specifications include region and time dummies. Regressions in Columns (1) and (4) are estimated via probit estimation. The probit estimates are the marginal effects and not the coefficients.

Robust standard errors in parentheses.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

occurs because young firms have less access to formal credit markets and they are less likely to get commercial loans because the requirements for getting those loans (such as having a business plan) are more stringent. A similar situation may apply to owners with poor credit records due to a bankruptcy filing. With less access to formal credit markets, they may be more likely to apply for loans through business credit cards. However, the bankruptcy makes it less likely that they will in fact be approved for a credit card. There is no significant difference in the interest rate charged on credit cards once they are issued.<sup>24</sup>

Previously delinquent businesses on the other hand are more likely to own credit cards, but also pay higher interest rates on the card (Column 2). Thus while they are not rationed out of the market, the cost of obtaining such credit is significantly higher

for them. On the positive side, access to such credit helps smooth out revenue streams—particularly when the business is going through tough times. However, large credit card balances are also symptomatic of poor business management, and could be a predictor of firm failure, according to the same Kauffman Firm Survey (Scott, 2009) study.

Other results from the table suggest that minority owned businesses, particularly Black and Hispanic, were less likely to own credit cards, while firms with less than 50 employees and sole proprietorships were significantly more likely to do so.

Table 7 uses questions relating to equity and venture capital financing to explore alternate types of financing. Probit regressions in this table define the dependent variable as being equal to 1 if the business used owner equity, angel investor equity, or venture capital to meet their financing needs. Owner equity refers to equity investments made by the owner or existing shareholders. Angel investors are investors who invest in businesses looking for higher returns than traditional investments. The study by Shane (2008) estimates that between 2001 and 2003, the number of people

<sup>24</sup> The lack of significance, however, may be a consequence of the limited number of observations for this variable. The sample size drops to 1783 for this regression and the number of firms with a bankruptcy record which report their interest rates is even lower.

**Table 6**  
Effect of bankruptcy on other types of credit.

	Prob (denied trade credit)	Int.Rt. CC	Prob (own CC)
Cum.Bankruptcy	0.038*** (0.017)	-0.513 (0.760)	-0.073** (0.036)
Cum.Delinquency	0.100*** (0.009)	2.220*** (0.278)	0.079*** (0.015)
Male	-0.006 (0.005)	0.623** (0.264)	-0.013 (0.013)
Age	-0.001*** (0.0002)	0.016 (0.013)	-0.001 (0.001)
College	-0.001 (0.004)	-0.547** (0.242)	0.102*** (0.012)
Black	0.023*** (0.010)	0.375 (0.743)	-0.088*** (0.026)
Asian	0.002 (0.009)	-0.236 (0.567)	-0.006 (0.027)
Hispanic	0.018* (0.011)	-0.311 (0.643)	-0.070*** (0.025)
Firm age	-0.0005* (0.0003)	0.005 (0.013)	-0.001 (0.001)
SmallFrm20	-0.00004 (0.006)	-0.509 (0.919)	0.111*** (0.020)
SmallFrm50	-0.005 (0.006)	-0.078 (1.066)	0.059** (0.025)
S-Corp	0.005 (0.013)	-0.729 (0.537)	0.071** (0.036)
C-Corp	0.015 (0.014)	-0.695 (0.604)	0.028 (0.036)
Partnership	-0.001 (0.013)	-0.827 (0.708)	0.044 (0.041)
Sole Prop	-0.006 (0.011)	-0.468 (0.524)	0.121*** (0.035)
Profit/asset	-0.0002* (0.0001)	0.005 (0.009)	-0.00009 (0.00006)
Debt/asset	-0.000009 (0.0001)	0.026** (0.011)	0.001** (0.001)
Urban	0.006 (0.005)	-0.740** (0.324)	0.033** (0.015)
Manufacturing	0.009 (0.008)	0.299 (0.460)	0.038* (0.021)
Services	-0.015*** (0.005)	0.296 (0.249)	0.029** (0.013)
Observations	12,205	1783	12,205
R-squared		0.063	

Note: All specifications include region and time dummies. Regressions in Columns (1) and (3) are estimated via probit estimation. The probit estimates are the marginal effects and not the coefficients.

Robust standard errors in parentheses.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

who made an angel investment is between 331,100 and 629,000. These angels invested almost \$23 billion in more than 50,000 companies, as compared to the \$3–\$5 billion per year that the formal venture capital community invests.

A venture capitalist provides investment and expertise to struggling businesses. In return, they get an equity position in the company, usually in proportion to their investment and risk taking. According to a study by Maier and Walker (1987), venture capital is a substitute, though not a perfect substitute, for other types of financing for small businesses. Typically, the riskier the investment, the less likely that commercial banks would be willing to lend to these businesses. However, venture capitalists are willing to accept such risks provided there is a possibility of extraordinary returns. Venture capital is available to small businesses in a variety of forms including funds from private investors, investment and pension funds, state governments, SBICs, and joint ventures between large and small firms.

Surprisingly, previously bankrupt firms are more likely to report the use of venture capital funds than other businesses, but

not any more likely to report own equity or investments by angel investors. There could be several reasons for this. First, as mentioned earlier, venture capital often serves as a substitute for other types of financing, which these businesses are highly unlikely to get. However, even there it is tough to make the argument that these businesses simply move to VC financing due to inadequate access to bank loans, since VC financing is tough to obtain for an average small firm.<sup>25</sup> VC's typically tend to invest in high growth firms that yield high returns, thus one likelihood is that at least some firms in the sample are high-growth businesses rather than regular mom-and-pop shops.<sup>26</sup> Second, a part of the venture capital could in fact reflect investments by Small Business Investment Companies that put venture capital, in the form of small business loans and equity financing into small businesses for growth, expansion and modernization. Some part of it could also reflect investments by private investors looking to take over the firm. Finally, a paper by Armour and Cumming (2006) suggests that the demand for venture capital may be higher in places where personal bankruptcy laws are more liberal. Since the fresh start enables entrepreneurs to discharge old debts, this raises their ability to obtain new financing unhampered by their earlier obligations. However, these results need to be interpreted with caution, since there are a limited number of observations and results are likely to be skewed due to the limited responses to this question.

Previously delinquent businesses seem to rely more on their own funds or angel investments.

Tables 8 and 9 use the interest rate regression models applied earlier but control for various loan characteristics as well as financing institution and owner characteristics. Columns (1)–(4) of Table 8 successively control for the loan amount granted, the loan repayment period, whether a guarantor was used, whether any collateral was provided to secure the loan. The coefficient on the cumulative bankruptcy variable remains significant in all these regressions. For instance, my results imply that a \$10,000 increase in the loan amount is associated with nearly a 0.8 percentage point decline in the interest rate. This is somewhat surprising since we would have expected that higher loan amounts are associated with higher interest rates, as the probability of default would be higher. However, these estimates are possibly capturing some characteristic of the borrower that enables him to not only get a higher loan amount but also a lower interest rate.

Further, in results not shown here, a variable defined as the interaction of the bankruptcy variable with these loan characteristic variables was created to see if a bankruptcy record would change the effect of these loan characteristics on the interest rate. A couple of interesting results emerged. First, for a previously bankrupt firm, the longer the loan repayment period is, the higher the interest rate on the loan. This is in contrast to the result for all other businesses on average wherein the longer the repayment period is, the lower the interest rate on the loan.<sup>27</sup> This might be a consequence of the higher repayment probabilities for loans with longer repayment periods. Second, the presence of a loan guarantor significantly reduces the interest rate on loans charged to previously bankrupt businesses. In addition, regressions were run to see if the effects of bankruptcy are different when the dependent variable is defined instead as a risk premium variable, calculated as the difference between the interest rate charged to the firm and the 10 year Treasury Bill rate (typically considered the risk free interest rate). In this case, the coefficient on the bankruptcy variable changes marginally to 1.03, relative to 1.05 in the baseline regression shown in

<sup>25</sup> For models of venture capital financing, see Eckhardt et al. (2006), Hsu (2007) and Sørensen (2007).

<sup>26</sup> The author thanks an anonymous referee for this suggestion.

<sup>27</sup> The result for non-bankrupt firms is counter to typical loan markets with upward sloping yield curves.

**Table 7**  
Effect of bankruptcy on other types of financing.

	Prob (owner equity)	Prob (angel investors)	Prob (venture capital) (in thousandths)
Cum.Bankruptcy	−0.020 (0.014)	0.009 (0.017)	0.407** (0.668)
Cum.Delinquency	0.053*** (0.008)	0.015*** (0.005)	0.015 (0.054)
Male	−0.012* (0.006)	−0.001 (0.003)	0.106** (0.123)
Age	−0.0004 (0.0003)	−0.0001 (0.0001)	0.001 (0.002)
College	0.020*** (0.006)	0.009*** (0.003)	0.076 (0.083)
Black	−0.002 (0.008)	−0.008*** (0.002)	0.063 (0.201)
Asian	−0.020** (0.009)	0.0001 (0.005)	0.057 (0.198)
Hispanic	−0.016* (0.009)	0.009 (0.009)	−0.057 (0.198)
Firm Age	−0.001*** (0.0003)	−0.00004 (0.0001)	−0.012** (0.011)
SmallFrm20	−0.011 (0.010)	−0.00009 (0.002)	−.733** (0.978)
SmallFrm50	−0.019** (0.009)	0.001 (0.003)	−0.027 (0.069)
S-Corp	−0.031** (0.013)	0.022** (0.008)	(pp)
C-Corp	−0.028** (0.013)	0.016* (0.008)	(pp)
Partnership	−0.004 (0.018)	(pp)	(pp)
Sole Prop	−0.031* (0.016)	(pp)	(pp)
Profit/asset	−0.0002* (0.0001)	−0.00005** (0.00002)	−0.003 (0.009)
Debt/asset	−0.0002 (0.0002)	−0.0005 (0.0003)	−0.013 (0.022)
Urban	0.011* (0.007)	−0.0005 (0.003)	0.111*** (0.110)
Manufacturing	0.004 (0.010)	−0.001 (0.004)	0.087 (0.183)
Services	−0.015** (0.006)	−0.002 (0.002)	0.028 (0.083)
Observations	12,205	7330	1737

Notes: (pp) Implies that the variable is a perfect predictor of the dependent variable and is dropped out of the regression. In regression (2), if the form of business ownership is a partnership or a sole proprietorship, then the data report zero investment by individual (angel) investors. This is equally true of venture capital investment as shown in regression (3). Further, in regression (3), being an S-Corporation is a perfect predictor of a value of 0 in the dependent variable. In contrast, *not* being a C-Corp is a perfect predictor of zero venture capital investments. All specifications include region dummies and time dummies. The probit estimates are the marginal effects and not the coefficients.

Robust standard errors in parentheses.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

Table 8, column 1. The coefficient remains positive and significant at 1%.

Table 9 controls for type of financing institution from which the loan is obtained, as well as owner net worth and home equity. Again, results for the cumulative bankruptcy variable remain robust to the inclusion of these other controls. Further, interactions between these variables and the bankruptcy variable did not yield any interesting results. In an earlier working paper by Charles et al. (2008), the authors found that Blacks tended to pay higher interest rates on vehicle loans relative to whites. This was traced to a greater use of finance companies by Blacks, which typically charge higher interest rates than traditional banking institutions. While the paper does not focus specifically on loans to Black-owned businesses, the data do suggest that loans from financial institutions are associated with higher interest rates as compared to loans from commercial banks, the government or family firms.

While my results do not show a significant impact on loans from government agencies, it is possible that the average interest

rate for commercial banks would have been even higher in the absence of government programs that are administered through regular commercial banks. For example, a study conducted by Financial Research Associates (1987) questioned whether Black-owned businesses were more likely to obtain loans from Black-owned financial institutions. However, the study conducted for the Minority Business Development Agency reported that black-owned financial institutions do not as a general rule make commercial loans.<sup>28</sup> To the extent that they do, these loans are usually provided via government programs that reduce the banks' risk exposure.<sup>29</sup> However, their competitive presence creates a more available and lower cost capital source for Black businesses.<sup>30</sup>

<sup>28</sup> Financial Research Associates (1987)

<sup>29</sup> Bates (1985).

<sup>30</sup> Craig et al. (2006) provide evidence that SBA's guaranteed lending program helped to promote economic performance through its impact on the small business credit market.

**Table 8**

Testing robustness of effect of bankruptcy on interest rates with controls for loan characteristics.

	Interest rate	Interest rate	Interest rate	Interest rate
Cum.Bankruptcy	1.055*** (0.379)	1.144*** (0.373)	1.137*** (0.372)	1.164*** (0.371)
Cum.Delinquency	0.120 (0.100)	0.154 (0.098)	0.172* (0.098)	0.185* (0.098)
Loan amount	-0.753*** (0.264)	-0.712*** (0.254)	-0.725*** (0.254)	-0.650** (0.254)
Loan pay period		-0.002*** (0.001)	-0.002*** (0.001)	-0.002** (0.001)
Loan guarantor			-0.254*** (0.085)	-0.242*** (0.085)
Loan collateral				-0.401*** (0.086)
Male	0.210** (0.100)	0.145 (0.099)	0.140 (0.099)	0.131 (0.099)
Age	-0.014*** (0.005)	-0.011** (0.005)	-0.011** (0.005)	-0.011** (0.005)
College	-0.430*** (0.086)	-0.373*** (0.085)	-0.360*** (0.085)	-0.366*** (0.084)
Black	1.552*** (0.288)	1.635*** (0.284)	1.624*** (0.284)	1.572*** (0.283)
Asian	0.097 (0.230)	0.037 (0.231)	0.020 (0.231)	-0.011 (0.231)
Hispanic	1.097*** (0.212)	0.797*** (0.217)	0.772*** (0.217)	0.757*** (0.216)
Firm Age	-0.016*** (0.004)	-0.016*** (0.004)	-0.017*** (0.004)	-0.017*** (0.004)
SmallFrm20	0.646*** (0.170)	0.624*** (0.166)	0.615*** (0.166)	0.596*** (0.165)
SmallFrm50	0.302 (0.205)	0.334* (0.200)	0.345* (0.199)	0.349* (0.199)
S-Corp	0.125 (0.224)	0.059 (0.221)	0.054 (0.221)	-0.009 (0.221)
C-Corp	0.106 (0.229)	0.033 (0.227)	0.022 (0.227)	-0.043 (0.226)
Partnership	0.636** (0.270)	0.558** (0.267)	0.518* (0.267)	0.384 (0.268)
Sole Prop	0.805*** (0.226)	0.722*** (0.224)	0.642*** (0.225)	0.571** (0.225)
Profit/asset	-0.0004* (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)
Debt/asset	0.016 (0.010)	0.012 (0.010)	0.012 (0.010)	0.011 (0.010)
Urban	0.007 (0.096)	0.025 (0.094)	0.030 (0.094)	0.032 (0.094)
Manufacturing	0.311** (0.144)	0.355** (0.141)	0.339** (0.141)	0.341** (0.141)
Services	0.422*** (0.091)	0.380*** (0.090)	0.377*** (0.090)	0.358*** (0.090)
Observations	4172	4025	4025	4025
R-squared	0.249	0.260	0.262	0.266

Note: All specifications include region dummies and time dummies.

The final table, Table 10, re-estimates the access to credit regressions on sub-samples of firms with the same demographic characteristics. This table is provided to address concerns that the coefficient estimates might be significantly different within sub-samples of comparable firms as compared to the regressions that pool across firm sizes and firm age. The sub-samples are composed of firms in the same age group and firms of the same size, as measured by employment. The distribution of firms is divided into ten deciles on the basis of these two characteristics, respectively. Columns 1 and 2 of this table show the coefficient on the cumulative bankruptcy variable when the dependent variable is the probability that a firm reported financing problems. Columns 3 and 4 report estimates from a regression of the probability of loan denial on cumulative bankruptcy for each decile. Columns 5 and 6 report estimates from a regression of interest rates on cumulative bankruptcy for each decile. The results suggest that even within

**Table 9**

Testing robustness of effect of bankruptcy on interest rates with controls for financing institution and owner net worth.

	Interest rate	Interest rate
Cum.Bankruptcy	1.174*** (0.371)	2.568*** (0.631)
Cum.Delinquency	0.190* (0.098)	0.135 (0.136)
Home equity (in millionths)		-0.199* (0.112)
Net worth (in millionths)		-0.012 (0.009)
Bank	0.359 (0.434)	0.283 (0.502)
Finance Co	1.644*** (0.530)	0.827 (0.614)
Family firm	0.836 (0.802)	-1.220 (1.030)
Government	1.528 (1.843)	1.406 (1.971)
Loan amount	-0.667*** (0.254)	-0.752* (0.418)
Loan repay period	-0.001** (0.001)	-0.001 (0.001)
Loan guarantor	-0.241*** (0.085)	-0.193* (0.117)
Loan collateral	-0.411*** (0.086)	-0.567*** (0.117)
Male	0.139 (0.099)	0.069 (0.140)
Age	-0.012*** (0.005)	-0.007 (0.006)
College	-0.355*** (0.084)	-0.275** (0.117)
Black	1.532*** (0.283)	2.335*** (0.401)
Asian	-0.028 (0.230)	0.117 (0.319)
Hispanic	0.755*** (0.216)	0.888*** (0.304)
Firm age	-0.016*** (0.004)	-0.020** (0.006)
SmallFrm20	0.595*** (0.165)	0.746*** (0.261)
SmallFrm50	0.339* (0.199)	0.356 (0.301)
S-Corp	-0.026 (0.221)	-0.038 (0.252)
C-Corp	-0.068 (0.226)	-0.036 (0.263)
Partnership	0.353 (0.268)	0.203 (0.342)
Sole Prop	0.551** (0.225)	0.455* (0.262)
Profit/asset	-0.0003 (0.0002)	-0.00001 (0.0002)
Debt/asset	0.012 (0.010)	0.0004 (0.011)
Urban	0.028 (0.094)	0.198 (0.133)
Manufacturing	0.343** (0.141)	0.466** (0.195)
Services	0.347*** (0.090)	0.363*** (0.123)
Constant	8.994*** (0.568)	6.425*** (0.693)
Observations	4025	2198
R-squared	0.269	0.302

Note: All specifications include region and time dummies. Standard errors in parentheses.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

comparable firms, the bankruptcy record has a negative effect on access to credit.



**Table 10**  
Bankruptcy impacts across firm age and firm size.

	Financing problem		Loan denied		Interest rates	
	Firm age	Firm size	Firm age	Firm size	Firm age	Firm size
Decile 1	-0.021 (0.044)	0.019 (0.045)	0.321 (0.146)**	0.543 (0.195)**	0.481 (1.444)	4.233 (3.472)
2	0.062 (0.056)	0.833 (0.491)**	0.265 (0.142)**	0.120 (0.148)	-0.833 (1.270)	-0.194 (1.257)
3	0.128 (0.064)**	0.144 (0.153)	0.238 (0.129)**	0.311 (0.240)	1.546 (1.019)	-3.582 (1.643)**
4	0.112 (0.060)**	0.111 (0.056)**	0.269 (0.111)**	0.120 (0.118)	0.591 (0.975)	0.0738 (1.089)
5	0.267 (0.116)**	0.106 (0.092)	0.450 (0.201)**	0.450 (0.326)	0.622 (1.569)	0.334 (2.697)
6	0.257 (0.091)***	0.223 (0.077)***	0.273 (0.184)**	0.369 (0.177)**	-2.1780 (1.263)*	0.178 (1.453)
7	0.079 (0.067)	0.102 (0.077)*	0.077 (0.116)	0.256 (0.128)**	2.667 (1.026)**	1.118 (0.927)
8	0.090 (0.074)*	0.118 (0.072)**	0.333 (0.207)**	0.360 (0.122)***	2.682 (1.405)*	1.844 (0.852)**
9	0.128 (0.092)**	0.124 (0.087)**	0.196 (0.166)*	0.305 (0.165)**	0.870 (1.161)	2.440 (1.008)**
Decile 10	0.281 (0.109)***	0.284 (0.104)***	0.191 (0.174)*	0.187 (0.110)**	4.632 (1.237)***	2.660 (0.792)***

Note: In columns 1 and 2, the dependent variable is the probability of reporting financing problems. In Columns 3 and 4, the dependent variable is the probability of reporting loan denials. In Columns 5 and 6, the dependent variable is the interest rate charged on the most recent loan. The explanatory variables in each of these regressions are the cumulative bankruptcy variable and the cumulative delinquency variable. We only report the coefficient on the cumulative bankruptcy variable in this table. The deciles refer to the cutoffs of the distribution based on firm size and firm age, respectively.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

In other results not shown here, the regressions were specified to include a control for the average number of firms reporting a bankruptcy in each region and over time. The intuition was that this variable would proxy for the average bankruptcy filing rate for the region. Presumably, the higher the filing rate, the higher the probability of loan denial and the higher the interest rate at which loans could be obtained. However, there was no significant effect of this variable in either the interest rate or the loan denial regressions.

## 6. Discussion and conclusion

This paper assesses the extent to which the US bankruptcy system provides small businesses a “fresh start” after a bankruptcy filing. Fundamental to the philosophy of the US bankruptcy code is the notion of a debt discharge. The debt discharge legally absolves the business of its pre-bankruptcy debts, thus allowing the owner to start afresh. While the extent of debt discharge varies across the type of filing (Chapter 7, 11 or 13), the generally pro-debtor nature of the bankruptcy code has interesting implications for entrepreneurial activity. This paper uses data from the 1993, 1998 and 2003 National Survey of Small Business Finances to explore how firms fare after a bankruptcy filing. The sample includes firms with and without a bankruptcy on their record, thus helping to distinguish between the outcomes for the two types of firms.

These results suggest some areas of concern though there are clearly promising aspects as well. On the positive side, bankrupt firms do not appear to be any more burdened than the average small firm by problems relating to profitability, cash flow, health insurance costs, or taxes—all considered to be major problems facing all small businesses. There is little to distinguish these firms in terms of firm size, as measured by employment. Some of this is

likely driven by the fact that we are pooling firms with a recent bankruptcy with firms that experienced a filing several years ago. However, in general, the fact that these firms are surviving several years after the filing suggests that the bankruptcy system does help some businesses recover and resume operations after a bankruptcy filing, thereby enabling a “fresh start”. However, whether it is an efficient system in terms of helping economically efficient firms survive and economically inefficient firms fail, is not a question this paper can answer given the data limitations.

The one area of concern that persists after a filing is financing or credit access. A bankruptcy on a firm’s credit record negatively affects the firm’s ability to obtain loans, especially at reasonable interest rates. In general, these firms have a nearly 24 percentage point higher likelihood of being denied a loan and are charged interest rates that are more than 1 percentage point higher than those charged to other businesses. A bankruptcy affects all types of financing, even trade credit. In fact, it appears that firms with a bankruptcy record are rationed out of the market, with all types of loans being denied at significantly higher rates than other firms. This fits in with the predictions of the *Stiglitz and Weiss (1981)* credit rationing model outlined earlier in the paper. When banks can distinguish between borrowers on the basis of their repayment probability, non-creditworthy borrowers are likely to be rationed out.

Of course, whether the bankruptcy *causes* the poor credit access is debatable. By the time failing businesses file for bankruptcy, they have usually been delinquent on their payments for extended periods, or have been in outright default. Therefore, their credit score is likely to already reflect these missed payments and creditors would take this into account before making loans. However, the presence of the bankruptcy on the credit record clearly has some long-term implications for small business financing.

Results suggest that bankruptcy leads to a class of discouraged borrowers who are significantly less likely to even apply for a loan. Further, owners of previously bankrupt firms are less likely to own credit cards, and are more likely to look for outside financing from venture capitalists.

Finally, there are interesting differences in credit access across minority owned businesses. In particular, while Black-owned and Hispanic-owned businesses are charged higher interest rates and are more likely to be denied loans, Asian-owned businesses are charged interest rates not significantly different than the average business and face loan denial rates that are only marginally higher than the average. These findings are in line with the earlier literature.

These results need to be interpreted with some caution for two reasons. First, the data only allow us to observe firms that survived the bankruptcy process. While there is some evidence to suggest that a large fraction of viable businesses are able to continue operating after bankruptcy, this does imply that the profitability results are likely to be biased upwards. On the other hand, the financial problems are likely to have been much worse for businesses that did not survive the bankruptcy. Therefore, if anything, the results for credit access problems would have been strengthened if those businesses did not drop out of the sample. Another disadvantage of the data is that one does not know the exact year in which the bankruptcy filing happened. It is likely that the consequences of a bankruptcy filing are worse in the period immediately following the filing and are likely to get mitigated over time. This is particularly expected to be true of measures like profitability and employment, which are likely to be significantly adversely affected at the time of filing. However, other observables such as financing problems are likely to show up in the long term as well, particularly since the filing stays on the owner and the firm's credit record for at least a 7 year period.

In future research, one should be able to use the 2008 NSSBF data to assess whether the results are robust to the inclusion of data following the 2005 Bankruptcy Act. As mentioned, the enhanced disclosure and reporting requirements on small businesses may have further exacerbated the financial problems of businesses deciding to file for bankruptcy. It would be interesting to study whether this had an impact on post-bankruptcy firm profitability and financing.

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## Appendix A

Fig. 4 shows the S–W equilibrium in a market with two observationally distinguishable borrower types,  $i$  and  $j$ .  $Ld(i)$  and  $Ld(j)$  are the loan demand curves for the two types of borrowers.  $Ls$  represents the bank's aggregate loan supply curve given the expected return ( $\rho_i$  and  $\rho_j$ ) from lending to the two types of borrowers at different interest rates. Note that we could show two loan supply curves for the two borrower types without fundamentally altering the analysis. If the cost of loanable funds for the bank is  $\rho^*$ , all type  $i$  borrowers who wish to borrow at  $\tilde{r}_i$  will obtain loans. Note that  $\tilde{r}_i$  is lower than  $r_i^*$ . This happens because banks have to compete for type  $i$  borrowers by lowering interest rates all the way down to the cost of the loan, which is  $\rho^*$ . In this example, some type  $j$  borrowers receive loans at interest rate  $r_j^*$ , while others are credit rationed.  $z$  Denotes the extent of credit rationing. If the cost of

obtaining loans rises to  $\rho^{**}$ , however, type  $i$  borrowers will continue to receive loans, but no type  $j$  borrower will receive loans since the cost of the loan exceeds the maximum return possible from lending to  $j$ .

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