Performance and access to government guarantees: The case of small business investment companies

Elijah Brewer III, Hesna Genay, William E. Jackson III, and Paula R. Worthington

In 1953, Congress established the Small Business Administration (SBA) to ensure the provision of adequate capital for the formation and growth of the nation's small businesses.[1] Small business investment companies (SBICs) are SBA-chartered and -regulated financial intermediaries that finance the activities of small business through equity investments and loans. While traditional financial intermediaries such as commercial banks provide loans to businesses, they do not, in general, provide equity financing. However, SBICs can simultaneously hold the equity of and lend to a client commercial firm. SBICs obtain their funds primarily from two sources—privately invested capital and long-term debentures (leverage) guaranteed by the SBA. In this article, we analyze the performance of 280 SBICs that were active at the beginning of 1986. Of these 280 SBICs, over half, or 56 percent, had failed by 1993. As of September 1995, 189 SBICs were in liquidation, with SBA-guaranteed debentures outstanding of over $500 million.[2] The U.S. General Accounting Office (GAO) estimated that only $200 million would ultimately be repaid (United States General Accounting Office 1995).

While these absolute dollar losses are small, the failure rates and the associated losses per dollar of guaranteed debentures are quite high compared with those of banks and thrifts over the 1980–91 period.[3] Because the SBA, a government agency, provides funds directly to SBICs and serves as a financial guarantor of securities sold by SBICs to third parties, taxpayers' funds are at risk. As a result, policymakers and taxpayers have a stake in evaluating the economic performance of SBICs. Such a study can shed light on the impact of government subsidization and loan guarantees on the behavior of financial intermediaries.

Furthermore, the SBIC program enlarges the permissible activities and investments of banking organizations beyond those typically permitted for their commercial bank and venture capital units. Banking organizations own and operate SBICs, as well as other venture capital firms. While traditional bank-owned venture capital units can only own up to 5 percent of a small firm's equity, SBIC units of banking organizations can own up to 50 percent of a small firm's equity. Thus, the SBIC program gives banking organizations a way to hold a substantial amount of commercial firms' equity while simultaneously holding their debt. Learning about how bank-owned SBICs operate may shed light on what could happen if the restriction on bank ownership of shares in commercial enterprises were relaxed.

Elijah Brewer III, Hesna Genay, and Paula R. Worthington are economists at the Federal Reserve Bank of Chicago and William E. Jackson III is an assistant professor at the University of North Carolina at Chapel Hill. The authors would like to thank Julian Zahalak for his excellent research assistance, the Small Business Administration for providing the data, Leonard W. Fagan, Jr., for providing detailed information on the SBIC program, and Anil Kashyap and David Marshall for comments on earlier drafts of this paper.

In previous research, Brewer and Genay (1994, 1995) studied the profitability of SBICs and documented a negative relationship between their use of SBA leverage and returns on equity (ROE). In this article, we extend this work to consider the relationship between various financial factors and SBIC failure, as well as the relationship between those factors and ROE, with special attention paid to the roles played by SBA leverage and SBICs' investment choices. We find that the relationship between failure and SBA leverage is positive and that between ROE and SBA leverage is negative. Poor short-term performance, as measured by ROE, does not necessarily imply losses to the taxpayers. Losses are incurred only when an SBIC experiences sustained losses over time and is unable to meet its obligations. For this reason, we also use a long-term measure of SBIC performance, specifically whether an SBIC fails or survives, to assess the relationship between SBA funding and the performance of SBICs.

Because Brewer and Genay (1994, 1995) found evidence that bank-owned SBICs differed significantly from nonbank-owned SBICs, we also consider whether the SBA leverage-performance relationship differs between bank-owned and nonbank-owned SBICs. We find that, compared with nonbank-owned SBICs, bank-owned SBICs had higher ROEs and lower SBA leverage use, and their investments in small businesses were more likely to be in equity form and to be intended for projects requiring careful monitoring, such as research and development and marketing projects. We also find that the significant negative relationship between SBA leverage and ROE differs between the two types of SBICs. When leverage is measured by an SBIC's ratio of SBA-guaranteed debt to total assets, both bank- and nonbank-owned SBICs exhibit a strong, negative relationship between ROE and leverage—high leverage use is associated with low ROE. Using an alternative leverage measure, the ratio of SBA-guaranteed debt to private capital, yields similar results. But when leverage is measured by the change in SBA funding relative to assets, the negative relationship remains significant only for nonbank-owned SBICs. The lack of correlation between leverage and ROE for bank-owned SBICs holds, even when we examine only those bank-owned SBICs that have positive SBA leverage. This suggests that the perceived costs and benefits of using SBA subsidies differ across SBIC types. Our findings for SBIC failure rates are broadly similar to those for ROE. In particular, we find that the likelihood of an SBIC failure increases with SBA leverage, though our results are somewhat sensitive to the definition of failure.

Our findings that ROE decreases and the likelihood of failure increases with SBA leverage are consistent with 1) the notion that risky SBICs are more likely to make greater use of SBA funding than other investment companies (*adverse selection*); 2) the tendency for firms with government liability guarantees to invest excessively in risky assets (*moral hazard*); 3) the *prepayment effect*, stemming from an SBA restriction that limited the ability of SBICs to refinance their SBA debt; and 4) the *mismatch effect* resulting from using SBA debt to finance equity investments. We offer some evidence on these explanations, but we cannot definitively quantify the relative importance of each. However, our research suggests that government subsidization of activities to fund small businesses can have unintended consequences if the assets financed by the subsidized intermediaries are riskier than they would be in the absence of the subsidies.

The SBIC program

The SBIC program was established in 1958 and is administered by the SBA.[4] The goal of the program is to encourage the provision of long-term capital to small firms, defined as firms having less than $6 million in net worth or a two-year average net income of less than $2 million. A company can be licensed as an SBIC if it satisfies a minimum capital requirement of $1 million. SBICs can be organized as corporations or partnerships and can be owned by individuals or other firms, including banking organizations.

Investment companies are eligible to receive subsidized funds through the issuance of debentures which are purchased directly or are guaranteed by the SBA. These debentures are usually of ten years duration. Each SBIC can receive up to $3 in SBA funds for every $1 of private capital, up to a maximum of $35 million.[5] The SBA's creditor position on debentures is fully

subordinated to all third-party creditors of the SBIC. Furthermore, if an SBIC is organized as a partnership, the general partner of the firm, in general, is not liable for the debt.[6] However, as a condition of receiving funds, the SBA may require a general partner to guarantee the repayment of SBA debt. Finally, during the period under review, SBICs could not prepay their SBA-held or -guaranteed debt during the first five years of issue.

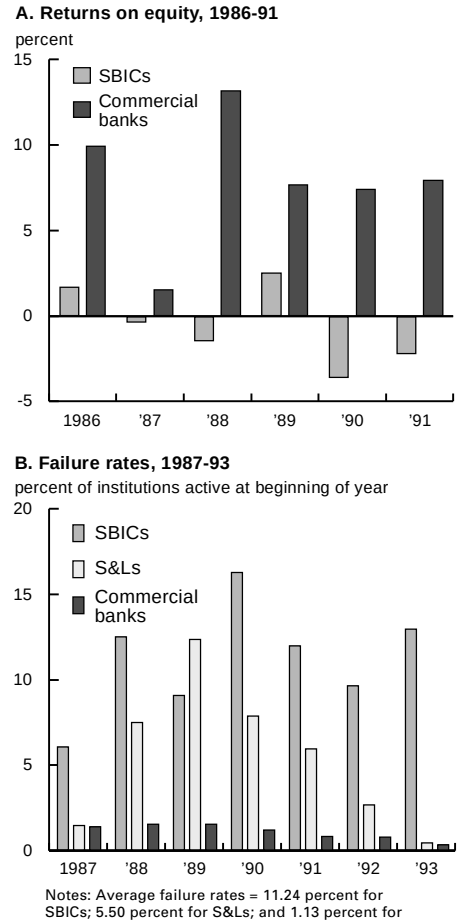
SBICs provide both equity capital and long-term loans to small firms. However, they are subject to certain restrictions on their investments. SBICs cannot invest in certain sectors, such as real estate, or foreign firms, and, in general, they cannot provide short-term financing. If an SBIC makes an equity investment in a small firm, it cannot acquire a controlling interest without a plan of divestiture.[7] SBICs owned by banking organizations face the same regulations on equity investments as other SBICs. The SBA also places restrictions on the maturity and interest rate of loans made by SBICs. The minimum maturity allowed is five years; the maximum interest rate that can be charged to small businesses is based on the interest rate on debentures issued by the SBICs.[8]

SBICs are subject to annual examinations by the SBA and certain reporting requirements, such as reporting their financial condition annually. They also are required to provide documentation on each investment they make in a small business. For instance, SBICs are required to provide information certifying that the firm meets SBA size standards and describing the financial condition of the firm.

In addition to these oversight regulations, SBICs using SBA leverage are subject to capital requirements. The SBA determines that an SBIC has serious financial problems if the sum of its net realized losses plus net unrealized losses on securities held exceeds 50 percent of its capital. If an SBIC is capital impaired by this test, the SBA gives the firm an opportunity to correct its weak capital condition. If the SBIC fails to correct the capital impairment or defaults on its payments, the entire SBA debt may be declared immediately payable. Under these circumstances, or if there is another violation of the loan agreement or any agreement with the SBA, the SBIC is liquidated or its license is revoked.

FIGURE 1

Performance of SBICs and other financial institutions



Notes: Average failure rates = 11.24 percent for SBICs; 5.50 percent for S&Ls; and 1.13 percent for commercial banks. For SBICs, failure is defined as liquidation or revocation of an SBIC's license by the SBA or surrender of license by an SBIC.

Sources: Authors' calculations from data provided by the U.S. Small Business Administration (SBA), the Office of Thrift Supervision, and in various issues of the *FDIC Quarterly Banking Profile*.

Overview of performance and leverage

The data used in this article are for 280 SBICs active at the beginning of 1986, which filed reports of both condition and investments.[9] The reports of condition provide detailed balance-sheet and income-statement information of SBICs for the 1986–91 period.[10] The investment data provide the name, SIC code, total assets, number of employees, and location of the firms being financed; the dollar amount and type of financing provided (loans, equity, or debt with equity features); whether there was a put option on the equity financing that requires the small firm to repurchase its equity in the future; whether the deal included debt

financing; the interest rate charged; the activity that was being financed; variables that indicate whether the SBIC previously provided financing to the firm; and whether the SBIC offered management services to the small business.

Figure 1 provides a comparison of several measures of performance for our sample of SBICs versus other financial institutions over the 1986–91 period. In brief, SBICs performed poorly over this period. Panel A of figure 1 shows that SBICs experienced very low ROEs between 1986 and 1991 and performed worse than commercial banks. SBICs' returns on equity were negative (–0.2 percent) over the 1986–91 period, and were positive for only two of the six years. Panel B of figure 1 reports the failure rates for sampled SBICs and other financial institutions. The failure rate for SBICs was a little above 11 percent per year, compared with 5.5 percent for savings and loan associations and 1 percent for commercial banks.[11] Over 56 percent of the 280 SBICs were liquidated, had their licenses revoked, or voluntarily surrendered their licenses prior to the end of 1993.

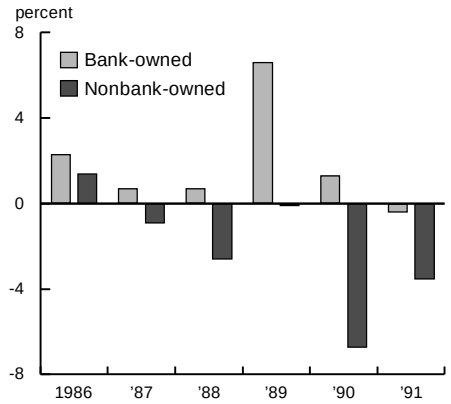
Figure 2 shows that bank-owned SBICs performed significantly better than their nonbank-owned counterparts.[12] Bank-owned SBICs had a mean ROE of 1.9 percent over the 1986–91 period, while nonbank-owned SBICs earned a –1.5 percent ROE. Failure rates differed as well: 41.4 percent of bank-owned SBICs had failed by 1993, while the comparable figure for nonbank-owned SBICs was 64.1 percent. The difference in failure rates is even greater if failure is defined to include only liquidations and license revocations.

Figures 3 and 4 show that SBA leverage was used by a majority of the SBICs in our sample, but it also reveals two other aspects of SBA leverage usage. First, nonbank-owned SBICs are much more likely to use SBA leverage than bank-owned SBICs (figure 3). Consequently, the mean ratio of SBA funds to total assets is much lower for bank-owned SBICs than for nonbank-owned SBICs (figure 4, panel A). Second, conditional on using any SBA leverage at all, bank-owned SBICs still used less leverage than their nonbank-owned counterparts, and their usage declined over the period under review (figure 4, panel B). It is clear from these figures that, by and large, bank-owned SBICs are not exploiting the SBA financing subsidy to the same extent as other SBICs.

FIGURE 2

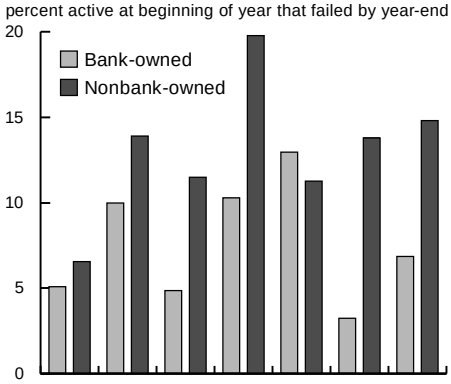
Performance of bank- and nonbank-owned SBICs

A. Returns on equity, 1986-91



B. Failure rates, 1987-93

percent active at beginning of year that failed by year-end



Notes: Average ROEs = 1.9 percent for bank-owned SBICs; –1.5 percent for nonbank-owned SBICs; and –0.2 percent for all SBICs. Average failure rates = 41.4 percent for bank-owned SBICs; 64.1 percent for nonbank-owned SBICs; and 56.1 percent for all SBICs. Failure is defined as liquidation or revocation of an SBIC's license by the SBA or surrender of license by an SBIC.

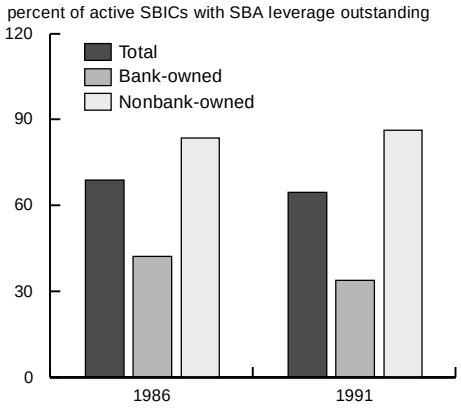
Source: Authors' calculations from data provided by the U.S. Small Business Administration.

Factors affecting SBIC performance

Why should SBA leverage influence return on equity (ROE) and the likelihood of failure, and what other factors may explain SBICs' weak earnings and failure? How might access to SBA subsidies affect the returns on capital invested in SBICs? One would expect that borrowing money at a subsidized rate would raise the returns to private investors. If there are no market imperfections, then investors will invest in SBICs until their risk-adjusted (post-subsidy) rates of return equal those available in other financial intermediaries. This means more projects would be funded

FIGURE 3

Use of SBA funding by SBICs, 1986 and 1991



Source: Authors' calculations from data provided by the U.S. Small Business Administration.

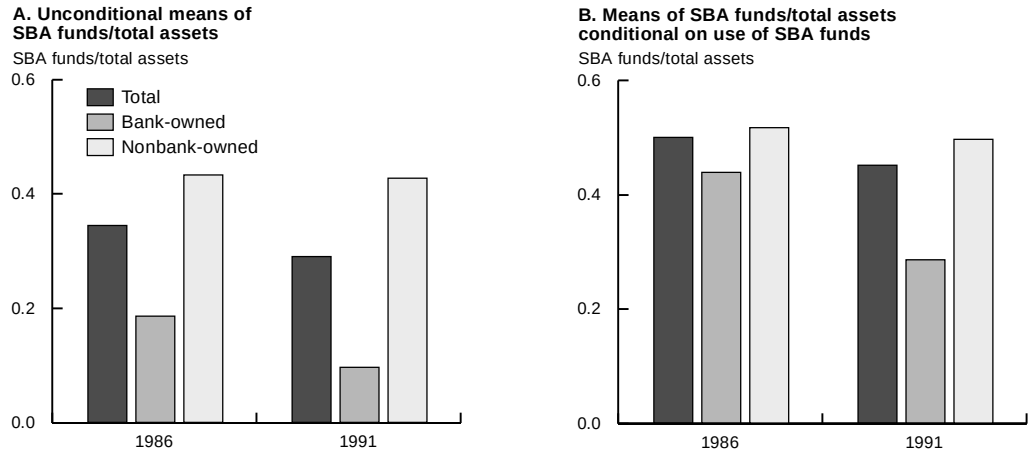
than would be the case in a world without SBA subsidies. However, if only the riskiest SBICs — those that would otherwise be unable to raise funds or could do so only at a hefty risk premium—use leverage, then this *adverse selection* problem may mean we observe a positive relationship between failure and SBA leverage. Further, if SBICs that use SBA leverage do so because they intend to invest in riskier projects than they would if only their own money were at stake, this *moral hazard* may also point to a positive relationship between failure and leverage.

Finally, aside from these two *information-related* concerns, we consider the *prepayment effect* and the *mismatch effect*. The SBA regulations in effect during the period under review essentially forbade prepayment of SBA-guaranteed debt during its first five years; hence, SBA regulations matched the minimum duration of SBICs' debt and the loans they made. Thus, falling interest rates could mean a decline in investment income but no commensurate decline in interest expenses, putting pressure on SBICs' profits. This prepayment effect would likely be most pronounced for SBICs with large loan portfolios.[13] A second factor is that SBA leverage required regular interest payments to the SBA, whether or not the SBIC earned any income over that period. Thus, many SBICs, especially equity-oriented SBICs whose realized income consists primarily of variable capital gains, may have found SBA leverage quite burdensome—the mismatch effect. Overall, then, we have several reasons to expect that SBA leverage may be negatively related to ROE and positively related to failure.

The relationship between ROE (and failure) and SBA leverage is obviously a complex one. We consider three measures of SBA leverage. The first measure, the ratio of total SBA funds to total assets (*SBATA*), is a good indicator of how an SBIC is funding its assets; that is, whether it is funding a large or small fraction of its assets with publicly subsidized funds. The second leverage measure, the ratio of total SBA

FIGURE 4

SBA leverage, 1986 and 1991



Source: Authors' calculations from data provided by the U.S. Small Business Administration.

funds to private capital (*SBAPRIV*), gives a sense of the extent to which the SBIC's own dollars are at stake relative to subsidized dollars. Thus, *SBAPRIV* may be a better measure of the possibility of moral hazard problems arising. The SBA implicitly recognized this possibility when it developed regulations limiting the amount of leverage to $3 of publicly subsidized capital for every $1 of privately provided capital. Our third leverage measure, *DSBATA*, is defined as the net change in SBA funding relative to total assets. Holding other things constant, we expect that ROE should decrease and the likelihood of an SBIC failure should increase with SBA leverage. Thus,

1) $ROE = f(SBALEV, CONTROL\ VARIABLES, \varepsilon)$

and

2) $FAILURE = g(SBALEV, CONTROL\ VARIABLES, \mu)$,

where *SBALEV* captures the extent to which an SBIC uses SBA funds; *FAILURE* is an indicator variable which is equal to one if an SBIC is liquidated, voluntarily surrenders its license, or has its license revoked, zero otherwise; *CONTROL VARIABLES* is a set of additional variables influencing ROE and SBIC failure; and ε and μ are identically and independently distributed error terms.

The bank failure literature suggests a set of control variables that is likely to be important in examining the relationship between SBA leverage and performance, as measured by profits or failure.[14] We group these variables as follows:

Asset composition and quality—The diversification and quality of an SBIC's asset portfolio, as well as the share of loans in its securities portfolio, are likely to be related to profitability (failure). *PCOMP*, the ratio of loans to portfolio securities, is a crude measure that controls for asset risk. *SBICLOSS*, the ratio of loss provisions on accounts receivable to total expenses, is a measure of asset quality and may be negatively (positively) related to profitability (failure). Two diversification measures, *HERFGEO* and *HERFSIC*2, are Herfindahl indexes constructed from the flows of investments made by the SBIC over the 1983–92 period; *HERFGEO* (*HERFSIC*2) is based on flows by state (two-digit SIC industry) of the small business receiving funding.[15] High levels of diversification (low Herfindahls) may be associated with high profitability (low failure), but specialization can yield economies on monitoring costs incurred by the SBIC; consequently, the net effect of the Herfindahls on profitability and failure is uncertain. A related measure is *INSTATE*, which is the share of dollars invested by an SBIC in small businesses located in its home state over the 1983–92 period. High levels of *INSTATE* may mean lower monitoring costs, thus higher profits (lower failure) for an SBIC.

Other SBIC characteristics—SBIC size (*SBICSIZE*), as measured by the natural logarithm of total assets (*TA*), and age (*SBICAGE*) are control variables, though standard arguments are that large SBICs may be more diversified and may hire better managers than small ones. We also include the ratio of operating expenses to total assets (*OPEX*) to capture the notion that efficient SBICs will earn superior returns and be less likely to fail.

Characteristics of the small businesses being financed—We consider two features, the dollar-weighted mean age of the small businesses receiving funding by the SBIC (*AGEFIRM*); and the share of dollar investments going to firms with fewer than 50 employees (*E*1–49). These measures also help to control for asset risk, to the extent that smaller, younger firms are riskier on average than are larger, older ones.

Projects being funded—We argue that the types of projects funded by an SBIC are likely to be correlated with its profitability (and failure). Each investment made by an SBIC is identified as being intended to finance a certain type of project being undertaken by the small business receiving funding, for example, research and development, land acquisition, or operating capital. We grouped the ten possible project types into three categories. *USETRANS* is defined as the share of dollars invested in transactions-type projects, whose execution is likely to involve little managerial discretion by the small business and to require little monitoring by the SBIC. We include plant modernization, debt consolidation, new building or plant, machinery acquisition, and land acquisition projects in this category. *USERELAT* is defined as the share of dollars invested in relationship-type projects that are likely to involve high levels of managerial discretion and SBIC

monitoring. We include acquisitions of existing businesses, marketing, research and development, and an *other* catch-all category here. Finally, *USEOPKAP* is the share of dollars invested in the last category, operating capital.

In principle, it is important to control for the types of projects and financial characteristics of the small businesses being financed by SBICs when examining the relationship between SBA leverage and performance. Hence,

TABLE 1

Characteristics of SBICs and their investments, 1986–91 means

Characteristics of SBICs		All SBICs	Bank-owned	Nonbank-owned
TA	Total assets, $ mil	16.973	30.148***	9.044
SBICAGE	Age, years	12.527	11.466***	13.166
SBICLIQ	(Current assets–current liabilities)/total assets	0.300	0.361***	0.263
SBICLOSS	(Provisions for losses on accounts receivable)/total expenses	0.034	0.024**	0.040
MARGIN	Net investment income/total assets	0.032	0.037***	0.029
OPEX	Operating expenses/total assets	0.041	0.036***	0.044
PCOMP	(Loans/total securities), book value	0.382	0.165***	0.511
ACOMP	(Total securities/total assets), market value	0.616	0.571***	0.644
SBATA	SBA funds/total assets	0.333	0.152***	0.441
SBAPRIV	SBA funds/private capital	1.044	0.371***	1.450
AGROW	Growth rate of total assets, in logs	0.041	0.092***	0.009
KIMPBA	Cumulative realized profits net of unrealized losses/private capital	0.820	0.126*	0.056

Characteristics of SBICs		All SBICs	Bank-owned	Nonbank-owned
AGEFIRM	$-weighted mean age of firms funded by an SBIC in each year	7.727	7.106*	8.102
USETRANS	Share of invested funds in each year intended for transactions-type projects	0.214	0.135***	0.260
USERELAT	Share of invested funds in each year intended for relationship-type projects	0.203	0.273***	0.162
USEOPKAP	Share of invested funds in each year intended for operating capital projects	0.583	0.590	0.579
E1–49	Share of invested funds in each year going to firms with 1–49 employees	0.651	0.563***	0.703
E50–249	Share of invested funds in each year going to firms with 50–249 employees	0.277	0.348***	0.234
E–GE250	Share of invested funds in each year going to firms with 250+ employees	0.073	0.088*	0.064
HERFSIC2	Herfindahl index, based on ten-year flows by two-digit SIC industry of small businesses	0.524	0.492***	0.543
HERFGEO	Herfindahl index, based on ten-year flows by location (state) of small businesses	0.692	0.657***	0.714
INSTATE	Share of invested funds going to small businesses located in the same state as the SBIC	0.554	0.546	0.559
FSTSHR	Share of invested funds in each year going to firms receiving funding for the first time from this SBIC	0.534	0.465***	0.575
SHRMFG	Share of invested funds in each year going to firms in manufacturing sector	0.420	0.544***	0.346
SHRTRANS	Share of invested funds in each year going to firms in transportation sector	0.084	0.061***	0.098
SHRRET	Share of invested funds in each year going to firms in retail sector	0.147	0.068***	0.195
SHRSVC	Share of invested funds in each year going to firms in services sector	0.186	0.192	0.182

Notes: Sample is 280 SBICs, 1986–91. Total observations: 1,102. Means are unweighted. *, **, and *** indicate means for bank-owned SBIC differ significantly from means for nonbank-owned at the 10%, 5%, and 1% levels, respectively.
Source: Authors' calculations from data provided by the Small Business Administration.

in the empirical specifications of equations 1 and 2, we include many of these measures as control variables.

Comparison of means—Table 1 reports the mean values of selected variables for all SBICs and for the bank- and nonbank-owned SBICs over the 1986–91 period. First, compared with nonbank-owned SBICs, bank-owned SBICs were larger (*SBICSIZE*), more equity-oriented (*PCOMP*), and more liquid (*SBICLIQ* and *ACOMP*). Second, as described above in more detail, bank-owned SBICs used less SBA leverage (*SBATA* and *SBAPRIV*). Third, they funded larger firms (*E*1–49 and *E*50–249) and more relationship-oriented projects (*USERELAT*). They also funded more firms in the manufacturing and service sectors and fewer in the transportation and retail sectors. Finally, bank-owned SBICs grew much more rapidly than did nonbank-owned SBICs from 1986 to 1991 (*AGROW*).

Performance of SBICs

The following equation provides a simple empirical specification of the relationship between ROE and selected financial variables:

$$3)\quad ROE_{j,t} = k_0 + \sum_{t=2}^{T} k_{0,t}\, DUM_t + k_1\, SBICSIZE_{j,t} + k_2\, SBICAGE_{j,t} + k_3\, SBICLOSS_{j,t} + k_4\, PORTFOLIO_{j,t} + k_5\, SBALEV_{j,t} + k_6\, OPEX_{j,t} + k_7\, AGEFIRM_{j,t} + k_8 E1\text{–}49_{j,t} + k_9\, HERFGEO_j + k_{10}\, HERFSIC2_j + k_{11}\, INSTATE_j + \varepsilon_{j,t},$$

where j,t denotes SBIC j in year t, DUM_t ($t = 2,3,...,T$) are time-specific binary variables, other explanatory variables are as defined earlier (see table 1 and text); and $\varepsilon_{j,t}$ is an error term.[16] *PORTFOLIO* is a vector of measures of income-earning assets held by SBICs, and we consider two alternative vectors detailed below. We estimate equation 3 using time-series cross-sectional data from 1986 to 1991 for the full sample of SBICs and for the bank- and nonbank-owned subsamples of SBICs.

To determine the relationship between failure of SBICs and our explanatory variables, we estimate the following logit model by maximum-likelihood procedures:

$$4)\quad Prob(FAILURE_{j,t} = 1) = \phi(X_{j,t-2}\,\beta),$$

where $FAILURE_{j,t}$ is equal to one if an SBIC is liquidated, voluntarily surrenders its license, or has its license revoked and zero otherwise; $X_{j,t-2}$ is the vector of explanatory variables on the right-hand side of equation 3; β is a vector of parameter estimates for the independent variables $X_{j,t-2}$; and ϕ is the log odds ratio.[17]

ROE results

Table 2 reports the results from regressing ROE on our first *SBALEV* measure, *SBATA*, and other variables, for the full sample as well as separately for the bank-owned and nonbank-owned SBICs. Column 1 contains the results on the simplest model estimated over the full sample of 280 SBICs, 1986–91, where the *PORTFOLIO* vector includes *USETRANS* and *USERELAT*. Two things stand out in column 1. First, the relationship between SBA leverage and ROE is negative, even after controlling for SBIC age, size, and portfolio composition, and characteristics of projects and small businesses. Second, several, though not all, of the other variables are significantly related to ROE. In particular, the operating expense variable, *OPEX*, has a significant negative correlation with ROE, and asset quality, as measured by *SBICLOSS*, has a modest negative effect. The share of investments going to transactions-type projects and, to a lesser extent, the share going to relationship-type projects are positively correlated with ROE (recall that operating capital is the excluded category). The diversification measures *HERFGEO* and *HERFSIC*2 are not significant, nor are *INSTATE*, *AGEFIRM*, or *E*1–49. Thus, there is little evidence that, once portfolio characteristics are taken into account, the types of small businesses funded by SBICs are important correlates of profitability.

Columns 2 and 3, which report results from the same regression estimated for the bank and nonbank samples, show that *SBICLOSS*, *USETRANS*, and *USERELA*T are important only for the nonbank SBICs. Given that the effect of the loss variable is likely to be nil for SBICs whose portfolios contain mostly equities (losses on accounts receivable are not likely to be related to the ultimate quality of the equities held by the SBIC) and that banks do most of their investing in the form of equity, the *SBICLOSS* result is not surprising. Why *USETRANS* and *USERELAT* seem important only for nonbank-owned SBICs is more of a puzzle. An alternative specification is presented in columns 4–6 of table 2; here, the *USETRANS* and *USERELAT* variables are replaced by

TABLE 2

The relationship between return on equity (ROE) and SBA leverage

	All SBICs	Bank-owned	Nonbank-owned	All SBICs	Bank-owned	Nonbank-owned
INTERCEPT	–0.477***	–0.665**	–0.482**	–0.461***	–0.698***	–0.454**
	(0.149)	(0.258)	(0.190)	(0.146)	(0.255)	(0.187)
SBICSIZE	0.035***	0.044***	0.044***	0.037***	0.046***	0.046***
	(0.008)	(0.014)	(0.011)	(0.008)	(0.014)	(0.010)
SBICAGE	0.009	–0.000	0.000	0.000	–0.001	–0.000
	(0.010)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
SBICLOSS	–0.108	0.000	–0.200*	–0.163**	–0.055	–0.254**
	(0.079)	(0.123)	(0.104)	(0.079)	(0.126)	(0.104)
OPEX	–0.993***	–0.896***	–1.03***	–0.903***	–0.756**	–0.958***
	(0.211)	(0.326)	(0.285)	(0.210)	(0.329)	(0.285)
SBATA	–0.238***	–0.221***	–0.380***	–0.286***	–0.242***	–0.415***
	(0.032)	(0.067)	(0.047)	(0.034)	(0.068)	(0.048)
AGEFIRM	0.000	–0.001	–0.000	–0.000	–0.001	–0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
USETRANS	0.080***	0.022	0.099***	-	-	-
	(0.029)	(0.055)	(0.033)			
USERELAT	0.044	0.035	0.071*	-	-	-
	(0.030)	(0.044)	(0.043)			
PCOMP	-	-	-	0.119***	0.122*	0.113***
				(0.025)	(0.064)	(0.029)
E1–49	0.034	0.011	0.0450	0.007	–0.011	0.012
	(0.026)	(0.043)	(0.034)	(0.026)	(0.044)	(0.034)
HERFGEO	0.061	0.144	–0.011	0.010	0.114	–0.059
	(0.063)	(0.148)	(0.070)	(0.064)	(0.147)	(0.071)
HERFSIC2	–0.040	–0.003	–0.073	–0.035	0.027	–0.070
	(0.045)	(0.107)	(0.051)	(0.045)	(0.108)	(0.051)
INSTATE	0.012	–0.039	0.056	0.021	–0.035	0.054
	(0.038)	(0.073)	(0.046)	(0.038)	(0.073)	(0.046)
$\bar{R}^2$	0.12	0.06	0.17	0.13	0.07	0.18
N	1,102	414	688	1,102	414	688

Notes: Sample is 280 SBICs, 1986–91. Dependent variable: ROE, 1986–91. Each specification includes (unreported) time dummies, and standard errors are in parentheses below coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Source: Authors' calculations from data provided by the Small Business Administration.

PCOMP, the ratio of loans to securities at book value. Since *USETRANS* and *PCOMP* are highly correlated (SBICs tend to finance transactions-oriented projects with debt), we exclude the *USE* variables in this specification. The main result is unchanged: SBA leverage is negatively related to ROE, even after controlling for other factors that may influence profitability.

Next, we consider our two alternative measures of SBA leverage, *SBAPRIV* and *DSBATA*. The results from using *SBAPRIV* shown in columns 1–3 of table 3 are quite similar to the results using *SBATA* in table 2, columns 4–6: SBA leverage has a significant negative effect, though the statistical significance of the effect is dampened with the new measure. The regression results from using *DSBATA*, in columns 4–6 of table 3, indicate that increases in SBA leverage relative to total assets affect ROE negatively only for nonbank-owned SBICs, not bank-owned SBICs. When considered in light of the SBA leverage usage patterns described above, this result is not surprising. Bank-owned SBICs were shedding their already low levels of SBA leverage over the 1986–91 period, while they were growing rapidly and earning higher returns than nonbank-owned SBICs. The relationship between leverage and ROE thus seems quite different for the two types of SBICs.

TABLE 3

The relationship between ROE and alternative measures of SBA leverage

	All SBICs	Bank-owned	Nonbank-owned	All SBICs	Bank-owned	Nonbank-owned
INTERCEPT	–0.743***	–0.835***	–0.854***	–0.708***	–0.852***	–0.588***
	(0.145)	(0.255)	(0.195)	(0.170)	(0.317)	(0.215)
SBICSIZE	0.049***	0.053***	0.061***	0.042***	0.049***	0.035***
	(0.008)	(0.014)	(0.012)	(0.009)	(0.017)	(0.012)
SBICAGE	0.001	–0.000	0.001	0.001	0.001	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.012)
SBICLOSS	–0.146*	–0.031	–0.243**	–0.124	0.027	–0.202*
	(0.081)	(0.128)	(0.108)	(0.091)	(0.148)	(0.119)
OPEX	–0.916***	–0.753**	–0.960***	–0.903***	–0.683*	–1.02***
	(0.215)	(0.333)	(0.296)	(0.241)	(0.393)	(0.319)
DSBATA	-	-	-	–0.171**	–0.030	–0.196***
				(0.071)	(0.175)	(0.075)
SBAPRIV	–0.043***	–0.046*	–0.057***	-	-	-
	(0.009)	(0.025)	(0.013)			
AGEFIRM	–0.000	–0.001	–0.001	0.001	–0.000	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
PCOMP	0.092**	0.115*	0.094***	0.032	0.065	0.047
	(0.027)	(0.067)	(0.031)	(0.028)	(0.081)	(0.032)
E1–49	0.012	–0.004	0.010	0.012	0.008	–0.005
	(0.027)	(0.044)	(0.036)	(0.032)	(0.056)	(0.040)
HERFGEO	0.050	0.090	0.013	0.029	0.114	–0.009
	(0.065)	(0.148)	(0.073)	(0.077)	(0.191)	(0.082)
HERFSIC2	–0.008	0.093	–0.043	0.043	0.140	0.022
	(0.046)	(0.107)	(0.053)	(0.054)	(0.134)	(0.059)
INSTATE	0.026	–0.037	0.063	0.038	–0.096	0.089*
	(0.038)	(0.074)	(0.048)	(0.046)	(0.092)	(0.054)
$\bar{R}^2$	0.10	0.05	0.12	0.08	0.03	0.11
N	1,102	414	688	843	322	521

Notes: Sample is 280 SBICs, 1986–91. Dependent variable: ROE, 1986–91. Each specification includes (unreported) time dummies, and standard errors are in parentheses below coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Source: Authors' calculations from data provided by the Small Business Administration.

Our principal finding from tables 2 and 3 is that after controlling for other factors that can influence ROE, we still find a strong, negative relationship between SBA leverage and profitability of SBICs. Can we identify which of the stories sketched above is most important? A report from the U.S. GAO (1993) emphasizes both the mismatch effect and the prepayment effect. To investigate the mismatch story, we reestimated equation 3, adding an interaction term to the set of regressors—the product of *SBATA* and *PCOMP*. Our reasoning was that the sign of its coefficient would be positive under the mismatch story, that is, the negative effect of SBA leverage on ROE would be most pronounced for SBICs with low values of *PCOMP* (high shares of equities in their portfolios). In fact, we do obtain a positive coefficient estimate on this interaction term, offering some support for the mismatch story.[18]

To investigate the prepayment effect, we reestimated equation 3, allowing the coefficient on SBA leverage to vary over time. We found statistically significant coefficients on the time dummy–SBA leverage interaction terms, suggesting that the prepayment story may be important. Next, we considered three possible ways of identifying the contribution from prepayment restrictions, and we found little evidence that prepayment restrictions were the source of the negative leverage-ROE relationship. Below, we briefly describe the interest rate environment faced by SBICs during our sample period and our findings on the prepayment issue.

Interest rates were high in the early 1980s compared with the years covered by our study, 1986–91. In the 1981–85 period, the ten-year U.S. Treasury bond rate averaged 12.2 percent, while over the 1986–91 period, it averaged 8.3 percent. If SBICs were unable to refinance their existing high-rate debt in the early years of our sample period, their profitability may have been adversely affected. We argue that this restriction, if important, should show up in our analysis in any one of the following three ways. First, the impact of SBA leverage on ROE should vary depending on whether interest rates are high or low relative to previous years. When interest rates are falling, we would expect the negative effect of SBA leverage to become more pronounced. To address this, we reestimated the ROE equation of table 2, columns 4–6, adding an interaction term for SBA leverage and the change in the ten-year Treasury rate.[19] We found a negative coefficient on the interaction term, so that when interest rates were falling in the early years of our sample, the negative impact of SBA leverage on ROE was *mitigated*, not exacerbated as the prepayment story would imply.

A second prepayment story emphasizes that the cost of failing to refinance high-rate debt is that though liabilities remain expensive, the assets of SBICs earn lower returns in the lower interest rate environment. That is, if an SBIC's customers can refinance when rates fall but the SBIC cannot, then the SBIC's liabilities remain costly, while its earnings on assets decline. Under this story, a measure of the *interest rate spread* earned by an SBIC would be a narrower and better measure of the net earnings likely to be affected by a decline in interest rates. To investigate this, we reestimated equation 3, now using an interest rate spread as the dependent variable, including an interaction term between SBA leverage and the change in interest rates, and controlling for macroeconomic conditions by including the growth rate of real GDP.[20] Again, we found no evidence that leverage's negative effect is most pronounced when interest rates are falling.

Finally, we computed what each SBIC's interest expenses would have been had it refinanced its entire stock of debt at the current year's ten-year Treasury rate. The prepayment story implies that SBICs whose actual interest expenses greatly exceeded these imputed expenses (measured by the difference between actual and computed interest expenses relative to total assets) are those for whom the prepayment restrictions are most burdensome; thus, we should see low ROEs for these SBICs. The simple correlation between ROE and this difference measure is indeed negative.[21] However in a regression of ROE on the same variables as in table 2 columns 4–6, plus this difference measure, the measure comes in strongly significant but with a *positive* coefficient, not a negative one. Again, this evidence does not support the prepayment story.

In summary, we have little evidence that the prepayment restrictions faced by SBICs during our sample period are the main source of the negative relationship between SBA leverage and ROE. However, we do find some support for the idea that the regular interest payments due on SBA leverage adversely affected profits at equity-oriented SBICs. More research is needed to consider the relative importance of other possible explanations for the negative ROE–SBA leverage relationship.

Failure results

Table 4 reports the results from the estimation of equation 4 for the full sample and the bank- and nonbank-owned samples. The first column for each sample presents the maximum likelihood estimates of the parameters and their standard errors. The second column reports the marginal effects of the explanatory variables on the probability of failure.

Consistent with the ROE results, SBA leverage measured by *SBATA* is negatively correlated with SBIC performance: SBICs with higher *SBATA* have a higher probability of failure two years hence. Furthermore, the positive relationship between SBA leverage and probability of failure is stronger for nonbanks. While an increase in *SBATA* increases the probability of failure for a bank-owned SBIC by 0.125, a similar increase in *SBATA* increases the probability of failure for a nonbank-owned SBIC by 0.187.

The correlations between failure and *SBICSIZE* and *SBICLOSS* are also consistent with the earlier results. *SBICSIZE* is negatively correlated with the probability of failure in all samples. *SBICLOSS* is positively correlated with the probability of failure, but has a significant effect only for the full sample. In the full and nonbank samples, higher ratios of loans to

TABLE 4

The relationship between the probability of failure and SBA leverage

	All SBICs		Nonbank-owned		Bank-owned	
	MLE	PROB	MLE	PROB	MLE	PROB
Constant	2.921	0.238	2.094	0.212	3.713	0.168
SBICSIZE	–0.375***	–0.031***	–0.308**	–0.031**	–0.468**	–0.021**
	(0.116)		(0.144)		(0.231)	
SBICAGE	0.000	0.000	0.007	0.001	0.001	0.000
	(0.013)		(0.015)		(0.029)	
PCOMP	–0.525*	–0.043*	–0.670**	–0.068**	0.891	0.040
	(0.294)		(0.340)		(0.748)	
SBICLOSS	1.366*	0.111*	0.772	0.078	1.747	0.079
	(0.810)		(1.084)		(1.347)	
SBATA	2.021***	0.165***	1.850***	0.187***	2.767***	0.125***
	(0.423)		(0.592)		(0.843)	
OPEX	4.537**	0.370**	6.308**	0.639**	3.969	0.179
	(2.241)		(2.947)		(3.824)	
AGEFIRM	–0.011	–0.001	–0.014	–0.001	–0.014	–0.001
	(0.014)		(0.016)		(0.029)	
E1–49	0.068	0.006	–0.139	–0.014	0.517	0.023
	(0.329)		(0.392)		(0.665)	
HERFGEO	–0.843	–0.069	–0.665	–0.067	–2.900	–0.131
	(0.769)		(0.872)		(2.051)	
HERFSIC2	0.953*	0.078*	0.784	0.079	2.844*	0.128*
	(0.531)		(0.623)		(1.460)	
INSTATE	0.097	0.008	0.071	0.007	0.552	0.025
	(0.461)		(0.550)		(1.019)	
$\chi^2(16)$	79.78***		44.09***		42.98***	
N	1,102		688		414	

Notes: The dependent variable is an indicator variable that takes on a value of one if an SBIC failed two years hence; otherwise, it takes on a value of zero. Failure is defined as either liquidation or revocation of license by the SBA, or surrender of license by an SBIC. *SBATA* is the ratio of SBA funds divided by total assets. In addition to the above explanatory variables, the model also includes time dummies for the years 1987–91. The MLE column presents the maximum likelihood estimates of the parameters and their standard errors. The PROB column presents the marginal effects of the right-hand side variables (X) on the probability of failure, computed at the mean values of X. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Source: Authors' calculations from data provided by the Small Business Administration.

total portfolio securities (*PCOMP*) are associated with lower probabilities of failure. On the other hand, *PCOMP* is not significant in the bank-owned sample. This result is comparable to the ROE results reported above.

Higher operating expenses are associated with higher probabilities of failure, and this relationship is particularly strong for the nonbank-owned SBICs. Taken together with earlier results on ROE, these results indicate that high operating expenses are associated with low profitability contemporaneously for all SBICs. For nonbank SBICs, high operating expenses are also associated with poor long-term performance, which suggests that the consequences of operating inefficiencies at nonbank-owned SBICs are more persistent.

Among the variables that describe the investment strategy of SBICs, only the industry-diversification measure, *HERFSIC*2, is significantly related to probability of failure. SBICs that are not diversified are more likely to fail than well-diversified SBICs; however, the relationship is significant only for the bank-owned SBICs.

Alternative views of failure

As Kane (1985, 1989) and others have recognized, failure of institutions with access to government liability-guarantees is not an automatic consequence of a weakened financial condition. It results from a conscious decision

by the regulatory agency to acknowledge and act upon the weakened financial condition of an institution. Our definition of SBIC failure combines three different events, liquidation, revocation, and surrender of license. Liquidation and revocation are generally thought to be choices of the SBA, while surrender of license is a choice of the SBIC. How sensitive are our results about SBA leverage to our definition of failure? When we reestimated equation 4 on the sample of SBICs consisting of survivors and those who were liquidated during our sample period, we obtained results very similar to the ones described above. However, using a sample consisting of survivors and those who surrender their licenses over the sample period yields different results: SBA leverage is no longer a statistically significant correlate of the probability of failure, where failure is defined as the surrender of a license.

The positive leverage–failure correlation in the liquidation sample reflects both an economic and a regulatory effect of leverage, and without further work, we cannot disentangle the two. Since leverage is not an important correlate of failure in the surrenders-only sam-

TABLE 5

The relationship between the probability of failure and SBA leverage, including SBA's measure of cumulative profitability

	All SBICs		Nonbank-owned		Bank-owned	
	MLE	PROB	MLE	PROB	MLE	PROB
Constant	1.215	0.093	0.264	0.025	2.489	0.103
SBICSIZE	–0.267**	–0.203**	–0.189	–0.018	–0.385	–0.016*
	(0.116)		(0.145)		(0.239)	
SBICAGE	0.010	0.001	0.018	0.002	0.011	0.000
	(0.013)		(0.015)		(0.029)	
PCOMP	–0.142	–0.011	–0.307	–0.029	1.546*	0.064*
	(0.321)		(0.364)		(0.859)	
SBICLOSS	1.464*	0.112*	0.904	0.084	1.711	0.071
	(0.809)		(1.121)		(1.342)	
SBATA	1.342***	0.102***	0.880	0.082	2.215**	0.091**
	(0.459)		(0.642)		(0.883)	
OPEX	3.081	0.235	4.190	0.391	3.086	0.127
	(2.226)		(3.033)		(3.607)	
AGEFIRM	–0.010	–0.001	–0.015	–0.001	–0.011	–0.001
	(0.014)		(0.017)		(0.029)	
E1–49	0.108	0.008	–0.062	–0.006	0.495	0.020
	(0.329)		(0.391)		(0.670)	
HERFGEO	–0.765	–0.058	–0.392	–0.037	–3.344	–0.138
	(0.766)		(0.882)		(2.094)	
HERFSIC2	1.018*	0.078*	0.763	0.071	3.165**	0.131**
	(0.538)		(0.637)		(1.505)	
INSTATE	0.098	0.007	0.085	0.008	0.593	0.024
	(0.465)		(0.558)		(1.017)	
KIMPBA	–1.134***	–0.086***	–1.393***	–0.130	–1.111	–0.458*
	(0.362)		(0.454)		(0.687)	
$\chi^2(17)$	90.45***		54.56***		45.75***	
N	1,102		688		414	

Notes: The dependent variable is an indicator variable that takes on a value of one if an SBIC failed two years hence; otherwise, it takes on a value of zero. Failure is defined as either liquidation or revocation of license by the SBA, or surrender of license by an SBIC. *SBATA* is the ratio of SBA funds divided by total assets. In addition to the above explanatory variables, the model also includes time dummies for the years 1987–91. The MLE column presents the maximum likelihood estimates of the parameters and their standard errors. The PROB column presents the marginal effects of the right-hand side variables (X) on the probability of failure, computed at the mean values of X. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Source: Authors' calculations from data provided by the Small Business Administration.

ple, a sample for which regulatory determinants of failure were presumably not important, the economic effect seems to be nil. How can we reconcile this result with our claims about the economic effects of leverage? First, the distinction between liquidations and surrenders in practice is not as clear as our discussion has implied. An SBIC may surrender its license just before facing a certain liquidation action by the SBA. Similarly, liquidations may occur for purely economic reasons. For example, the U.S. GAO (1993) reported that several SBICs entered liquidation to avoid the prepayment penalties associated with paying off their SBA leverage. So, we do not view liquidations as purely regulatory events, nor surrenders as purely economic events. Second, we have other evidence from our ROE analysis that the negative effect of SBA leverage on performance remains even when the sample consists only of survivors and surrenders, that is, when SBICs that ultimately are liquidated are removed from the sample. Estimating equation 3 on this other sample still yields a significant, negative coefficient on SBA leverage, which is consistent with there being an economic effect of leverage on performance. In summary, though we cannot gauge the quantitative importance of the economic effects of leverage versus any regulatory impact coming through the SBA's closure rule, we feel confident that the positive coefficient on leverage in the failure equations truly reflects the negative economic impact of leverage on performance.

Finally, as noted earlier, the SBA considers an SBIC to be a poor performer if net realized losses plus unrealized losses of the SBIC exceed 50 percent of its private capital. If an SBIC is capital impaired by this measure, the SBA considers the SBIC in default and has the right to liquidate its assets. Table 5 reports the results from the estimation of equation 4 when the SBA's measure of performance, *KIMPBA*, is included in the model as another explanatory variable.[22] The greater the SBA's exposure to losses, the more likely it is to take actions to close an investment company. Thus, we expect that the probability of SBIC failure will increase with SBA leverage and with the degree of capital impairment.

We find that SBICs that perform well by the SBA's standards are indeed less likely to fail; this relationship is particularly strong for the nonbank-owned SBICs. For nonbank-owned SBICs, including *KIMPBA* in the model dampens the relationship between probability of failure and SBA leverage. Because most of the nonbank-owned SBICs take advantage of SBA subsidies, it is not surprising that SBA closure decisions are related more to the financial condition of these SBICs than to the level of their SBA funding. On the other hand, SBA leverage remains a significant correlate of probability of failure for bank-owned SBICs, even after *KIMPBA* is included. Since there are significant differences across bank-owned SBICs in the use of SBA funding, it is not surprising that the level of SBA funding, as well as their financial condition, is significantly correlated with the probability of failure for these SBICs.

Conclusion

Encouraging financial institutions to provide funding to small businesses has been a central goal of U.S. public policy for a long time. The SBIC program is designed to encourage the flow of long-term capital to small firms. Because government guarantees are used to fund many of the companies licensed under the program, their performance is of particular interest to policymakers.

In this article, we analyze the performance of 280 SBICs that were active at the beginning of 1986, paying special attention to the impact of access to government liability guarantees on ROE and failure. We find that SBICs performed poorly. Of the 280 SBICs, over half had failed by 1993. The ROE measure reveals a similarly dismal performance.

We find that high usage of SBA-guaranteed debt is associated with poor performance, particularly for nonbank-owned SBICs. We describe several factors that may account for this relationship and offer evidence on two of them, the prepayment effect and the mismatch effect. We find little evidence that prepayment restrictions faced by SBICs are important factors behind the poor performance record of SBICs, but we do find evidence that equity-oriented SBICs found SBA leverage burdensome due to its regular interest payment requirements. Our results are also consistent with information-related problems (adverse selection and moral hazard) being important. However, our results are not sufficiently precise to differentiate these information-related effects of leverage from its

other effects. Nevertheless, the results suggest that public subsidies aimed at encouraging the flow of funds to small firms may have unintended consequences if the assets funded by SBICs are riskier than they would have been in the absence of the subsidy.

Finally, we note that in 1994 the SBA revised many regulations pertaining to the SBIC program. For example, minimum private capital requirements were raised, prepayment restrictions were lifted, and a new equity-like form of leverage was developed and made available to equity-oriented SBICs. Our analysis suggests that the latter change may be quite valuable and that lifting the prepayment restrictions may be less so. Furthermore, higher capital requirements could, in principle, mitigate some of the information-related problems that characterized the program in earlier years. However, a complete assessment of the likely impact of the new regulations on the performance of SBICs must wait for future research.

NOTES

[1]Initially, the Small Business Administration was established as a temporary government agency to provide intermediate-term financing to small firms. In 1958, Congress made the SBA a permanent government agency. For a discussion, see Osborn (1975).

[2]The SBA's Statistical Package reports that 1,361 SBICs were licensed over the 1959–94 period. Of these, 455 (33 percent) were transferred into liquidation between 1967 and 1994.

[3]For example, bank failures generated losses to the FDIC of about $40 billion. For thrifts, the loss was near $200 billion, most of which was beyond the resources of the deposit insurer and was thus charged to taxpayers. For a discussion of the magnitude of the bank and thrift debacle of the 1980s, see Bartholomew (1993) and Kaufman (1995). Over the 1985–89 period, the cost to the FDIC to close failing commercial banks averaged about 17 cents per dollar of failed bank assets. See Barth, Brumbaugh, and Litan (1992) for a discussion of resolution costs associated with bank failures. For the now defunct Federal Savings and Loan Insurance Corporation, the cost to close failing S&Ls averaged about 33 cents per dollar of assets over the 1985–89 period. See Barth (1991) for the numbers used to compute the cost per dollar of assets.

[4]In 1994, the SBA put into effect new regulations that were significantly different from those in effect over the 1986–91 period. In this article, we focus on the regulation during the 1986–91 period. In 1976, the program was extended to include specialized SBICs (SSBICs) that provide funds to small firms owned by "economically disadvantaged persons." In this article, we focus only on regular SBICs, leaving an analysis of SSBICs for a future study.

[5]Under certain circumstances, SBICs can obtain up to $4 in SBA funds for every $1 of private capital, up to a maximum amount of $35 million.

[6]The general partners are usually liable for all obligations of a partnership. Thus, the liability structure offered by the SBA is a departure from this norm and offers a relief to general partners.

[7]If the SBIC provides a plan of divestiture, it can maintain a controlling interest in a small business up to seven years.

[8]Limits on interest rates that can be charged to small businesses are effective for all SBICs, whether or not they use SBA leverage.

[9]The SBA's SBIC Statistical Package reports that there were 335 reporting SBICs in 1986.

[10]Specifically, the financial statements pertain to the fiscal years 1987–92.

[11]Our definition of SBIC failure is not exactly comparable with that used for banks and savings and loan associations (S&Ls). For SBICs, we define failure as liquidation, revocation, or voluntary surrender of license. Few, if any, banks or S&Ls voluntarily surrender their charters, and the numbers in figure 1 exclude these voluntary surrenders. If our definition of SBIC failure included only liquidations, the results would still indicate a higher failure rate for SBICs.

[12]An SBIC is classified as bank-owned in any year in which at least 10 percent of its equity was controlled by a banking organization. Otherwise, the SBIC is classified as nonbank-owned.

[13]This would be true if the mean duration of equity investments was greater than the mean duration of debt investments.

[14]Sinkey (1975), Altman (1977), and Martin (1977) analyze financial ratios constructed from balance sheets and income statements to develop a system to help regulators identify financially troubled institutions as early as possible. These financial ratios were grouped into five broad categories: capital adequacy, asset quality, management competence, earnings, and liquidity. The same types of broad categories were used by Avery and Hanweck (1984), Barth et al. (1985), Benston (1985), and Gajewski (1989) to examine the likelihood of an institution's closure. Cole (1993) examines economic insolvency and closure using a larger number of financial factors than in the previous studies. For an excellent review of the literature on bank failure, see Demirgüc-Kunt (1989).

[15]The Herfindahl index is often used to measure competition in banking markets. It is calculated as the sum of the squares of deposit shares of all competitors in a market.

If the index is equal to one, little or no diversification (or competition) in the market is present, and the smaller the index the more diversified (or competitive) the market. Here, *HERFSIC2*, for example, is calculated as the sum of squared shares of funding in a particular SIC code to the total fundings made by an SBIC over the 1982–92 period. Similarly, the shares of investments made by an SBIC by state are used to calculate the *HERFGEO* index.

[16]Recall that *HERFGEO* and *HERFSIC2* are computed over the full ten-year period, 1983–92, as opposed to separately for each year. Our method implicitly assumes a ten-year duration for the investments made by SBICs, whereas the year-by-year method assumes a one-year duration.

[17]Many failed SBICs are missing financial records for the year preceding failure. Consequently, we focus on two-year ahead failure prediction in the models we present below. Once we discard the available observations pertaining to the year before failure, as well as four observations with data problems, we have 1,102 observations, of which 414 (688) are classified as bank-owned (nonbank-owned) SBICs.

[18]Our coefficient (standard error) estimates are –0.326 (0.044) on the *SBATA* variable and 0.119 (0.083) on the *SBATA–PCOMP* interaction variable. At the sample mean of *PCOMP*, which is 0.381, this implies a total coefficient of –0.281 on *SBATA*; for SBICs with zero loans in their portfolios, the total coefficient is –0.326. Analyzing bank-owned and nonbank-owned SBICs separately, we find that the interaction coefficient is positive and significant at the 1 percent level for only the nonbank-owned SBICs.

[19]We controlled for macroeconomic conditions by including the growth rate of real GDP in this regression, as well as in all the other regressions described in this section on prepayment restrictions; thus, time dummies are not included as in equation 3.

[20]We defined the interest rate spread as the difference between the interest rate received by the SBIC (interest income relative to interest-earning assets) and the interest rate paid by the SBIC (interest expenses relative to total debt owed by the SBIC).

[21]We recognize that we cannot exclude the possibility that a large difference may occur for some SBICs because they are currently poor performers that wish to avoid the scrutiny associated with refinancing. Though the SBA may not explicitly price risk when it sets interest rates on its debentures, it may indirectly penalize a poorly performing SBIC in other ways when the SBIC requests new funding.

[22]This analysis uses our original definition of SBIC failure.

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