PERSONAL BANKRUPTCY AND
CREDIT SUPPLY AND DEMAND

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ABSTRACT

This paper examines how personal bankruptcy and bankruptcy exemptions affect the supply

and demand for credit. While generous state-level bankruptcy exemptions are probably viewed by

most policymakers as benefitting less-well-off borrowers, our results using data from the 1983

Survey of Consumer Finances suggest they increase the amount of credit held by high-asset

households and reduce the availability and amount of credit to low-asset households, conditioning

on observable characteristics. We also find evidence that interest rates on automobile loans for low-

asset households are higher in high exemption states. Thus, bankruptcy exemptions redistribute

credit toward borrowers with high assets.

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Over the last decade, increasing numbers of individuals and married couples have filed for personal bankruptcy in the United States. In 1983 (the year of our data set), there were 313,000 personal bankruptcy filings. An upper bound estimate of the resulting loss to creditors that year was about $12.5 billion (1983) dollars.[1] Since 1983, the number of personal bankruptcy filings per year has risen steadily and it peaked in 1992 at 900,000. In total over the decade 1983-1992, about 5,300,000 individuals or married couples filed for bankruptcy, which implies that nearly 6 percent of U. S. households experienced a personal bankruptcy filing during this period.[2]

Households that file for personal bankruptcy under Chapter 7 of the United States Bankruptcy Code are required to give up any assets that exceed the applicable, state-specific exemption levels, but are not required to devote any of their future income to debt repayment. In return for giving up non-exempt assets, they receive a discharge from most types of debt. Thus, even households with both high income and high assets can avoid repaying their debts in bankruptcy as long as their assets are below the applicable exemption level. Debtors can often increase their financial benefit from bankruptcy by shifting assets from non-exempt to exempt categories before filing.

Personal bankruptcy law became much more favorable to debtors following the passage of the Bankruptcy Reform Act of 1978 (BRA78). Prior to 1978, bankruptcy exemptions were specified by the states and tended to be very low. The Commission on the Bankruptcy Laws of the United States

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[1]This figure equals the number of personal bankruptcy filings in 1983 times the mean debt level in Sullivan, Warren and Westbrook's [1989, p. 64] sample of personal bankruptcy filings, which was $38,000 in 1981 dollars or $41,600 in 1983 dollars. The estimate is an upper bound because it assumes that no debt is repaid in bankruptcy. In practice about one percent is repaid in bankruptcy [White, 1987; Sullivan, Warren and Westbrook, 1989, Chapter 12].

[2]The figure of 5,300,000 is overstated to the extent that debtors have made repeat bankruptcy filings. According to Sullivan, Warren and Westbrook [1989], the repeat rate is about 8 percent. Since 1992, the number of bankruptcy filings has fallen slightly. Data on number of personal bankruptcy filings and number of U. S. households are taken from *Statistical Abstract of the U. S. 1994*, tables 865 and 65.

[1973] argued that a high and uniform bankruptcy exemption would be beneficial to less-well-off households. The argument was that with the rise of the consumer credit industry and its aggressive advertising and sales techniques, households tended to accumulate substantial debt but little savings, and therefore were vulnerable to unexpected events such as illness, layoff, or wives quitting work due to pregnancy. Given harsh collection practices by creditors, debtor households often found it difficult to recover from these setbacks and would suffer further adverse consequences such as ill health, family strain, divorce, and job loss, unless a generous exemption in bankruptcy left them with adequate assets for a "fresh start." Thus the Commission advocated the adoption of a high and uniform Federal bankruptcy exemption on the grounds that it would help households whose financial situation was marginal before bankruptcy and who would otherwise have difficulty recovering from financial setbacks.

While the House adopted the Commission's populist view, the Senate preferred to continue allowing the states to set their own bankruptcy exemptions.[3] In a compromise, the BRA78 specified a uniform bankruptcy exemption of $7,500 for equity in "homesteads" (owner-occupied principal residences) and $4,000 for non-homestead property, with the exemption values doubled when married couples filed for bankruptcy. However, the Act permitted states to opt out of the Federal exemption by adopting their own bankruptcy exemptions. By 1983, all states had done so, although 12 allowed debtors to choose between the state and the Federal bankruptcy exemptions. Many states raised their bankruptcy exemptions when they passed opt-out legislation, but they adopted widely varying exemption levels.[4] At the two extremes, Iowa's exemption as of 1983 was $500 for homestead equity and $5,000 for non-homestead property, while Texas' exemption was unlimited for homestead equity

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[3]Commission on the Bankruptcy Laws of the United States [1973] and House of Representatives Report [1977].

[4]See Duncan [1981] for discussion of the legislative history of the Bankruptcy Reform Act and of the opt-out legislation adopted by Nebraska.

and $30,000 for non-homestead property (see below).

Because U. S. households tend to have few financial assets and are not required to use their incomes to repay debt in bankruptcy, more households could benefit financially by filing for bankruptcy than actually file.[5] In addition, Congress recently made filing for bankruptcy even more attractive by doubling the Federal bankruptcy exemption.[6] This suggests that in the future, the practice of filing for personal bankruptcy could become much more common as households become increasingly knowledgeable about the bankruptcy system. But despite the importance of personal bankruptcy, the subject has been almost completely neglected by economists.

In this paper we begin to address the issue of how personal bankruptcy and the bankruptcy exemption affect credit markets. Bankruptcy exemptions are likely to affect both the supply and demand for credit. As the bankruptcy exemption rises, debtors are more likely to file for bankruptcy and repay less in bankruptcy, holding other factors constant. Also the bankruptcy exemption provides partial wealth insurance and the higher the exemption level, the greater the insurance coverage. Even when lenders raise interest rates to offset increases in the exemption level, greater wealth insurance makes risk averse debtors better off and causes their demand for credit to rise. But higher bankruptcy exemptions also reduce the amount that creditors receive in repayment of debt and may make them more likely to refuse to lend in the first place. Thus, higher bankruptcy exemptions are predicted to reduce credit supply. We estimate a model of the effect of bankruptcy exemptions on credit supply and demand, using data from the 1983 *Survey of Consumer Finances* and information on bankruptcy exemptions in each state.

We find that state personal bankruptcy exemptions have a significant, positive effect on the

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[5]White and Petropolous [1996] estimate that between 15 and 50 percent of U. S. households would benefit financially from filing for bankruptcy as of 1992, with the range depending on what strategies households are assumed to pursue before filing in order to increase their financial benefit from bankruptcy.

[6]This provision was part of the Bankruptcy Reform Act of 1994.

probability that households will be turned down for credit or discouraged from borrowing. We also find that the amount of debt held by households in the top half of the asset distribution is positively related to state bankruptcy exemptions, suggesting that high-asset households have higher demand for credit in high-exemption states. Households with large amounts of assets have the most to gain from generous bankruptcy exemptions, hence it is these households for whom we would expect demand effects to be greatest. This result is reversed for households in the lowest quartile of the asset distribution, where the amount of debt held is negatively related to the level of the bankruptcy exemption. For these households, supply effects appear to dominate and lenders either deny credit completely or loan smaller amounts. This raises the possibility that low-income households in states with high exemptions receive less credit than otherwise equivalent borrowers in states with low exemptions. We also present evidence that interest rates on automobile loans are higher for low-asset households in states with higher bankruptcy exemptions than they are in states with low exemptions. Thus, while generous state-level bankruptcy exemptions are probably viewed by most policymakers as benefitting less-well-off borrowers, our results suggest they increase the amount of credit held by high-asset households and reduce the availability of credit to low-asset households, *i.e.*, they redistribute credit toward borrowers with high assets.

I. Background Literature

Previous empirical papers on personal bankruptcy have focussed on the effect of the BRA78 on the number of filings over time. Shepard [1984], Peterson and Aoki [1984], and Boyes and Faith [1986] find evidence that the BRA78 increased the number of bankruptcy filings relative to what would be predicted based on time series patterns prior to 1978, but Domowitz and Eovaldi [1993] find that the BRA78 had no effect. Boyes and Faith also suggest that risky borrowers may have been excluded from the credit market by BRA78. White [1987] found that the number of Chapter 7 bankruptcy filings in 1981 was positively and significantly correlated with the level of the state

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bankruptcy exemption.[7]

There is a large theoretical literature on credit markets with asymmetric information that explores

when credit rationing occurs, how it is reduced by borrowers pledging collateral, and whether low-risk

or high-risk borrowers are affected when credit rationing occurs.[8] Because these models assume that

borrowers are corporations rather than individuals, they do not consider the role of bankruptcy

exemptions on credit markets because there is no equivalent of the bankruptcy exemption for

corporations in bankruptcy.[9]

II. Legal and Institutional Background

When debtors file under Chapter 7 of the U. S. Bankruptcy Code, they receive a discharge from

unsecured debt in return for giving up assets in excess of the relevant state's bankruptcy exemption.

Several provisions of the Bankruptcy Code prevent debtors from waiving their right to benefit from

the Chapter 7 bankruptcy exemption and hence make it impossible to use private contracts as a means

of voiding statutory bankruptcy exemptions. Creditors may not enforce claims against debtors' assets

if the assets are covered by the Chapter 7 bankruptcy exemption. This provision prevents creditors

from taking a blanket security interest in all of debtors' possessions.[10] Creditors can only enforce

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[7]Also see Luckett [1988] for an overview of economic aspects of personal bankruptcy; Sullivan, Warren, and Westbrook [1989] for discussion of the characteristics of a sample of bankruptcy filers from the early 1980s; and White [1991] for discussion of sociological versus economic approaches to bankruptcy. Paxson [1986], using a sample of households from 1951, 1957, 1962, and 1967, provides evidence that state laws such as interest rate ceilings can affect credit market behavior, but she does not examine bankruptcy provisions.

[8]See Bester [1985, 1994], Besanko and Thakor [1987], and Boot, Thakor and Udell [1991].

[9]Another strand of the literature on credit markets with asymmetric information derives from Stiglitz and Weiss [1981]. In their model, lenders cannot observe the riskiness of the investment project that borrowers engage in. They show that changes in the interest rate alter the riskiness of the pool of borrowers, which causes lenders to deny loans to some borrowers and to charge less than the market clearing interest rate. Mankiw [1986] explores a similar model of the student loan market and emphasizes that a small increase in lenders' opportunity cost of funds may cause the loan market to collapse.

[10]11 U.S.C. §§ 522(e) and (f).

secured claims against debtors' assets if creditors provided the money to finance a particular asset's purchase. (See below for further discussion of Chapter 7 bankruptcy exemptions).

There is a second U. S. personal bankruptcy procedure, Chapter 13 of the U. S. Bankruptcy Code, and debtors may not waive their right to choose between Chapters 7 and 13.[11] Under Chapter 13 bankruptcy, debtors are not obliged to give up any assets, but they must propose a plan to repay a portion of their debts from future income over several years. Debtors have an incentive to choose Chapter 7 rather than Chapter 13 whenever their assets are less than the bankruptcy exemption, since doing so allows them to avoid repaying debt from either assets or future income. Because many states' exemption levels are high relative to the assets of typical households that file for bankruptcy, around 70 percent of all personal bankruptcy filings occur under Chapter 7 [White 1987]. Even when households file under Chapter 13, the amount that they are willing to repay is strongly affected by the Chapter 7 bankruptcy exemption. For example, suppose a household with assets of $20,000 living in a state whose exemption level is $10,000 considers filing for bankruptcy. Because the household would have to give up $10,000 in assets if it filed under Chapter 7, it would be willing to pay creditors no more than $10,000 (in present value) from future income if it filed under Chapter 13. As a result of this close relationship between Chapter 7 and Chapter 13 bankruptcy filings, we ignore the distinction between them.[12]

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[11] 11 U.S.C. § 706(a) provides that cases filed under Chapter 7 may not be converted to Chapter 13 unless the debtor requests such a conversion. In 1986, an amendment to the Bankruptcy Code (11 U.S.C. § 707(b)) was adopted that allows bankruptcy judges to dismiss Chapter 7 personal bankruptcy filings if discharge of debt would be a "substantial abuse" of Chapter 7. However this provision was not in effect during 1983, the year of our data set, and in any case has rarely been used.

[12] Other reasons why debtors might choose to file for bankruptcy under Chapter 13 are that certain types of debts, such as those incurred by fraud, are dischargeable only under Chapter 13. In some Bankruptcy Courts, judges encourage debtors to file under Chapter 13 and this leads to many plans being filed that call for only token repayment of debt. Another reason that debtors sometimes file under Chapter 13 is that they have filed under Chapter 7 within the past few years. Debtors who file under Chapter 7 are barred from filing again for 6 years, but there is no limit on the number of filings allowed under Chapter 13. See Elias, Renauer, and Leonard [1993].

Household debt can be divided into secured and unsecured loans. Secured loans include mortgages, home equity lines of credit and automobile loans. These loans allow lenders the right to foreclose on the house or repossess the automobile if the debtor defaults, regardless of whether the debtor files for bankruptcy. Unsecured loans include credit card and other consumer loans. When debtors file for bankruptcy, they are only obligated to repay unsecured loans if they have assets that exceed the exemption level and are not subject to creditors' liens.

Unsecured loans would seem more likely to be affected by bankruptcy exemptions than secured loans. In practice, however, the distinction is blurred and households are often able to arbitrage assets and debts across categories and thereby increase their financial benefit from bankruptcy. For example, debtors might borrow on their credit cards or obtain new consumer loans in order to reduce their mortgage debt. These transactions convert non-dischargeable secured debt into unsecured debt that is dischargeable in bankruptcy. Or debtors might sell personal property that is in excess of the personal property exemption and use the proceeds to reduce their mortgages or to buy exempt property.[13] In addition, bankruptcy undermines the value of collateral to lenders, since lenders may be delayed in repossessing it or may be unable to repossess it at all. Lenders also incur extra legal costs because they must obtain the permission of the bankruptcy trustee in order to repossess collateral. For these reasons we examine the effects of bankruptcy exemptions on total debt, rather than distinguishing between secured and unsecured debt.

While debtors may arbitrage assets and debts across categories, in the empirical work that follows, we assume that debtors do not make interstate moves before filing for bankruptcy. For typical debtors contemplating bankruptcy, the cost of such moves are prohibitive, since moving usually

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[13]Debtors may have to wait 90 days before filing for bankruptcy if they use these strategies, since the transfers may otherwise be considered "preferences" that the bankruptcy trustee can set aside. 11 U.S.C. §§ 547(b),(c)(7). Debtors may also conceal assets or transfer them to relatives, but if discovered, there is a small risk their bankruptcy filings may be dismissed on grounds of fraud.

requires paying a moving company in cash and making a cash deposit to a new landlord, in addition to leaving friends and family and finding a new job. For affluent debtors, these costs are less prohibitive and there have been some well-publicized cases of debtors moving to states that have unlimited homestead exemptions.[14] But the practice is uncommon because of transactions costs and the fact that Bankruptcy Courts have occasionally dismissed bankruptcy filings by debtors who used this strategy [Elias, Renauer, and Leonard 1993, p. 2/21].

IV. Empirical Hypotheses

Suppose in period 1 consumers borrow some amount B at interest rate r. Consumers' period 2 wealth, denoted W_2, is unknown as of period 1 but is distributed according to the distribution $f(W_2)$. The overall bankruptcy exemption in the borrower's state of residence is denoted E, where we assume that assets are fungible across categories. In period 2, the loans come due, consumers learn their period 2 wealth, and they must decide whether to repay the debt in full or default and file for personal bankruptcy. If consumers file for bankruptcy, their obligation to repay the loan depends on their wealth. They are obliged to repay nothing if $W_2 \le E$ and to repay an amount $W_2 - E$ if

$E < W_2 \le E + B(1+r)$. If wealth W_2 exceeds $E + B(1+r)$, then consumers must repay their debts in full and cannot benefit by filing for bankruptcy. Borrowers therefore benefit financially from filing for bankruptcy whenever their wealth W_2 turns out to be below $E + B(1+r)$.[15]

Borrowers' period 2 wealth distribution can be divided into three regions of no repayment (a),

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[14]For example, Martin Siegel, an investment banker, purchased a $3.25 million dollar home in Florida when investors filed a civil lawsuit against him demanding $2.75 million in damages. See "Rich Debtors Finding Shelter Under a Populist Florida Law," *New York Times*, July 25, 1993.

[15]Wealth W_2 and the distribution of wealth $f(W_2)$ are assumed to be measured after debtors have pursued any strategies that they use to conceal or reduce their wealth before filing for bankruptcy (moral hazard).

partial repayment (*b*), and full repayment (*c*), as shown in figure I. The level of the bankruptcy exemption affects the sizes of the three repayment regions. A higher exemption causes the boundaries between regions (*a*) and (*b*) and regions (*b*) and (*c*) to shift to the right. Thus, as E rises, the probability that debtors file for bankruptcy and repay nothing rises and the probability that they avoid bankruptcy and repay in full falls. Also, debtors repay an amount W_2-E if their period 2 wealth falls into region (*b*), so that they repay less as E rises.

If the exemption rises, lenders will raise the interest rate. Suppose the interest rate rises enough that expected repayments remain the same. Bankruptcy provides borrowers with partial wealth insurance. If borrowers are risk averse, an increase in the exemption raises expected utility because the amount of insurance has increased. When borrowers' period 2 wealth falls into region (*b*), the exemption increase raises their wealth, which makes them better off. When borrowers fall into region (*c*), the increase in the interest rate that offsets the exemption increase lowers their wealth, which makes them worse off. But these changes make borrowers better off ex-ante, since the wealth increase occurs when their marginal utility of wealth is high and the wealth decrease occurs when their marginal utility of wealth is low. Thus a higher exemption level in bankruptcy makes risk averse borrowers better off, which increases their demand for loans. The hypothesis that demand for loans rises with the bankruptcy exemption is examined below.[16]

An increase in the interest rate that fully offsets the increase in the default rate when the exemption level rises must leave lenders equally well off. In this case, the supply of loans would be unaffected as long as lenders are risk neutral. But if borrowers are heterogeneous, it may become

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[16]Creditors may not be able to raise interest rates enough to offset the effect of the increase in the bankruptcy exemption. In this case they may stop lending completely or, if they can distinguish among borrowers, ration loans to the least credit-worthy. Rea [1984] and Dye [1986] discuss the insurance effect of bankruptcy exemptions.

worthwhile for lenders to adjust the supply of credit in response to changes in the exemption level.

As an example, suppose some borrowers are opportunists, while others are not. Assume that it is too costly for lenders to attempt to distinguish between types when borrowers apply for loans. Opportunistic borrowers file for bankruptcy whenever their period 2 wealth falls into regions (a) or (b) in figure I. In contrast, non-opportunistic borrowers file for bankruptcy only if illness or job loss occurs and their period 2 wealth falls into regions (a) and (b). A rise in the bankruptcy exemption, therefore, increases the probability that opportunistic debtors will file for bankruptcy by more than it increases the probability that non-opportunistic debtors file for bankruptcy.[17] The increase in the exemption level may make it worthwhile for lenders to invest in efforts to identify opportunistic borrowers in advance. Thus, as the exemption level rises, lenders may devote more resources to checking potential borrowers' credit histories and, as a result, they may be more likely to turn down loan applicants. The hypothesis that otherwise similar borrowers are more likely to be turned down for credit in states with higher exemption levels is also examined below. In addition, increased losses from opportunistic behavior by borrowers in high exemption states may cause lenders to reduce the amount they lend or charge higher interest rates to otherwise similar borrowers in these states. We cannot directly identify credit demand and supply, but we examine whether the negative effect of a high exemption on the supply of credit is larger or smaller than the positive effect of a high exemption on the demand for credit. We also examine whether lenders charge higher interest rates in high-exemption states.

V. Data, Identification, and Descriptive Evidence

We use data from the 1983 Survey of Consumer Finances (SCF) to examine the empirical

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[17]For simplicity we assume that the probability of illness or job loss occurring is less than perfectly correlated with the period 2 wealth distribution.

hypotheses.[18] For a sample of 3,706 households, the SCF gives detailed information on the types and amounts of credit held by households, their assets, sources of income, demographic characteristics, credit market experience, and state of residence.[19]

We supplement the 1983 SCF with information on states' bankruptcy exemptions in 1983. Most states have separate exemptions for equity in homesteads, equity in motor vehicles, personal property, tools of the trade, the cash value of life insurance and pensions, household goods and clothing, and a miscellaneous ("wildcard") category. Some states allow debtors to choose between the state's exemption and the (uniform) Federal exemption, while the rest require that the state's exemptions be used. Some states also allow married couples who file for bankruptcy to double the exemptions. Table I lists the homestead exemption and the combined value of the personal property, tools of the trade, automobile and wildcard exemptions in each state in 1983.[20] The table also indicates whether each state allows its residents to use the Federal bankruptcy exemption (listed at the end of the table) and whether the state allows married couples to double the exemption.

The exemption values vary widely across states and there appears to be no strong geographic pattern.[21] Seven states have unlimited homestead exemptions, while three states and the District of Columbia have zero homestead exemptions (although they allow their residents to use the Federal

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[18]See Avery and Elliehausen [1988] for details about the data and Juster and Kuester [1991]; Curtin, Juster, and Morgan [1989]; and Avery, Elliehausen, and Kennickell [1988] for a discussion of the 1983 SCF's good data quality.

[19]Later SCFs do not identify state of residence, so we are unable to use them for this paper. The 1983 SCF includes data on a subsample of high-income households, but because state of residence is not provided for this group, we drop these households.

[20]We exclude the pension and life insurance exemptions because in many cases they involve specific conditions, such as requiring that the insurance only benefit dependents. We also exclude the exemption for household goods and clothing since it is generally not subject to a dollar limitation.

[21]Exemptions change infrequently, which increases our confidence in treating the cross-state variation in exemptions as exogenous to credit market behavior.

exemptions). The combined value of non-homestead exemptions range from $0 in Connecticut to $30,000 in Texas and is unlimited in two states.

For each household in the SCF, we compute a value for the homestead plus non-homestead exemptions in bankruptcy. Because assets are fungible, for the empirical work below we combine exemptions.[22] The overall exemption is assumed to be unlimited if either the homestead or non-homestead exemption in the relevant state is unlimited. If the state allows its residents to choose between the state or the Federal exemption, then households are assumed to choose whichever exemption is greater. We also double the exemption if the SCF household is married and the relevant state allows doubling for married couples.

The SCF contains a set of questions that ask whether respondents have been turned down for credit in the three years prior to the survey or whether they were discouraged from applying to borrow because they thought they would be turned down. While it is common in the literature to interpret these questions as indicating that a borrower is credit constrained (see, for example, Jappelli [1990]), people could, in principal, be turned down because they asked for inappropriately large amounts of credit. Cox and Jappelli [1993] and Duca and Rosenthal [1993], however, show that the observed level of credit for SCF households who were turned down or discouraged from borrowing is roughly $10,000 lower on average than would be predicted, where the predictions come from a selection model of credit demand estimated using the characteristics of the sub-sample of households who were not turned down or discouraged from borrowing. This result supports the idea that SCF households who were turned down or discouraged from borrowing are in fact constrained by credit supply (also see Perraudin and Sorensen [1992]). These questions allow us to examine the empirical hypothesis that borrowers in high-exemption states are more likely to be turned down for loans than observationally

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[22]Elias, Renauer, and Leonard [1993, p. 2/20] gives this advice on asset substitution: "If you have an asset that is not exempt, you may want to sell it before you file for bankruptcy. You can use the proceeds to buy exempt property."

equivalent borrowers in low-exemption states.

For households that are not supply constrained, observed levels of credit reflect some mix of supply factors, which should decrease the amount of credit made available to borrowers in high-exemption states, and demand factors, which should increase the amount of credit held by borrowers in high-exemption states. Thus, an increase in the bankruptcy exemption will have an ambiguous *a priori* effect on the amount of debt held by unconstrained households. However, if we observe that unconstrained households in high-exemption states hold more debt than households in low-exemption states, controlling for other characteristics, then we can infer that higher bankruptcy exemptions stimulate demand for credit. Thus, the SCF data on debt held by households can be used to make inferences about the effects of bankruptcy exemptions on demand for credit. Additionally, this discussion implies that credit should be more expensive in states with high exemptions.

Two figures help illustrate our hypotheses. Figure II plots the probability of being turned down for credit or discouraged from borrowing after we split the sample into bankruptcy exemption quartiles and asset quartiles.[23] Households with "low" exemptions are in the bottom quartile of the combined exemption distribution. Households with "unlimited" exemptions are located in states that have either an unlimited homestead exemption or an unlimited non-homestead exemption. In each of the asset quartiles, households in unlimited-exemption states are more likely to be turned down for credit than are households in low-exemption states. The increased probability of being turned down or

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[23]The combined bankruptcy variable is discrete, hence the "quartiles" include uneven shares of the population. The first quartile (up to $12,700) includes 27.1 percent of the population, the second (up to $25,400) includes 31.5 percent and the third (up to $70,400) includes 22.7 percent of the population. The remaining households live in states with unlimited exemptions (the top quartile, equalling 18.7 percent of the population). We refer to this breakdown as quartiles throughout the rest of the paper. The results are not sensitive to alternative, sensible specifications of the exemption variable.

Total assets are composed of financial and real assets. Financial assets are the sum of checking accounts, money market accounts, saving accounts, IRAs and Keoghs, CD's, saving bonds, bonds, stocks, mutual funds, and trust accounts. Real assets are net equity in the home plus net equity in other assets such as cars and art work. The quartile breakpoints for the total asset distribution are $7,855, $48,535, and $109,637.

discouraged from borrowing in a unlimited-exemption state ranges from 1.2 percentage points in the bottom quartile of the asset distribution to 8.7 percentage points (or 54 percent) in the second quartile.

The effect of the bankruptcy exemption on households' demand for credit should depend nonlinearly on assets. To illustrate, suppose the bankruptcy exemption in a state increases to $40,000 from $30,000. This change should increase the demand for credit by a household having $35,000 in assets, since the increase in the exemption level lowers the household's expected cost of borrowing, but it would have little or no effect on the demand for credit by a household having $10,000 in assets. In the extreme case of households that will never have assets, the bankruptcy exemption will not affect demand for credit because there is (and will be) nothing for these households to shelter in bankruptcy.

Figure III graphs median total debt against quartiles of the distribution of total assets and the bankruptcy exemption. The figure shows the importance of accounting for potential nonlinearities in the asset-exemption relationship. For households in the bottom half of the asset distribution, median holdings of debt change little across exemption levels. For households in the top half of the asset distribution, median holdings of debt generally increase with the size of the exemption (although the relationship is not monotonic).

The figures display patterns that are consistent with the empirical hypotheses. The probability of being turned down for credit or discouraged from borrowing is positively related to the bankruptcy exemption within asset quartiles. Households in the top half of the asset distribution in states with high exemptions appear to have stronger demand for credit than their counterparts in states with low exemptions. We measure the size, significance, and robustness of these effects, conditioning on other characteristics, in the following section.

VI. Regression Analysis

Our first hypothesis is that the higher a state's bankruptcy exemption, the more likely that lenders turn down credit applicants or that applicants will be discouraged from borrowing. We examine this

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hypothesis using probit regression.

Probability of Being Denied Credit

The central variable of interest in the empirical model is the bankruptcy exemption. We use dummy variables to represent quartiles of the exemption distribution, with the lowest quartile being the excluded category. A number of other factors are also likely to affect the probability that a household gets turned down for credit or is discouraged from borrowing. The life-cycle hypothesis suggests that younger households are more likely to borrow than older households. Consequently we include age and age squared in the regression. Income affects households' access to credit and may affect their demand for credit, so income and income squared are included.[24] In a manner similar to income, assets affect households' access to credit and may also affect their demand, so we include the level of total assets in our analysis. We use several additional variables to proxy for tastes: family size, education of the household head, and dummy variables for whether the household head is married or is nonwhite.

There may be geographic variation across credit markets that could spuriously influence our exemption variables.[25] We include the Herfindahl index for financial institutions in the area as a crude proxy variable for the competitiveness of the local lending market, and dummy variables indicating whether branch banking was allowed state-wide and whether multi-bank holding companies were prohibited in the state. We include the county unemployment rate in 1992, a dummy variable for rural households, and three dummy variables for the region of the country (the west is the excluded category) to account for potential geographic variation in credit markets.

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[24]For example, income tends to be positively correlated with tax rates. Households with high marginal tax rates may find it profitable to borrow because the after-tax interest rate on borrowing is lower than the after-tax rate of return on investments (recall that in 1983, interest on all loans was tax-deductible).

[25]One potential source of geographic variation in credit markets might be state usury laws, but they had been abolished by 1983.

We also include additional observable characteristics that enter the credit scoring function used by financial institutions. Following Boyes, Hoffman, and Low [1989], we include the mean income of the profession of the household head (also see Cox and Jappelli [1993]) and years working at the household head's current employer.[26] Descriptive statistics for the variables used in the analyses are given in Appendix Table 1.

Table II shows the results of a probit regression examining the factors correlated with being turned down for credit or discouraged from applying to borrow. Standard errors are computed using Huber's method [StataCorp 1995] to account for potential correlation in the error terms at the state level. We find that the exemption variable for households in unlimited exemption states is positively and significantly related to the probability of being turned down for credit or discouraged from borrowing. This result is consistent with the descriptive evidence presented in Figure II. The fourth column of the table shows the effect of a marginal change in a given covariate on the probability of not receiving credit. It shows that the economic significance of the bankruptcy variable is substantial. In the sample, 17.3 percent of households were denied credit or discouraged from borrowing. The exemption variables suggest that the probability of being turned down for credit or discouraged from borrowing is 5.5 percentage points higher in states with unlimited exemptions than in states in the bottom quartile of the exemption distribution. The other two exemption dummies are not significantly different from zero, but the point estimates show a roughly 2.7 percentage point difference.[27]

As expected, the magnitude of all the estimated exemption coefficients increases if the sample is restricted to households with low assets. If we restrict the sample to households in the bottom half of

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[26]Boyes, Hoffman, and Low [1989] had access to confidential credit history information (especially credit bureau reports) when estimating their score function of being turned down for a credit card.

[27]The results are robust to a large number of alternative specifications and the inclusion of additional geographic characteristics. Dropping the regional dummies increases the magnitude of the exemption variables by roughly one percentage point, makes the second exemption dummy significant at the 7 percent level, and the others significant at all usual levels of confidence.

the asset distribution, the marginal effect for the unlimited exemption increases to 7.9 percentage points. If we restrict the sample further, to households in the bottom quarter of the asset distribution, the marginal effect increases to 10.2 percentage points. It is statistically significant in each specification. Thus, it appears that the bankruptcy exemption is strongly correlated with the probability of being turned down for credit or discouraged from borrowing, particularly for low-asset households.

The other coefficient estimates conform to intuition and previous empirical estimates (for example, Jappelli [1990]). The probability of being denied credit or discouraged from applying falls at an increasing rate with age and falls at a decreasing rate with income. The banking market variables suggest that households are less likely to be turned down for credit or discouraged from applying in more highly concentrated financial markets and states that prohibit multi-bank holding companies. All the binary covariates are interpreted as the effect of switching the variable to one from zero. The largest economic effects are that nonwhite households are 8.7 percentage points more likely to be denied credit and married households are 5.7 percentage points less likely to be denied credit, relative to baseline characteristics evaluated at the mean.

Household Debt[28]

We write households' desired level of debt, D as

$$D = X\beta_1 + \alpha_1 E + \varepsilon_1,$$

where E is the bankruptcy exemption in the household's state of residence and X denotes a vector of other factors influencing the demand for debt. We do not observe D, however, because the household may be turned down for credit or discouraged from applying and therefore the observed level of debt,

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[28]The selection model of household debt is similar to Cox and Jappelli [1993] and Duca and Rosenthal [1993]. Neither previous study examines the effect of bankruptcy exemptions on credit markets.

D^*, may be less than D. In addition, the distribution of D^* is truncated at zero. Therefore, we

define two indicator variables

$$
\begin{aligned}
I_1^d &= 1 && \textit{if } D^* = D \\
I_1^d &= 0 && \textit{otherwise}
\end{aligned}
$$

and

$$
\begin{aligned}
I_2^d &= 1 && \textit{if } D^* > 0 \\
I_2^d &= 0 && \textit{otherwise},
\end{aligned}
$$

where I_1^d distinguishes households that are not turned down or discouraged from applying for loans,

and I_2^d distinguishes households with positive observed amounts of debt. We parameterize the

indicator functions using a bivariate probit model,

$$
I_1^d = X_T \beta_T + \varepsilon_T
$$

$$
I_2^d = X_Z \beta_Z + \varepsilon_Z \,,
$$

where X_T represents a vector of factors influencing the decision of banks to deny credit to applicants,

X_Z represents a vector of factors affecting the incidence of positive debt, and ε_T and ε_Z are

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distributed bivariate normal.[29]

The empirical model of the demand for debt is

$$D^* = \beta_1^* X_1 + \alpha_1^* E + \theta_T^d \lambda_T^d + \theta_Z^d \lambda_Z^d + \eta_1$$

where, under the assumptions of normality, formulas for the two selection terms are straightforward

extensions of the usual Mill's ratio in selection models, calculated from the bivariate probit model, and η_1

is a normally distributed error term.

Because the distribution of household debt is highly skewed, we use the natural logarithm of total

household debt as the dependent variable in our primary specification. To account for potential

nonlinearities between the bankruptcy exemption and assets, we treat the combined bankruptcy

exemption as a continuous variable for states whose exemptions are not unlimited and interact this

exemption variable with asset quartile dummies, leading to four asset-exemption interaction variables

(where states with unlimited exemptions are coded as zeros). Because any specific coding of the

unlimited exemption states is arbitrary, we also add a second set of four variables that interact the

dummy variable for states with unlimited exemptions with the four asset quartile dummies. We also

include an age spline (defined in Appendix I) for the age of the household head to capture life-cycle

patterns in the use of debt, and a series of dummy variables measuring the educational attainment of

the household head (where the omitted category is no high school diploma). Otherwise the covariates

---

[29]Estimates for the bivariate probit model are given in Appendix Table II. The specification for the denied or discouraged from borrowing portion of the model is identical to Table II, with the coding of the dependent variable reversed. The covariates for having positive amounts of credit differ by dropping one of the variables included as part of the bank's credit scoring function (average income in the household head's profession) and by adding a dummy variable for "attitude toward credit." The latter variable comes from an SCF question that asks whether respondents think "it is a good idea or a bad idea for people to buy things on the installment plan." Three answers are possible: "good idea", "good in some ways, bad in others," and "bad idea." We expect households answering the question that credit is a "bad idea" are less likely to apply for credit and therefore more likely to have zero debt without ever having been turned down for credit, making this a useful exclusion restriction.

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are the same as in the probit equation for positive debt.

Table III gives estimates for the amounts of debt held by households that were not denied credit or discouraged from borrowing. As in Figure III, debt holdings are positively and significantly correlated with the bankruptcy exemption for households in the top half of the asset distribution. The effects are larger for almost all households in states with unlimited exemptions than similar households in states without unlimited exemptions. This result is consistent with the hypothesis that increases in the personal bankruptcy exemption increase demand for debt by high-asset households. The estimated coefficient on the exemption for households in the bottom quartile of the asset distribution is negative and significant, indicating that households with no or few assets hold less debt in high-exemption states than observationally equivalent borrowers in low-exemption states. The mean effects are considerably larger for households in states with unlimited exemptions. Thus, the evidence suggests that the demand effect exceeds the supply effect for high-asset households in high-exemption states, while the supply effect exceeds the demand effect for low-asset households in high-exemption states.

We find a life-cycle pattern of debt in which households under age 35 have higher levels of debt, and debt declines almost monotonically for older households. Debt increases with education, income (though at a decreasing rate), assets, being married, family size, and living in the west. Debt is negatively related to the concentration of the financial market and the number of years that the household head has worked at the current employer.

The selection term for the probability of being credit constrained is negative and significant. This result implies that unobserved factors that increase the probability of being denied credit are negatively correlated with the unobserved factors that affect credit demand. This selection result is similar to Cox and Jappelli [1993].

Selection models of the type described above impose stringent distributional assumptions on the error terms and, when violated, can generate misleading inferences [Goldberger, 1983]. To examine

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the robustness of our results, we also estimate the debt equation using median regression. This alternative specification provides a useful check for the sensitivity of our analysis to distributional assumptions and outliers.[30] The results are given in Table IV, where the dependent variable is defined as the log of total household debt (adding $1 to total household debt to avoid taking the log of zero). Standard errors are bootstrapped. The sign, size and significance of the central variables of interest – the bankruptcy exemption interacted with assets – are consistent across the two specifications.[31]

In Table V we examine the economic significance of the coefficient estimates from the double selection model of log debt. Our baseline household is defined as having the following characteristics: gross assets of $100,000 (3rd quartile), 45 years old, college degree, income of $75,000, married, family size of four, white, male head of household, living in the midwest, 10 years of job tenure, and living in an area with a county unemployment rate of 9.64 percent and a Herfindahl index of financial market concentration of 1.377. We estimate that this household would have $31,014 of debt in a state with a combined bankruptcy exemption of $6,000 (such as Maryland or West Virginia). If the household lived in a state with an exemption of $50,000 (roughly the size of California's exemption), we estimate that the household would have debt of $49,725. Other characteristics also have large effects, particularly for households in high exemptions states. Thus, state bankruptcy exemptions appear to have a substantial effect on households' debt levels.

VII. Do Interest Rates Adjust?

Creditors may respond in a number of ways to the phenomenon of bankruptcy relative to a situation where borrowers never default: raise interest rates, set higher minimum standards to qualify for loans, increase collateral requirements, or screen loan applicants more vigorously. In this section

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[30]The largest value of debt in our sample is $1,247,000.

[31]The other covariates generally retain their patterns and significance, with the exception of the age spline, assets, and several of the indicator variables.

we examine whether households who live in states with higher bankruptcy exemptions pay higher interest rates on loans than households who live in states with lower bankruptcy exemptions. Our sample is households in the 1983 SCF who purchased new or used cars during 1982 or the first quarter of 1983 and financed their purchases with loans, which gives us a homogeneous sample of loans. We further limited our sample to households who obtained their loans from commercial banks, savings and loans, or credit unions.[32] This process yields a sample of 310 households.

Because the sample consists only of households who purchased cars with credit, we estimate a standard Heckit selection model.[33] All other independent variables are defined as above, but we also include quarterly dummy variables that allow for quarterly variation in the level of interest rates. The exemption variables are defined exactly as in Tables III and IV.

Results for the interest rate model are presented in Table VI. Bankruptcy exemptions are significantly and positively related to the interest rate for households in the two lowest asset quartiles. In order to quantify the magnitude of the effects, we again use the baseline household defined in Table V, with the exception that the household owns only $30,000 in assets, which would put it in the second quartile of the asset distribution (effects are insignificant in the top two asset quartiles). In a state with a $5,000 bankruptcy exemption, this household would pay an interest rate of 17.8 percent on its car loan. In a state with a $50,000 exemption, the household would pay an interest rate of 20.1 percent, or 230 basis points higher. This 13 percent increase is well within the range of rates observed

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[32]We eliminated households who obtained credit from friends, dealers and automobile financing companies, since interest rates on these loans clearly would reflect a host of other factors. For example, a car dealer can offer a lower interest rate by adjusting the purchase price of the car.

[33]In addition to functional form, the selection model is identified using the attitudinal variable whether the household thinks that it is a "good idea" to borrow. As before, households who think it is not a good idea to borrow are less likely to be in the selected sample. The probit results are given in Appendix Table III.

in the sample during this high-interest-rate sample period.[34]

This result is consistent with the results found in previous sections of the paper. It appears that low-asset households do not demand more debt in high exemption states, because they pay higher interest rates than they would pay in low exemption states. However, high-asset households do not pay significantly higher interest rates in high-exemption states than in low-exemption states, probably because they have assets greater than the bankruptcy exemption level or they offer lenders greater collateral.[35]

VIII. Conclusions

In this paper we find a number of empirical results that are consistent with simple hypotheses about the effects of the bankruptcy exemption on credit markets. We find that the size of the relevant state's bankruptcy exemption has a statistically and economically significant, positive effect on the probability that potential borrowers in the state are denied credit or are discouraged from applying to borrow. We also find that households in the lower half of the asset distribution have less debt and face higher interest rates on car loans in states with high bankruptcy exemptions than borrowers in low-exemption states, after conditioning on observable characteristics. In contrast, households in the upper half of the asset distribution have more credit in states with high bankruptcy exemptions, suggesting that these households have higher credit demand that lenders are willing to accommodate. Thus, while generous state-level bankruptcy exemptions would probably be viewed by most

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[34]Most other variables conform to expectations. Even controlling for differences in market structure, some regional variation in interest rates remains, as households in the northeast face lower interest rates than anywhere else in country. Interest rates varied considerably even during this short time frame of 15 months, reflecting the volatility of interest rates during the 1982-1983 sample period.

[35]We also ran a similar regression for the term to maturity of loans. The thought was that loans with shorter terms to maturities would be considered "safer" by banks. Indeed, using the exact same model as before we find that high bankruptcy exemptions appear to reduce the term to maturity by about 12 months for low asset households. Again we find that car loans to high-asset households are not significantly affected by changes in exemption levels. The results are available from the authors upon request.

policymakers as benefitting less-well-off borrowers, our results suggest they increase the amount of credit held by high-asset households and reduce the availability of credit to low-asset households, *i.e.*, they redistribute credit toward borrowers with high assets.

Given the explosion in the number of personal bankruptcy filings (to roughly 900,000 in 1992, from roughly 300,000 in 1983), we suspect that the empirical magnitudes documented in this paper are conservative estimates of the current economic effects of personal bankruptcy exemption levels on credit markets. Moreover, in 1994 Congress passed the National Bankruptcy Review Commission Act, which, among other provisions, doubled the Federal personal bankruptcy exemption and, therefore, increased the number of households who would benefit financially from filing for bankruptcy. Thus, personal bankruptcy may become an even more important influence on credit markets in the future.

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Table I
State Bankruptcy Exemptions in 1983

State	Home-stead	Non-homestead	Use Fed. exemp?[a]	Doub. for spouse?[b]	Other provisions[c]
Alabama	5000	3000	no	yes	
Alaska	27000	1500	no	yes	
Arizona	50000	7600	no	no	
Arkansas	nolimit	950	no	no	
California	45000	2500	no	no	all furniture/two systems
Colorado	20000	5000	no	no	
Connecticut	0	0	yes	yes	
D.C.	0	1200	yes	yes	
Delaware	5000	75	no	no	books, clothing
Florida	nolimit	1000	no	yes	
Georgia	5000	4500	no	no	
Hawaii	20000	1000	yes	no	if over 65, $30000 homestead
Idaho	1200	4000	no	yes	
Illinois	7500	2750	no	yes	
Indiana	7500	4100	no	no	total exemption < $10000
Iowa	500	4000	no	no	
Kansas	nolimit	500	no	no	
Kentucky	5000	6000	no	no	
Louisiana	15000	nolimit	no	no	
Maine	7500	2300	no	yes	if over 60, $60000 homestead
Maryland	2500	3500	no	no	*[d]
Mass.	60000	3500	yes	no	$200 month for rent
Michigan	3500	1000	yes	no	
Minnesota	nolimit	9500	yes	no	
Mississippi	30000	8000	yes	no	business partnership exempt
Missouri	8000	3500	no	no	$1000 if mobile home
Montana	40000	200	no	no	
Nebraska	6500	5500	no	no	business partnership exempt
Nevada	90000	9000	no	no	

Table I: continued

New Hamp	5000	5500	no	no
New Jersey	0	1000	yes	no
New Mex	20000	6500	yes	yes
New York	10000	5600	no	yes
N. Carolina	7500	8500	no	no
N. Dakota	80000	10000	no	no
Ohio	5000	3700	yes	no
Oklahoma	nolimit	5000	no	no
Oregon	15000	2650	no	no	homestead $20000 for couples
Penn.	300	0	yes	no
R. Island	0	1800	yes	no
S. Carolina	5000	3750	no	no
S. Dakota	nolimit	2400	no	no
Tennessee	5000	4750	no	no	homestead $7500 for couples
Texas	nolimit	30000	yes	no	*e
Utah	8000	3000	no	no	*f
Vermont	30000	nolimit	yes	no	pers. prop. incl. all clothes and furn.
Virginia	3500	5000	no	yes
Washington	30000	6750	yes	no	homestead unlimited in some cases
W. Virginia	5000	1000	no	no
Wisconsin	25000	900	yes	no
Wyoming	10000	3000	yes	yes
Federal	7500	4000	na	yes

Source: Individual state bankruptcy codes.

[a]A "yes" means that a household may use the Federal exemptions if they are more generous.
[b]Exemptions levels are doubled for married couples.
[c]Most states also allow exemptions for automobiles and life insurance. See Elias, Renauer, and Leonard (1993) for additional detail on current exemptions.
[d]If debts only by one spouse, homestead may be exempt
[e]Car and insurance are included under the personal property exemption.
[f]Can add $2000 for a spouse and $500 per dependent to the homestead exemption.

Table II
Probability of Being Turned Down for Credit or Discouraged from Borrowing[a]

Variable	Coefficient	Std. Error	Huber T-Statistic	dF/dX
Constant	-0.100	0.241	0.41	
Second exemption quartile	0.133	0.107	1.25	0.0277[b]
Third exemption quartile	0.126	0.144	0.87	0.0264[b]
Unlimited bankruptcy exemption	0.249	0.081	3.06	0.0550[b]
Age (in 100)	0.058	0.821	0.07	0.0118
Age squared (in 10,000)	-3.052	0.986	3.10	-0.6166
Education	-0.003	0.010	0.33	-0.0007
Income (in $10,000)	-0.158	0.026	6.08	-0.0320
Income squared (in $100,000,000)	0.003	0.001	5.74	0.0006
Total assets (in $1,000,000)	-0.164	0.331	0.50	-0.0331
Married dummy	-0.272	0.075	3.62	-0.0570[b]
Family size	0.049	0.018	2.72	0.0099
Nonwhite dummy	0.375	0.091	4.13	0.0869[b]
Male dummy	0.016	0.058	0.28	0.0033[b]
Northeast dummy	-0.033	0.114	0.29	-0.0065[b]
Midwest dummy	-0.171	0.135	1.26	-0.0330[b]
South dummy	-0.011	0.128	0.08	-0.0021[b]
Rural dummy	-0.137	0.072	1.92	-0.0273[b]
Average income of household's profession (in $10,000)	0.013	0.019	0.69	0.0027
Herfindahl index for financial institutions in the area (in 1,000)	-0.092	0.026	3.51	-0.0186
Years working at current employer	-0.019	0.006	3.21	-0.0038
State-wide branch banking	0.068	0.061	1.12	0.0139[b]
No multi-bank holding companies in state	-0.176	0.079	2.23	-0.0330[b]
County unemployment rate in 1982 x 10	0.002	0.001	3.09	0.0005

Pseudo R^2 = .1880

[a]In the sample 642 households out of 3,706 report being turned down or discouraged from borrowing.
[b]Simulated derivative (evaluated at the means of the independent variables) is for a discrete change of the dummy variable from 0 to 1

Table III
Double Selection Model of Log Debt, Estimated with the Unconstrained Sample with Positive Debt.

Variable	Coefficient	Std. Error	T-Statistic
Constant	6.465	1.487	4.35
Combined bankruptcy exemption (in $10,000) x dummy variable for first quartile of the total asset distribution	-0.534	0.047	11.39
Bankruptcy exemption x 2nd asset quartile dummy	-0.223	0.041	5.43
Bankruptcy exemption x 3rd asset quartile dummy	0.084	0.038	2.22
Bankruptcy exemption x 4th asset quartile dummy	0.156	0.040	3.93
Unlimited bankruptcy exemption x 1st asset quartile dummy	-1.157	0.213	5.43
Unlimited bankruptcy exemption x 2nd asset quartile dummy	-0.168	0.195	0.86
Unlimited bankruptcy exemption x 3rd asset quartile dummy	0.578	0.175	3.30
Unlimited bankruptcy exemption x 4th asset quartile dummy	0.750	0.179	4.20
Age spline under 24 (See Appendix Table 1)	0.130	0.055	2.38
Age spline 25-34	-0.006	0.016	0.39
Age spline 35-44	-0.044	0.014	3.01
Age spline 45-54	-0.042	0.017	2.48
Age spline 55-64	-0.051	0.023	2.24
Age spline over 65	-0.055	0.037	1.47
High school diploma dummy	0.121	0.100	1.21
Some college dummy	0.395	0.116	3.41
College degree or more dummy	0.516	0.129	4.02
Income (in $10,000)	0.141	0.052	2.73
Income squared (in $100,000,000)	-0.004	0.001	2.65
Total assets (in $1,000,000)	0.284	0.102	2.79
Married dummy	0.023	0.166	0.14
Family size	0.121	0.034	3.53
Nonwhite dummy	0.146	0.159	0.92
Male dummy	0.147	0.089	1.65
Northeast dummy	-0.673	0.137	4.92
Midwest dummy	-0.426	0.170	2.51
South dummy	-0.582	0.161	3.63
Rural dummy	0.020	0.088	0.23

Herfindahl index for financial institutions in area (in 1,000)	-0.104	0.044	2.36
Years working at current employer	-0.020	0.006	3.37
Dummy for "thinks credit is a bad idea"	0.023	0.113	0.20
State-wide branch banking	-0.009	0.104	0.09
No multi-bank holding companies in state	-0.022	0.131	0.17
County unemployment rate in 1982 x 10	0.001	0.001	0.57
Lambda-Unconstrained	-1.544	0.614	2.51
Lambda-Positive Debt	-0.245	0.591	0.41

Adjusted R^2 = .434
Sample size = 2,118

Table IV
Median Regression Estimates of Log Debt, with Bootstrapped Standard Errors

Variable	Coefficient	Std. Error	T-Statistic
Constant	-1.029	4.109	0.25
Combined bankruptcy exemption (in $10,000) x dummy variable for first quartile of the total asset distribution	-0.655	0.121	5.41
Bankruptcy exemption x 2nd asset quartile dummy	-0.155	0.077	2.01
Bankruptcy exemption x 3rd asset quartile dummy	0.171	0.058	2.95
Bankruptcy exemption x 4th asset quartile dummy	0.243	0.057	4.23
Unlimited bankruptcy exemption x 1st asset quartile dummy	-1.203	0.287	4.18
Unlimited bankruptcy exemption x 2nd asset quartile dummy	-0.024	0.235	0.10
Unlimited bankruptcy exemption x 3rd asset quartile dummy	0.736	0.204	3.61
Unlimited bankruptcy exemption x 4th asset quartile dummy	0.813	0.299	2.72
Age spline under 24 (See Appendix Table 1)	0.360	0.173	2.08
Age spline 25-34	0.010	0.023	0.42
Age spline 35-44	-0.059	0.015	3.86
Age spline 45-54	-0.008	0.023	0.34
Age spline 55-64	-0.567	0.049	11.66
Age spline over 65	-0.073	0.027	2.66
High school diploma dummy	0.293	0.191	1.54
Some college dummy	0.524	0.156	3.35
College degree or more dummy	0.801	0.169	4.73
Income (in $10,000)	0.276	0.055	5.03
Income squared (in $100,000,000)	-0.006	0.002	2.91
Total assets (in $1,000,000)	0.033	0.285	0.12
Married dummy	0.891	0.165	5.41
Family size	0.104	0.040	2.58
Nonwhite dummy	-0.256	0.144	1.77
Male dummy	-0.063	0.100	0.63
Northeast dummy	-0.765	0.139	5.52
Midwest dummy	-0.571	0.146	3.92
South dummy	-0.477	0.134	3.56
Rural dummy	-0.003	0.100	0.03

Herfindahl index for financial institutions in area (in 1,000)	-0.023	0.054	0.43
Years working at current employer	0.004	0.009	0.48
Dummy for "thinks credit is a bad idea"	-0.361	0.124	2.92
State-wide branch banking	-0.030	0.142	0.21
No multi-bank holding companies in state	-0.240	0.171	1.40
County unemployment rate in 1982 x 10	0.001	0.001	0.78

Pseudo R^2 = .334
Sample size = 3,706

Table V
Estimates of Median Total Debt Implied by the Double Selection Model of Log Debt[a]

Characteristics	Median Total Debt	
	Low Exemption ($6,000)	High Exemption ($50,000)
Baseline[b]	34,303	49,725
Assets = $47,000 (second quartile)	28,105	10,551
Assets = $150,000 (highest quartile)	36,316	72,076
Income = $30,000	21,823	31,641
Income = $250,000	44,387	64,354
Age = 65	13,390	19,413
Years with Current Employer = 20	28,119	40,768
No High School Degree	20,466	29,672
Family Size = 2	26,906	39,010
Live in Northeast	31,014	44,966

[a]The baseline is defined as a household with gross assets of $100,000 (3rd quartile), 45 years old, college degree, $75,000 income, married, family size of 4, white, male head of household, living in the Midwest, with 10 years on the current job, in an area with a Herfindahl index of financial market concentration of 1.377 and county unemployment rate of 9.64 percent. The remaining rows of this table alter these characteristics.

[b]The rows show the effect on total desired debt of altering the listed characteristic relative to the baseline characteristics.

Table VI
Selection Model of the Interest Rate Paid on Car Loans

Variable	Coefficient	Std. Error	T-statistic
Constant	20.196	9.403	2.15
Combined bankruptcy exemption (in $10,000) x dummy variable for first quartile of the total asset distribution	0.874	0.359	2.43
Bankruptcy exemption x 2nd asset quartile dummy	0.510	0.290	1.76
Bankruptcy exemption x 3rd asset quartile dummy	0.088	0.249	0.35
Bankruptcy exemption x 4th asset quartile dummy	0.287	0.324	0.89
Unlimited bankruptcy exemption x 1st asset quartile dummy	5.724	1.821	3.14
Unlimited bankruptcy exemption x 2nd asset quartile dummy	2.833	1.419	2.00
Unlimited bankruptcy exemption x 3rd asset quartile dummy	-0.086	1.461	0.06
Unlimited bankruptcy exemption x 4th asset quartile dummy	-0.024	1.692	0.01
Age (in 100)	-0.288	0.153	1.88
Age squared (in 10,000)	0.003	0.002	1.94
High school diploma dummy	-0.650	0.841	0.77
Some college dummy	-1.548	0.972	1.59
College degree or more dummy	-0.036	1.034	0.04
Income (in $10,000)	0.217	0.488	0.44
Income squared (in $100,000,000)	-0.029	0.044	0.66
Total assets (in $1,000,000)	2.410	3.090	0.78
Married dummy	-1.339	0.867	1.54
Family size	0.475	0.208	2.28
Nonwhite dummy	-1.395	0.791	1.76
Male dummy	-0.128	0.540	0.24
Northeast dummy	-1.627	0.887	1.83
Midwest dummy	-1.093	0.985	1.11
South dummy	0.186	1.045	0.18
Rural dummy	-0.850	0.644	1.32
Herfindahl index for financial institutions in the area (in 1,000)	0.478	0.272	1.76
Years working at current employer	-0.043	0.039	1.09
State-wide branch banking	-0.836	0.877	0.95

No multi-bank holding companies in state	-0.251	0.871	0.29
County unemployment rate in 1983 x 10	-0.014	0.081	0.18
1982: first quarter dummy	-0.346	1.400	0.25
1982: second quarter dummy	-2.007	1.153	1.74
1982: third quarter dummy	0.907	1.201	0.76
1982: fourth quarter dummy	-1.193	1.123	1.06
Lambda - Auto loan?	-3.136	1.522	2.06

Adjusted R^2 = .21
Sample size = 310

Variable	Mean	Std. Dev.	Minimum	Maximum
Dummy variable for credit constrained	0.173	0.378	0.00	1.00
Natural log of total debt	6.186	4.350	0.00	14.04
Dummy variable for positive debt	0.701	0.458	0.00	1.00
Second exemption quartile	0.315	0.465	0.00	1.00
Third exemption quartile	0.227	0.419	0.00	1.00
Unlimited bankruptcy exemption	0.187	0.390	0.00	1.00
Age (in 100)	0.458	0.172	0.16	0.98
Age squared (in 10,000)	0.240	0.173	0.03	0.96
Education	12.168	3.250	6.00	17.00
Income (in $10,000)	2.562	2.898	-2.41	53.04
Income squared (in $100,000,000)	14.962	83.373	0.00	2813.24
Total assets (in $1,000,000)	0.112	0.375	0.00	17.41
Married dummy	0.616	0.486	0.00	1.00
Family size	2.716	1.530	1.00	13.00
Nonwhite dummy	0.170	0.376	0.00	1.00
Male dummy	0.517	0.500	0.00	1.00
Northeast dummy	0.200	0.400	0.00	1.00
Midwest dummy	0.280	0.449	0.00	1.00
South dummy	0.351	0.477	0.00	1.00
Rural dummy	0.401	0.490	0.00	1.00
Average income of household's profession (in $10,000)	1.529	1.939	0.00	50.61
Herfindahl index for financial institutions in the area (in 1,000)	1.378	1.007	0.00	4.92
Years working at current employer	5.525	8.131	0.00	55.00
State-wide branch banking	0.445	0.497	0.00	1.00
No multi-bank holding companies in state	0.144	0.351	0.00	1.00
County unemployment rate in 1982 x 10	96.391	36.232	25.00	224.00

Combined bankruptcy exemption (in $10,000) x dummy variable for first quartile of the total asset distribution	0.472	1.185	0.00	7.04
Bankruptcy exemption x 2nd asset quartile dummy	0.453	1.103	0.00	7.04
Bankruptcy exemption x 3rd asset quartile dummy	0.508	1.222	0.00	7.04
Bankruptcy exemption x 4th asset quartile dummy	0.556	1.301	0.00	7.04
Unlimited bankruptcy exemption x 1st asset quartile dummy	0.055	0.228	0.00	1.00
Unlimited bankruptcy exemption x 2nd asset quartile dummy	0.043	0.203	0.00	1.00
Unlimited bankruptcy exemption x 3rd asset quartile dummy	0.043	0.204	0.00	1.00
Unlimited bankruptcy exemption x 4th asset quartile dummy	0.045	0.207	0.00	1.00
Age spline under 24[a]	23.832	0.753	16.00	24.00
Age spline 25-34[a]	8.011	3.446	0.00	10.00
Age spline 35-44[a]	5.780	4.600	0.00	10.00
Age spline 45-54[a]	4.027	4.635	0.00	10.00
Age spline 55-64[a]	2.547	4.069	0.00	10.00
Age spline over 65[a]	1.624	4.337	0.00	34.00
High school diploma dummy	0.325	0.468	0.00	1.00
Some college dummy	0.200	0.400	0.00	1.00
College degree or more dummy	0.191	0.393	0.00	1.00
Dummy for "thinks credit is a bad idea"	0.238	0.426	0.00	1.00
Total debt (in $10,000)	1.631	4.181	0.00	124.67

[a]The age spline is defined in the following manner:

age1 = age	if age $\leq$ 24;	age1 = 24 otherwise;
age2 = min(age-24,10)	if age > 24;	age2 = 0 otherwise;
age3 = min(age-34,10)	if age > 34;	age3 = 0 otherwise;
age4 = min(age-44,10)	if age > 44;	age4 = 0 otherwise;
age5 = min(age-54,10)	if age > 54;	age5 = 0 otherwise;
age6 = age-64	if age > 64;	age6 = 0 otherwise.

Appendix II
Bivariate Probit Estimates for Double Selection Model in Table III

Variable	Coefficient	Std. Error	T-Statistic
Probability of Not Being Credit Constrained (3,064 out of 3,706)			
Constant	0.092	0.325	0.28
Second exemption quartile	-0.133	0.083	1.60
Third exemption quartile	-0.126	0.124	1.01
Unlimited bankruptcy exemption	-0.250	0.097	2.58
Age (in 100)	-0.057	1.093	0.05
Age squared (in 10,000)	3.063	1.168	2.62
Education	0.003	0.011	0.33
Income (in $10,000)	0.159	0.039	4.07
Income squared (in $100,000,000)	-0.003	0.004	0.74
Total assets (in $1,000,000)	0.170	0.112	1.53
Married dummy	0.273	0.080	3.40
Family size	-0.050	0.022	2.27
Nonwhite dummy	-0.377	0.070	5.39
Male dummy	-0.018	0.060	0.31
Northeast dummy	0.034	0.115	0.29
Midwest dummy	0.173	0.150	1.15
South dummy	0.013	0.139	0.09
Rural dummy	0.139	0.067	2.07
Average income of household's profession (in $10,000)	-0.012	0.019	0.64
Herfindahl index for financial institutions in the area (in 1,000)	0.093	0.034	2.70
Years working at current employer	0.019	0.005	3.90
State-wide branch banking	-0.068	0.079	0.86
No multi-bank holding companies in state	0.177	0.102	1.73
County unemployment rate in 1982 x 10	-0.002	0.001	2.67
Have Positive Amounts of Debt (2,599 out of 3,706)			
Constant	-0.767	0.282	2.72
Second exemption quartile	0.026	0.074	0.35

Third exemption quartile	0.137	0.103	1.33
Unlimited bankruptcy exemption	0.203	0.089	2.30
Age (in 100)	5.697	0.932	6.11
Age squared (in 10,000)	-8.523	0.943	9.04
Education	0.019	0.009	2.21
Income (in $10,000)	0.161	0.020	8.22
Income squared (in $100,000,000)	-0.004	0.001	6.57
Total assets (in $1,000,000)	-0.116	0.088	1.32
Married dummy	0.368	0.069	5.35
Family size	0.067	0.019	3.48
Nonwhite dummy	-0.184	0.067	2.73
Male dummy	-0.214	0.055	3.91
Northeast dummy	-0.160	0.099	1.61
Midwest dummy	-0.122	0.128	0.96
South dummy	0.040	0.118	0.34
Rural dummy	-0.048	0.062	0.78
Herfindahl index for financial institutions in the area (in 1,000)	-0.017	0.030	0.57
Years working at current employer	0.006	0.003	1.91
Dummy for "thinks credit is a bad idea"	-0.328	0.058	5.65
State-wide branch banking	0.003	0.074	0.04
No multi-bank holding companies in state	-0.109	0.091	1.19
County unemployment rate in 1982 x 10	0.001	0.001	0.96
Correlation of Error Terms	-0.045	0.040	1.14

Log-likelihood = -3102.1

Appendix III
Probit Estimates for Selection Model in Table VI

Variable	Coefficient	Std. Error	T-statistic
Constant	-2.058	1.212	1.70
Combined bankruptcy exemption (in $10,000) x dummy variable for first quartile of the total asset distribution	-0.068	0.046	1.49
Bankruptcy exemption x 2nd asset quartile dummy	0.005	0.038	0.14
Bankruptcy exemption x 3rd asset quartile dummy	0.064	0.034	1.92
Bankruptcy exemption x 4th asset quartile dummy	-0.061	0.043	1.42
Unlimited bankruptcy exemption x 1st asset quartile dummy	-0.334	0.215	1.56
Unlimited bankruptcy exemption x 2nd asset quartile dummy	0.023	0.189	0.12
Unlimited bankruptcy exemption x 3rd asset quartile dummy	-0.287	0.183	1.57
Unlimited bankruptcy exemption x 4th asset quartile dummy	-0.283	0.204	1.39
Age (in 100)	-0.027	0.017	1.63
Age squared (in 10,000)	0.014	0.014	0.97
High school diploma dummy	0.178	0.102	1.75
Some college dummy	0.155	0.115	1.35
College degree or more dummy	0.140	0.124	1.13
Income (in $10,000)	0.081	0.051	1.57
Income squared (in $100,000,000)	-0.005	0.004	1.06
Total assets (in $1,000,000)	-0.827	0.365	2.26
Married dummy	0.260	0.102	2.55
Family size	0.033	0.027	1.21
Nonwhite dummy	-0.068	0.104	0.65
Male dummy	0.015	0.072	0.21
Northeast dummy	-0.073	0.117	0.63
Midwest dummy	0.001	0.128	0.00
South dummy	0.011	0.135	0.08
Rural dummy	0.168	0.080	2.10
Herfindahl index for financial institutions in the area (in 1,000)	0.002	0.004	0.57
Years working at current employer	0.010	0.005	2.12
State-wide branch banking	0.097	0.108	0.90

No multi-bank holding companies in state	-0.166	0.112	1.48
County unemployment rate in 1983 x 10	-0.020	0.010	1.94
1982: first quarter dummy	0.089	0.135	0.66
1982: second quarter dummy	-0.072	0.110	0.65
1982: third quarter dummy	0.078	0.094	0.83
1982: fourth quarter dummy	-0.071	0.088	0.81
Dummy for "thinks credit is a bad idea"	-0.183	0.083	2.20

Log-likelihood = -1816.9

Figure I

The Relationship Between Wealth and Debt Repayment Under Bankruptcy

(a) Bankruptcy, Repay zero

(b) Bankruptcy, Repay W_2 - E

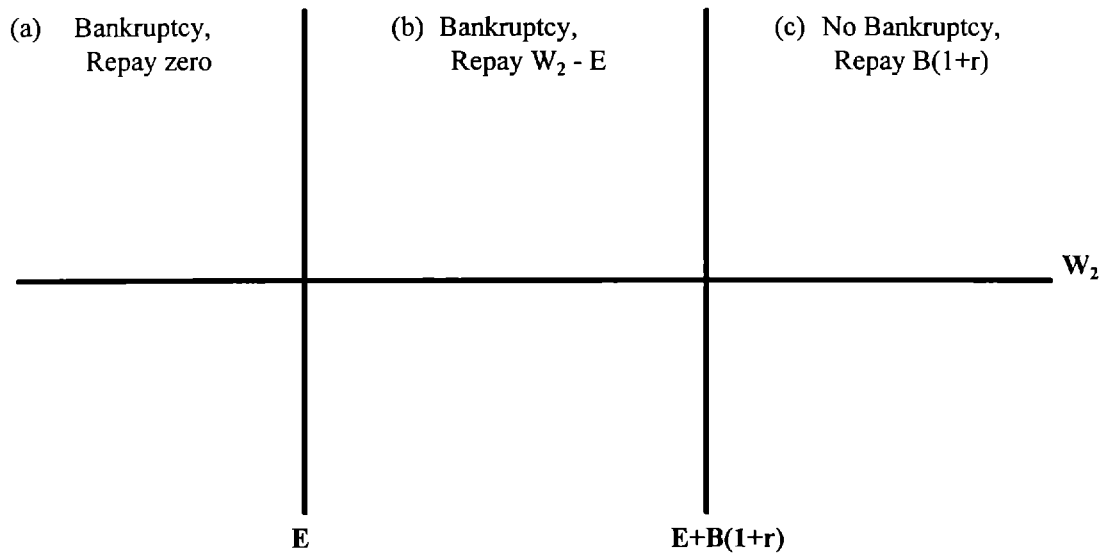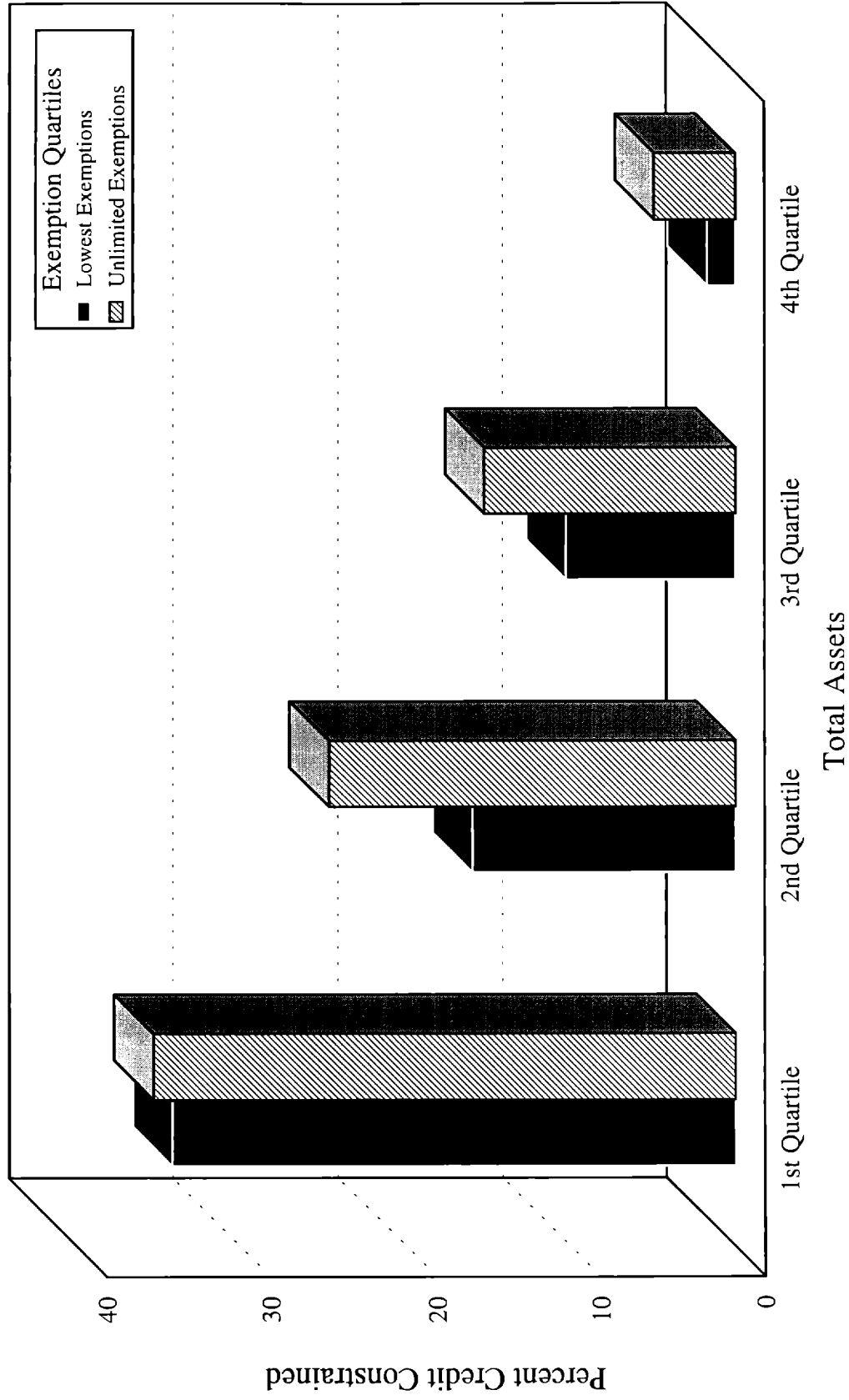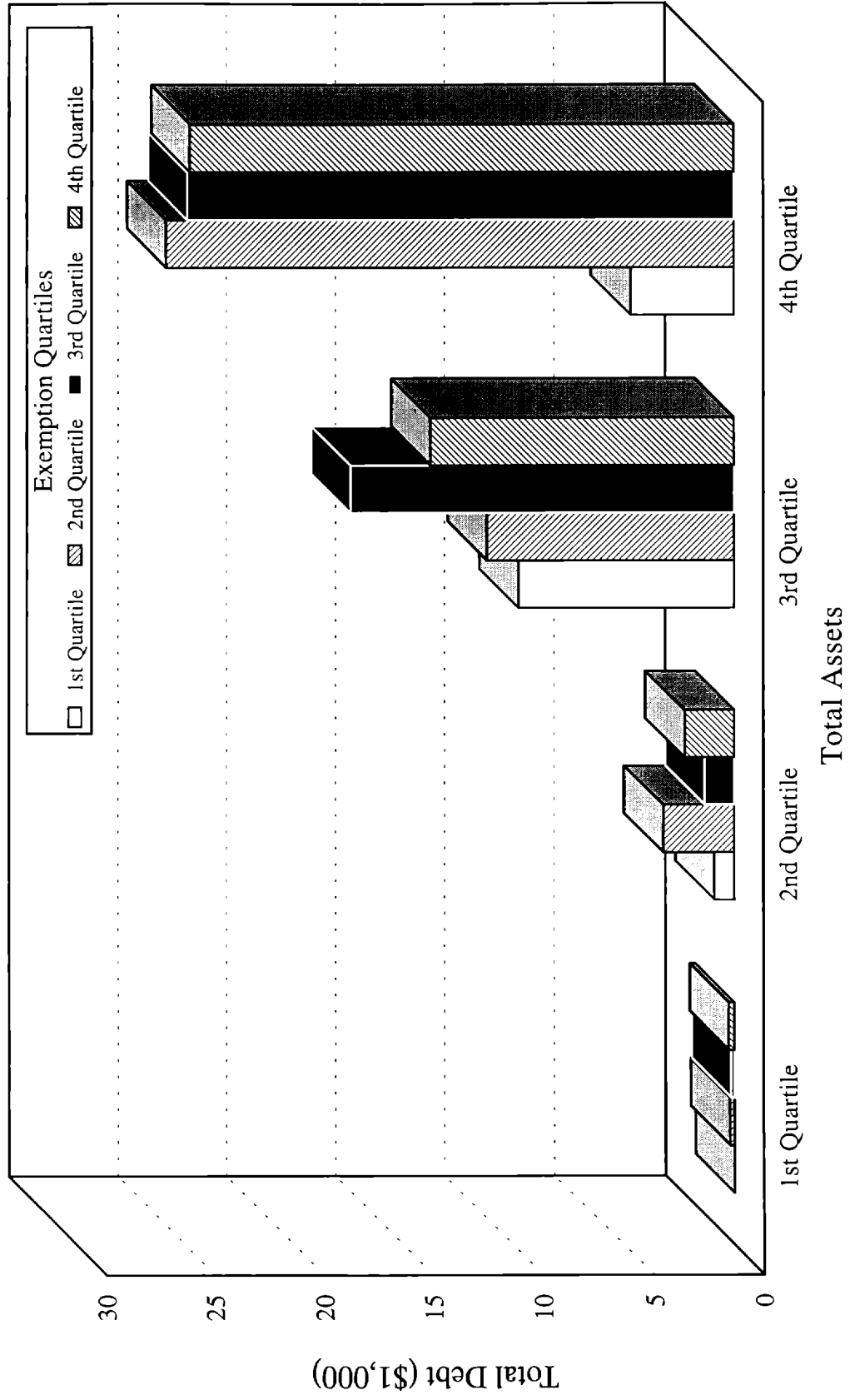(c) No Bankruptcy, Repay B(1+r)

W_2

E

E+B(1+r)

Figure II
Probability of Being Turned Down or Discouraged From Borrowing
By Asset and Exemption Quartiles, 1983

Source: 1983 Survey of Consumer Finances

Figure III
Median Total Household Debt
By Asset and Exemption Quartiles, 1983

Source: 1983 Survey of Consumer Finances