Beyond Bankruptcy: Does the Bankruptcy Code Provide a Fresh Start To Entrepreneurs?

by

Aparna Mathur

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Aparna Mathur *

Executive Summary

This paper assesses the extent to which the U.S. bankruptcy system is effective in providing small businesses a "fresh start" after a bankruptcy filing. We use data from the 1993, 1998 and 2003 National Survey of Small Business Finances to explore how firms fare after a bankruptcy filing. Our results suggest some areas of concern though there are clearly promising aspects as well.

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—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. Further, the fact that these firms are surviving several years after the filing is itself a testament to the efficient functioning of the U.S. bankruptcy system. It suggests that the bankruptcy system goes a long way toward helping businesses recover and resume operations after a bankruptcy filing.

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 a firm's ability to obtain loans, especially at reasonable interest rates, even controlling for credit scores. 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. This fits in with the predictions of the Stiglitz and Weiss (1981) credit rationing model. However, it appears that the rationing happens either through loan denials or through higher interest rates, but not through differences in loan amounts approved. The above results lead to a class of discouraged borrowers who are significantly less likely to even apply for a loan.

To summarize, while the bankruptcy code does help certain businesses get back on their feet, the persistence of credit access issues after bankruptcy suggests that the promise of the "fresh start" has not been fully realized.

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*Resident Scholar, American Enterprise Institute. Email: amathur@aei.org. The author would like to thank Matt Jensen for excellent research assistance with this article.

I. Introduction

The fundamental philosophy of the U.S. bankruptcy system has not changed for more than a century. This philosophy, which was first codified in the 1978 law but has guided bankruptcy regulation since the early nineteenth century, is the idea of a "fresh start" after bankruptcy.[1] Under Title 11 of the modern bankruptcy code, businesses can file for bankruptcy under Chapters 7, 11 and 13.[2] Chapter 7 bankruptcy is a liquidation procedure most frequently used by individual debtors and small businesses.[3] The advantage is that debtors can protect their "exempt" assets from being used to repay debts, and they get an immediate debt discharge after non-exempt assets are distributed. The debtor is then released from any future obligation to repay the debt.[4] These exemptions relate to different types of assets, but the most important is the exemption for equity in an owner-occupied home. This is termed the homestead exemption. 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.[5] 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, jewellery etc. Chapters 11 and 13 are reorganization procedures. Chapter 13 is available to consumers and sole proprietors, and Chapter 11 to any type of business entity. Both procedures require the debtor to come up with a repayment plan out of future income. However, the amount of debt discharged approaches that under Chapter 7. In effect, the bankruptcy procedure provides failed entrepreneurs the ability to get back on their feet by reducing or eliminating their pre-bankruptcy debts.

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[1] 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).

[2] 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).

[3] About 70 percent of all filings occur under Chapter 7 (American Bankruptcy Institute data).

[4] Partnerships and corporations do not receive a discharge. The 2005 law made it tougher for debtors to file under this Chapter.

[5] These states are Arkansas, Florida, Iowa, Kansas, Minnesota, Oklahoma and Texas.

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. 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, Scholz and White (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. Hence the literature clearly suggests costs and benefits of bankruptcy regulations on entrepreneurship.

However, there is a surprising dearth of literature on how business owners actually fare post-bankruptcy.[6] What impact does the filing have on access to credit and interest rates? What happens to wages and employment? A paper by Blanchflower, Levine and Zimmerman (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 prior bankruptcy filing, prior 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.

[6] We found only one study, Porter and Thorne (2006) that surveyed households about their financial situation after a bankruptcy. However that study did not distinguish between consumer and business bankruptcies.

Our paper focuses on the effects of bankruptcy specifically and therefore fills a 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 prior bankruptcy filing. However, we find 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, our 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. We also find some 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, Levine and Zimmerman (2003), Munnel et al. (1996), Chen and Cole (1988) and Craig, Jackson, and Thomson (2006) have shown that Black-owned firms face higher interest rates and loan denial rates in credit markets.

To summarize, our analysis finds that the bankruptcy system is partly successful in getting small businesses back on their feet. In our data, approximately 2-2.8 percent of businesses reported a prior bankruptcy every year. Using weights, these firms represented approximately 170,000 firms in 2003, 106,000 firms in 1998 and 133,000 firms in 1993. The fact

that these businesses were still surviving (or showed up in the data), some of them profitably, is a testament to the "fresh start" principle. It suggests that the bankruptcy system goes a long way toward helping businesses recover and resume operations after a bankruptcy filing. One caveat worth adding to these results is that, of necessity, our sample includes only businesses that survived the bankruptcy filing. Therefore, our 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 percent 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 percent of such businesses survived the bankruptcy and moved on to found new firms. Since Chapter 11 bankruptcies typically undergo a liquidation or a reorganization, we can use this as a proxy for the survivorship rates for small businesses that go bankrupt under Chapter 7 liquidation or Chapter 13 reorganization. Hence it is likely that by using the NSSBF we are observing a majority of firms that could survive the bankruptcy process. 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 an 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. Therefore, while our data is not perfect, we are reasonably confident that the results provide an accurate insight into the post-bankruptcy scenario for small businesses.

The one area of concern that persists after a filing is credit access. In fact, it appears that firms with a bankruptcy record are rationed out of the market with loan denial rates nearly three times higher than other firms. 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.

While our data cover years prior to 2005, one could question whether our 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. We would argue that the passage of BAPCPA would have a marginal impact on our conclusions. While it influences the choice of Chapter for a failing business by pushing relatively more individuals towards Chapter 13, it might have 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 we 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, empirically, we have little to suggest that businesses that reorganize are more or less likely to survive over the longer run than businesses that shut down and restart. Therefore, while this is clearly a promising area for future study, we suspect that our broad conclusions would be largely unchanged.

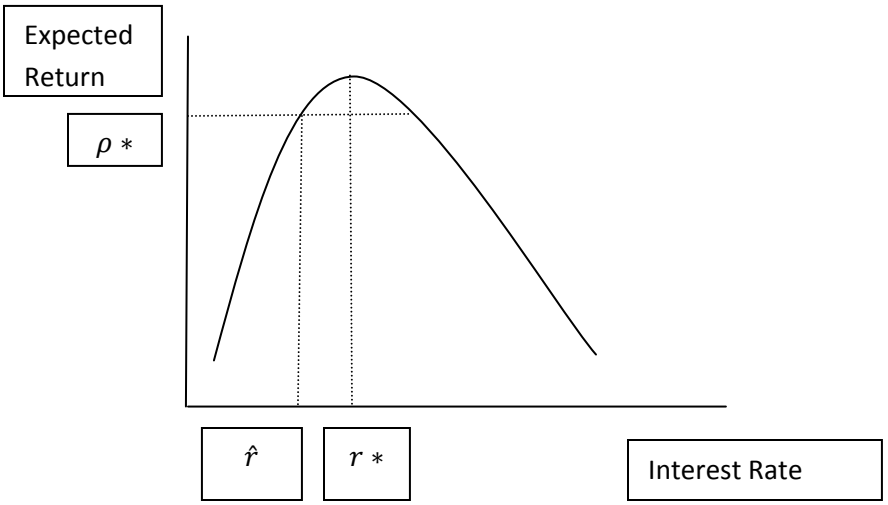
In the next section, we motivate our analysis using a Stiglitz and Weiss (1981) credit rationing model with observationally distinguishable borrowers. Section III provides an overview of the U.S. personal bankruptcy system and how it applies to small businesses. Section IV presents our data and Section V discusses results from our empirical estimation. Section VI concludes.

II. Theory

The motivation for our empirical analysis derives from the credit rationing model discussed in Stiglitz and Weiss (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 that rate. 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 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.

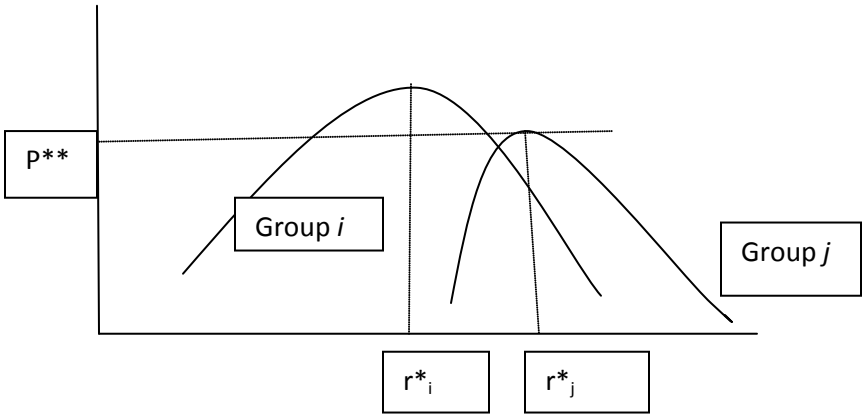
Figure 1. Expected Return on Loans



Clearly, at the optimal interest rate it is conceivable that the demand for funds exceeds the supply of funds. However, even if borrowers want to bid up the interest rate to obtain loans, the bank would be unwilling to do so. This is the source of credit rationing in this model.

An extension of this model, which is relevant for our analysis, applies to observationally distinguishable borrowers. Suppose there are 2 groups of borrowers, *i* and *j*, with different expected return schedules due to different risk characteristics. Suppose that $max\rho(r_i) > max\rho(r_j)$, so that the maximum return ρ possible from lending to group *i* exceeds the maximum return possible from lending to group *j*. In that case, it can be shown that type *j* borrowers will only receive loans if credit is not rationed to type *i* borrowers. Further, the equilibrium interest rates would be such that for all *i,j* receiving loans, the expected returns would be equalized across the two groups.

Figure 2. Observationally Distinguishable Borrowers



The intuition is that if banks have a cost of loanable funds ρ**, then all type *i* borrowers will be able to obtain a loan, and some type *j* borrowers (though not necessarily all) will be able to receive a loan. The interest rate charged to type *i* borrowers will be bid down from the optimal rate as banks try to compete away these borrowers from other banks.

In the context of our paper, we can imagine type *j* borrowers as all businesses with a prior bankruptcy and type *i* borrowers as all businesses without a bankruptcy. For example, in the 2003 National Survey of Small Business Finances, nearly 3 percent of businesses reported a prior bankruptcy (Table 1). Since a bank is able to clearly distinguish between borrowers with and without a bankruptcy on their records, we can 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 our 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 is evident in Table 2 which shows much higher loan denial rates and higher interest rates for businesses with a prior bankruptcy relative to those without a bankruptcy record.

III. Bankruptcy Law For Small Businesses

Before we move on to the data and the analysis, it would be useful to review the essential features of the bankruptcy system as it applies to small businesses. In the U.S., small businesses can essentially file for bankruptcy under three chapters. The most common is Chapter 7

bankruptcy.[7] To qualify for relief under Chapter 7, a debtor may be an individual, a partnership, a corporation or any other business entity. Under a Chapter 7 filing, a debtor is allowed to retain certain exempt property from being used to pay creditors. Chapter 7 also allows a discharge of debts to give an honest individual debtor a "fresh start". 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, 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 our sample are organized as sole proprietorships. Table 1 shows that across all three years more than 30 percent of businesses were organized as sole proprietorships. In 1998, over 40 percent were. Amongst businesses with a bankruptcy record, over 52 percent were 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.

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.

While our analysis uses three 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 we study though certain details, such as the level of assets that qualify for exemption, may have changed. Further, we are unable

[7] 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

to distinguish a Chapter 7 bankruptcy from a Chapter 11 or a Chapter 13 bankruptcy.[8] However, since the purpose of the 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 our analysis.

One disadvantage of our data is that we do 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 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 seven year period. In general, our estimates should be taken as being conservative since there are likely to be at least a few bankruptcies that occurred even 5 to 7 years prior to the year sampled, and thus we may be capturing (on average) the long-term impacts which are likely to be weaker than the short-term impacts. We will discuss this issue more in the next section where our results for recent delinquencies are more significant than bankruptcies for certain variables such as profitability and cash flows.

IV. 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. We use data from the years 1993, 1998 and 2003. The 1993 survey was conducted for the Federal Reserve Board and the U.S. Small Business Administration to collect information on the availability of credit to small and minority owned businesses. The data contain 4,637 firms with less than 500 employees. These represent (appropriately weighted) about 4.99 million small businesses. Of these, 2.6 percent 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 percent and the loan denial rate was 15.5 percent.

[8] 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.

The 1998 survey contains 3,561 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 Dun and Bradstreet credit score of the firm as well as questions relating to the owner's housing and non-housing wealth.[9] Approximately 1.8 percent of owners and another 0.2 percent of firms reported a prior bankruptcy. In terms of credit market conditions, the average interest rate on loans was .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 4,240 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 percent of the owners and 0.9 percent of firms reported a prior bankruptcy. 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 percent reported financing as a major problem in 1993, but only about 6 percent 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 three years.

The estimates indicate that on average, 1.8-2.6 percent of the owners reported a prior bankruptcy filing while about 0.2 to 0.9 percent reported a prior firm bankruptcy. From these, we

[9]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?

constructed a dummy variable titled *cumulative bankruptcy* which equals 1 when either the firm or the owner has reported a prior bankruptcy. Another variable that we include in our estimation is whether the owner or the firm reported a recent delinquency i.e. a delinquency in the three year period preceding the survey. The specific question that is asked in the survey is "In the previous three 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 percent of owners and 19 percent of firms reported a delinquency. For 1998, the corresponding numbers were 12.3 and 13.4 percent, and for 2003, 12.1 and 15.6 percent. The number of delinquencies has declined somewhat between 1993 and 1998, and this could again be a 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.[10] 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.[11] 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 our 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 we pointed out earlier, a bankruptcy may simply reflect the final stage of extended periods of non-payment. These delinquencies are

[10] Some studies suggest that for loans that are 60 or more days delinquent, the default rate is approximately 27%.
[11] http://www.articlesbase.com/real-estate-articles/commercial-loan-workouts-can-help-delinquent-borrowers-2108140.html

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.

Another reason we are interested in the coefficients on the delinquency variable is that since the delinquency happened in a relatively recent period (i.e. a three year period preceding the sample year), 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. We will get into these results in the next section.

In terms of the composition of firms, the average employment size of the firm across all three years was about 8 (which typically includes the owner), and the average age of the firm was about 14 years. Nearly 3 to 4 percent 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 percent of businesses organized as such. Finally, more than 95 percent 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 prior bankruptcy yields interesting insights into the loan market for small businesses. Table 2 shows that previously bankrupt firms are nearly 3 times as likely to report financing problems, and marginally more likely to report labor 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 taxes and government regulations.

In terms of credit access, previously bankrupt businesses were significantly worse off when compared to businesses without a prior 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 percent of these businesses reported problems obtaining trade credit as opposed to 5 percent 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.[12] The one outlier in this table is that firms with a prior bankruptcy 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 prior bankruptcy.

The other interesting observations, though not shown in the table, are that within the pool of businesses with a reported bankruptcy, there is a higher percentage of Black-owned businesses relative to Hispanic and Asian-owned businesses. Also, the majority of these are organized as sole proprietorships.

Figure 3 shows the kernel distribution of interest rates across firms with and without a prior bankruptcy. 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. Also, the distribution for these businesses lies above that for other businesses along the right tail, implying that previously bankrupt businesses are more concentrated along the high interest rate margin.

Figure 4 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.

IV. Estimation Strategy

The typical empirical strategy employed in earlier papers, such as Blanchflower, Levine and Zimmerman (2003) is to estimate a series of regressions with either interest rates or a loan denied dummy as the dependent variable, and a host of explanatory factors such as the personal and financial characteristics of the firm and the owner, demographic and other variables, etc. To motivate our analysis, we start with the traditional regression specifications to show that we are able to reproduce results from earlier studies. This acts as a check on our data and our estimation techniques. Our data is pooled across all three years, 1993, 1998 and 2003. All regressions are weighted 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, we are unable to control for

[12] The profit to asset ratios we 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 our survey data.

state-level factors that might be important in these regressions. We address this by including region dummies to account for all the unobservables. Note that throughout this section, our cumulative bankruptcy variable equals 1 if *either* the owner or the firm reported a prior bankruptcy. Our cumulative delinquency variable equals 1 if either the firm or the owner reported a prior delinquency.

In the first column of Table 3, we report 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. 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. For instance, our results show that businesses with a prior 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 our sample (of 2.2), this implies that such firms are nearly 4 percent more likely to report financial problems than other firms. Firms with a prior delinquency (either of the firm or the owner) are 7.3 percentage points more likely to report financial problems than those without a prior delinquency. Our 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 (six or seven 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 U.S. 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 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 prior bankruptcy record are not more likely to report profitability problems than other firms. This reflects positively on the bankruptcy system-even after a bankruptcy, firms and owners can hope to not just get back to business, but also to be profitable. 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 we run this regression 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.

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 more likely to report costs of labor as an important problem facing businesses. Previously delinquent businesses as well as Black-owned businesses are also significantly more likely to report these as issues. Finally, smaller firms (with less 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 to 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 manufacturing are also more likely to report these as problems. On average, firms with a prior bankruptcy 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 prior bankruptcy is no more likely to report cash flow problems than firms without a bankruptcy. However, firms with a delinquency in the previous three year period are more likely to report cash flow problems. Again, it's likely that our 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.[13]

[13] 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.

To see how bankruptcy affects other firm characteristics, we ran linear regression models with employment and wages as the dependent variables. 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. Therefore, bankruptcies have no long lasting impacts on firm size. It is 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 $2,619 for previously bankrupt firms than those without a prior 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 less 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 our results relating to access to credit issues for small firms with a prior 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 percent with a sizable coefficient. Having a bankruptcy on the record leads to nearly a 24 percentage point increase in the probability of loan denial.[14] This confirms our earlier 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.[15] In their paper, Blanchflower,

[14] This implies a nearly 11 percent increase in the probability of loan denial for previously bankrupt businesses or owners.

[15] For example, according to the CBO, almost 20 percent of nonminority firms obtain debt capital from commercial banks, but only 12.6 percent 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 percent financial application success rate, Blacks were successful only 66 percent of the time.

Levine and Zimmerman (2003) report that being Black-owned raises the probability of loan denial from anywhere between 22 percentage points to 46 percentage points. Therefore, our estimate lies within their range of estimates. 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 percent. Further, firms with less than 20 employees and those with less 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 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, Levine and Zimmerman (2003).

Smaller firms, with less than 20 or less 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 three years, there were periods when they needed credit but did not apply for a loan. We estimate a probit model of the probability that the respondent answered yes to this survey question. Results show that firms with a prior bankruptcy 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, Levine and Zimmerman (2003). Firms with less 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 prior bankruptcy 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. Trade credit is a form of lending between businesses wherein a firm purchases goods from another on account, agreeing to pay cash at a future date. Our 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 percent 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.[16] This 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. [17]

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

[16] The KFF study reported that between 2007 and 2008, about 92 percent 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.

[17] The lack of significance, however, may be a consequence of the limited number of observations for this variable. The sample size drops to 1,783 for this regression and the number of firms with a prior bankruptcy which report their interest rates is even lower.

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 investors 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 that traditional investments. The study by Shane (2008) estimates that between 2001 and 2003, the number of people 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 to $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 we mentioned earlier, venture capital often serves as a substitute for other types of financing, which these businesses are highly unlikely to get. 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. 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. In columns (1)-(4) of Table 8, we 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, our 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 to us since we would have expected that higher loan amounts are associated with higher interest rates, as the probability of default would be higher. However, we 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, we interacted the bankruptcy variable with these loan characteristic variables to see if a prior bankruptcy 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.[18] 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.

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, Hurst and Stephens (2006), 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

[18] The result for non-bankrupt firms is counter to typical loan markets with upward sloping yield curves.

companies by Blacks, which typically charge higher interest rates than traditional banking institutions. While our paper does not focus specifically on loans to Black-owned businesses, we do find that loans from financial institutions are associated with higher interest rates as compared to loans from commercial banks, the government or family firms.

While our 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 in 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.[19] To the extent that they do, these loans are usually provided via government programs that reduce the banks' risk exposure.[20] However, their competitive presence creates a more available and lower cost capital source for Black businesses. [21]

In other results not shown here, we included a control for the average number of firms reporting a prior 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, we find no significant effect of this variable in either the interest rate or the loan denial regressions.

V. Discussion and Conclusion

This paper assesses the extent to which the U.S. bankruptcy system is effective in providing small businesses a "fresh start" after a bankruptcy filing. Fundamental to the philosophy of the U.S. 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

[19] Financial Research Associates (1986)
[20] Bates (1985)
[21] Craig, Thomson, and Jackson (2006) provide evidence that SBA's guaranteed lending program helped to promote economic performance through its impact on the small business credit market.

entrepreneurial activity. In this paper, we use data from the 1993, 1998 and 2003 National Survey of Small Business Finances to explore how firms fare after a bankruptcy filing. Our sample includes firms with and without a bankruptcy on their record, thus helping us to distinguish between the outcomes for the two types of firms.

Our results suggest some areas of concern though there are clearly promising aspects as well. 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—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. Further, the fact that these firms are surviving several years after the filing is itself a testament to the efficient functioning of the U.S. bankruptcy system. It suggests that the bankruptcy system goes a long way toward helping businesses recover and resume operations after a bankruptcy filing.

However, 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, 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. 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.

Our results show that bankruptcy leads to a class of discouraged borrowers who are significantly less likely to even apply for a loan. We also find 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.

Finally, we find some 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.

Our results need to be interpreted with some caution. One disadvantage of our data is that we do 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. In fact, the relatively recent effect of delinquencies on these variables could reflect the short-term impact of a bankruptcy filing to some extent. 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 seven year period. In general, our estimates should be taken as being conservative since there are likely to be at least a few bankruptcies that occurred even 5 to 7 years prior to the year sampled, and thus we may be capturing (on average) the long-term impacts which are likely to be weaker than the short-term impacts.

Because the NSSBF has been discontinued, for future research, we hope to use the Kauffman Firm Survey (KFS) to assess whether our results are robust to the inclusion of data following the 2005 Bankruptcy Act. As we mentioned in the introduction, the Act made it tougher for businesses to file under Chapter 7 by introducing a means-test, and forcing all above average income individuals to file under Chapter 13 reorganization. Therefore, we might find differential impacts of BAPCPA along the income distribution of small business-owning households. The KFS would also enable us to study how small businesses fared under the current recession, their failure rates and the consequent impact on employment and investment. It would be interesting to learn the short-term impacts of bankruptcy, as the KFS contains an annual question on business bankruptcy.

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Table 1
Descriptive Statistics

Variable	Mean (SD)	Obs.	Mean (SD)	Obs.	Mean (SD)	Obs.
	1993		1998		2003	
Financing Problem	.105(.307)	4637	.067(.251)	3561	.059(.236)	4240
Labor Cost Problem	.032(.177)	4637	.038(.193)	3561	.013(.115)	4240
Tax Problem	.052(.223)	4637	.068(.252)	3561	.053(.225)	4240
Profits Problem	.096(.295)	4637	…	0	.195(.396)	4240
Owner Bankruptcy	.026(.161)	4637	.018(.135)	3561	.024(.153)	4240
Firm Bankruptcy	…	0	.002(.045)	3561	.009(.095)	4240
Owner Delinquent	.134(.341)	4637	.123(.329)	3561	.121(.326)	4240
Firm Delinquent	.190(.392)	4637	.134(.341)	3561	.156(.363)	4240
Interest Rate on Loan(%)	8.767(2.460)	1695	9.439(2.304)	784	6.502(3.138)	1761
Loan Denied	.155(.362)	2007	.172(.378)	962	.071(.258)	1897
Loan Amount Granted	326590.7(2101104)	1695	181162.7(766639.8)	796	326433.9(1686740)	1761
Black	.029(.168)	4637	.041(.199)	3561	.038(.192)	4240
Hispanic	.042(.202)	4637	.055(.229)	3561	.043(.203)	4240
Asian	.035(.185)	4637	.042(.201)	3561	.043(.204)	4240
Sole Proprietorship	.322(.467)	4637	0.411(.492)	3561	.302(.459)	4240
Partnership	.073(.259)	4637	.057(.232)	3561	.051(.219)	4240
Age	49.405(11.450)	4637	50.111(11.198)	3561	51.620(11.412)	4156
College Educated	.466(.498)	4637	.484(.499)	3561	.501(.500)	4240
Male	.739(.439)	4637	.720(.449)	3561	.261(.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

Table 2
Descriptive Statistics, by Bankruptcy Status

	Cumulative Bankruptcy=0 Mean	Cumulative Bankruptcy=1 Mean
Problems Facing Firms		
Financing Problem	0.082	0.213
Labor Cost	0.058	0.099
Taxes	0.058	0.056
Profits	0.126	0.163
Health Insurance	0.109	0.125
Government Regulations	0.047	0.015
Problems Obtaining Credit		
Interest Rate on Loan(%)	7.899	9.070
Loan Amount Granted($)	291927	399594
Loan Denied	0.147	0.489
Interest Rate on Credit Card	12.593	12.786
Own a Credit Card?	0.447	0.406
Denied Trade Credit?	0.051	0.134

Table 3
Effect of Bankruptcies on Firms: Types of Problems Reported

	Financial	Profit	Labor Cost	HealthIns	CashFlow
Cum.Bankruptcy	0.087***	0.011	0.021*	0.005	0.004
	(0.026)	(0.025)	(0.014)	(0.016)	(0.017)
Cum.Delinquency	0.074***	0.031***	0.029***	0.012**	0.029***
	(0.009)	(0.010)	(0.006)	(0.005)	(0.008)
Male	-0.005	0.001	-0.006	0.001	-0.002
	(0.006)	(0.009)	(0.005)	(0.005)	(0.006)
Age	-0.0002	0.001***	-0.0001	-0.001***	0.0002
	(0.0003)	(0.0004)	(0.0002)	(0.0002)	(0.0002)
College	-0.006	0.016**	0.002	-0.019***	0.018***
	(0.006)	(0.008)	(0.004)	(0.005)	(0.006)
Black	0.110***	0.057***	0.026***	0.002	0.025**
	(0.019)	(0.021)	(0.008)	(0.007)	(0.012)
Asian	0.021	0.051**	-0.009	0.005	-0.013
	(0.015)	(0.022)	(0.007)	(0.012)	(0.011)
Hispanic	0.020*	0.044**	0.011	0.018*	0.005
	(0.012)	(0.020)	(0.009)	(0.010)	(0.012)
Firm Age	-0.002***	-0.001***	-0.0004**	0.0004*	-0.001***
	(0.0003)	(0.0004)	(0.0002)	(0.0002)	(0.0003)
Smallfrm20	0.001	0.002	-0.021**	0.004	0.003
	(0.011)	(0.015)	(0.009)	(0.007)	(0.010)
Smallfrm50	-0.001	-0.022	0.003	0.026**	-0.007
	(0.013)	(0.016)	(0.008)	(0.012)	(0.011)
S-Corp	-0.003	-0.017	-0.011	-0.004	0.058**
	(0.019)	(0.021)	(0.011)	(0.022)	(0.026)
C-Corp	0.002	0.022	-0.012	-0.008	0.057**
	(0.019)	(0.024)	(0.011)	(0.021)	(0.027)
Partnership	0.009	0.002	-0.017*	-0.022	0.054*
	(0.023)	(0.026)	(0.010)	(0.017)	(0.033)
Sole Prop	-0.009	0.023	-0.022*	-0.018	0.043**
	(0.019)	(0.022)	(0.012)	(0.022)	(0.020)
Profit/Asset	-0.0003**	-0.00001	-0.000003	-0.0006	-0.0001
	(0.0002)	(0.00002)	(0.00002)	(0.0001)	(0.0001)
Debt/Asset	0.0003*	-0.00009	-0.0004	-0.00005	0.0002**
	(0.0002)	(0.0002)	(0.0003)	(0.0002)	(0.0001)
Urban	-0.001	-0.014	0.002	-0.004	0.002
	(0.008)	(0.010)	(0.005)	(0.006)	(0.007)
Manufacturing	0.002	0.035**	-0.009*	0.015*	0.027**
	(0.010)	(0.016)	(0.005)	(0.008)	(0.012)
Services	-0.030***	0.016*	-0.013***	0.006	0.020***
	(0.006)	(0.008)	(0.004)	(0.005)	(0.006)
Observations	12,205	12,205	12,205	12,205	12,205

Robust standard errors in parentheses
* significant at 10%; **significant at 5%; *** significant at 1%

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 been bankrupt or 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.

Table 4
Effect of Bankruptcy on Firm Employment and Wages

	Employment	Wage/Employment
Cum.Bankruptcy	0.079	-2,619.003**
	(0.650)	(1,069.739)
Cum.Delinquency	-0.017	-732.504
	(0.359)	(644.463)
Male	0.842***	263.483
	(0.278)	(739.893)
Age	-0.032*	-26.684
	(0.019)	(47.249)
College	1.923***	2,326.463***
	(0.284)	(794.153)
Black	-0.683	-2,606.743***
	(0.449)	(877.287)
Asian	-0.087	-2,198.779**
	(0.583)	(994.881)
Hispanic	-0.223	-491.227
	(0.448)	(958.821)
Firm Age	0.241***	152.936**
	(0.034)	(60.512)
SmallFrm20		-5,321.411***
		(1,478.154)
SmallFrm50		519.322
		(1,491.492)
S-Corp	2.317***	1,533.646
	(0.748)	(2,206.532)
C-Corp	3.915***	2,931.262
	(0.815)	(2,245.210)
Partnership	-1.996*	-3,450.542
	(1.021)	(2,704.784)
Sole Prop	-6.887***	-6,691.460***
	(0.693)	(2,136.222)
Profit/Asset	-0.001***	3.288
	(0.0001)	(2.627)
Debt/Asset	-0.007	-66.694***
	(0.004)	(17.134)
Urban	0.400	1,627.198**
	(0.315)	(724.131)
Manufacturing	5.481***	-2,564.684***
	(0.619)	(864.045)
Services	-1.452***	-513.702
	(0.266)	(852.037)
Constant	6.754***	17,354.054***
	(1.180)	(3,027.447)
Observations	12,205	8,713
R-squared	0.075	0.032

Robust standard errors in parentheses
* significant at 10%; **significant at 5%; *** significant at 1%

Note.-All specifications include region and time dummies.

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***	1.041***	0.018	0.342***
	(0.065)	(0.379)	(0.022)	(0.042)
Cum.Delinquency	0.160***	0.125	-0.007	0.311***
	(0.019)	(0.100)	(0.006)	(0.014)
Male	-0.015	0.210**	-0.0005	0.005
	(0.015)	(0.100)	(0.006)	(0.011)
Age	-0.00007	-0.014***	0.0001	-0.003***
	(0.001)	(0.005)	(0.0003)	(0.0005)
College	-0.042***	-0.444***	0.019***	-0.033***
	(0.013)	(0.086)	(0.005)	(0.010)
Black	0.252***	1.554***	-0.003	0.252***
	(0.046)	(0.288)	(0.017)	(0.027)
Asian	0.053*	0.092	0.006	0.006
	(0.035)	(0.230)	(0.013)	(0.021)
Hispanic	0.088***	1.103***	-0.008	0.087***
	(0.033)	(0.212)	(0.012)	(0.022)
Firm Age	-0.004***	-0.016***	0.0005*	-0.004***
	(0.001)	(0.004)	(0.0002)	(0.001)
SmallFrm20	0.083***	0.745***	-0.132***	0.061***
	(0.016)	(0.166)	(0.010)	(0.015)
SmallFrm50	0.075**	0.376*	-0.099***	0.024
	(0.035)	(0.204)	(0.012)	(0.024)
S-Corp	0.003	0.128	-0.004	0.029
	(0.038)	(0.224)	(0.013)	(0.028)
C-Corp	-0.026	0.112	-0.007	0.033
	(0.036)	(0.230)	(0.013)	(0.029)
Partnership	-0.049	0.628**	0.011	-0.016
	(0.033)	(0.270)	(0.016)	(0.030)
Sole Prop	0.008	0.818***	-0.016	0.017
	(0.039)	(0.226)	(0.013)	(0.026)
Profit/Asset	-0.00007*	-0.0004*	-0.000004	-0.001*
	(0.00003)	(0.0002)	(0.00001)	(0.0003)
Debt/Asset	0.002*	0.016	0.0002	0.0005
	(0.001)	(0.010)	(0.001)	(0.0004)
Urban	0.020	0.004	0.003	0.017
	(0.014)	(0.097)	(0.006)	(0.011)
Manufacturing	0.024	0.313**	-0.002	0.018
	(0.025)	(0.144)	(0.008)	(0.017)
Services	0.007	0.435***	-0.017***	-0.010
	(0.015)	(0.091)	(0.005)	(0.010)
Constant		8.583***	0.137***	
		(0.364)	(0.021)	
Observations	4,788	4,172	4,184	12,205
R-squared		0.247	0.065	

Robust standard errors in parentheses
* significant at 10%; **significant at 5%; *** significant at 1%

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.

Table 6
Other Types of Credit

	Prob(Denied Trade Credit)	Prob(Int.Rt. CC)	Prob(Own CC)
Cum.Bankruptcy	0.038***	-0.513	-0.073**
	(0.017)	(0.760)	(0.036)
Cum.Delinquency	0.100***	2.220***	0.079***
	(0.009)	(0.278)	(0.015)
Male	-0.006	0.623**	-0.013
	(0.005)	(0.264)	(0.013)
Age	-0.001***	0.016	-0.001
	(0.0002)	(0.013)	(0.001)
College	-0.001	-0.547**	0.102***
	(0.004)	(0.242)	(0.012)
Black	0.023***	0.375	-0.088***
	(0.010)	(0.743)	(0.026)
Asian	0.002	-0.236	-0.006
	(0.009)	(0.567)	(0.027)
Hispanic	0.018*	-0.311	-0.070***
	(0.011)	(0.643)	(0.025)
Firm Age	-0.0005*	0.005	-0.001
	(0.0003)	(0.013)	(0.001)
SmallFrm20	-0.00004	-0.509	0.111***
	(0.006)	(0.919)	(0.020)
SmallFrm50	-0.005	-0.078	0.059**
	(0.006)	(1.066)	(0.025)
S-Corp	0.005	-0.729	0.071**
	(0.013)	(0.537)	(0.036)
C-Corp	0.015	-0.695	0.028
	(0.014)	(0.604)	(0.036)
Partnership	-0.001	-0.827	0.044
	(0.013)	(0.708)	(0.041)
Sole Prop	-0.006	-0.468	0.121***
	(0.011)	(0.524)	(0.035)
Profit/Asset	-0.0002*	0.005	-0.00009
	(0.0001)	(0.009)	(0.00006)
Debt/Asset	-0.000009	0.026**	0.001**
	(0.0001)	(0.011)	(0.001)
Urban	0.006	-0.740**	0.033**
	(0.005)	(0.324)	(0.015)
Manufacturing	0.009	0.299	0.038*
	(0.008)	(0.460)	(0.021)
Services	-0.015***	0.296	0.029**
	(0.005)	(0.249)	(0.013)
Observations	12,205	1,783	12,205
R-squared		0.063	

Robust standard errors in parentheses
* significant at 10%; **significant at 5%; *** significant at 1%

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.

Table 7
Other Types of Financing

	Prob(Owner Equity)	Prob(Angel Investors)	Prob(Venture Capital) (in thousandths)
Cum.Bankruptcy	-0.020	0.009	0.407**
	(0.014)	(0.017)	(0.668)
Cum.Delinquency	0.053***	0.015***	0.015
	(0.008)	(0.005)	(0.054)
Male	-0.012*	-0.001	0.106**
	(0.006)	(0.003)	(0.123)
Age	-0.0004	-0.0001	0.001
	(0.0003)	(0.0001)	(0.002)
College	0.020***	0.009***	0.076
	(0.006)	(0.003)	(0.083)
Black	-0.002	-0.008***	0.063
	(0.008)	(0.002)	(0.201)
Asian	-0.020**	0.0001	0.057
	(0.009)	(0.005)	(0.198)
Hispanic	-0.016*	0.009	-0.057
	(0.009)	(0.009)	(0.198)
Firm Age	-0.001***	-0.00004	-0.012**
	(0.0003)	(0.0001)	(0.011)
SmallFrm20	-0.011	-0.00009	-.733***
	(0.010)	(0.002)	(0.978)
SmallFrm50	-0.019**	0.001	-0.027
	(0.009)	(0.003)	(0.069)
S-Corp	-0.031**	0.022**	(pp)
	(0.013)	(0.008)	
C-Corp	-0.028**	0.016*	(pp)
	(0.013)	(0.008)	
Partnership	-0.004	(pp)	(pp)
	(0.018)		
Sole Prop	-0.031*	(pp)	(pp)
	(0.016)		
Profit/Asset	-0.0002*	-0.00005**	-0.003
	(0.0001)	(0.00002)	(0.009)
Debt/Asset	-0.0002	-0.0005	-0.013
	(0.0002)	(0.0003)	(0.022)
Urban	0.011*	-0.0005	0.111***
	(0.007)	(0.003)	(0.110)
Manufacturing	0.004	-0.001	0.087
	(0.010)	(0.004)	(0.183)
Services	-0.015**	-0.002	0.028
	(0.006)	(0.002)	(0.083)
Observations	12,205	7,330	1,737

Robust standard errors in parentheses
* significant at 10%; **significant at 5%; *** significant at 1%

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 Asian-owned business or 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.

Table 8
Testing Robustness with Controls for Loan Characteristics

	Interest Rate	Interest Rate	Interest Rate	Interest Rate
Cum.Bankruptcy	1.055***	1.144***	1.137***	1.164***
	(0.379)	(0.373)	(0.372)	(0.371)
Cum.Delinquency	0.120	0.154	0.172*	0.185*
	(0.100)	(0.098)	(0.098)	(0.098)
Loan Amount	-0.753***	-0.712***	-0.725***	-0.650**
	(0.264)	(0.254)	(0.254)	(0.254)
Loan Pay Period		-0.002***	-0.002***	-0.002**
		(0.001)	(0.001)	(0.001)
Loan Guarantor			-0.254***	-0.242***
			(0.085)	(0.085)
Loan Collateral				-0.401***
				(0.086)
Male	0.210**	0.145	0.140	0.131
	(0.100)	(0.099)	(0.099)	(0.099)
Age	-0.014***	-0.011**	-0.011**	-0.011**
	(0.005)	(0.005)	(0.005)	(0.005)
College	-0.430***	-0.373***	-0.360***	-0.366***
	(0.086)	(0.085)	(0.085)	(0.084)
Black	1.552***	1.635***	1.624***	1.572***
	(0.288)	(0.284)	(0.284)	(0.283)
Asian	0.097	0.037	0.020	-0.011
	(0.230)	(0.231)	(0.231)	(0.231)
Hispanic	1.097***	0.797***	0.772***	0.757***
	(0.212)	(0.217)	(0.217)	(0.216)
Firm Age	-0.016***	-0.016***	-0.017***	-0.017***
	(0.004)	(0.004)	(0.004)	(0.004)
SmallFrm20	0.646***	0.624***	0.615***	0.596***
	(0.170)	(0.166)	(0.166)	(0.165)
SmallFrm50	0.302	0.334*	0.345*	0.349*
	(0.205)	(0.200)	(0.200)	(0.199)
S-Corp	0.125	0.059	0.054	-0.009
	(0.224)	(0.221)	(0.221)	(0.221)
C-Corp	0.106	0.033	0.022	-0.043
	(0.229)	(0.227)	(0.227)	(0.226)
Partnership	0.636**	0.558**	0.518*	0.384
	(0.270)	(0.267)	(0.267)	(0.268)
Sole Prop	0.805***	0.722***	0.642***	0.571**
	(0.226)	(0.224)	(0.225)	(0.225)
Profit/Asset	-0.0004*	-0.0003	-0.0003	-0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Debt/Asset	0.016	0.012	0.012	0.011
	(0.010)	(0.010)	(0.010)	(0.010)
Urban	0.007	0.025	0.030	0.032
	(0.096)	(0.094)	(0.094)	(0.094)
Manufacturing	0.311**	0.355**	0.339**	0.341**
	(0.144)	(0.141)	(0.141)	(0.141)
Services	0.422***	0.380***	0.377***	0.358***
	(0.091)	(0.090)	(0.090)	(0.090)
Observations	4,172	4,025	4,025	4,025
R-squared	0.249	0.260	0.262	0.266

Note.- All specifications include region dummies and time dummies.

Table 9
Testing Robustness with Controls for Financing Institution and Owner Net Worth

	Interest Rate	Interest Rate
Cum.Bankruptcy	1.174***	2.568***
	(0.371)	(0.631)
Cum.Delinquency	0.190*	0.135
	(0.098)	(0.136)
Home Equity		-0.199*
(in millionths)		(0.112)
Net Worth		-0.012
(in millionths)		(0.009)
Bank	0.359	0.283
	(0.434)	(0.502)
Finance Co	1.644***	0.827
	(0.530)	(0.614)
Family Firm	0.836	-1.220
	(0.802)	(1.030)
Government	1.528	1.406
	(1.843)	(1.971)
Loan Amount	-0.667***	-0.752*
	(0.254)	(0.418)
Loan Repay Period	-0.001**	-0.001
	(0.001)	(0.001)
Loan Guarantor	-0.241***	-0.193*
	(0.085)	(0.117)
Loan Collateral	-0.411***	-0.567***
	(0.086)	(0.117)
Male	0.139	0.069
	(0.099)	(0.140)
Age	-0.012***	-0.007
	(0.005)	(0.006)
College	-0.355***	-0.275**
	(0.084)	(0.117)
Black	1.532***	2.335***
	(0.283)	(0.401)
Asian	-0.028	0.117
	(0.230)	(0.319)
Hispanic	0.755***	0.888***
	(0.216)	(0.304)
Firm Age	-0.016***	-0.020***
	(0.004)	(0.006)
SmallFrm20	0.595***	0.746***
	(0.165)	(0.261)
SmallFrm50	0.339*	0.356
	(0.199)	(0.301)
S-Corp	-0.026	-0.038
	(0.221)	(0.252)
C-Corp	-0.068	-0.036
	(0.226)	(0.263)
Partnership	0.353	0.203
	(0.268)	(0.342)
Sole Prop	0.551**	0.455*
	(0.225)	(0.262)
Profit/Asset	-0.0003	-0.00001
	(0.0002)	(0.0002)

Debt/Asset	0.012	0.0004
	(0.010)	(0.011)
Urban	0.028	0.198
	(0.094)	(0.133)
Manufacturing	0.343**	0.466**
	(0.141)	(0.195)
Services	0.347***	0.363***
	(0.090)	(0.123)
Constant	8.994***	6.425***
	(0.568)	(0.693)
Observations	4,025	2,198
R-squared	0.269	0.302

Standard errors in parentheses
* significant at 10%; **significant at 5%; *** significant at 1%

Note.-All specifications include region and time dummies.

Figure 3: Distribution of Interest Rates Across Businesses With and Without a Prior Bankruptcy

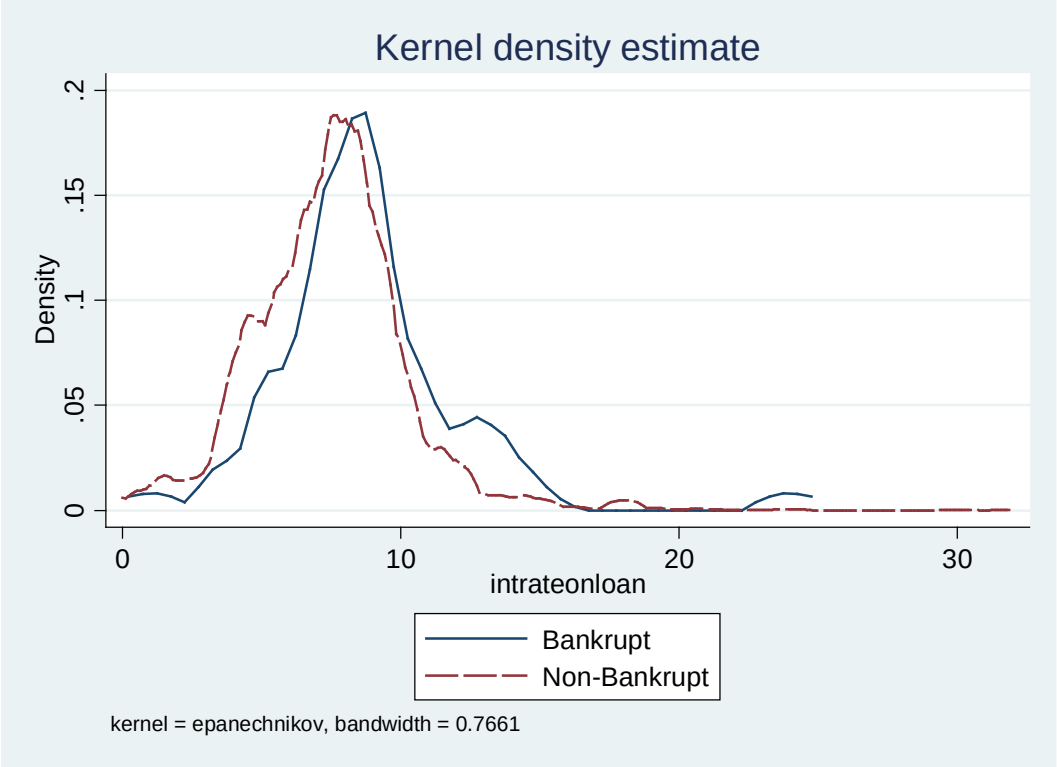

Figure 4: Distribution of Interest Rates Across Businesses With and Without a Prior Delinquency