A Trojan horse or the golden fleece? Small business investment companies and government guarantees

Elijah Brewer III
Federal Reserve Bank of Chicago

Hesna Genay
Federal Reserve Bank of Chicago

William E. Jackson III
Kenan-Flagler Business School
University of North Carolina-Chapel Hill

Paula R. Worthington
Federal Reserve Bank of Chicago

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Profitability is a central concern when governments provide guarantees to increase the flow of funds to disadvantaged groups. We examine the profitability of small business investment companies (SBICs) that are chartered and regulated by the U.S. Small Business Administration (SBA) to finance the activities of small firms. We document, over the 1986-91 period, dismal performance by SBICs. Because SBICs have access to government-guaranteed funds, financial distress among SBICs can expose the SBA, and hence taxpayers, to losses. Using two alternative sample selection models, we examine the relationship between SBICs' use of SBA funds and returns on equity (ROE) and survival probabilities. The first sample selection model is based on a model of failure/survival. The second selection model is based on our observation that many SBICs do not take advantage of SBA leverage: nearly one-third of SBICs use no leverage at all, and that figure rises to three-fifths for bank-owned SBICs. The results from our sample selection models indicate that SBA leverage--the amount of funds borrowed from the SBA as a percent of private capital--reduces ROE and the probability of survival. In addition, we find that the probability of using SBA leverage decreases for bank-owned SBICs relative to other SBICs and for highly profitable and efficient SBICs, while it increases for SBICs using debt to finance the activities of small firms. Thus, our results suggest that an SBIC's performance is negatively correlated with SBA leverage.

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1. Introduction

Policymakers regularly propose and endorse programs designed to encourage the flow of funds to selected consumers and businesses. For instance, the Community Reinvestment Act (CRA) regulations aim to increase the flow of funds to disadvantaged communities or persons by requiring depository institutions to make a minimum amount of effort to fund these groups. Similarly, the Small Business Administration's (SBA) 7(a) loan program and its Small Business Investment Company program aim to encourage the flow of funds to small businesses through government guarantees of debt issued by the small businesses and/or the financial intermediaries providing the funds to the small businesses. In this paper we examine the profitability of the SBA's small business investment companies (SBICs) over the 1986-91 period. Because SBICs had access to government-guaranteed funds and because these guarantees exposed the SBA and taxpayers to losses, an evaluation of the performance of SBICs and factors that are correlated with it is of interest to policymakers and taxpayers.

As we shall describe in more detail below, the time period we study, 1986-1991, was characterized by very low profitability and very high failure rates of SBICs: Of our sample's 280 SBICs operating in 1986, 89 entered liquidation by the end of 1993, and 67 had surrendered their licenses, leaving 123, or well under half, the original sample. This poor performance generated significant losses to the federal government: the U.S. General Accounting Office (GAO) estimated that only $200 million of the $500 million owed by SBICs in liquidation as of September 1995 would ultimately be repaid (GAO, 1995). What role, if any, did government-guaranteed debt of SBICs play in their poor performance over this time period? This paper examines this question in detail, and thus contributes to our understanding of how credit guarantees affect the performance

of financial intermediaries that use them.

In previous work, we found that poor SBIC performance was associated with high usage of SBA-guaranteed debt ("SBA leverage") (Brewer, Genay, Jackson, and Worthington, 1996a), and a study by the GAO (1993) reported similar findings. We expand on this earlier work in several ways. First, we examine both book and market returns on equity, and we find that our earlier results are unchanged. Second, we estimate two alternative sample selection models; under assumptions that we detail below, this provides consistent parameter estimates in our profitability equations. The first selection model is based on a model of failure/survival: since we can estimate the impact of SBA leverage on profitability only for those SBICs that survive over some period of time, simple OLS coefficient estimates of leverage's effect will be inconsistent. Consequently, we use Heckman's procedure for obtaining consistent and efficient parameter estimates by using maximum likelihood techniques to jointly estimate survival and profitability equations.[1] Our second selection model is based on our observation that many SBICs do not take advantage of SBA leverage: nearly one-third of SBICs uses no leverage at all, and that figure rises to 60 percent for bank-owned SBICs. If some unobservable SBIC characteristic affects both the choice of leverage and profitability outcomes, then OLS estimates of leverage's impact on profitability will be inconsistent. To address this, we again estimate a sample selection model. Estimates from both selection models point to a negative relationship between the extent to which SBICs use SBA-guaranteed funds and their economic performance.

Overall, we interpret our results as being consistent with the notions that 1) risky SBICs

[1]See Holtz-Eakin, Joulfaian, and Rosen (1994) for a similar approach when assessing the impact of inheritance receipt on the profitability of the recipient's small business.

are more likely to make greater use of SBA funding than are other SBICs (*adverse selection*); 2) firms with government liability guarantees tend to invest excessively in risky assets (*moral hazard*); 3) SBICs using debt to finance equity investments suffered from a mismatch between income and expenses (the *mismatch effect)*; 4) leveraged SBICs who could not prepay their SBA leverage when interest rates fell in the late 1980s experienced significant losses as a result (the *prepayment effect*). Assessing the relative importance of these four effects is left for future research.

2. The SBIC Program[2]

The SBIC program was established in 1958 to encourage the provision of long-term debt and equity capital to small firms. SBICs fund their operations through private capital, public debt and equity issues, and loans, and SBICs can be "stand-alone" financial intermediaries or can be owned, completely or in part, by other financial institutions, including banks. SBICs can issue debentures which are purchased directly or are guaranteed by the SBA; these debentures are typically priced 50 to 100 basis points above similar maturity Treasury securities, hence are subsidized relative to rates paid by other (private sector) financial intermediaries raising funds. These debentures are usually of ten years duration, and, during the time period we study, SBICs faced prepayment restrictions on the debentures that they issued.

Between 1958 and 1996, the SBA licensed 1,403 SBICs with approximately $2 billion in private capital. Over the years, the program has experienced periods of success, as well as periods of large losses; Gompers (1994) offers a concise review of the program. For instance, according to the SBA, SBICs have funded such successful companies as Apple Computer, Cray

[2]For a more detailed description of the SBIC program and regulations, see Appendix A.

Research, Federal Express, and America on Line. In addition, between 1983 and 1996, SBICs funded 25,127 firms with $8.89 billion. On the other hand, the program has also experienced very high failure rates among SBICs and relatively large losses to the SBA. According to SBA statistics, between 1967 and 1996, 459 SBICs entered liquidation and had close to $1 billion in SBA leverage outstanding at the time of liquidation. Moreover, losses to the SBA from liquidations appear to be significant. For instance, the GAO (1995) estimated that only $200 million of the $500 million owed by SBICs in liquidation as of September 1995 would ultimately be repaid.

How SBICs compare to other financial intermediaries

SBICs are both similar to and different from other financial intermediaries, including commercial banks and venture capital firms. Like commercial banks, SBICs lend money to small firms and fund their investments, in part, by issuing debt. Just as mispriced federal deposit insurance allows commercial banks access to deposits at below market rates, SBA guarantees allow SBICs to issue debentures at subsidized rates. However, subsidized liabilities fund a greater fraction of commercial banks' assets than SBICs: deposits averaged 78% of total assets for banks, while SBA leverage averaged 34% of SBICs' assets over the time period we study.[3] Furthermore, commercial banks, on average, were 10 times larger than SBICs and were much more profitable between 1986 and 1991 (figure 1).

One important difference between banks and SBICs is that while banks are severely restricted in equity participations and provide funds to firms almost exclusively through loans,

[3]Other leverage ratios, such as total borrowings and total liabilities as percentages of total assets, also indicate higher leverage at commercial banks relative to SBICs.

SBICs make convertible debt and equity investments as well as loans.[4] In fact, between 1983 and 1996, only 19.5% of the dollar amount disbursed by SBICs were through loans; the remainder were through debt with equity (31.1%) and straight equity (49.4%) securities (SBA, 1997).

Loans made by SBICs do appear to differ from loans made by banks. Although the interest rates on bank and SBIC loans are highly correlated and move in tandem over the business cycle, the rates on SBIC loans are higher and vary less over time than do bank loan rates (figure 2). This suggests that banks may be lending to different types of firms than SBICs or that the two types of contracts have different characteristics.[5] Furthermore, firms funded by SBICs differ from those funded by banks. For instance, compared to firms sampled in the 1987 National Survey of Small Business Finances (NSSBF), firms funded by SBICs are younger, have greater assets, more employees, and are more likely to be organized as corporations rather than sole proprietorships or partnerships (table 1).

Although SBICs are considered a part of the venture capital industry, they differ from other venture capital firms in a number of ways.[6] First, SBICs account for only a small fraction of the entire venture capital industry. In 1991, total capital under management at SBICs accounted for only slightly over 6% of total capital managed by the entire venture capital industry. In addition, SBICs provided less than 2% of the total disbursements by all venture capital firms in

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[4]Because banks can and do own and operate SBICs, however, banks can make equity investments indirectly through their SBIC subsidiaries.

[5]Data on interest rates on bank loans are obtained from the Federal Reserve's Survey of Terms of Business Lending. The Survey is conducted four times a year and collects detailed information on all commercial and industrial loans made during the survey week by participating banks.

[6]All statistics on venture capital investments in the following discussion are as reported in Alger (1993).

the 1983-1992 period. Second, like other venture capital firms, SBICs purchase equity securities; yet, while venture capital firms invest mostly through convertible securities (Sahlman, 1990), the majority of SBIC investments are straight equity. SBIC and other venture capital firms also appear to fund different types of firms and projects. For instance, compared to total venture capital investments, a greater fraction of funds disbursed by SBICs are for leveraged buy-outs, acquisitions, and first-time financings.[7]

3. Factors affecting SBIC performance

Economic models indicate that the relationship between access to subsidized funds and performance is complicated. At first glance, one would expect that borrowing money at a subsidized rate would raise the returns to private investors. If markets are efficient, then investors will invest in subsidized institutions until their risk-adjusted (post-subsidy) rates of return equal those available in other financial intermediaries. This means more projects would be funded than would be the case in a world without SBA subsidies. However, if only the riskiest institutions—those that would otherwise be unable to raise funds or could do so only at a hefty risk premium— use subsidies, this adverse selection may produce a negative relationship between financial performance and use of subsidized funds. Similarly, if financial institutions that take advantage of government subsidies do so because they intend to invest in riskier projects than they would if only their own money were at stake (moral hazard), we would again observe a negative relationship between profitability and use of subsidies.

[7]While only about 7% of all funds disbursed by venture capital firms in 1991 was for LBOs and acquisitions, close to 35% of funds disbursed by SBICs was for such purposes. In addition, between 1983 and 1992, over 56% of SBIC investments was first-time financings; in contrast, only about 36% of all venture capital disbursements over the same period were first-round financings.

Furthermore, regulations often accompany subsidies. Although many SBIC regulations may have been sensible ex ante, they often exposed levered SBICs to losses arising from unanticipated changes in their operating environment. For instance, the SBA regulations in effect during the period under review essentially forbade prepayment of SBA leverage during its first five years. Thus, falling interest rates could mean a decline in investment income but no commensurate decline in interest expenses, putting pressure on profits. This prepayment effect would likely be most pronounced for SBICs with large loan portfolios.[8] In fact, when the SBIC program's regulations were revised in 1994, this prepayment penalty was essentially eliminated, as the SBA recognized the possible interest rate risk faced by SBICs whose liabilities were fixed rate.[9] A second regulatory feature is that SBA leverage required regular interest payments to the SBA, potentially creating a mismatch between assets and liabilities of SBICs. Thus, many SBICs, especially equity-oriented SBICs whose realized income consists primarily of variable capital gains, may have found SBA leverage quite burdensome. Although the prepayment and mismatch costs were known features of SBA leverage, they nevertheless exposed SBICs to interest rate and cash flow risks. Overall, then, we have several reasons to expect that SBA leverage may be negatively related to ROE and positively related to failure.

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[8]This would be true if the mean duration of equity investments was greater than the mean duration of debt investments. Our previous research (BGJW 1996a) found little evidence of a prepayment effect for our sample SBICs.

[9]The SBIC Reinvention Council (1995, p. 45) noted that under the old regulations, SBICs could not prepay debentures for their first five years and that the interest rates SBICs were permitted to charge borrowers were linked to the level of *current* interest rates, not the *lagged* interest rates that governed the actual cost of funds to SBICs with previously selected SBA leverage levels. The new regulations relaxed both of these regulatory features.

Previous research

Several strands of the banking and finance literature are relevant for our work. The bank/thrift failure literature identifies factors correlated with the likelihood of failure, and the bank performance literature, with its emphasis on exogenous factors such as market structure and on endogenous factors such as capital/assets ratios, offers some solid evidence on factors influencing bank profitability.

The financial institution failure literature: Research in this area has clearly shown that diversification, asset risk, interest rate risk, and managerial efficiency measures are important correlates of bank and thrift failure probabilities. Previous studies range from those estimating single equation logits or probits to those estimating two-equation systems or time-varying proportional hazard models (for examples, see Avery and Hanweck, 1984; Barth et. al., 1985; Brewer et. al., 1989; Cole, 1993; Gajewski, 1989; Helwege, 1996). The GAO (1993) studied a sample of SBICs similar to the one we examine and found that increases in SBA leverage and in the share of equities in the SBIC's portfolio of securities raise the likelihood of SBIC liquidation.

The bank performance literature: Many papers examine the relationship between bank profitability and various measures of market structure and regulatory conditions (for instance, Berger, 1995a and 1995b; Demirguc-Kunt and Huizinga, 1997; Hughes et. al., 1997). A central issue in these studies is often characterized as the market power versus efficiency question: do highly profitable banks earn profits because they exercise market power, or because they are highly efficient? Previous studies offer evidence to support both hypotheses (see Berger (1995a)). Another issue in these studies, and one that is especially relevant for our study of SBA leverage, is the relationship between capital and earnings in banking. Berger (1995b) characterizes

"conventional wisdom" as pointing to a negative relationship between capital and earnings: in perfect capital markets, a bank with a higher capital/assets ratio has, *ceteris paribus*, a lower probability of failure. Consequently, investors require a lower (after-tax) rate of return to hold the bank's equity. In practice, though, data reveal a positive, not a negative, correlation between capital and profits (Berger, 1995b; Demirguc-Kunt, 1997). Lower expected costs of bankruptcy associated with capital and asymmetric information between investors and bank management offer potential explanations for the empirical evidence: An increase in capital may raise profitability by lowering costs of financial distress, or banks may credibly signal better quality with higher capital ratios. The GAO (1993) study, as well as our previous research, finds a negative correlation between leverage and earnings, a finding similar to Berger's, since highly levered SBICs have low capital/assets ratios. We will return to this issue below when we discuss our regression results.

4. Data

We use data from 280 SBICs active at the beginning of 1986, which filed reports of both condition and investments.[10] The reports of condition data provide detailed balance-sheet and income-statement information of SBICs for the 1986-91 period.[11] We use these stock and flow data to construct several measures of SBIC financial performance as well as control variables for our analysis below. The investments data are transactions-level records of each investment made by every SBIC over the 1983-1992 period, and they provide details on the firm being financed, the intended use of funds, the size and type of investment (debt, equity, or some hybrid), and other information.

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

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

Profitability measures We construct both book and market values of profitability. Accounting-based measures of performance are used in this study because stock market-based measures of performance are not readily available for most of the SBICs in our sample. Several performance measures are computed using historical cost (book value) information obtained from reported income and balance sheet data. Other performance measures are computed using various adjustments to historical cost information to make them suitable measures of economic performance. Beside using historical cost accounting procedures to report each investment, an SBIC is required to adjust the historical cost value of each investment by any unrealized gains or losses embedded in the instrument (market value). Since net unrealized gains are as reported by an SBIC, this adjustment to historical cost values might not generate a "true" market value measure. Nevertheless, it provides an alternative index to examine the association between SBA leverage and SBIC performance. SBIC performance is captured by both return on equity (ROE) and cumulative profitability measures (CP). Thus, we construct book and market values of ROE and CP.

ROE, as measured by the ratio of net earnings to equity, is perhaps the most commonly used measure of profitability. From the standpoint of financial theory, ROE provides a proxy for the returns available to shareholders. An SBIC with low earnings as a percentage of shareholder claims is likely to experience falling share prices and therefore increased costs of external capital. In such a case, the company's growth potential is likely to be lowered commensurately. Thus, annual ROEs offer reasonable measures of SBICs' current performance.

Cumulative profitability measures are employed to examine capital adequacy. We consider three measures: book value, market value, and a value corresponding to the measure

used by the SBA to determine whether an SBIC is capital impaired. Cumulative profitability is defined as the ratio of accumulated, undististribued earnings ("cumulative profits") to original equity capital. Because we do not have data on the dividends paid out over the SBIC's lifetime, the CP measures potentially understate how much the SBIC has earned over the course of its lifetime. Instead, our cumulative profitability measures capture "what's left in the till" for creditors should the firm fail overnight. The book value measure excludes accumulated unrealized net gains on securities held by the SBIC, while the market value measure includes such gains. The CP measure used by the SBA includes accumulated unrealized losses but excludes accumulated unrealized gains. This variable allows us to examine those factors that are likely to lead to poor performance by SBA's standards.

Because of the many well-known problems associated with using accounting data to reflect economic reality, it is important to check the validity of our accounting-based variables as measures of SBIC performance.[12] To obtain a measure of economic performance, we employ stock market data. Annual shareholders' returns ($RET_{i,t}$) were computed for the eight SBICs that had readily available stock market data over the 1986-1991 period. Of the 48 possible firm-years observations, we have complete data for 38. Panel A of table 2 contains the simple Pearson correlation coefficients for the different variables. The sample correlation coefficients suggest that there is a statistically significant association between RET and ROE. The association is stronger when market value ROE is used as the accounting performance measure.

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[12]See Benston (1985), for a general critique of the validity of using accounting data to infer economic performance. Ronen and Sorter (1972) explain various adjustments that must be made to both accounting earnings and balance sheet data to make accounting rates of returns suitable measures of economic returns.

A model relating annual shareholders' returns, RET, to ROE can be written as:

$$RET_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \varepsilon_{i,t}$$

We estimate this equation using pooled cross-section time series data and report the results in panel B of table 2. The results indicate a positive and significant correlation between accounting returns and stock market returns. This is consistent with the conclusions found in other studies using a much larger number of observations than that employed here.[13] Thus, these results suggest that information contained in accounting-based measures of performance can be used to provide insights into the economic performance of SBICs.

Failure rates Table 3 shows how our sample of 280 SBICs fared over the 1986-1993 time period. Less than half of our sample, 43.9%, remained by the end of 1993, with liquidations and surrenders of license accounting for about three-fifths and two-fifths, respectively, of all the exits.[14] In this paper, we treat liquidations as failures, and our sample excludes SBICs who ultimately surrender their licenses.[15] The SBA typically places an SBIC in liquidation because of

[13]See Jacobson (1987) and Landsman and Shapiro (1995) for a discussion of the relation between accounting-based measures of performance and economic returns.

[14]If we allow for entry of new SBICs and recompute annual exit rates from the sample including SBICs established after 1986, we find similar exit rates.

[15]SBICs can surrender their licenses under several circumstances. First, two or more SBICs merge directly, leading to at least one surrender. Second, two or more parent organizations of SBICs merge, leading the new parent to surrender at least one of the licenses. Third, the SBIC owners are truly exiting the industry; this latter category could be considered "failures," as we infer that the owners felt they were not earning a competitive rate of return on their investment. Our sample of 280 SBICs excludes SBICs from the first category. However, our data do not allow us to distinguish between the second and third categories. Consequently, we choose to exclude all surrenders from our analysis; this does not bias our results, though it costs us some efficiency in our estimation.

regulatory violations, often including poor financial performance that has left the SBIC undercapitalized. However, not all liquidations are SBA-initiated: the GAO (1993) reports that between 1986 and 1991, several SBICs voluntarily entered liquidation to avoid penalties for prepaying the long-term SBA leverage they owed. Consequently, we view liquidations as both economic and regulatory events, in which liquidation is likely to follow poor financial performance but need not do so.

Asset risk measures Our measures include several financial indicators commonly used in the bank/thrift failure literature: the ratio of loans to total portfolio securities at book value; Herfindahl indexes of investments, based on industry and geographical groupings; and measures of size and age of the small firms being funded by the SBIC. We also include three additional variables in this category: the shares of SBIC investments going to "relationship-oriented" projects, to "transactions-related" projects, and to firms located in the same state as the SBIC.[16] We expect SBICs with high shares of relationship-oriented investments to have higher asset risk, hence higher (ex ante) rates of return and higher failure rates.

Lagged profitability, capital, and leverage Since we are primarily interested in the impact of SBA leverage on profitability, all of our regressions include a leverage measure, either the ratio of leverage to total assets or the ratio of leverage to private capital. We also include a lagged measure of cumulative profitability, which we defined above as the ratio of accumulated, undistributed earnings to original equity capital. We do not include a capital/assets ratio in our

[16]Transactions-oriented projects include plant modernization, debt consolidation, new building or plant, machinery acquisition, and land acquisition projects. Relationship-oriented projects include acquisition of existing businesses, marketing, research and development, and all other (unspecified) projects. Operating capital is the excluded category.

regressions, because of its large (in absolute value) correlation with both of our leverage measures.

Other variables We include a measure of managerial efficiency, the ratio of operating expenses to total assets, as well as SBIC age and size as simple control variables. Some of our specifications also include year dummies and regional dummies based on the SBIC's state of operation. Other specifications exclude the time dummies but include other variables which vary by year, not by SBIC. For instance, in some specifications, we include the number of SBIC exams performed by the SBA in each year. Further, some specifications include a measure of the economic conditions faced by SBICs, the investment share-weighted average small business failure rate. We construct the failure rate, which is originally available by year and state, by using each SBIC's investment records to compute the flow of dollars going to each of the 50 states in each year, and then share-weighting the state and year-specific failure rates. In several specifications below, we use identifying characteristics of the SBICs to identify our equations. In particular, we use the legal form of the SBIC (corporation or partnership), bank ownership of the SBIC, and public or private status in several of our models.

Summary statistics Tables 4 and 5 contain some descriptive statistics of our data. Table 4, which describes the liability structure of SBICs, shows that about two-thirds of SBICs use SBA leverage, with the rate falling to about 40% for bank-owned SBICs. Table 4 shows clearly that most debt owed by SBICs was long-term debt, and most of this took the form of SBA leverage. That is, SBICs borrowed essentially no funds except for those guaranteed by the SBA. Table 5 reports the simple means and standard deviations for the variables used in the paper. We report these statistics for two samples. The first, which includes 1197 records on 280 SBICs between

1986 and 1991, is the set of SBIC-year observations for which we have financial records filed. The second, which includes 889 records, is formed from the first in several steps. First, we eliminate all SBICs who ultimately surrender their licenses; second, we drop records pertaining to the year before failure; third, we drop records in which the profitability measures are in the 1% tails of the distribution; and finally, we drop a small number of records for which needed variables are missing or incomplete.

5. Methodology

In our previous work, we used simple OLS equations to describe the relationship between SBIC profitability, SBA leverage, and other variables. We also estimated the probability of failure with probit models as well. In this paper, we consider several alternative econometric specifications to better address issues of sample selection. We organize our discussion along two distinct lines of concern. First, we consider the selection problems posed by the fact that many of our SBICs fail (exit from the industry) over our sample period. If some unobservable characteristic of SBICs influences both the profitability of SBICs as well as the likelihood of survival over some period of time, then OLS estimates from a regression of profitability on leverage and other independent variables will be inconsistent. Second, we consider the problems that arise if SBICs' choice of leverage is correlated with profitability, again perhaps through some unobservable variable. For both models, we estimate selection models to consistently estimate the coefficient on leverage in the profitability equations.

The survival/failure issue

We model profitability, A, as follows:

(1) $A_{it+2} = X_{it}\beta + \varepsilon_{it}$

where X_{it} are correlates of profitability, and where we assume that ε_{it} is distributed normally, with mean 0 and variance σ^2_{ε}. When SBICs fail, they leave our dataset; however, we also tend to "lose" SBICs one year before failure, perhaps due to irregular reporting practices at troubled SBICs. Consequently, we structure our dataset so as to estimate profitability at time t+2 as a function of independent variables at time t.[17]

Turning now to the survival process, we let y^*_{it+2} denote SBIC i's net worth at time t+2, which we model as follows:

(2) $y^*_{it+2} = W_{it}\gamma + u_{it}$

where W_{it} are correlates of net worth (including some, perhaps all, of X_{it}). True net worth is, of course, unobservable; instead, we observe whether or not an SBIC survives between time periods t and t+2:

(3) $y_{it+2} = 1$ *if* $y^*_{it+2} > 0$,
$y_{it+2} = 0$ *otherwise*

We assume that u_{it} is distributed normally, with mean 0 and variance σ^2_u. If ε_{it} and u_{it} are correlated, then OLS estimates of β will be inconsistent. We would expect to see such a

[17]If, instead, we estimated our model on a one-year ahead basis, any selection model we estimate would be faulty, since we would count as failures in year t+1 SBICs who, in fact, survived through year t+1 and subsequently failed in year t+2.

correlation if, for example, the most poorly managed SBICs, or the SBICs most likely to make risky investments, are those most likely to fail and to experience low profitability while still in operation. To address this possiblity, we try two approaches. First, we estimate the selection model given by equations (1) and (3), as suggested by Heckman (1976) and others.[18] Note that equation (3) is estimated over our full sample, while equation (1) is estimated only for surviving SBICs (since we obviously do not have observations on profits at time t+2 for SBICs that fail between time t and time t+2). To estimate this system, we need to specify X_{it} and W_{it}. As is well-known, if these sets of variables are identical, then we obtain identification only through functional form, which, in our decidedly nonstructual model would be inappropriate. Instead, we let W_{it} include all of X_{it}, plus an additional four variables that we believe are likely to affect failure but not profitability: whether the SBIC is owned by a bank; whether the SBIC is publicly held; whether the SBIC is a corporation or a partnership; and the number of exams conducted by the SBA in each year. We choose these variables because failure in this model is, at least in part, a regulatory event as well as an economic one. Consequently, whether an SBIC fails, i.e., whether the SBA takes a particular regulatory action, may depend on certain legal characteristics of the SBIC and on how many resources the SBA devoted to examining SBICs.

The endogeneity of SBA leverage

In this specification, we consider the possibility that only the "worst" SBICs, i.e., those most likely to invest in high-risk assets and/or behave recklessly, decide to use SBA leverage, and those are the very SBICs whose observed profitability may be lowest. As in the survival/failure model, failing to control for this correlation between leverage and profitability will bias the

[18]See Holtz-Eakin, Joulfaian, and Rosen (1994) for a similar approach.

coefficient on leverage in equation (1). We model leverage choice as a binomial choice variable:

$$(4)\quad \begin{array}{ll} z_{it} = 1 & \textit{if } SBIC_i \textit{ has any SBA leverage outstanding at time } t \\ z_{it} = 0 & \textit{otherwise} \end{array}$$

We also alter slightly the timing structure of our model, allowing time t profitability to be a function of X_{it}. Our complete model is given by equations (1)' and (5):

$$(1)' \quad A_{it} = X_{it}\# + \varepsilon_{it}$$

$$(5) \quad Prob(Z_{it} = 1) = 1 - F(-S_{it}\#)$$

where F( ) is the normal distribution function, and S_{it} are correlates of the leverage choice variable. We estimate this system by estimating a probit on equation (5); computing the implied inverse Mills ratios (IMRs); and estimating equation (1)' by least squares, where we include the IMRs as regressors. Note that both equations are estimated over the full sample of SBICs (i.e., those that use leverage and those that do not). As in the survival/failure model, we restrict X_{it} and S_{it} to identify the parameters. In particular, we let S_{it} include all of X_{it} plus the three SBIC legal and ownership characteristics mentioned earlier in the paper.

6. Results and discussion

We turn first to the results of estimating the model given by equations (1) and (3), considering book ROE (Table 6) and market ROE (Table 7) in turn. We include regional dummies and year dummies in all of our profitability regressions. The survival selection equations, however, include the regional dummies only, since one of the variables we expect to

affect survival (but not ROE) is the number of SBIC exams conducted by the SBA, a variable that varies only over time, not across SBICs. The book and market ROE results are qualitatively similar, so for brevity, we focus on the book ROE results of Table 6. First, the cumulative profits measure is insignificant and has the wrong sign in the profits equation but is "well-behaved" in the survival selection equation: cumulative profitability at time t-2 tells us nothing about time t returns on equity, but tells us much about the likelihood of the SBIC's survival through the end of time t.

Second, note the asset risk measures produce mixed results. High ratios of loans to total portfolio securities raise ROE and the probability of survival. If we view loans made by SBICs as safer than their equity investments, then this result has the flavor of Berger's (1995b) result: although safer assets should require lower rates of return in equilibrium, here we find the opposite. The Herfindahl indices, which rise as portfolio diversification decreases, do not enter the profits equation significantly. In the survival equation, these indices are significant, with the geographical index entering positively and the industry-based index entering negatively. In other words, industrial diversification raises survival prospects, while geographic diversification hurts them. The variable measuring the share of investments going to an SBIC's home state enters the profits equation positively though not significantly, and increases in this share lower the probability of survival. This result seems in conflict with the geographically-based Herfindahl index: geographic diversification lowers survival prospects, but so do increases in the share of investments going locally. The variables reflecting the types of projects ultimately funded by the SBICs do not enter either equation significantly. The average age of the small firms funded enters negatively and significantly; funding older firms, on average, lowers returns on equity. The size of the small firms that are funded is insignificant.

Finally, we turn to the leverage variable, the ratio of SBA leverage to private capital, which enters negatively and significantly in both the profits and survival equations. As we discussed above, our leverage measure is highly negatively correlated with the capital asset ratio, which previous studies found to be positively related to earnings for banks. Hence, some of our results are likely to be due to this simple leverage effect, not necessarily a *subsidized* leverage effect coming through the use of (underpriced) SBA leverage.

The variables we hypothesize to affect the probability of survival but not to influence profitability (the SBIC organizational form variables and the number of SBIC exams conducted by the SBA) do not perform particularly well. None is significant viewed alone, reflecting the low simple correlations between ROE and these variables.

We now turn to the results of estimating the selection model given by equations (1)' and (5). Table 8 reports the coefficient estimates and standard errors from estimating a probit on equation (5), where the dependent variable takes a value of 1 if an SBIC uses any SBA leverage and a value of 0 otherwise. Because we have little to guide us in selecting regressors for this equation, we take an agnostic approach and include all of the regressors from the ROE equations above, plus the three SBIC organizational form variables we used in the survival selection model. The first specification, reported in the first two columns of the table, includes book value cumulative profitability (CP) as a regressor, while the second specification, reported in columns 3 and 4, includes instead market value CP. Both specifications reveal that the probability of using SBA leverage falls for bank-owned SBICs relative to other SBICs, as the simple figures in Table 4 suggest. This implies that banks establish and operate SBICs not to obtain subsidized leverage but for some other reason; the obvious candidate is SBICs' ability to make equity investments in

small firms, an activity that is severely restricted for commercial banks.

Other variables also influence the likelihood that an SBIC uses SBA leverage: highly profitable and efficient SBICs are less likely to use leverage. Furthermore, debt-oriented SBICs are more likely to use leverage than others. Thus, the "mismatch" story of why leverage could diminish profitability is not very compelling: SBICs with high ratios of loans to total portfolio securities are more likely to use leverage than more "equity-oriented" SBICs, indicating that they take into account potential cash flow implications of SBA leverage.

We use these probit estimates to generate inverse Mills ratios (IMRs) and then include the IMRs as regressors in our ROE equations. Before reviewing the selection model results, however, we comment briefly on the results of estimating equation (1)' using simple OLS; these estimates are contained in the first two columns of Table 9 and Table 10 for book ROE and market ROE, respectively. Leverage's effect on ROE is negative in both cases, but it is statistically significant only for market ROE.

The selection model results are in the third and fourth columns of Tables 9 and 10. The results show that, once we take account of the correlation between the errors of the SBA leverage choice equation and the profitability equation, increases in leverage decrease profitability, though the effect is not significant at conventional levels.[19] The IMR enters negatively in both equations but is significant only for market ROE. Both the book ROE and market ROE results indicate that ROE rises with increases in contemporaneous CP and that ROE falls with increases in the investment share-weighted small business failure rate and the ratio of operating expenses to total

[19] We do find (but do not report) a significant negative coefficient on SBA leverage when leverage is measured as a percentage of assets, rather than private capital.

assets. The performance of the other asset risk variables, control variables, and dummy variables differs between the two ROE measures. For book ROE, the share of investments in relationship-oriented projects enters positively and significantly (at 10% level), as does SBIC size. For market ROE, the share of loans in the securities portfolio is positively correlated with profitability; however, no other asset risk variable is significant at conventional levels.[20]

To summarize, our results show a significant negative correlation between SBA leverage and profitability (and probability of survival) of SBICs under alternative selection models. Furthermore, SBIC profitability is significantly correlated with efficiency. Under certain specifications, past profitability and asset risk of SBICs are also correlated with profitability and probability of survival.[21]

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[20]These results, where either the share of loans in the securities portfolio or one of the other asset risk measures are significantly correlated with profitability, is consistent with our previous results on security choice of SBICs (Brewer, Genay, Jackson, and Worthington, 1996b). The results of that study indicate that SBICs' choice of debt versus equity investment in a small firm is significantly correlated with the type of project being funded and the characteristics of the small firm receiving the funds.

[21]Any differences between the results of our two selection models in the significance and sign of the coefficients arise from two sources. First, the timing of variables in the models are different. In the survival selection model, we explain profits at time t+2 with correlates at time t. On the other hand, in the leverage selection model, we model time t profits as a function of time t variables. Second, while the survival selection model examines profitability of SBICs in the 1986-1989 period, the SBA leverage selection model examines profitability in the 1986-1991 period. To the extent that the relationship between profitability and its correlates are different in the two periods, the two models would produce different results.

7. Conclusions

In this paper we examined the profitability of the SBA's small business investment companies (SBICs) over the 1986-91 period. We examined both book and market returns on equity and estimated two alternative sample selection models: one based on survival, the other based on use of SBA leverage. Estimates from both selection models point to a negative relationship between the extent to which SBICs use SBA-guaranteed funds and their economic performance.

Several factors may account for the negative relationship between SBA leverage and profitability of SBICs: moral hazard and adverse selection problems associated with access to subsidized funds, mismatch between the liabilities and assets of SBICs that use SBA leverage, and prepayment restrictions that were in effect during the period under study. A natural extension of the current study is to differentiate between these alternative, although not mutually exclusive, explanations for our results.

We plan to extend our current analysis in a number of ways. First, we will investigate alternative econometric specifications to check the robustness of our results. For example, we can consider fixed-effects regressions of profitability, or we can use instrumental-variables techniques to address issues related to endogenous SBA leverage use. Second, we wish to distinguish more carefully between the effect of SBA leverage as simple leverage (that is, debt in the capital structure) versus the effect arising from underpricing of the leverage. At present, we leave this issue for future research.

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Appendix A: Description of the SBIC program

The SBIC program was established with the passage of the Small Business Investment Act of 1958. The goal of the program is to encourage the provision of long-term funds to small firms. In the following, we describe the regulations in effect during the 1986-1991 period. As noted at the end of the appendix, the SBIC program was modified extensively in 1994; those changes are described briefly at the end of the appendix. During the period studied in this paper, small business was defined to be a firm with net worth less than $6 million and average after-tax earnings of less than $2 million. With only a few exceptions, any person or organization that meets the SBA's minimum capital and other licensing requirements can be approved to establish an SBIC. Although the minimum capital requirement to start an SBIC has increased over time, the requirement in 1991 was $2.5 million.

In return for focusing their investments to small businesses, SBICs are eligible to receive SBA leverage at favorable terms equal to 300 percent of their private capital. Under certain circumstances, private capital can be levered up to 400 percent with SBA funds; however, until 1994, the maximum amount of SBA funds an SBIC could receive was $35 million. As noted in the paper, SBICs can obtain SBA funds by issuing debentures directly to the SBA or by issuing SBA-guaranteed debentures to third parties. The interest rates on SBA-guaranteed debt are typically 50 to 100 basis points above the interest rates on Treasuries of comparable maturity.

In addition to the regulations noted in the paper, SBICs are subject to other forms of supervision and regulation. SBICs cannot invest in certain sectors (such as unimproved real estate, finance and investment companies, 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.[22] SBICs owned by banking organizations face the same regulations on equity investments as other SBICs.[23] 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.[24]

SBICs are subject to annual examinations by the SBA and certain reporting requirements. In addition to oversight regulations, SBICs using SBA leverage are subject to minimum performance 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 "capitally 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 by the SBA. 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 by the SBA.

There are two types of SBICs: regular SBICs examined in this study and specialized SBICs (SSBICs) that provide funds solely to small businesses owned by economically or socially disadvantaged persons. Compared to regular SBICs, SSBICs are subject to smaller capital

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[22]If an SBIC provides a plan for divestiture, it can maintain a controlling interest in a small business up to seven years.

[23]Under banking regulations, a bank can purchase only up to 5 percent of the equity of any one firm; an SBIC, even if it is affiliated with a banking organization, can acquire up to 49.9 percent of the equity of any one small business.

[24]Limits on interest rates that can be charged to small businesses are effective for all SBICs, whether or not they receive SBA leverage. Also, see footnote 9 in the paper.

requirements and less stringent regulations on their investments. Furthermore, SSBICs can obtain more SBA leverage at lower interest rates. However, SSBICs are smaller and less profitable than regular SBICs.

After experiencing substantial losses in the SBIC program, in 1994 the SBA established new regulations to improve the performance of SBICs and increase the flow of funds to small firms. Under the new rules, SBICs are eligible to issue not only SBA-guaranteed debentures, but also participating securities that are structured like preferred stock. Furthermore, the maximum amount of SBA leverage an SBIC can obtain was raised to $90 million. However, SBICs also face higher capital requirements. Currently, minimum capital requirements are $5 million; if an SBIC intends to use participating securities, the minimum requirement is $10 million. Size definitions also increased; SBICs can finance firms with net worth under $18 million and average after-tax earnings of less than $6 million in the past two years.

Since the establishment of new regulations, the SBA's budget for funding SBICs has increased significantly. During the period we examine in the paper, the SBA had the highest level of funding in 1990 with $295.4 million. In contrast, the 1997 budget was $667.4, more than double the amount in 1990. SBA's funding of SBICs has increased commensurately with its budget: in 1986, the SBA provided $136 million to regular SBICs; in 1996, SBA funding had increased to $481.2 million, including $93.3 million in commitments. At the same time, SBICs appear to perform better since 1994. According to the SBA (1997), the weighted average return in the SBIC program was 12.98 percent in the 1992-1996 period, increasing from 9.77% in the

1986-1991 period.[25]

[25]The differences in the rates of return reported by the SBA and those reported in this paper are due to differences in aggregate book value ROE for all SBICs and average ROEs.

Figure 1. Bank and SBIC ROEs

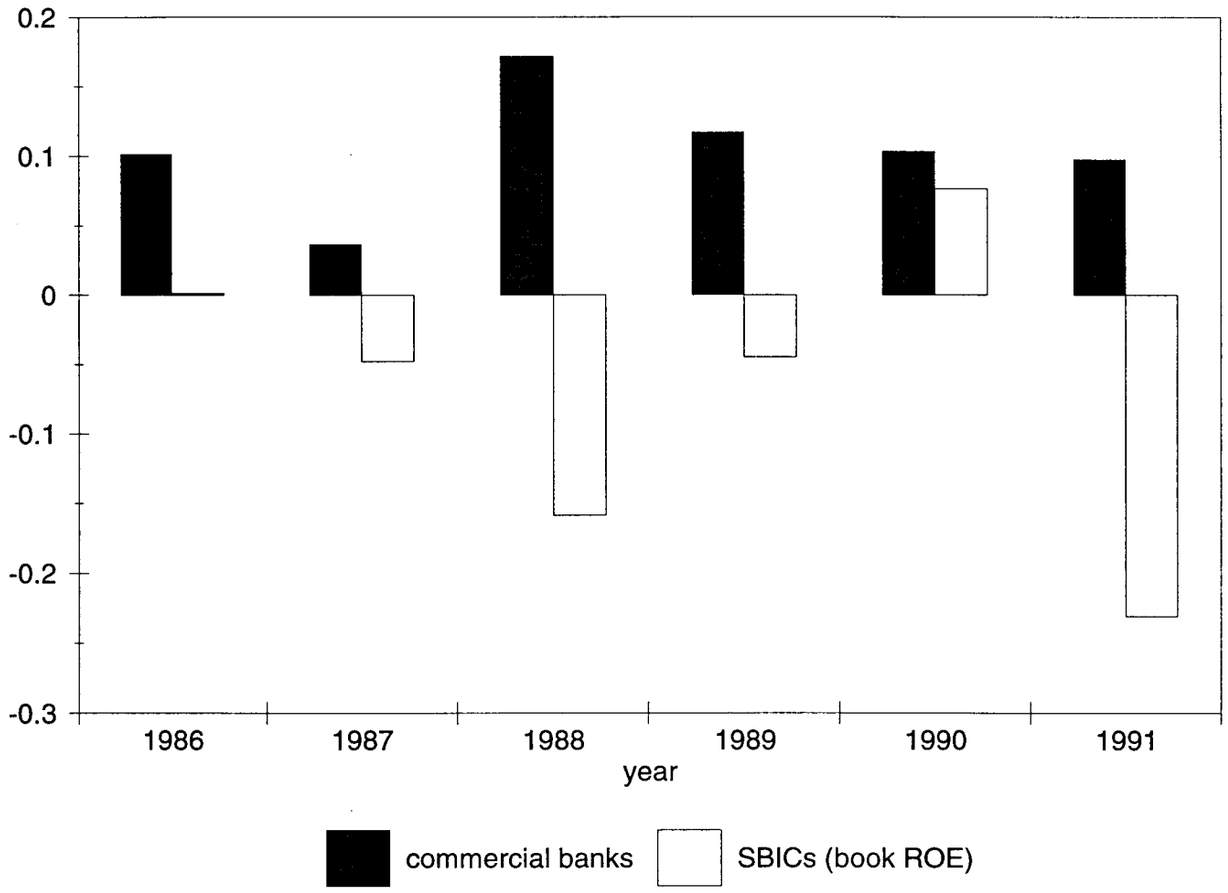

Figure 2. Interest Rates

SBIC, bank, and government bond rates

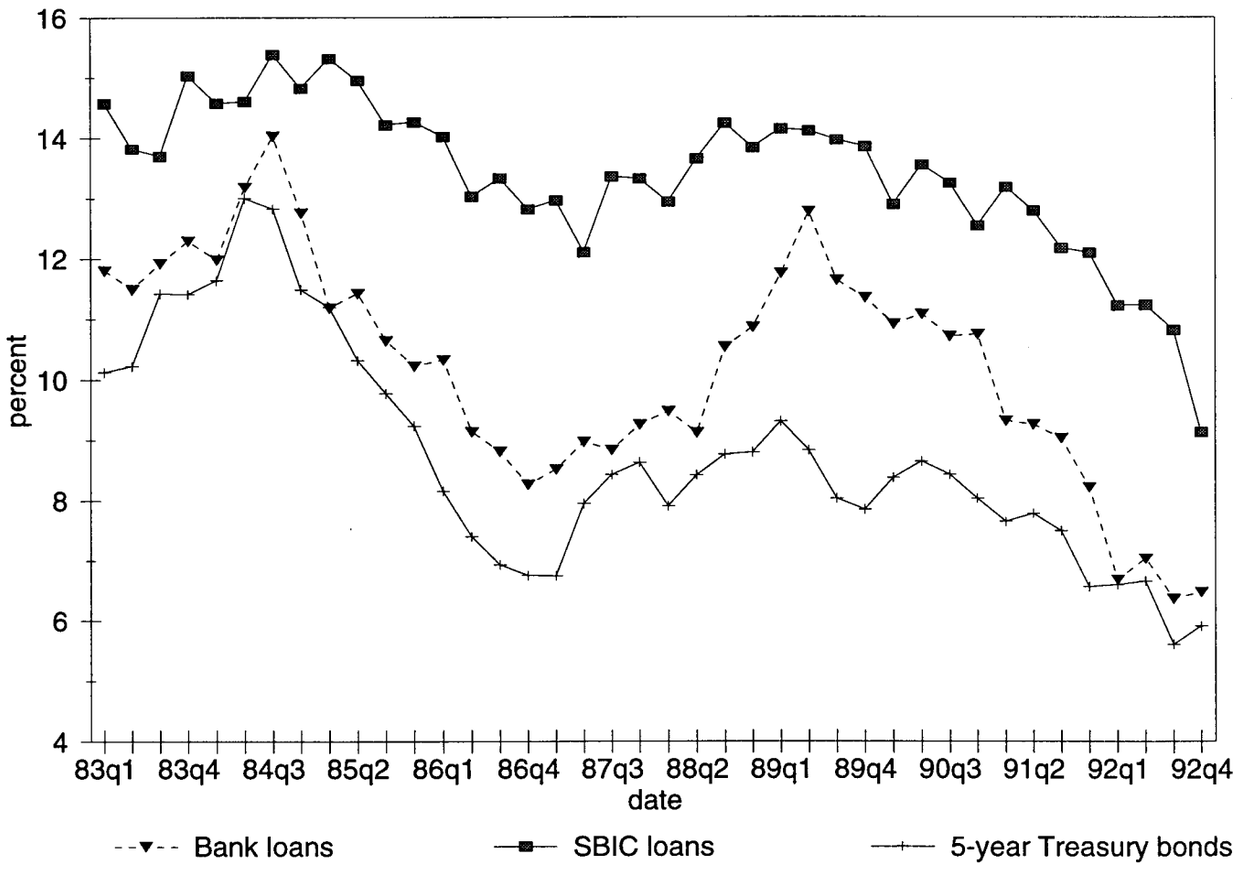

Table 1 Small firms funded by SBICs, 1983-1992

Distributions of firms that are financed by SBICs in the 1983-1992 period and firms surveyed in the 1987 National Survey of Small Business Finances (NSSBF).

Panel A. Number of employees	NSSBF[a]	SBIC[b]
1-4	54.3%	10.2%
5-9	22.2	7.0
10-19	11.8	13.9
20-49	7.8	20.4
50-99	2.4	17.5
100-499	1.6	24.0
$500	0.0	8.3
Panel B. Firm age	**NSSBF[a]**	**SBIC[b]**
0-4	14.5%	56.4%
5-9	19.7	23.1
10-14	17.0	7.0
15-19	11.7	4.6
20-24	7.7	2.2
25-49	20.7	5.0
$50	8.6	1.7
Panel C. Total assets, in thousands of dollars	**NSSBF[a]**	**SBIC[b]**
<25	15.8%	4.6%
25-49	12.5	1.3
50-99	17.2	2.0
100-249	23.7	4.5
250-499	13.5	5.4
500-999	7.8	7.8
1,000-4,999	7.3	30.5
$5,000	2.2	35.7
Panel D. Organizational form	**NSSBF[a]**	**SBIC[b]**
Corporation	51.7%	92.9%
Partnership	8.3	5.0
Sole proprietorhip	40.0	2.2

[a] Percentage of firms in the 1987 NSSBF sample; source: Federal Reserve.

[b] Percentage of dollars disbursed by SBICs to firms with given characteristics over the 1983-1992 period; source: authors' calculations from the SBIC database.

Table 2 The association between accounting-based measures of performance and stock market returns

Panel A: Pearson correlation coefficients between SBICs stock market returns and accounting returns

This part of the table provides sample correlation coefficients between accounting-based measure of returns and stock market returns. RET is the stock return of an SBIC; ROEBOOK is the book value measure of ROE computed using historical cost accounting procedures and is equal to (NII + RGNS)/(CAPTOT - URZG); and ROEMKT is the market value measure of ROE computed by adjusting historical cost accounting data for any unrealized gains or losses embedded in the SBIC's portfolio and is equal to (NII + RGNS +URZG)/(CAPTOT - URZG + URZGE). NII is net investment income; RGNS is realized gains or losses on securities sold; CAPTOT is total capital, including unrealized gains or losses on securities held (URZG); and URZGE is the unrealized appreciation on securities held.

RET	ROEBOOK	ROEMKT
1.000	0.3883*	0.6664**
	1.0000	0.3359*
		1.0000

Notes: * significance at the 5 percent level.
**significance at the 1 percent level.

Panel B: Simple regression of accounting returns on stock market returns

This part of the table reports the results of estimating the following model using annual data over the 1986-1991 sample period:

$$RET_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \varepsilon_{i,t},$$

where $RET_{i,t}$ is stock return of the SBIC i in time period t, $ROE_{i,t}$ is a measure of the accounting return on equity, and $\varepsilon_{i,t}$ is a stochastic error term. The two accounting returns on equity are ROEBOOK and ROEMKT.

Accounting return	Coefficient	p-value
ROEBOOK	0.2774	0.0160
ROEMKT	0.7823	0.0001

Note: This table reports on the association between accounting performance measures and SBICs' stock returns. The sample consists of 8 SBICs with publicly-traded common stock between 1986 and 1991. Annual stock returns are calculated using daily stock returns. Of the 48 possible firm-years observations, we have complete data for 38.

Table 3 Exit frequencies of SBICs, 1986-1993

Year	Survive	Surrender License	Liquidate Assets	Revoke License	Total	Total as %
1986	280	-	-	-	-	-
1987	263	5	12	0	17	6.1
1988	230	17	16	0	33	12.5
1989	209	9	12	0	21	9.1
1990	175	14	20	0	34	16.3
1991	154	10	11	0	21	12.0
1992	139	6	9	0	15	9.7
1993	123	6	9	1	16	11.5
totals	123	67	89	1	157	

Note: For SBICs reporting both a liquidation and a surrender date, the earliest date is used to determine the exit type. In general, liquidations precede surrenders of licences. In four cases, liquidation and surrender are reported on the same date: three in 1987 and one in 1988. We label the exit type as liquidations in these cases. The last column is computed as the total number of exits as a percent of the previous year's survivors. Our dataset "loses" SBICs in the year of exit, and many failing SBICs disappear the year before failure as well. We have the following numbers of financial records, by year, 1986-1991: 280, 235, 216, 183, 157, and 126.

Table 4 Liability structure of SBICs, 1986-1991

	All SBICs	Bank-owned SBICs	Nonbank-owned SBICs
% of SBICs using SBA leverage	69.7	39.5	87.4
Mean ratio of SBA leverage to total assets			
Unconditional	0.342	0.161	0.449
Conditional	0.491	0.407	0.513
Mean ratio of SBA leverage to private capital			
Unconditional	1.050	0.376	1.446
Conditional	1.507	0.952	1.654
Mean ratio of long-term debt to total assets			
Unconditional	0.317	0.150	0.414
Conditional	0.452	0.372	0.474
Mean ratio of long-term debt to total debt			
Unconditional	0.605	0.361	0.733
Conditional	0.820	0.783	0.830
Mean ratio of long-term SBA leverage to long-term debt			
Unconditional	0.964	0.938	0.971
Conditional	0.984	0.989	0.982

Note: statistics are computed over the pooled cross-section time series of 280 SBICs, 1986-1991; number of observations = 1197. Conditional means are computed over only those SBICs reporting positive amounts of SBA leverage outstanding.

Table 5 Summary statistics 1986-1991

	Mean	Std	Mean	Std
Return on equity, book	-.037	1.19	-.011	.248
Return on equity, market	-.056	.852	-.028	.288
Cumulative profitability, book	.094	.706	.099	.450
Cumulative profitability, market	.318	1.08	.320	.733
SBA leverage/private capital	1.05	1.03	1.14	1.04
SBA leverage/total assets	.342	.278	.359	.267
Operating expenses/total assets	.042	.049	.038	.035
Loans/total securities	.377	.400	.372	.390
Herfindahl index, by state	.693	.231	.674	.231
Herfindahl index, by industry	.528	.252	.499	.245
Share to transactions uses	.210	.306	.210	.302
Share to relationship uses	.200	.296	.214	.302
Share to instate firms	.556	.338	.544	.330
Share-wted mean age of firms	7.70	8.83	7.68	8.63
Share to firms < 50 employees	.653	.354	.641	.355
Log (total assets of SBIC)	15.48	1.35	15.69	1.34
Age of SBIC	12.37	9.24	12.73	9.24
Share-wted mean sml bus failure rate	99.28	53.4	96.74	50.91
Owned by bank	.370	-	.379	-
Publicly held	.123	-	.117	-
Corporation	.822	-	.813	-
# of SBIC exams by SBA	308.3	-	299.6	-
Number of observations	1197		889	

Note: The sample of 1197 observations includes all 280 SBICs, 1986-1991. The smaller sample excludes records if they pertain to an SBIC that ultimately surrenders its license; if the SBIC fails in the next calendar year; if the return on equity variables fall in the 1% tails of the relevant distribution; or if any of the other variables of this table are missing.

Table 6 Book return on equity 1986-1989, survival selection model estimates

	Dependent variable = return on equity, book, time t + 2		Survival selection equation	
	Coefficient estimate	Standard error	Coefficient estimate	Standard error
Cumulative profitability, book	-.007	.030	1.87[a]	.388
SBA leverage/private capital	-.039[a]	.014	-.548[a]	.126
Operating expenses/total assets	-1.27[a]	.411	-6.25[b]	2.83
Loans/total securities	.125[a]	.041	-.055	.339
Herfindahl index, by state	-.047	.100	1.56[c]	.850
Herfindahl index, by industry	.051	.069	-1.45[b]	.586
Share to transactions uses	.036	.041	.417	.411
Share to relationship uses	.044	.043	.246	.414
Share to instate firms	.094	.062	-1.01[c]	.573
Share-wted mean age of firms	-.004[a]	.001	.028	.020
Share to firms < 50 employees	.032	.038	-.311	.353
Log (total assets of SBIC)	.040[a]	.012	-.022	.110
Age of SBIC	.002	.001	.000	.013
Share-wted mean sml bus failure rate	-.001[c]	.000	-.005	.002
Owned by bank	no		-.188	.274
Publicly held	no		-.114	.300
Corporation	no		.368	.255
# of SBIC exams by SBA	no		.001	.001
year dummies	yes		no	
regional dummies	yes		yes	
Constant	yes		yes	
Log likelihood	-112.12			
Number of observations	557			

Note: estimates are from joint maximum likelihood estimation of the profitability equation (1) and the selection (survival) equation (3). Dummy variables are included in the regressions as noted in the table, though their coefficient estimates are not reported. Sample includes SBICs that survive and those that enter liquidation; observations pertaining to the year before liquidation or to SBICs that ultimately surrender their licenses are omitted. Superscripts a, b, and c denote statistical significance levels .01, .05, and .10, respectively.

Table 7 Market return on equity 1986-1989, survival selection model estimates

	Dependent variable = return on equity, market, time t + 2		Survival selection equation	
	Coefficient estimate	Standard error	Coefficient estimate	Standard error
Cumulative profitability, market	-.020	.020	1.23[a]	.299
SBA leverage/private capital	-.031[b]	.015	-.575[a]	.121
Operating expenses/total assets	-1.20[a]	.440	-5.86[b]	2.86
Loans/total securities	.102[b]	.043	.455	.327
Herfindahl index, by state	-.094	.106	1.75[b]	.860
Herfindahl index, by industry	.056	.073	-1.33[b]	.588
Share to transactions uses	.061	.044	.555	.419
Share to relationship uses	.009	.046	.180	.406
Share to instate firms	.059	.066	-1.15[b]	.569
Share-wted mean age of firms	-.002	.001	.025	.020
Share to firms < 50 employees	-.057	.040	-.347	.344
Log (total assets of SBIC)	.023[c]	.013	-.063	.118
Age of SBIC	.004[b]	.002	.002	.013
Share-wted mean sml bus failure rate	-.000	.000	-.006[a]	.002
Owned by bank	no		.191	.264
Publicly held	no		-.227	.291
Corporation	no		.376	.251
# of SBIC exams by SBA	no		.001	.001
year dummies	yes		no	
regional dummies	yes		yes	
Constant	yes		yes	
Log likelihood	-149.30			
Number of observations	557			

Note: estimates are from joint maximum likelihood estimation of the profitability equation (1) and the selection (survival) equation (3). Dummy variables are included in the regressions as noted in the table, though their coefficient estimates are not reported. Sample includes SBICs that survive and those that enter liquidation; observations pertaining to the year before liquidation or to SBICs that ultimately surrender their licenses are omitted. Superscripts a, b, and c denote statistical significance levels .01, .05, and .10, respectively.

Table 8 Determinants of SBA leverage use 1986-1991

	Coefficient estimate	Standard error	Coefficient estimate	Standard error
Cumulative profitability, book	-.778[a]	.158	no	
Cumulative profitability, market	no		-.193[b]	.098
Operating expenses/total assets	-.997	1.77	-.635	1.78
Loans/total securities	.930[a]	.233	.710[a]	.224
Herfindahl index, by state	.300	.573	.548	.556
Herfindahl index, by industry	-1.90[a]	.381	-2.09[a]	.373
Share to transactions uses	.304	.248	.160	.241
Share to relationship uses	.179	.223	.119	.217
Share to instate firms	-.769[b]	.350	-.864[b]	.345
Share-wted mean age of firms	-.005	.007	-.002	.007
Share to firms < 50 employees	.034	.200	.044	.196
Log (total assets of SBIC)	.290[a]	.069	.241[a]	.070
Age of SBIC	-.014[c]	.008	-.019[b]	.008
Share-wted mean sml bus failure rate	-.001	.002	-.001	.002
Owned by bank	-1.86[a]	.167	-1.96[a]	.166
Publicly held	-.014	.197	.003	.194
Corporation	-.058	.199	-.094	.196
year dummies	yes		yes	
regional dummies	yes		yes	
Constant	yes		yes	
Log likelihood	-281.88		-293.04	
Pseudo R squared	.45		.43	
Number of observations	889		889	

Note: Estimates are from probit estimation of the leverage use equation (5). Dummy variables are included in the regressions as noted in the table, though their coefficient estimates are not reported. Sample includes SBICs that survive and those that enter liquidation; observations pertaining to the year before liquidation or to SBICs that ultimately surrender their licenses are omitted. Superscripts a, b, and c denote statistical significance levels .01, .05, and .10, respectively.

Table 9 Book return on equity 1986-1991, leverage use selection model

	Dependent variable = return on equity, book, time t			
	Coefficient estimate	Standard error	Coefficient estimate	Standard error
Cumulative profitability, book	.207[a]	.019	.218[a]	.021
SBA leverage/private capital	-.010	.009	-.014	.009
Operating expenses/total assets	-1.15[a]	.221	-1.14[a]	.221
Loans/total securities	.050[c]	.026	.033	.029
Herfindahl index, by state	.049	.062	.046	.062
Herfindahl index, by industry	-.004	.044	.015	.047
Share to transactions uses	.034	.027	.033	.027
Share to relationship uses	.048[c]	.027	.049[c]	.027
Share to instate firms	.012	.040	.024	.041
Share-wted mean age of firms	-.001	.001	-.001	.001
Share to firms < 50 employees	-.034	.025	-.031	.025
Log (total assets of SBIC)	.019[b]	.008	.019[b]	.008
Age of SBIC	-.001	.001	-.001	.001
Share-wted mean sml bus failure rate	-.001[a]	.000	-.001[a]	.000
year dummies	yes		yes	
regional dummies	yes		yes	
Constant	yes		yes	
Inverse Mills ratio	no		-.026	.020
Adjusted R squared	.28		.28	
Number of observations	889		889	

Note: Inverse Mill ratio is constructed from estimates of Table 8, columns 1 and 2. Dummy variables are included in the regressions as noted in the table, though their coefficient estimates are not reported. Estimates are from least squares estimation of the profitability equation (1)'. Sample includes SBICs that survive and those that enter liquidation; observations pertaining to the year before liquidation or to SBICs that ultimately surrender their licenses are omitted. Superscripts a, b, and c denote statistical significance levels .01, .05, and .10, respectively.

Table10 Market return on equity 1986-1991, leverage use selection model

	Dependent variable = return on equity, market, time t			
	Coefficient estimate	Standard error	Coefficient estimate	Standard error
Cumulative profitability, market	.123[a]	.015	.124[a]	.015
SBA leverage/private capital	-.020[b]	.010	-.018	.011
Operating expenses/total assets	-1.33[a]	.269	-1.33[a]	.269
Loans/total securities	.138[a]	.032	.147[a]	.034
Herfindahl index, by state	-.009	.076	-.007	.076
Herfindahl index, by industry	.031	.054	.018	.057
Share to transactions uses	.052	.033	.051	.033
Share to relationship uses	.042	.033	.041	.033
Share to instate firms	.025	.048	.016	.050
Share-wted mean age of firms	-.000	.001	-.000	.001
Share to firms < 50 employees	-.051[c]	.030	-.053[c]	.030
Log (total assets of SBIC)	.012	.009	.011	.009
Age of SBIC	-.001	.001	-.002	.001
Share-wted mean sml bus failure rate	-.000	.000	-.000	.000
year dummies	yes		yes	
regional dummies	yes		yes	
Constant	yes		yes	
Inverse Mills ratio	no		.016	.024
Adjusted R squared	.21		.21	
Number of observations	889		889	

Note: Inverse Mill ratio is constructed from estimates of Table 8, columns 3 and 4. Dummy variables are included in the regressions as noted in the table, though their coefficient estimates are not reported. Estimates are from least squares estimation of the profitability equation (1)'. Sample includes SBICs that survive and those that enter liquidation; observations pertaining to the year before liquidation or to SBICs that ultimately surrender their licenses are omitted. Superscripts a, b, and c denote statistical significance levels .01, .05, and .10, respectively.