

Why Do Guaranteed SBA Loans Cost Borrowers So Much?*

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Abstract

The SBA assists small businesses in obtaining access to bank credit by guaranteeing a portion of their loans. Despite the substantial federal guarantee and a history of modest default rates, borrowers are charged rates similar to those on low-grade bonds. We suggest several possible explanations for this phenomenon, including lack of competition between SBA lenders, and a relatively high cost of insured capital for guaranteed loans. Using comprehensive data obtained from SBA on all disbursed loans from 1988 to 2008, we find some evidence of market power in that large lenders charge borrowers relatively high rates. To evaluate the cost of capital on the guaranteed portion of SBA loans, we develop a Monte Carlo model of the cash flows on fully guaranteed SBA securitized pools, taking into account historical default and prepayment patterns. Comparing our model predictions to market prices provided by large dealer in SBA pools, we find that investors required a spread between 100 and 200 bps over the Treasury curve to hold these securities.

Keywords: **Credit subsidy, government guarantee, banking competition, and securitization.**

JEL Classification: D4, G2, and H8.

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1 Introduction

The federal government increasingly relies on subsidized credit guarantees in lieu of grants or other forms of assistance to targeted groups. In providing credit assistance, the government has a choice between direct lending where it funds loans directly via the Treasury, and guaranteed lending where funds are raised indirectly via private financial institutions in the capital markets. Whether guaranteed lending is an efficient way of subsidizing credit is an important question that we explore here in the context of the Small Business Administration's (SBA) 7(a) program.

The goal of the SBA 7(a) program is to lower the cost and improve the availability of credit to U.S. small businesses. In 2006, it guaranteed 82,000 loans totaling \$12 billion. The loans generally have an original maturity of 7 to 25 years, and interest is based on the prime rate plus a fixed spread. Qualified borrowers are able to obtain loans from SBA-certified private financial institutions, usually commercial banks, with the backing from a federal guarantee that insures the lender against 50 to 85 percent of credit losses.

One of the arguments to justify guaranteed lending programs is that private institutions have better screening skills than the government. The SBA only provides partial guarantees, leaving banks with some default risk and inducing them to pick out qualified borrowers. The minor historic default rates confirm that private lenders are indeed motivated by the right screening incentives. As a result, the government is subject to the tradeoff between efficient screening versus the potential rent transfers from borrowers to lenders.

Despite the benefit of a substantial federal guarantee and default experience that is no worse than that on seemingly comparable loans and bonds, 7(a) borrowers are charged rates that are no lower than on comparable uninsured securities. In this paper we review the evidence that supports this conclusion, and evaluate several possible explanations for why borrowers are charged such seemingly high rates. One hypothesis is that high borrowing rates are a consequence of imperfect competition in the 7(a) lending market, making the loans a profitable line of business for participating lending institutions. In 2006 more than 2000 lenders originated SBA-backed loans. Some of the banks originate large numbers of 7(a) loans, while others choose not to participate in the program at all, and in some regions there are very few SBA lenders.

To examine the hypothesis that high costs are due to limited competition, we first study the effect of regional banking concentration on interest rates. We calculate a measure of local SBA lender concentration based on a Herfindahl index and regress interest rate spreads on Herfindahl index values, controlling for observable borrower and loan characteristics. We find no evidence that rate spreads increase with lender concentration, and in fact consistently find the opposite. We then consider an alternative to the Herfindahl index, based on the cross-section of bank size. We assign each bank to a size category based on the number of loans originated in a given year. According to this classification we find that the largest lenders tend to charge higher spreads than smaller ones, even after controlling for default and prepayment.

High borrowing rates for 7(a) borrowers may also be attributable to a higher cost of insured capital for 7(a) lenders than what one would expect with a full faith and credit federal guarantee. Past studies have shown that federally guaranteed obligations such as RTC bonds and student loans bear higher rates than standard Treasury securities despite full faith and credit federal guarantees, and that the rate differences can be substantial (Longstaff (2004) [7], Lucas and Moore (2009) [8]). These authors point to lower liquidity as a likely reason for the higher required rates of return than on comparable Treasury's.

In evaluating the rate charged on 7(a) loans, one has to take into account that 7(a) loan cash flows are risky, despite being guaranteed against default risk.¹ There is considerable uncertainty as to the timing of payments because of the possibility of default and prepayment, and due to movements in the prime rate. This can introduce systematic risk into cash flows even though direct losses from default are precluded. The additional layers of intermediation introduced by relying on banks and securitization markets also create additional costs that can elevate spreads.

To evaluate the cost of capital on the guaranteed portion of SBA loans, we develop a Monte Carlo model of the cash flows on such securities, taking into account historical default and prepayment behavior, and modeling interest rates using a two-factor Cox, Ingersoll and Ross (CIR) [2] model. Discounting these cash flows at the risk-free rates along each path, we find the theoretical value of the cash flows at Treasury rates. By comparing these theoretical prices to actual secondary market prices of the securitized pooled and guaranteed portion of SBA loans, we can then infer the spread over Treasury rates necessary to equate the theoretical price with the market price. We find

¹This is also true of other federally guaranteed loans such as FHA loans and student loans.

evidence that investors typically demand a spread between 100 and 200 bps over Treasury rates in the period for which we have data (1/06 through 6/08), which explains part of why 7(a) loans cost borrowers so much despite the benefit of a federal guarantee.

A lending market with a large number of banks is not necessarily competitive (Wolinsky 1986 [14], Stiglitz 1979 [11]), and as a result lenders may not lower interest rates when they obtain loan insurance. In fact, lenders may optimally increase the interest rates and lend more to riskier borrowers when the percent guaranteed rises. These considerations lie beyond the scope of this paper and will be pursued in future research. Our analysis focuses on a cost-based approach which evaluates the level of interest rates that banks could charge if the market for SBA loans was assumed to be perfectly competitive.

The rest of the paper is organized as follows: Section 2 gives a brief overview of the 7(a) program. Section 3 presents evidence that 7(a) loans appear relatively expensive for borrowers, and also very profitable for lenders. Section 4 reports on how borrower characteristics, loan characteristics, and the concentration among SBA lenders are related to the cross-section of credit spreads. In Section 5 we develop the model to price SBA guaranteed loan pools, and compare model prices with market prices to infer the premium over Treasury rates demanded by investors. The likely profitability of SBA loans is reevaluated given this information. We conclude in Section 6 with a discussion of the policy implications of the findings.

2 SBA 7(a) Program Overview

In this section we briefly describe the most salient features of the 7(a) lending program for this analysis, since more complete descriptions are available elsewhere (e.g., CBO (2000) [10] and Glennon and Nigro (2005) [5]). In terms of total size, the program that has grown rapidly since 2001, with \$12 billion in principal disbursed on more than 82,000 loans in 2006. Still, 7(a) loans represent less than 5 percent of total U.S. small business borrowing. What we refer to as the 7(a) program actually has two parts, a regular program and an “Express” program. The Express program promises borrowers and lenders quick eligibility decisions, but provides a federal guarantee on only 50% of loan principal and has a stricter restriction on loan size. The Express program has grown to represent near 75 percent of loans guaranteed, but only 20 percent of dollar loan volume.

2.1 Borrowers

Businesses seeking 7(a) loans must satisfy a number of criteria. The most subjective is that they must establish that they have not been able to obtain credit elsewhere on “affordable terms.” They also must demonstrate an ability to repay the loans, for instance based on collateral, the amount of owners’ equity, and the general quality of management.² More concretely, the business must be for-profit, small (the definition varies by industry), and independently owned and operated. Borrowers come from a wide variety of industries, with the largest three being retail trade, accommodation and food services, and manufacturing, which together account for about 50 percent of loans disbursed.

2.2 Loan Terms and Characteristics

Over 96 percent of 7(a) borrowers pay an interest rate set to a fixed spread over the prime rate. The prime rate is a floating rate that since 2000 has hovered around 3 percent above the overnight Fed Funds rate. The spread is capped by SBA regulation, but on most loans the spread cap does not appear to bind. There are also a variety of fees assessed by the SBA, some paid by the borrower directly and others by the lender. Borrowers pay a graduated one-time guarantee fee that ranges from 2 percent of principal for loans of less than \$150,000 to 3.5% for loans of \$1 million. Borrowers with long-term loans also face high prepayment penalties in the first three years of the loan’s life, after which prepayment is a free option. Lenders pay the SBA an annual servicing fee of .545 percent on the guaranteed balance, although they bear most servicing costs themselves.

Loan maturity typically is 7 to 10 years, but varies with the purpose of the loan. Loans for real estate and equipment may extend to 25 years. The effective duration of loans is considerably shorter, both because the loans are amortizing and because of voluntary prepayments and defaults. Loans in the regular program can be for up to \$2 million, and in the Express program up to \$350,000.

The maximum percentage guaranteed varies with the loan size and program. In the regular program, for loans under \$150,000, SBA guarantees up to 85% and for loans above \$150,000 the maximum is 75%. On Express loans the maximum guarantee percentage is 50%. Loans do not always bear the maximum allowable guarantee, presumably to reduce the amount of fees paid to SBA. Upon default, a lender can recover from SBA the face value of the outstanding principal bal-

²The SBA assigns a risk rating to individual loans, but it is not a standard credit score and that data is proprietary

ance, and subsequently will receive a pro rata share of any recoveries. However, lenders sometimes choose not to exercise the guarantee when they expect to recover more from retaining the entire loan. Thus the SBA default statistics that we rely on are somewhat downward-biased estimates of the default rate experienced by the borrower.³

2.3 Lender Characteristics

SBA-backed loans are typically made by commercial banks, but some thrifts and finance companies also participate. Lenders classified by SBA as “preferred lenders” have the authority to determine eligibility in the Express program. For commercial banks, an advantage of participation is that it helps to satisfy Community Reinvestment Act requirements. As described in more detail in section 4, relatively few banks⁴ originate large numbers of 7(a) loans. Of 2017 distinct lending organizations identified for 2006, only 13 originated more than 1,000 loans each, and 880 originated only 1 or 2 loans. The identities of the 20 largest originators and their lending volume are shown in Table 1.

2.4 The Guaranteed Loan Pool Certificate Program (GLPCP)

To increase access to capital for 7(a) lenders, since 1995 the SBA has sponsored the Guaranteed Loan Pool Certificate Program (GLPCP). Under this program 7(a) lenders can sell the guaranteed portion of 7(a) loans to a Pool Assembler. The Assembler puts together pools of loans that are similar in terms of maturity, rate basis (e.g., monthly and prime-based), and rate spread. Each pool has a minimum of four underlying loans that total at least \$1 million in aggregate. The strictest restrictions on rate floors or ceilings on the individual loans are reported for the pool. The pools are sold via an auction to investors, and there is also a secondary market in the Certificates.

It appears that the securitization process does not introduce any significant counterparty risk into the lending process. Payments on the securities are centralized and made by Fiscal and Transfer Agent (FTA-Colson Associates), who is appointed by the government and acts as their agent. Payments are made on time even when default and prepayments occur. These payments are made by the FTA to investors in the form of advances. Lenders also do not bear counterparty

³For the purposes of calculating returns to lenders, this problem is mitigated by the fact that non-surrendered loans are those with relatively high recovery rates.

⁴A bank for this tabulation consolidates over institutions governed by the same holding company, even if they operate in far flung geographic regions.

risk either since they deal directly with the FTA.

The program has become an increasingly important source of financing, with a \$4.0 billion of guaranteed securities sold into pools in 2006, representing 42% of the total guaranteed amount of loans approved in that year. We have no evidence on whether securitized loans deviate systematically from a typical SBA loan in terms of default or prepayment behavior. We assume that there is no significant selection bias since they represent a large fraction of total originations. The market prices of these certificates is of interest in this analysis because they can be used to infer the cost of capital for the default-risk-free portion of 7(a) loans, as discussed in Section 5 below.

3 The Cost and Profitability of 7(a) Loans

Our inferences about the cost of SBA loans rely on comprehensive data obtained from SBA on all disbursed loans from 1988 to 2008. Associated with each loan is static information about the borrower (e.g., type and size of business), the lender (e.g., name, state), and loan terms (e.g., rate spread, basis, maturity, if collateral). There is also a record of prepayments and defaults. The SBA loan data is described in more detail in Appendix 1.

3.1 Cost to Borrowers

Average rate spreads and guaranteed shares on 7(a) loans are summarized in Table 2. The average spread over prime is 2.46%, based on all loans disbursed from 1988 and 2008. Over the sample period the prime rate averaged 2.77% over the overnight Fed Funds rate⁵, and the level of the Fed Funds rate was roughly equivalent to the 1-year Treasury rates (see Figure 1). Thus on average borrowers paid a spread of about 5.23% over the 1-year Treasury rate, even though the average loan bore a federal guarantee on 68.6% of principal. The initial guarantee fee added about 40 bps to the effective rate paid by borrowers⁶.

To assess whether these spreads are in line with other credit obligations with comparable default risk, we draw on the analysis in CBO (2007), which uses the same SBA loan data. Figure 2 (reproduced from CBO (2007), Figure 4) shows that the spread charged SBA borrowers has been consistently higher than that for all commercial and industrial (C&I) loans by a margin of about two percentage points for regular 7(a) loans, and over three percentage points for Express loans.

⁵Fed Funds is used as a reference point because since 2000 the prime rate has been fixed at 3% over Fed Funds.

⁶This assumes a 2.5% guarantee fee, a 7-year initial maturity, and a discount rate of 7%.

Higher rates on SBA loans might be justified, even with a partial guarantee, if the probability of default is significantly higher than on other C&I loans. The most direct evidence that it is not higher comes from, Glennon and Nigro (2005), who find that, although medium-maturity loans originated under the SBA 7(a) loan guarantee program are targeted to small firms that fail to obtain credit through conventional channels, the default experience is comparable to that of a large percentage of loans held by larger commercial banks. Further evidence on default rates is found by comparing the cumulative default rates on 7(a) loans and public debt. CBO (2007) finds that the default experience on 7(a) loans falls between that on BB and BBB-rated bonds (see Figure 3, reproduced from Figure 9 in CBO (2007)). Figure 4 shows that overall default rates on 7(a) loans have fallen over time, and have stabilized at just less than 2 percent of principal outstanding since 1995. Netting the average recovery rate of between 40 and 50 percent suggests an annual loss rate to SBA of about 1 percent.

3.2 Returns to Lenders

The value of 7(a) loans from a lender's perspective depends on the margin between revenues and costs. Revenues arise from borrower payments and proceeds from loan sales. Costs include the lender's weighted average cost of funds, servicing and other ongoing administrative costs, and fees paid to the SBA. Taking these costs into account, we do a simple back-of-the-envelope calculation in this section suggesting that 7(a) loans on average are quite profitable for banks.

For bank lenders, holding a 7(a) loan is like owning a portfolio of a default-risk-free government security and a risky small business loan. Banks' weighted average cost of capital for 7(a) loans should reflect these two components, and in a competitive market the advantage of the guarantee should be passed through to the borrower. The cost of funds is clearly different for the insured and uninsured portions of a loan. The insured portion is virtually default-risk free, suggesting that investors would require a return close to a short-term risk-free Treasury rate on a floating rate loan⁷. (In Section 5 we present a more careful analysis of the cost of funds for the guaranteed portion.) On the uninsured portion, default experience suggests funding costs similar to those on BB to BBB-rated loans. Based on historical BB rate spreads, the gross funding rate on the risky portion is taken to be Treasury + 3.5 percent. This is also consistent with the spread between C&I

⁷Consistent with this view, banks investing in GLPCP certificates have a 0% capital requirement against these holdings.

loans and SBA loans in Figure 2. Based on an average 68.6% of guaranteed principal, the WACC is at a spread of 1.03% above Treasury.

The net spread between revenues and expenses is calculated by subtracting the weighted average cost of capital and other costs from interest payments received net of the expected default loss rate. Other expenses are assumed to be .75% annually for servicing and other administrative costs, and .545% annually for the SBA servicing fee on the guaranteed portion. Default losses are assumed to be 1.25% on the non-guaranteed portion, slightly higher than those suggested by SBA experience⁸. Together, these assumptions imply a net spread of 2.6%. The net spread measures profit as a percentage of loan principal. Another way to assess the significance of this margin is to ask what the breakeven cost of uninsured capital would be for the lender to break even according to this calculation. The break-even spread on uninsured capital is 12.4%, which is 8.85% more than the cost of uninsured capital suggested by market prices. Clearly this estimate is sensitive to the many assumptions made, but it does suggest that 7(a) lending is a profitable line of business.

4 Loan Spreads and Market Concentration

A possible explanation for the high spreads charged to borrowers is that lending institutions have market power that allows them to charge a higher than competitive rate. As mentioned earlier, a relatively small number of banks are active originators of 7(a) loans, but many others make few or no such loans. Figure 5 shows the distribution of the number of loans originated by institution in 2006. The average number of loans originated is 39.6, but the median is only 3 loans. The distribution by dollar amounts of originations is similarly skewed to the left.

To explore the effect of local lender concentration on rates charged, we first define a measure of the regional competitiveness of SBA lending markets, and then regress rate spreads (over the prime rate) on this quantity and a set of control variables that could also affect the rate spread, including the percentage guarantee, loan maturity, loan size, and whether it is an Express loan. The cross-sectional data is pooled over the years 1988 to 2006. In the second set of regressions we only use the 2006 cohort, and account for market power by assigning lenders to 5 lender-distribution buckets, constructed with the number of SBA loans that lenders originated in 2006.

⁸This is based on about a 1% default rate for the SBA, and a .25% adjustment for the loans that default but are entirely retained by the lender.

For construction of the Herfindahl index, a region is taken to be a Core Based Statistical Area (CBSA), which defines micropolitan and metropolitan areas. In each of these areas we look at the level of competition in the lending market for SBA loans. Using the borrower’s zip code we are able to assign each loan to a CBSA. Then for a given year and a given CBSA we determine the number and the dollar amount of loans originated by each lender. With this information we calculate a Herfindahl index for each CBSA and each year. The Herfindahl index for CBSA i at time t is given by:

$$H_t^i = \sum_{n=1}^{N_{i,t}} (s_{n,t}^i)^2, \quad (1)$$

where $s_{n,t}^i$ is the market share of lender n , in CBSA i at time t , and $N_{i,t}$ is the total number of lenders in CBSA i at time t . The Herfindahl index gives a number between 0 and 1, with 1 representing a monopolistic market and 0 a perfectly competitive market.

The SBA has enacted interest rate-spread limits and maximum loan guarantees based on loan type, loan size, and maturity. For loans with rates close to the ceiling, this could bias inferences about the effect of market power on rate spreads. The spread and guarantee limits are presented in Table 3. In the regressions of spreads on Herfindahl index we split the sample to incorporate these spreads and guarantee caps, and run a regression for each subsample separately. In the regression of spread on lender’s distribution we incorporate a dummy variable if the spread of the loan is within 25 basis point of the interest rate cap.

In table 4 we present the regression results, for tests of spreads on regional concentration. The sample is subdivided by whether the loan is regular or Express, by loan size, and by maturity. Control variables include the percentage guaranteed, the loan size, and maturity. All regressions suggest that the Herfindahl index does not explain higher interest rate spread. In fact, the regressions suggest that regions with more concentrated lending markets are associated with lower interest rate spreads, which seems counterintuitive. Perhaps borrowers cross city boundaries to look for affordable loans, and therefore regional concentration may not be the best way to capture market power. If that is the case, then higher Herfindahl index may be associated with smaller markets, and perhaps smaller lenders that have less market power. This would be consistent with the analysis by Petersen and Rajan (2002) [9] who find that in recent years the distance between

borrowers and lenders plays a reduced role in relationship lending for small businesses⁹.

For robustness, we construct an alternative measure of regional banking concentration by relying on banking activities which are not necessarily related to SBA lending. In particular, we use annual Summary of Deposits data from the FDIC to estimate the Herfindahl index for each region and for each calendar year. The FDIC data provides the total deposits of all branches and offices of all FDIC-insured institutions. For this experiment, a region is taken to be a county, which covers a broader area than does a CBSA¹⁰. Table 5 displays results for regressions of loan spreads on regional concentration, using this alternative Herfindahl index. Controls include percentage guaranteed, loan size, firm size (number of employees), and lagged default rates. The results show that regional concentration does not explain the high spreads paid by small businesses. The results are very similar to what was achieved by the regressions using SBA regional concentration.

We consider a size-based measure of lender market power, based on a set of indicator variables for the number of loans that a lender originated in a given year. The categories are LARGE-LENDERS, MEDIUM-LENDERS, and SMALL-LENDERS. The SMALL-LENDERS dummy selects the banks that originated less than the median number of loans. LARGE-LENDERS are alternatively defined as the top 1st, 5th, or 10th percentile¹¹. In addition, we introduce a dummy variable to flag Express loans. To avoid spurious estimation we discard loans that are within 25 basis points of the interest rate limits shown in table 3.

The results in table 6 suggest that the largest lenders tend to charge higher interest rate spreads than smaller ones, even after accounting for the lagged default of the lender's SBA portfolio. In addition, controlling for other loan characteristics, Express loans charge an extra 127 basis points above Regular loans. The adjusted- R^2 of the current specification shows a slightly higher explanatory power than the previous specifications. This suggests that some of the unexplained variation in spreads that was captured by the intercept in previous specifications is accounted for by lenders' size. Figures 10 and 11 suggest that there are no relevant discrepancies in defaults and prepayments due to lender size. The only exceptions are the 1991 crisis when small lenders

⁹Gathering and processing information on small firms is costly, which suggests that long term relationships between borrowers and lenders provide a mutual benefit by improving information flow. The reduced importance of distance may reflect technological advances that have improved the ability to monitor borrower quality from afar.

¹⁰Using the FDIC data we also calculate a Herfindahl index based on a CBSA instead of county. The results are similar.

¹¹We test different thresholds in our definition of LARGE lenders. As shown on table 5, the results are robust to the top 1st, 5th, or 10th percentile thresholds.

experienced spike in defaults relative to medium and large banks, and in 2007 when large lenders experienced a higher surge in defaults than small and medium lenders.

An important caveat to this analysis is that it cannot account for the effect of market power that arises from a lack of sophistication among small business borrowers. To the extent that SBA borrowers are inclined to take the recommendation of their banker rather than shopping for better terms, limited competition may exist even in markets with a potentially large number of lenders. The literature on monopolistic competition suggests that imperfect information leads to imperfect competition, even in markets with large number of borrowers and lenders. When borrowers face costly information the market equilibrium is characterized either by lenders charging the monopoly rate or dispersion of rates above the competitive level (Stiglitz (1979) [11] and Wolinsky (1985) [14]). A SBA borrower applying for a loan usually does not observe the interest rates offered to other similar businesses, and therefore can only learn if better terms are available by submitting loan applications at multiple banks. To the extent that this entails search costs or costly delays in obtaining funds, such shopping behavior may be limited, leaving borrowers with interest rates that are above the competitive level.

What remains to be explained is why the largest lenders charge higher interest rates. One possibility is that large lenders offer a superior product. If large lenders have more branches and offer a menu of alternative products and services in addition to the loan, they may have an advantage in attracting small businesses.

5 Cost of Capital for Fully Guaranteed Loans

The analysis thus far suggests that borrowers pay a relatively high rate on SBA loans, and that the market power of larger lenders may be part of the explanation. We also know, however, that many banks choose to make very few or no 7(a) loans, suggesting that our estimate of profitability to lenders in Section 3.2 is likely too high. In this section we show that the apparent profitability of 7(a) lending is reduced by the fact that the cost of capital for fully guaranteed 7(a) loans is significantly above Treasury rates, as inferred from the pricing of securities in the Guaranteed Loan Pool Certificate Program (GLPCP).

5.1 Data

We were able to obtain a history of monthly market prices on 166 of GLPCP pools that were issued by Coastal Securities between January 2006 and May 2008. Coastal Securities is one of the leading dealers in SBA-backed securities, and actively markets GLPCP pools. Other than secondary market certificate prices, the data set includes the origination date, final maturity, loan origination amount, and spread to prime. The average pool size at origination is \$10.3 million, with a standard deviation of \$12.2 million. The smallest pool size at origination is \$1.0 million, and the largest is \$95.2 million.

Our sample falls into a period with historically narrow credit spreads. Figure 6 shows that prior to the sample period and following the end of our sample (based on Bloomberg estimates and not our model), the yields on GLPCP securities were much higher. This suggests that usually there may be an even higher risk premium than what we infer in the analysis that follows.

5.2 Pricing Model

To estimate the risk premium priced into GLPCP securities, we implement a Monte Carlo Model to project the distribution of pool cash flows over the maximum life of the pool. The term structure of Treasury rates evolves stochastically according to a 2-factor CIR model following Kaplan, Sun and Jagannathan (2001) [6]. The Prime rate set to a 3 percent spread over the implied instantaneous Treasury rate. The model is described in more detail in Appendix 2.

Cash flows are affected by three sources of uncertainty: prepayments, defaults, and changes in the prime rate. Thus although there is no risk of loss of principal or accrued interest because of default, the cash flows are not free of risk. Prepayments and defaults both trigger a terminal payment of outstanding principal and interest. Rate changes affect the interest payment in the next period, and also require a re-amortization of the remaining principal.

Annual prepayment and default rates in each year after origination are calibrated based on average rates derived from the SBA loan data for each year in a loan's life. Both prepayment and default rates vary significantly over the life of a loan. Prepayment rates on medium- and long-term loans peak between 6% and 8% in years 3 to 6 and then steadily decline. Default rates peak in year 2 and 3 at between 2% and 3%, and drop off sharply thereafter. These patterns are reflected in the simulations, which employs draws from a uniform random number generator to determine

whether a default or prepayment has occurred in a given month.

Uncertainty arising from changes in the prime rate, default, and prepayment potentially introduces systematic risk into the cash flows. The spread between Prime and Treasury, which we take to be fixed, in fact is expected to be countercyclical, since credit spreads increase in downturns. This imparts a slightly negative beta to the promised cash flows, which thereby get larger when times are bad. The sign on the systematic risk introduced by default and prepayment is not obvious. Both trigger an early return of principal, so the effect depends on the systematic risk of the triggering event, and whether the GLPCP securities tend to be systematically priced at a discount or premium to par in a downturn. Rather than assuming a value for the risk premium, we solve for the fixed percentage point spread over 1-month Treasury rates implied by the CIR model that equates the model price with the market price from the Coastal Securities data. The spread can be interpreted as the sum of a risk premium, a liquidity premium, and an error term due to model misspecification.

5.3 Results and Sensitivity Analysis

The results of the analysis are shown in Figure 7, which show the dispersion of implied risk premia across loan pools in each month in the sample. Note that the amount of price data increases over time, since new pools are entering the sample and older pools are not aging out of it. The overall average premium is 122 bps, with a standard deviation of 33 bps.

To provide some insight into the observed variation in spreads, we ran a Fama-Macbeth [3] cross sectional-time series regression of spreads on coupons, pool size, original maturity, and a dummy variable that distinguishes pools with original maturity longer than 15 years. The results are reported in Table 7. The premium demanded on the guaranteed securities is increasing in the pool's coupon rate, but none of the other explanatory variables is significant. The effect of a higher coupon rate is to shorten a pool's duration if it indicates higher expected defaults. Estimates of the premium over the risk-free rate on these securities are sensitive to our assumptions about default and prepayment rates, and it is interesting to look at its sensitivity to these assumptions. We do this by introducing a multiplicative factor which inflates the prepayment or default probabilities by some multiple. For instance, if the default factor is two then in each period the default probability used in the pricing model will be two times higher than the historic default probability used in the

base case. We find that the default factor which implies a zero premium is on average 21.4 over all of the loan pools, with a standard deviation of 10.9. This means that in order to match the observed market prices for a given pool the probability of default in a given month needs to be 21 times higher than the historical average in the last 20 years. Similarly, the average prepayment factor is 8.0, with a standard deviation of 6.13. This shows that the model prices are quite insensitive to changes in the default and prepayment probabilities, which also provides a hint that these risks are not the main drivers of the premium over the risk free rate earned by the guaranteed pools.

5.4 Implications for Profitability

The simple profitability calculation in Section 3.2 took the short-term Treasury rate as the cost of capital for the guaranteed portion of 7(a) loans. The analysis of this section suggests that the cost is higher by an average of 127 bps. Taking this into account in the cost of capital calculation decreases estimated profits as a percent of loan value from 2.6% to 1.6%, and decreases the breakeven cost of uninsured capital from 17.6% to 14.3%. Hence, the significantly higher than risk-free cost of capital to finance the guaranteed portion of SBA 7(a) loans explains part, but not all, of why loans cost borrowers so much.

6 Summary and Conclusions

In this paper we have looked at two possible and complementary explanations for the high rates charged to borrowers in the 7(a) program. We find support in the data for both: (1) that large SBA lenders may be able to exert market power and thereby charge higher rates, and (2) that the cost of funding the guaranteed portion of SBA loans is significantly above Treasury's cost of funds. These findings suggest that there may be ways to modify the 7(a) program to reduce costs to borrowers and finance the program more efficiently.

The leading alternative to guaranteed lending is direct lending, where the government directly funds and originates loans. A rationale for involving private intermediaries in the origination process for government loan programs is when screening for credit quality is important. Although we did not try to assess the value of this function for the 7(a) program, clearly small business loans are risky and require judgment, suggesting an important screening role for the private sector. Nevertheless, it seems that the government could reduce program costs by purchasing the guaran-

teed portion of loans directly from bank lenders and funding those purchases through the Treasury rather than through sponsorship of a private securitized loan market ¹². This would allow bank lenders to continue to provide screening services in the origination process, but eliminate a layer of intermediation in the securitization process where there is no obvious value added by operating through the private sector.

If in fact large SBA lenders are able to exert market power in loan pricing, a further role for the federal government could be to try to increase competitiveness in the market, perhaps by introducing a more centralized loan application process that would force lenders to compete more directly for borrowers. This would be consistent with the general trend toward the increased reliance on credit scoring and other types of hard information in small business lending, although local lenders may still have information advantages that make them the most efficient originators.

¹²This was the rationale in 1973 for consolidating federal borrowing for different programs through the Federal Financing Bank.

A APPENDIX - SBA 7(a) Loan Level Data

The SBA administers 7(a) Program data in their Electronic Loan Information Processing System (ELIPS). This system incorporates static data – information that does not regularly change over the life of a loan – as well as loan transactions related to balance, purchase, recovery, and other activities. The current project relies on data from ELIPS to identify basic loan, size, maturity, lender information, borrower zip code, as well as transactions data to track loan performance related to purchases and recoveries to identify defaults and prepayments.

Static Loans File: The ELIPS file consists of over 1.2m of SBA loans since the program has been in place, with one static record per loan. Each record contains a list of relevant information introduced at time of origination. It includes record of the following: date the loan was issued, loan amount, loan size, maturity date, SBA guarantee, interest rate (including the spread above prime rate), program type (Regular or Express), borrower and lender’s zip code, lender’s name, and characteristics of the business.

Transactions File: The file consists of all transactions for each corresponding loan in the static file. These transactions include disbursements, monthly loan payments (including fees), balance, SBA loan repurchases when there is default, and recoveries (given default). Based on the information contained in the transaction file it is possible to determine whether and when default and prepayment have occurred. The transactions file also provides full information about recoveries and other information which are important in determining the default and prepayment behavior of all SBA loans.

B APPENDIX - Valuing GLPCP Securities (SBA Pools)

B.1 Overview of Securities and Underlying Risks

The GLPCP securities (SBA pools) in our dataset amortize every month and pays interest at PRIME rate plus a fixed spread. The pool cash flows are subject to early termination in the form of default or prepayment. Either of these events triggers a final payment of outstanding principal and accrued interest. There is full and explicit Government guarantee on these securities, which means that certificate holders do not lose any principal when default occurs. However, since these pools typically trade above par, when these pools terminate earlier than expected investors may lose the difference between the market price and the remaining principal plus accrued interest. Yet, it is unclear which portion of these risks is diversifiable and which portion is systematic. The approach used to address this question is to treat these risks as independent from interest rate risk, and use the historic default and prepayment to model these events. Furthermore, we perform a sensitivity analysis to infer that the magnitude of an increase in default (prepayment) frequency does not have a large impact on pool prices.

This appendix describes details of the Monte Carlo implementation used to model the distribution of pool cash flows and the value of the certificates, and is organized as follows; we first use a two-factor Cox-Ingersoll-Ross (CIR) model to simulate risk-neutral paths of interest rates used for credit-risk-free discounting and for determining the pool floating interest payments. We then model prepayment and default using the historic experience derived from 20 years of comprehensive data obtained from the SBA. We combine these three components to compute the value of each pool in our sample, and then devise an algorithm to measure the spread above Treasuries embedded in the market price of these securities.

B.2 Interest Rates and Pool Amortization

We employ a two-factor CIR model to simulate paths of future Treasury rates. In the Jagannathan Kaplin Sun (JKS – 2003) [6] version of the CIR model the instantaneous interest rate $R(t)$ is the sum of a constant \bar{R} and the two state variables $y_i(t)$, for $i = 1, 2$:

$$R(t) = \bar{R} + y_1(t) + y_2(t). \quad (2)$$

Each state variable follows an independent, mean-reverting, square root process along any period

s , between time t and the maturity date T :

$$dy_i(s) = \kappa_i [\theta_i - y_i(s)] ds + \sigma_i \sqrt{y_i(s)} dW_i(s), \quad i = 1, 2 \quad (3)$$

where $W_i(s)$ are standard and independent Brownian motions. Under the pricing (risk-neutral) measure the factors evolve according to:

$$dy_i(s) = \bar{\kappa}_i [\bar{\theta}_i - y_i(s)] ds + \sigma_i \sqrt{y_i(s)} dW_i^*(s), \quad i = 1, 2 \quad (4)$$

where

$$\bar{\kappa}_i = \kappa_i + \lambda_i \quad (5)$$

and

$$\bar{\theta}_i = \frac{\kappa_i \theta_i}{\kappa_i + \lambda_i} \quad (6)$$

The market price of risk, λ_i for each state variable is assumed to be linear. The price at current-time t of a zero coupon bond that pays \$1 at maturity date T is

$$P(t, T) = e^{-\bar{R}(T-t)} p_1(t, T) p_2(t, T), \quad (7)$$

where

$$p_i(t, T) = e^{A_i(t, T) - B_i(t, T) y_i(t)}, \quad (8)$$

$$A_i(t, T) = \frac{2\kappa_i \theta_i}{\sigma_i^2} \ln \left[\frac{2\gamma_i \exp \left\{ (\gamma_i + \bar{\kappa}_i) \frac{(T-t)}{2} \right\}}{2\gamma_i + (\gamma_i + \bar{\kappa}_i) [\exp \{ \gamma_i (T-t) \} - 1]} \right], \quad (9)$$

$$B_i(t, T) = \frac{2(\exp[\gamma_i(T-t)] - 1)}{2\gamma_i + (\gamma_i + \bar{\kappa}_i) [\exp\{\gamma_i(T-t)\} - 1]}, \quad (10)$$

and

$$\gamma_i = \sqrt{\bar{\kappa}_i^2 + 2\sigma_i^2} \quad (11)$$

The yield to maturity, YTM of a zero coupon bond maturing at T is

$$YTM(t, T) = \frac{-\ln P(t, T)}{T-t} \quad (12)$$

In our analysis we use the two-factor parameters estimated in JKS [6] using weekly LIBOR rates of various maturities:

Two factor CIR parameters (estimated by JKS)

Factor	κ	θ	σ	λ
1	0.3922	0.2727	0.0153	-0.00038
2	0.0532	0.0162	0.0430	-0.05917
$\bar{R} = -0.2289$				

Factor 1 has stronger degree of mean reversion and drives the gap between long and short rates. Factor 2 has higher volatility parameter.

In every period t we solve for the initial state variables, $y_1(t)$ and $y_2(t)$, by fitting two points in the yield curve from historic Treasury data, the three month T-Bill rate and the ten year Treasury bond rate. We perform this in two steps, first set the historic yields on left hand side of equation (12) to solve for $P(t, T)$. Then use P and system (7) – (11) to solve for $y_1(t)$ and $y_2(t)$.

We need initial state variables to simulate the (monthly) discrete version of (4), with Monte Carlo paths that start at time t and end at T . Using monthly Euler-discretizations we set time step $h = \frac{1}{12}$. For any time s between t and T we have:

$$y_i(s+h) = y_i(s) + \bar{\kappa}_i [\bar{\theta}_i - y_i(s)] h + \sigma_i \sqrt{\max\{y_i(s), 0\}} \sqrt{h} W_i \quad (13)$$

where W 's are drawn from standard and independent normal random generator.

From (2) and the initial state variables we compute the initial short rate $R(t)$. In turn, cash flows arriving $t+h$ are discounted back to t using the factor

$$d(t, t+h) = \frac{1}{1 + R(t)h} \quad (14)$$

Cash flows arriving at $s+h$ are discounted back to t using a factor which can be recursively solved from (14)

$$\begin{aligned} d(t, s+h) &= \prod_{u=t}^s d(u, u+h) \\ &= \frac{d(t, s)}{1 + R(s)h} \end{aligned} \quad (15)$$

We assume that the prime rate is 3% above the short rate¹³. Suppose a SBA guaranteed pool pays the fixed spread above prime, Δ . Then for the same Monte Carlo run as above we set the pool's floating interest rate to

$$\rho(s) = R(s) + 0.03 + \Delta \quad (16)$$

¹³Figure 1 indicates that after 1994 the Prime rate has been consistently set to 300 basis points above the Fed Funds rate plus a very small noise. In addition, the Fed Funds rate has usually been higher than the short rate.

For a given balance $B(s)$ the pool payment in the next month (when there is no termination) and new balance are set by the amortization schedule:

$$Pmt(s+h) = \frac{B(s)\rho(s)h}{1 - (1 + \rho(s)h)^{s-(T-t)}} \quad (17)$$

and

$$B(s+h) = [1 + \rho(s)h]B(s) - Pmt(s+h). \quad (18)$$

B.3 Default and Prepayment

A guaranteed pool is formed with the insured portion of several¹⁴ SBA loans. In practice these certificates may experience partial termination when only some, and not all of the underlying loans default or prepay. Instead of buying a pool certificate investors could acquire a single guaranteed loan certificate, which would be a claim on the insured portion of a single SBA loan. A large pool does not diversify away the systematic risk and therefore must be priced in the same way as a single guaranteed loan certificate. Hence, for valuation purposes we can model pools as if they were single loans by assuming that default or prepayment triggers full termination. The termination events in this section are reflected in simulations, which employ draws from a uniform random number generator to determine whether a loan has defaulted or prepaid.

We estimate default and prepayment frequencies as a function of loan age, using twenty years of comprehensive data provided by the SBA. The historic prepayment and default frequencies are summarized in figures 8 and 9. From those frequencies we can easily calculate the contemporaneous default and prepayment probabilities. In period s the default and prepayment probabilities for loan j are expressed by $\pi_j^d(s)$ and $\pi_j^p(s)$, respectively.

In time step s of the Monte Carlo run we draw W to feed in the expression of eq. (13) and we also draw two independent numbers from a uniform number generator, U_s^d and U_s^p . Default on loan j is triggered if $U_s^d \leq \pi_j^d(s)$ and prepayment is triggered if $U_s^p \leq \pi_j^p(s)$. When either event occurs the pool terminates and investors receive the remaining balance plus any accrued interest. In those nodes Pmt in (17) becomes:

$$Pmt(s) = [1 + \rho(s-h)h]B(s-h) \quad (19)$$

¹⁴A pool must be issued with at least four underlying loans. The pool holds only the guaranteed portion of the loans. This means that the uninsured piece would have been stripped out before the pool has been assembled.

For valuation purposes it is convenient to set $Pmt(u) = 0$ for any $u > s$, where s is a termination time.

B.4 Model Price

Using the interest rate behavior and termination behavior above we obtain pool prices at any time t . The only inputs for each pool are the origination date t_o , the maturity date T , and the pool's fixed spread above the prime rate Δ . For a given Monte Carlo path indexed by n the price at time t of the pool j is

$$m_j^n(t) = \sum_{s=t+1}^T Pmt(s)d(t, s) \quad (20)$$

The model price of pool j at time t is computed as the average price of all simulated paths, and represented by

$$M_j(t) = \frac{1}{N} \sum_{n=1}^N m_j^n(t) \quad (21)$$

In our simulations we set the number of sample paths to $N = 100,000$.

B.5 Market Prices, Spreads, and Sensitivity

In our sample, pool market prices are often lower than model prices $M_j(t)$, which suggests that investors discount pool cash flows at higher than (credit-risk-free) Treasury rates. Alternatively, investors may demand a premium for bearing any systematic termination-risk which may not have been accounted in our model. In this section we introduce a premium above (or below) the Treasury curve which equates model prices to market prices. We also perform a similar exercise by introducing a multiplicative premium over default and prepayment probabilities to examine the price impact of changes in termination probabilities.

Define the discount premium ζ , and add it to the factor (14) to discount cash flows from $t + h$ back to t and (15) to discount cash flows from $s + h$ back to t . For $s > t$ we rewrite the discount factors to incorporate premium ζ as:

$$d(\zeta; t, t + h) = \frac{1}{1 + [R(t) + \zeta] h} \quad (22)$$

and

$$d(\zeta; t, s + h) = \prod_{u=t}^s d(\zeta; u, u + h) \quad (23)$$

$$= \frac{d(\cdot; t, s)}{1 + [R(s) + \zeta] h}$$

For each pool j and time t we solve for the ζ which equates $M_j(t)$ to market prices. The results are summarized in Figure 7, which shows the monthly dispersion of premium along our sample.

An alternative way to measure the premium demanded by pool investors is to introduce a multiplicative factor which inflates (depresses) the prepayment or default probabilities by some multiple. For instance, if φ^d is a default-probability-multiplicative-premium then default on loan j is triggered at time s if $U_s^d \leq \varphi^d \pi_j^d(s)$ and prepayment is triggered if $U_s^p \leq \pi_j^p(s)$. Analogously, if φ^p is a prepayment-probability-multiplicative-premium then default on loan j is triggered at time s if $U_s^d \leq \pi_j^d(s)$ and prepayment is triggered if $U_s^p \leq \varphi^p \pi_j^p(s)$.

References

- [1] Collin-Dufresne, Pierre and Bruno Solnik (2001), “On the Term Structure of Default Premia in the Swap and LIBOR Markets,” *Journal of Finance* 56, 1095-1115
- [2] Cox, J. C., J. E. Ingersoll and S. A. Ross (1985), “A Theory of the Term Structure of Interest Rates,” *Econometrica*, vol. 53, pp. 385-408.
- [3] Fama, Eugene F. and James D. MacBeth, “Risk, Return, and Equilibrium: Empirical Tests ” *The Journal of Political Economy*, Vol. 81, No. 3 (May - Jun., 1973), pp. 607-636
- [4] Gale, W.G. (1991), “Economic Effects of Federal Credit Programs,” *The American Economic Review*, vol. 81, no. 1, pp. 133-152.
- [5] Glennon, D. and P. Nigro (2005), “Measuring the Default Risk of Small Business Loans: A Survival Analysis Approach,” *Journal of Money, Credit, and Banking*, vol. 37, no. 5.
- [6] Jagannathan, R., A. Kaplin, and S.G. Sun, (2003), “An Evaluation of Multi-Factor CIR Models Using LIBOR, Swap Rates, and Cap and Swaption Prices,” *Journal of Econometrics*, vol. 116(1-2), pp. 113-146.
- [7] Longstaff, F. (2004), “The Flight-to-Liquidity Premium in U.S. Treasury Bond Prices,” *The Journal of Business*, 2004, vol. 77, no. 3.
- [8] Lucas, D. and Damien Moore (2009), “Guaranteed vs. Direct Lending: The Case of Student Loans,” forthcoming in *Measuring and Managing Federal Financial Risk*, D. Lucas editor, NBER.
- [9] Petersen, M. and R.G. Rajan (2002) “Does Distance Still Matter? The Information Revolution in Small Business Lending”, *Journal of Finance*, 57 (6): 2533-2570 Dec 2002.
- [10] SBA (2007), “The Small Business Economy for Data Year 2006,” US Government Printing Office, http://www.sba.gov/advo/research/sb_econ2007.pdf
- [11] Stiglitz, J. E. (1979) “Equilibrium in Product Markets with Imperfect Information”, *The American Economic Review*, Vol. 69, No. 2, Papers and Proceedings of the Ninety-First Annual Meeting of the American Economic Association (May, 1979), pp. 339-345.

- [12] U.S. Congressional Budget Office (2005), “Estimating the Value of Subsidies for Federal Loans and Guarantees,” Washington, D.C.
- [13] U.S. Congressional Budget Office (2007), “Federal Financial Guarantees under the Small Business Administration’s 7(a) Program,” <http://www.cbo.gov/ftpdocs/87xx/doc8708/10-15-SBA.pdf>
- [14] Wolinsky, Asher (1986) “True Monopolistic Competition as a Result of Imperfect Information”, *The Quarterly Journal of Economics*, Vol. 101, No. 3 (Aug., 1986), pp. 493-511.

Table 1: Top 20 SBA Lenders in 2006 and Lagged Default Rates

The twenty largest SBA lenders in 2006 are sorted based on the total number of loans originated in that year. For each lender we include the following information: number of loans originated in 2006, the total \$-amount originated in 2006, average loan \$-size of new loans in 2006, and the lagged default rate in 2006 covering the past year and the past two years.

Lender	New Loans in 2006	Total (\$)Amt. of New Loans in 2006	Avg. New Loan Size(\$)	Lagged Default (1yr)	Lagged Default (2yrs)
BANK OF AMERICA	9,776	447,449,130	45,770	4.0%	3.2%
JPMORGAN CHASE	6,567	695,544,516	105,915	2.1%	2.5%
RBS CITIZENS	4,905	299,151,862	60,989	0.3%	0.2%
WELLS FARGO	4,448	666,003,115	149,731	1.9%	1.8%
CAPITAL ONE	4,159	206,557,962	49,665	0.1%	0.1%
U.S. BANK	4,093	460,909,009	112,609	1.4%	1.6%
WASHINGTON MUTUAL	2,653	157,455,477	59,350	1.0%	2.4%
PNC BANK	2,078	388,056,517	186,745	1.0%	1.3%
NATIONAL CITY	1,947	162,624,308	83,526	0.9%	1.3%
BANCO POPULAR	1,492	357,218,724	239,423	3.6%	3.9%
CIT	1,380	792,124,943	574,004	4.2%	4.7%
M&T BANK	1,289	144,180,273	111,854	1.6%	1.4%
HSBC	1,025	71,770,931	70,020	1.2%	1.0%
CITIBANK	983	67,509,780	68,677	1.6%	2.1%
HUNTINGTON NATIONAL	916	105,736,523	115,433	1.8%	1.8%
KEYBANK NATIONAL	892	139,012,935	155,844	2.1%	2.7%
COMPASS BANK	884	94,241,957	106,609	3.0%	3.2%
COMMERCE BANK	732	159,338,573	217,676	1.2%	1.1%
ZIONS FIRST NATIONAL	712	84,877,789	119,210	2.1%	2.6%
CALIFORNIA BANK & TRUST	565	85,047,012	150,526	2.2%	2.0%

Table 2: Interest Rate (bps Spread above Prime) and SBA Guarantees, 1988-2008

Between 2004 and 2008 over 93% of the borrowers paid a floating interest rate set to a fixed spread above the Prime rate. The second and fourth columns display the average and dollar-weighted average spread (above Prime) on all floating rate loans originated between 1988 and 2008. The rows display average spread for all types of loans, as well as Regular 7 (a) loans and Express loans, respectively. The third and fifth columns display the average and dollar-weighted average SBA guarantee provided for loans originated between 1988 and 2008, including the ones that paid a fixed interest rate. Likewise, we calculate the average guarantee all types of loans, as well as Regular 7 (a) loans and Express loans.

	Avg. Interest Spread	Avg. SBA Insurance	\$\$-Weighted Avg. Spread	\$\$-Weighted Avg. Guarantee
Full Sample	246.1	68.6%	194.6	72.1%
Regular 7 (a) Loans	193.1	79.6%	183.7	75.6%
Express Loans	329.0	50.1%	262.8	50.1%

Table 3: Maximum Guarantee and Interest Rate (bps above Prime) Caps

Lenders structure their own loans to small businesses according to SBA's guidelines and apply and receive partial guarantees from SBA. The SBA has enacted interest rate-spread limits and maximum loan guarantee which applies to loan type, loan size and maturity. Lenders select the interest rate which must be no higher than the limit established by the SBA. Table 3-A displays the maximum SBA guarantee that lenders may receive on each loan. The caps are based on loan type and loan size. Table 3-B shows the maximum interest rate spread that lenders can charge on Express loans. These ceilings are determined by loan size. Table 3-C presents the interest spread ceilings for Regular 7 (a) loans based on loan size and maturity.

A. MAXIMUM GUARANTEES

		Maximum SBA Guarantee
Loan Type	Loan Size	
Regular	\$0 - \$150K	85%
Regular	\$150K+	75%
Express	all	50%

B. MAXIMUM INTEREST RATE SPREAD - EXPRESS LOANS

		Maximum Interest Rate Spread
Loan Size		
\$0 - \$50K		6.5%
\$50K+		4.5%

C. MAXIMUM INTEREST RATE SPREAD - REGULAR 7(a) LOANS

		Maximum Interest Rate Spread
Loan Size	Maturity	
\$0 - \$25K	7yrs +	4.75%
\$0 - \$25K	0 - 7yrs	4.25%
\$25K - \$50K	7yrs +	3.75%
\$25K - \$50K	0 - 7yrs	3.25%
\$50K +	7yrs +	2.75%
\$50K +	0 - 7yrs	2.25%

Table 4: Effect of Regional Concentration on Interest Rate Spreads (Split Regressions)

Regional competitiveness is measured by the Herfindahl index for each Core Based Statistical Area (CBSA). CBSAs are defined as the metropolitan and micropolitan areas in the U.S.. Each year the index is constructed based on the market shares of SBA lenders in each region, e.g. eq. (1). Because interest rate caps (e.g. table 3) could influence lenders' competitive behavior we test the influence of concentration on interest rate spreads separately for each subgroup shown on table 3. The subgroups are displayed on table 4-A. Table 4-B shows regression results for each subgroup. Guarantee, loan size, and maturity are used as controls. The standard errors are clustered by cohort.

A. Groups by Loan Type, Maturity, and Size

Groups	Type	Size	Maturity	Sample Size
Express - Small	Express	0-\$50K	-	95,043
Express - Large	Express	\$50K+	-	80,596
7 (a) - Small - Short	Regular 7 (a)	0-\$25K	0-7yr	11,130
7 (a) - Small - Long	Regular 7 (a)	0-\$25K	7yrs +	1,351
7 (a) - Medium - Short	Regular 7 (a)	\$25K-\$50K	0-7yr	29,825
7 (a) - Medium - Long	Regular 7 (a)	\$25K-\$50K	7yrs +	8,124
7 (a) - Large - Short	Regular 7 (a)	\$50K-\$150K	0-7yr	76,315
7 (a) - Large - Long	Regular 7 (a)	\$50K-\$150K	7yrs +	64,319
7 (a) - Huge - Short	Regular 7 (a)	\$150K+	0-7yr	41,144
7 (a) - Huge - Long	Regular 7 (a)	\$150K+	7yrs +	167,310

B. Regression Results

	Intercept	Herfindhl	Guarantee	Size	Maturity	Adj Rsq
Express - Small	474.23	-55.3	-352.1	-0.00252	2.038	0.0894
	20.05	-14.33	-7.49	-50.4	75.4	
Express - Large	347.66	-58.41	-123.98	-0.000381	0.481	0.0639
	24.19	-15.43	-4.35	-65.25	29.9	
7 (a) - Small - Short	90.91	-22.76	129.73	0.000345	0.156	0.008
	5.61	-5.18	7.03	1.57	2.95	
7 (a) - Small - Long	33.83	-46.89	230.64	0.00064	-0.194	0.044
	0.78	-4.52	4.67	1.24	-3.66	
7 (a) - Medium - Short	83.11	-36.51	154.36	-0.00018	0.089	0.0153
	9.25	-14.59	15.59	-2.3	3	
7 (a) - Medium - Long	75.46	-39.32	188.11	-0.00022	-0.119	0.0249
	4.35	-9.04	9.81	-1.49	-5.45	
7 (a) - Large - Short	134.7	-44.26	81.97	-0.00007	0.075	0.0139
	27.87	-28	15.23	-5.67	4.33	
7 (a) - Large - Long	123.77	-48.35	108.98	0.000058	-0.07428	0.0218
	23.79	-30.27	18.79	4.53	-13.38	
7 (a) - Huge - Short	180.32	-31.06	25.69	-0.00001	0.044	0.0069
	34.38	-14.93	4.16	-5.11	2.17	
7 (a) - Huge - Long	181.36	-8.57	58.09	-0.000014	-0.116	0.0283
	70.33	-8.79	18.41	-23.64	-46.81	

Table 5: Effect of Regional Concentration on Interest Rate Spreads (Pooled Regression)

Regional competitiveness is measured by the Herfindahl index for each county in the U.S.. Each year the index is constructed based on the market shares of SBA lenders in each region, e.g. eq. (1). This table displays results of pooled regressions of regional concentration on interest rate spreads. The controls are SBA guarantee, loan size(\$), maturity, firm size (employees), lagged default (1yr), and express loans (dummy). We have tested lagged 2-year defaults, and contemporaneous default rates but results are similar. The standard errors are clustered by cohort.

	Specification 1	Specification 2	Specification 3
Guarantee(%)	-13.04 (-0.3)	-11.18158 (-0.2)	-10.95021 (-0.2)
Loan Size	-0.00006 (-4.4)	-0.00006 (-4.3)	-0.00006 (-4.3)
Maturity (months)	0.08 (2.6)	0.08 (2.6)	0.08 (2.6)
Firm Size (# of employees)	-0.006 (-1.6)	-0.006 (-1.6)	-0.006 (-1.6)
Bank Concentration (Herfindahl by County)	-10.49 (-0.9)	-10.77 (-0.9)	
Express Loans (Dummy)	120.18 (9.3)	120.90 (9.3)	120.90 (9.3)
Lagged Default (1yr)	100.08 (1.6)		
Constant	209.58 (5.4)	210.54 (5.4)	208.95 (5.3)
Observations	550,909		
Adj-R ²	18.7%	18.7%	18.7%

Table 6: Effect of Lender Size on Interest Rate Spreads (clustered by cohort)

We consider a size-based measure of lender market power, based on a set of indicator variables for the number of loans that a lender originated in that year. The categories are LARGE-LENDERS, MEDIUM-LENDERS, and SMALL-LENDERS. The SMALL LENDERS dummy selects the banks that originated less than the median number of loans in that year. LARGE LENDERS are alternatively defined as the top 1st, 5th, or 10th percentile. This table displays the result of a regression of lender size on interest rate spreads. SBA guarantee, loan size(\$), maturity, firm size (employees), lagged default (1yr), and express loans (dummy) are used as controls. The standard errors are clustered by cohort.

	Specification 1	Specification 2	Specification 3
Loan Size	-0.0000446 (-6.32)	-0.0000476 (-6.08)	-0.0000477 (-5.91)
Guarantee	-37.7587 (-0.66)	-41.22346 (-0.72)	-46.15977 (-0.79)
Maturity	0.0783794 (4.89)	0.0830075 (5.61)	0.0890191 (5.66)
Lagged Default (1yr)	107.6756 (1.51)	119.0581 (1.63)	126.3903 (1.67)
Large Lenders Dummy	203.0592 (4.58)	192.2177 (4.35)	190.9896 (4.29)
Medium Lenders Dummy	164.6121 (3.92)	160.4368 (-3.89)	148.2142 (3.48)
Small Lenders Dummy	143.8052 (3.46)	145.5233 (3.47)	159.8129 (3.81)
Express Loans Dummy	77.87298 (5.34)	83.09269 (5.7)	84.81583 (5.8)
Adj-R ²	19.8%	19.0%	18.7%
Observations	459523		
Medium-Large cutoff	99th percentile	95th Percentile	90th Percentile
Small-Medium cutoff	50th percentile	50th percentile	50th percentile

Table 7: Explaining the Premium of SBA Guaranteed Pools above Treasury

The premia (above Treasury) that investors require to hold SBA guaranteed pools are estimated using a simple Monte Carlo model. The simulated premia are shown on figure 7. The pool premia are regressed against several observed characteristics. The results are displayed in this table.

	Specification 1	Specification 2
Intercept	118.35 (19.16)	118.85 (29.25)
Coupon (above Prime)	25.33 (11.72)	25.30 (10.93)
Original Pool Size	-5.42E-10 (-0.01)	1.55E-08 (0.40)
Original Maturity	0.041 (0.78)	0.036 (1.23)
Dummy (above 15yrs)	-0.76 (-0.16)	

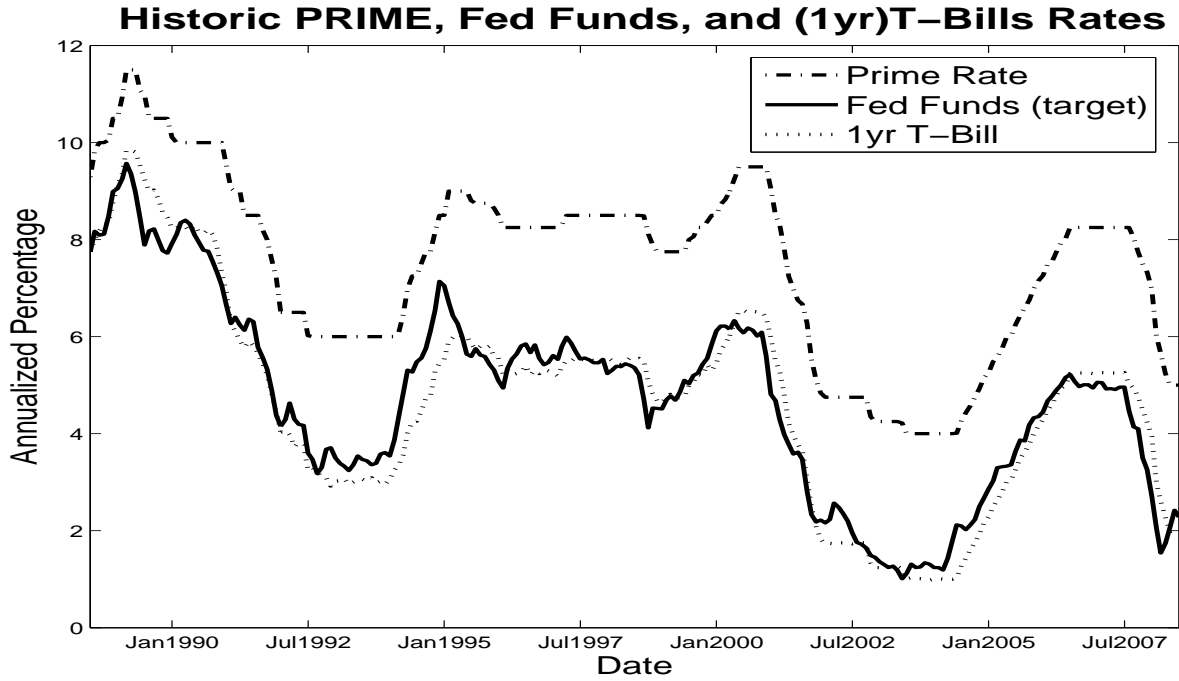


Figure 1: Historic PRIME, Fed Funds, and (1yr) T-Bill Rates

The figure shows the evolution of the Prime rate, Fed Funds (effective) rate, and the 1 year T-Bill rate. Since the end of 1994 the difference between the Prime rate and the Fed Funds (effective) rate have hovered around 3%.

Interest Rate Spread (%) above the PRIME Rate for SBA 7(a) Loans and for Commercial & Industrial Loans (by Cohort) - 1988 to 2006

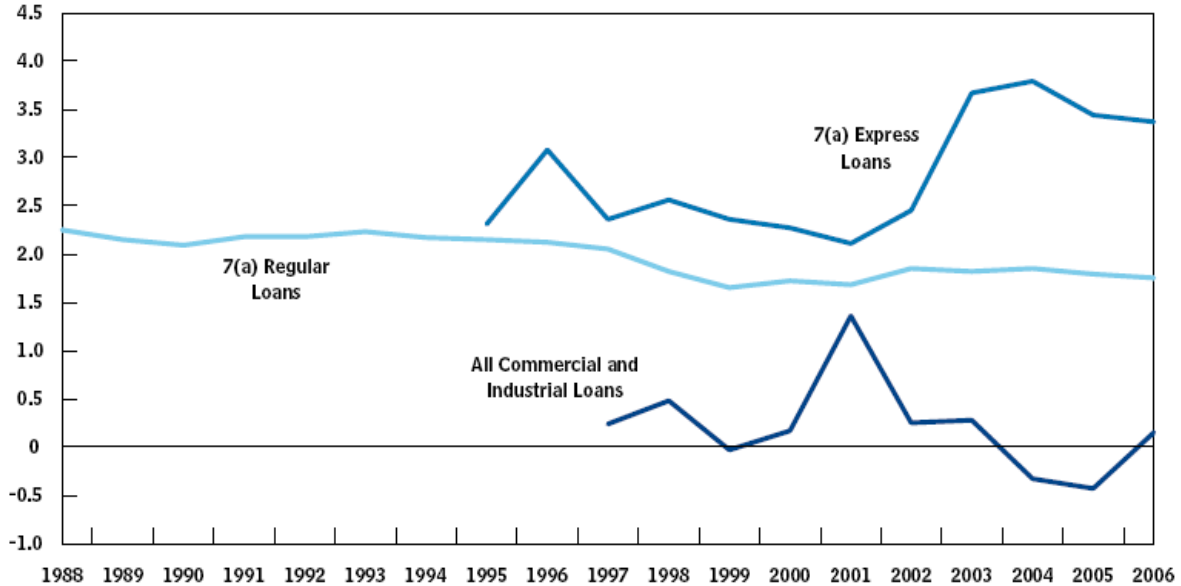


Figure 2: Interest Rate Spread above PRIME for SBA 7(a) Loans and Commercial&Industrial Loans (by Cohort), 1988-2008

Evolution of the average interest rate spread (above Prime) on Regular 7 (a) loans, SBA Express loans, and Commercial and Industrial (C&I) loans. C&I loans represent an important alternative source of financing for small businesses. These loans do not carry any kind of government guarantee. The size of C&I loans is comparable to the size of SBA loans; the principal range from \$100K up to \$999K. In addition, Glennon and Nigro [5] show that the default experience of C&I and SBA loans are comparable.

Source: Congressional Budget Office based on data from the SBA and the Board of Governors of the Federal Reserve System.

Cumulative Default Rates: SBA 7(a) Loans and S&P Corporate Bonds

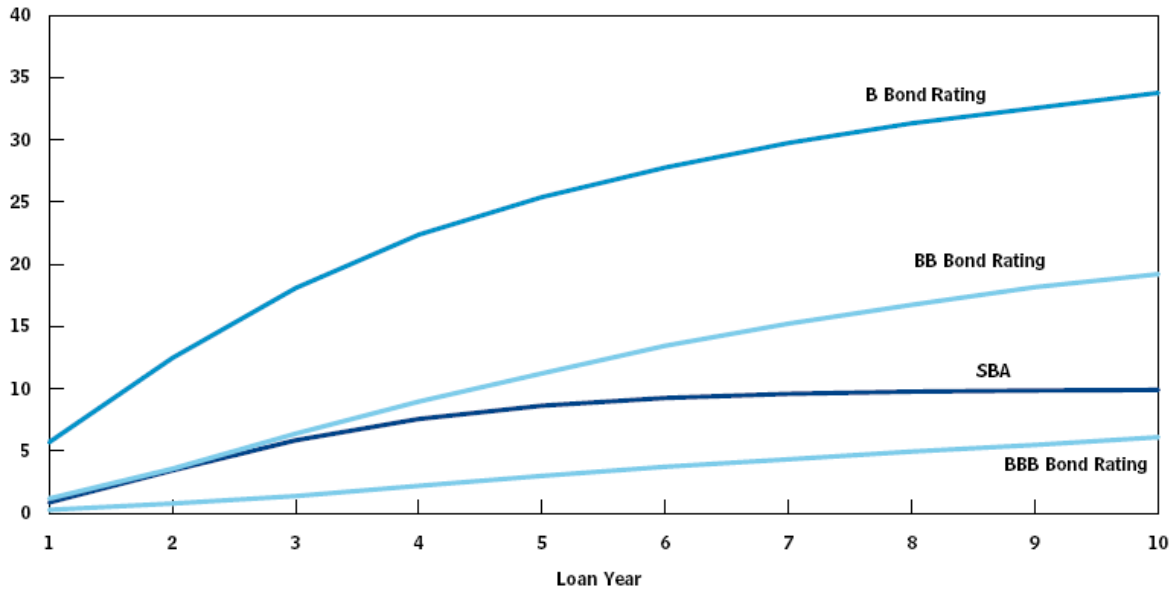


Figure 3: Cumulative Default Rates on SBA 7(a) Loans and S&P Corporate Bonds

Cumulative default rates measure the proportion of loans that default from cohort formation up to and including a given loan year. The figure plots the cumulative default rates for all SBA 7(a) loans from 1988 until 2006, and the B, BB, and BBB-rated corporate bonds. The default history on SBA loans are no better than BBB-rated bonds, but no worse than BB bonds. However, the SBA guarantees reduce lenders' cumulative losses to about a fourth of the SBA cumulative default rate.

Source: Congressional Budget Office based on data from the SBA and the Standard & Poor's.

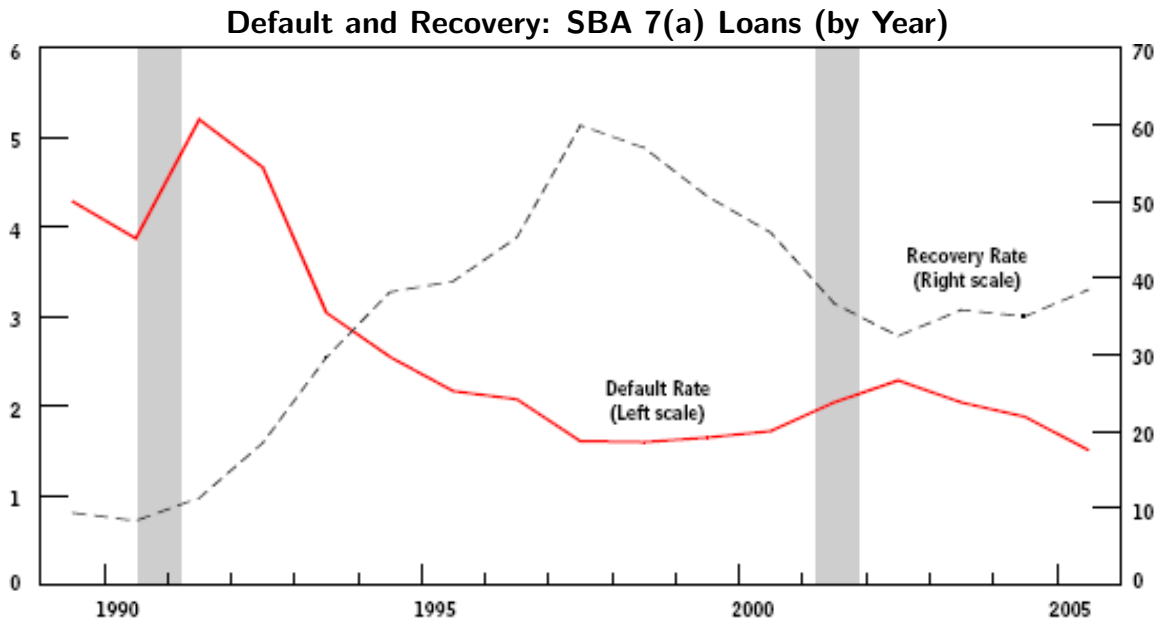


Figure 4: Default and Recovery: SBA 7(a) Loans (by Year)

Defaults in a given year represent the proportion of default claims during the year relative to the loans balance outstanding. Recovery measures the proportion of the remaining balance that is recovered on the loans that defaulted in a given year. Defaults are pro-cyclical while recovery is counter-cyclical.

Source: Congressional Budget Office based on data from the SBA.

Distribution of SBA Lenders Based on Total Loans Originated in 2006

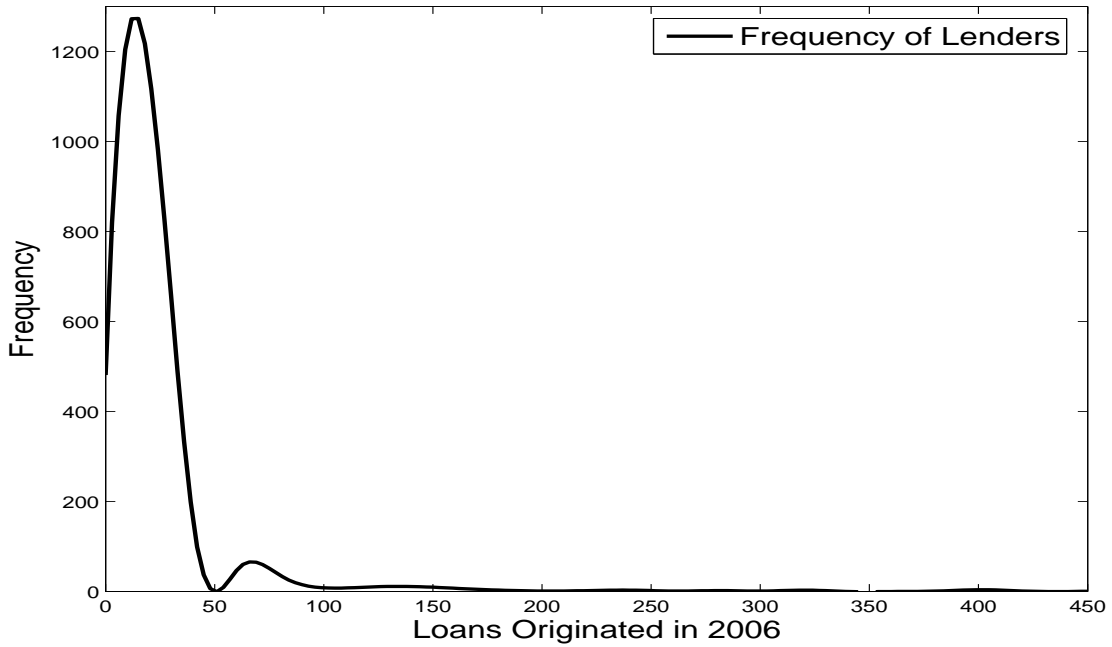


Figure 5: Distribution of SBA Lenders Based on Total Loans Originated in 2006

The distribution of lenders measures the total number of lenders that originated a given number of loans in 2006. In that year the median lender originated 3 loans while each of the six largest lenders originated more than 4,000 loans. The twenty largest lenders account for more than 70% of loans originated that year.

**Market Spread (to Prime) on SBA Guaranteed Pools
 ([PRIME-125bps] Coupon; 10yrs & 21+yrs Maturity)**

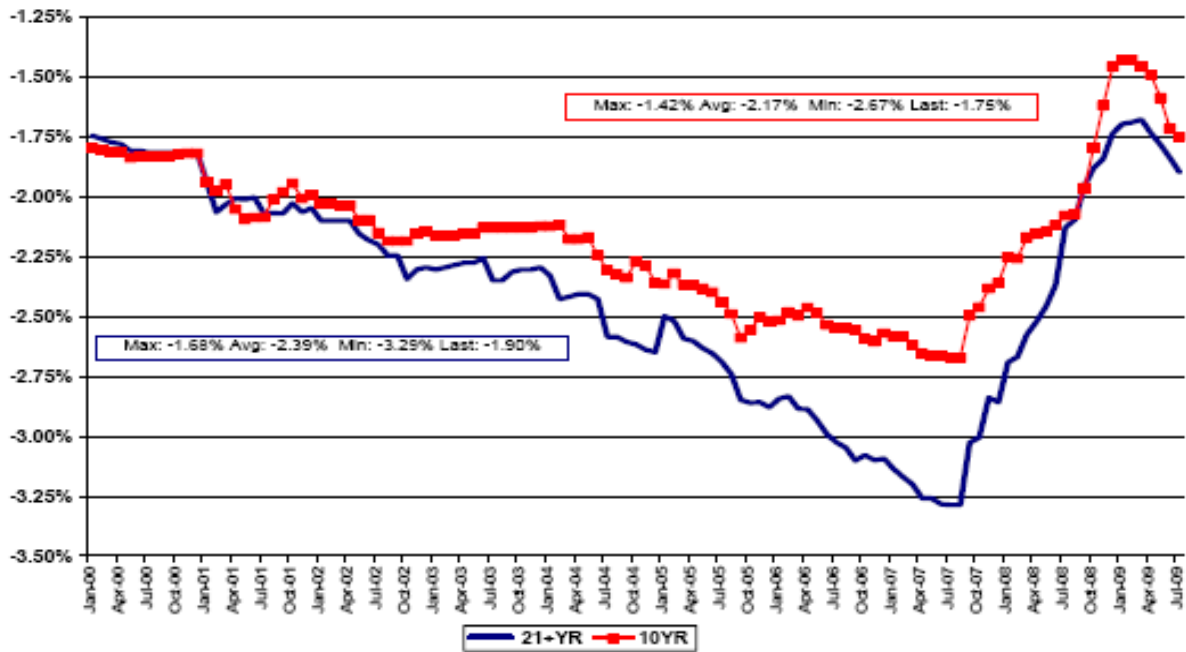


Figure 6: Market Spread (to Prime) on SBA Guaranteed Pools ([PRIME-125bps] Coupon; 10yrs & 21+yrs Maturity)

The figure shows the evolution of the market spread (relative to Prime) on selected SBA Pools issued by Coastal Securities. The selected pools pay a floating monthly coupon set to the Prime rate minus 125bps. The premium represent the discount rate (relative to Prime) which matches market price to expected cash-flows using Coastal Securities pricing model and Bloomberg’s CPR estimates. The red line corresponds to pools with 10 years maturity and the blue line corresponds to over 21 years maturity.

Source: Coastal Securities SBA Market Outlook Mid-Year 2009.

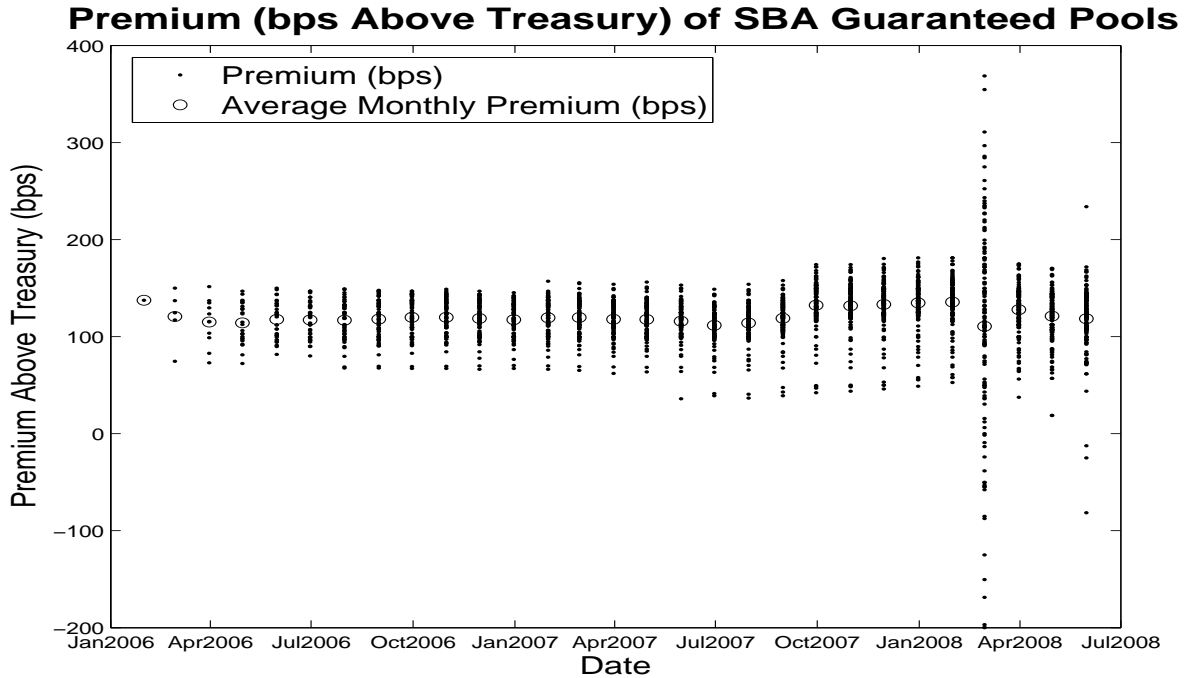


Figure 7: Premium (bps above Treasury) of SBA Guaranteed Pools

The figure shows the market premium (relative to Treasury) on selected SBA Pools issued by Coastal Securities between January 2006 and May 2008. The selected pools pay a floating monthly coupon set to the Prime rate plus a fixed spread. The premium represent the discount rate (above the Treasury) which matches market price to expected cash-flows using a Monte Carlo pricing model which incorporates the historic default and prepayment probabilities derived from the SBA database. The dots represent the premium on individual pools and the circles represent the mean monthly premia on the selected pools.

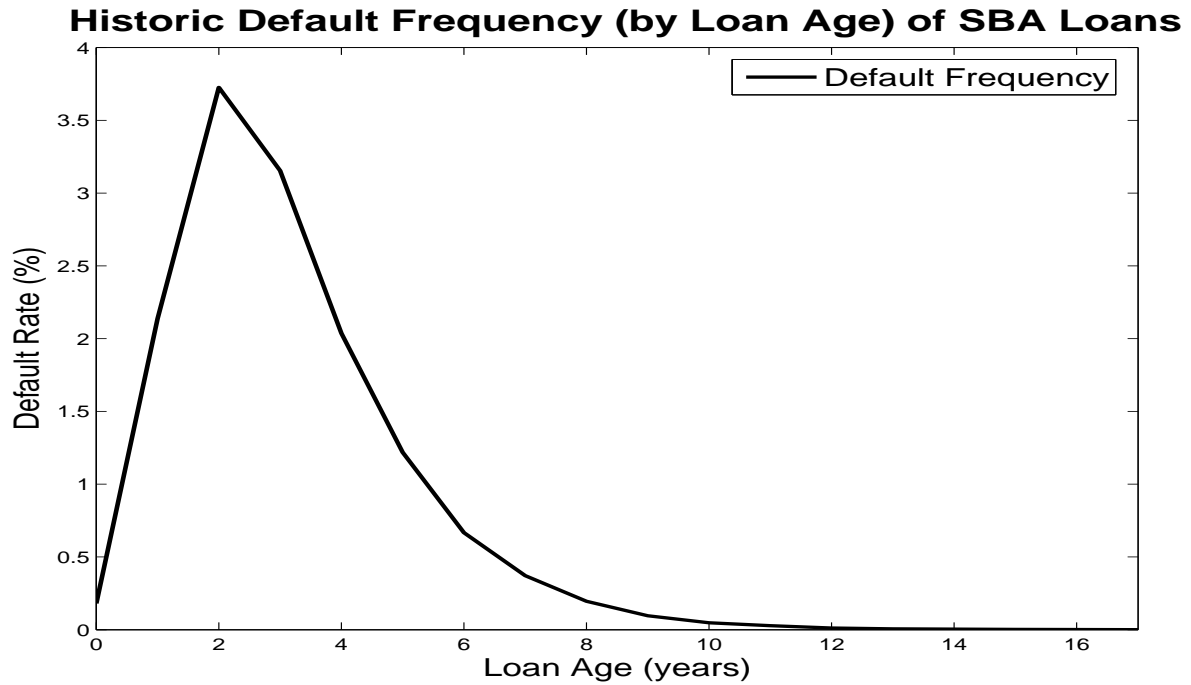


Figure 8: Historic Default Frequency (by Loan Age) of SBA Loans
Default frequencies measure the proportion of loans that default from cohort formation to a given loan year. The default frequencies are estimated using historic SBA data from 1988-2008. During this period defaults peaked in the loan's third year.

Historic Prepayment Frequency (by Loan Age) of SBA Loans

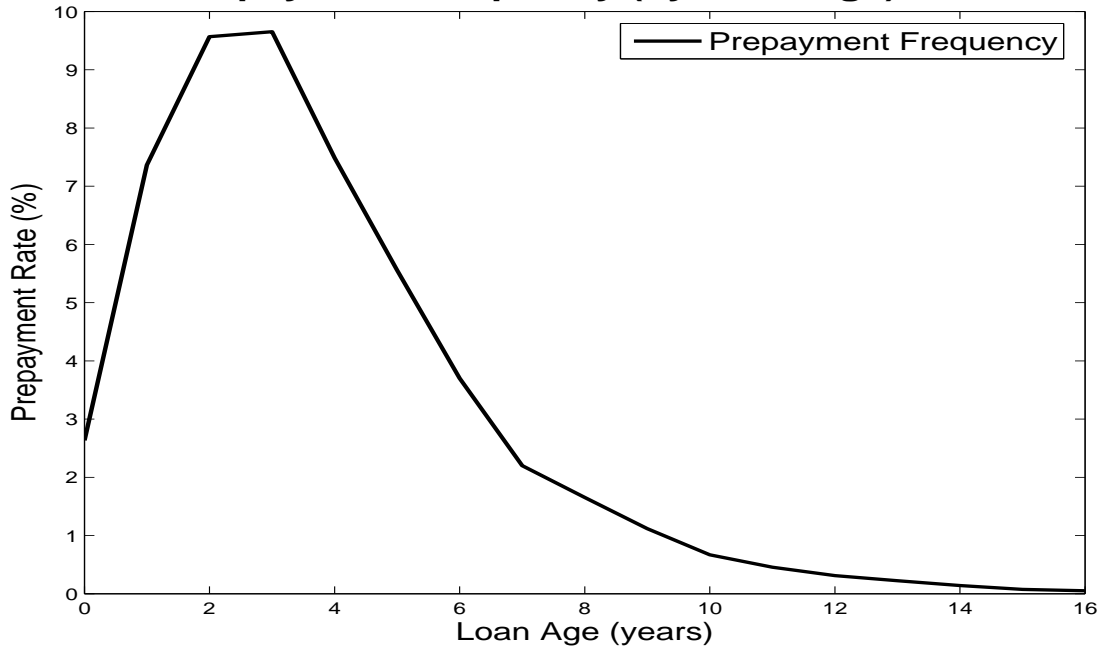


Figure 9: Historic Prepayment Frequency (by Loan Age) of SBA Loans

Prepayment frequencies measure the proportion of loans that prepay from cohort formation to a given loan year. The prepayment frequency are estimated using historic SBA data from 1988-2008. During this period prepayment peaked in the loan's fourth year.

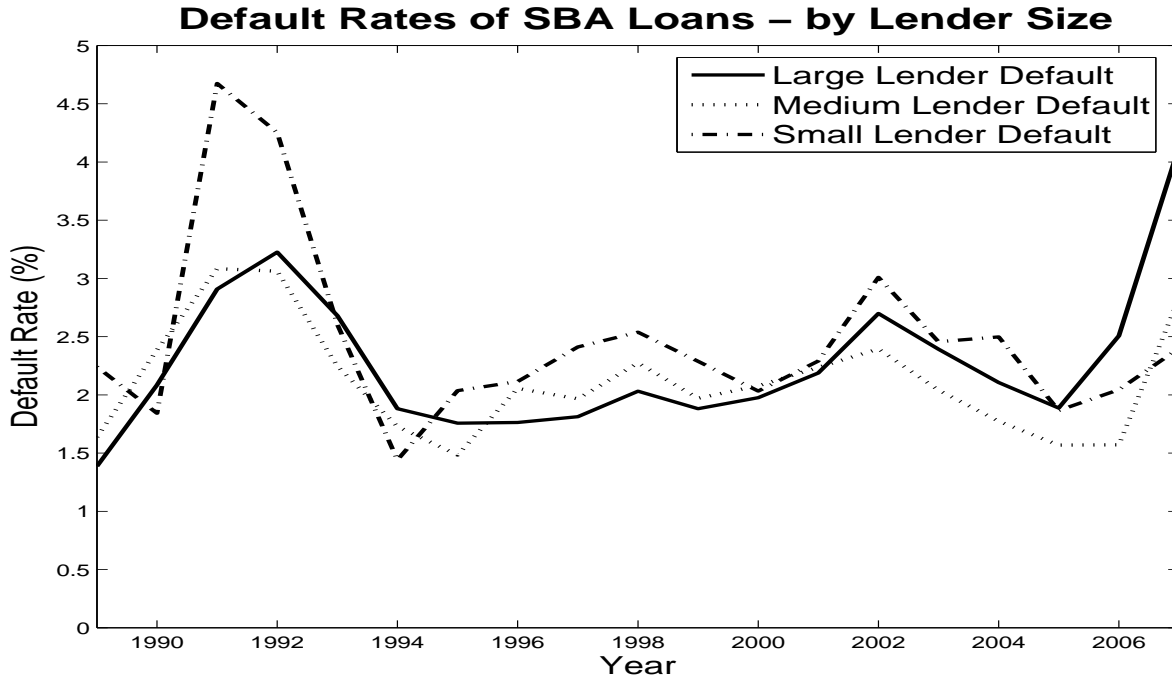


Figure 10: Default Rates of SBA Loans - by Lender Size

Defaults in a given year represent the proportion of default claims during the year relative to the loans outstanding for each lender. Then in each year the default rates are averaged out based on the lender size according to three categories. The categories are large lenders, medium lenders, and small lenders. The small lenders are the ones that originated less than the median that year. Large lenders are alternatively defined as the top 1st percentile. medium lenders are the rest.

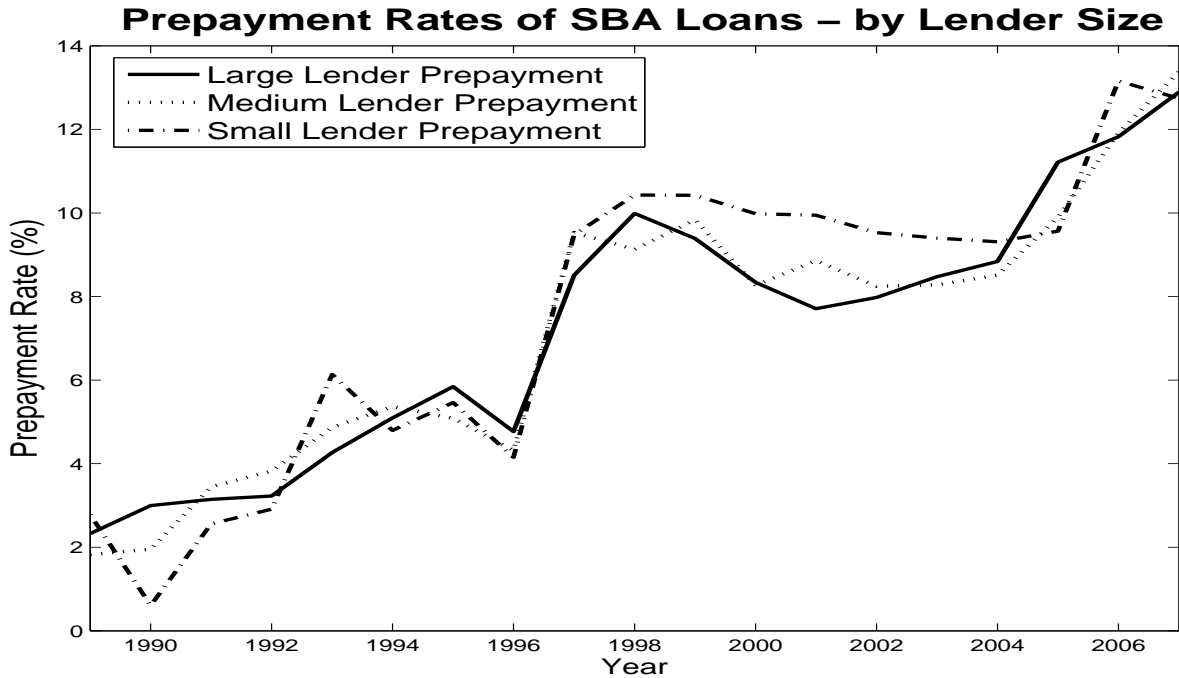


Figure 11: Prepayment Rates of SBA Loans - by Lender Size

Prepayments in a given year represent the proportion of prepayment claims during the year relative to the loans outstanding for each lender. Then in each year the prepayment rates are averaged based on the lender size according to three categories. The categories are large lenders, medium lenders, and small lenders. The small lenders are the ones that originated less than the median that year. Large lenders are alternatively defined as the top 1st percentile. medium lenders are the rest.