

GAO

Report to the Chairman, Committee on  
Small Business, U. S. Senate

May 1993

SMALL BUSINESS

Financial Health of  
Small Business  
Investment Companies



148898



**Resources, Community, and  
Economic Development Division**

B-250762

May 5, 1993

**The Honorable Dale L. Bumpers  
Chairman, Committee on Small Business  
United States Senate**

Dear Mr. Chairman:

The Small Business Investment Act of 1958 created a program to help small businesses obtain financing for starting, maintaining, and expanding operations. Under the program, small business investment companies (SBIC) provide such financing to small businesses through equity investments (stock) and debt (loans). SBICs obtain their resources primarily from two sources—privately invested capital and long-term debentures (also called leverage) guaranteed by the Small Business Administration (SBA).

When an SBIC has losses exceeding half of its private capital or is unable to repay SBA for leverage, the agency may liquidate the SBIC. When this occurs, small businesses lose an important source of financing, and the private investors and the federal government can lose all or part of their investments. Between October 1, 1986, and September 30, 1991, SBA incurred losses of over \$90 million from SBICs' liquidations, more than 3-1/2 times the amount it had lost since the beginning of the program.

Concerned about this trend, you asked that we examine factors associated with SBICs' liquidations. As agreed with your office, this report provides information on (1) reasons for SBICs' liquidations between January 1986 and March 1991, (2) a comparison of the financial performance of active and liquidating SBICs, and (3) the statistical correlation of several key characteristics of SBICs and their investments with their liquidations and financial performance.

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**Results in Brief**

Most SBICs that entered liquidation between January 1986 and March 1991 had violated SBA's regulations involving the investment companies' overall financial performance. Specifically, of the 126 SBICs that entered liquidation during this period, 81, or nearly two-thirds, did so because (1) their losses, in comparison to their private capital, exceeded an acceptable level; (2) they defaulted on their agreement for repaying leverage owed to SBA; or (3) they were bankrupt. In other instances, liquidations occurred because SBICs committed regulatory violations such

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as making ineligible investments or voluntarily surrendered their license to withdraw from the program.

Our analysis of financial performance showed that in recent years, liquidating SBICS had a lower net realized return on investment than active SBICS, mostly because of high expenses—particularly interest expenses. The median gross yield on investments was similar for active SBICS and liquidating SBICS—9 percent and 7 percent, respectively. But with interest expenses deducted, this yield was 7 percent for active SBICS and -2 percent for liquidating SBICS. The effect of interest expenses was particularly pronounced for liquidating SBICS that had primarily made equity investments. Although such investments often take years to produce revenues, SBICS had to make semiannual interest payments on their SBA-guaranteed debt. One would expect that without adequate capitalization, these SBICS would have poor liquidity and, in some cases, would be liquidated. Our analysis of recent liquidations of SBICS is consistent with this expectation. In September 1992, the Congress enacted the Small Business Equity Enhancement Act of 1992, creating a new method for funding SBICS, which addresses these concerns by allowing equity-oriented SBICS to, in effect, pay interest only when they make profits.

Our statistical analysis of SBICS' characteristics showed that the greater the leverage an SBIC had (in this instance, the ratio of its debt owed to SBA and its private capital), the greater the likelihood that it would be liquidated. Our analysis also indicated that the greater the extent to which an SBIC made equity investments rather than debt investments, the greater the likelihood of liquidation. Additionally, we found that larger SBICS and those that had been in the program for a longer time tended to be financially stronger.<sup>1</sup>

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## Background

In a 1958 study, the Federal Reserve Board found that there was limited financing available to small businesses, particularly those just beginning operation. As a result, the Congress enacted the Small Business Investment Act of 1958, which created the SBIC program to help small businesses obtain equity capital and long-term financing for starting up, maintaining operations, and expanding. The act was amended in 1972 to establish the specialized SBIC (SSBIC) program, which targets assistance to

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<sup>1</sup>It should be noted that the data upon which our analyses were based were for, at most, the last 4 years of an SBIC's operations and may not reflect the SBIC's performance over time.

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small businesses owned by socially or economically disadvantaged persons.<sup>2</sup>

Financing small businesses and new businesses is risky. For example, according to a recent study, manufacturing firms in general go out of business at a rate approximately 32 percent higher than the rate for larger manufacturing firms. The study also found that, on average across manufacturing industries, about 62 percent of the firms starting up go out of business within 5 years and about 80 percent, within 10 years.<sup>3</sup>

In return for pledging to finance only small businesses, SBICs and SSBICs qualify for long-term (up to 15 years) government-guaranteed funds to augment their own privately invested financial resources. Specifically, SBA provides leverage to SBICs and SSBICs through the public sale of certificates of participation in a pool of SBA-guaranteed debentures. Under the terms and conditions prevailing at the time of our review, the interest rate charged SBICs for leverage was based on the U.S. Treasury rate, with payments due semiannually. In addition, most leverage had a fixed 10-year term, and up until June 1992, SBICs could not prepay leverage during the first 5 years. In June 1992, however, SBA changed its rules to allow SBICs to prepay leverage during the first 5 years of their loans from the agency.

The 1958 act initially allowed SBICs to receive up to a dollar of long-term government-guaranteed debt for every dollar of private capital they maintained. Subsequent amendments allowed debt-oriented and balanced SBICs to receive up to \$3 for every dollar of private capital and equity-oriented SBICs to receive up to \$4 for every dollar of private capital.<sup>4</sup>

From investing in small businesses, SBICs generally receive revenue through interest on loans, through dividends, and from the sale of equity investments. Debt-oriented SBICs may generate revenue on a more regular basis—from interest on loans—than equity-oriented SBICs, which generally generate most of their income only when their investments mature and are sold or when their investments are repurchased by the small businesses. The primary expenses of SBICs are (1) the interest on SBA-guaranteed

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<sup>2</sup>Except where we make a distinction, we use "SBIC" to represent both SBICs and SSBICs.

<sup>3</sup>T. Dunne, M.J. Roberts, and L. Samuelson, "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries," *RAND Journal of Economics*, Vol. 19, No. 4 (Winter 1988).

<sup>4</sup>SBA has defined three types of SBICs: equity-oriented, debt-oriented, and balanced. Equity-oriented SBICs are those for which more than 70 percent of the amount of their investments in small businesses is in the form of equity (e.g., stock in small businesses). Conversely, debt-oriented SBICs have more than 70 percent of the amount of their investments in the form of debt (e.g., loans to small businesses). All other SBICs are considered balanced.

debentures; (2) payments for services provided by others, including advice about investments and the management of them; and (3) salaries and benefits.

A total of 1,622 SBICs were licensed by SBA from January 1959 through December 1992. The number of SBICs entering liquidation<sup>5</sup> has been increasing. Between fiscal years 1967 and 1992, according to the data available, 543 SBICs entered liquidation. Of these SBICs, about 33 percent (181), entered liquidation between October 1985 and September 1992. Furthermore, while SBA incurred cumulative losses of about \$36 million from SBICs' liquidations through fiscal year 1985, 7 years later cumulative losses had risen to \$169 million. SBA has estimated that it will eventually lose another \$114.3 million from liquidations among those SBICs that are currently active. As of September 1992, there were 322 active SBICs, with outstanding SBA-guaranteed debt of nearly \$1 billion.

In December 1991, we briefed your staff on the markets served by SBICs and the factors associated with liquidations. In July 1992, we briefed your staff on the extent to which proposals to change the SBIC program's financial structure would address the factors we had identified as associated with liquidations.

The Small Business Equity Enhancement Act of 1992, enacted in September 1992, in addition to creating a new method of funding that allows an equity-oriented SBIC to postpone some interest payments, reduced the maximum amount of leverage from SBA to 3 times a SBIC's private capital. The act also increased the statutory minimum of private capital required of a SBIC.

## Most SBICs Entered Liquidation for Financial Reasons

Of the 126 SBICs that entered liquidation between January 1986 and March 1991, 81, or 64 percent, were placed in liquidation in whole or in part because of poor financial performance—specifically, because of capital impairment, default, and bankruptcy.<sup>6</sup> These SBICs had outstanding leverage of \$338 million, or 78 percent of the total outstanding leverage for

<sup>5</sup>Liquidation is a process by which SBA may remove an SBIC from the program. SBA may place an SBIC in liquidation for willfully or repeatedly violating or failing to observe any rule or regulation of the agency's—having losses, in comparison to private capital, that exceed an acceptable level, for example. In addition, some SBICs that desire to surrender their license but are unable to repay outstanding leverage can also be placed in liquidation.

<sup>6</sup>An SBIC is considered to be capitally impaired if its cumulative losses exceed one-half of its private capital (three-quarters for an SSBIC). An SBIC has defaulted if it has not met the terms of its leverage agreement (e.g., by not making payments).

all SBICs that were placed in liquidation during that period. Of the remaining SBICs, 16 were placed in liquidation for other regulatory reasons, such as making ineligible investments, maintaining more than 25 percent of their capital in the form of idle funds, and paying dividends while incurring losses. Seven SBICs entered liquidation because they wished to voluntarily surrender their license. With one possible exception, these SBICs chose liquidation because they wanted to pay off their outstanding debt to SBA and avoid incurring a penalty for prepaying outstanding leverage. Finally, for the remaining 22 SBICs, we were unable to definitively identify SBA's reasons for initiating liquidation. (See app. I for more details on SBA's reasons for liquidating SBICs.)

## Interest Costs and Problems With Liquidity Significantly Contributed to SBICs' Liquidations

For SBICs in liquidation, interest expenses had a more significant influence on their realized return on investment, and thus on financial viability, than was the case for active SBICs. In comparison with active SBICs, the SBICs we reviewed that were in liquidation for financial reasons had a lower median net realized return on invested capital: -8 percent versus 2 percent. For the liquidating SBICs, interest expenses had more of an impact on their net realized return than did the yield on their investments.<sup>7</sup> That is, while the median yields on investment were similar for active SBICs and liquidating SBICs—9 percent and 7 percent, respectively—if interest expenses are included, active SBICs' return is reduced to 7 percent, but liquidating SBICs' return is reduced to -2 percent. For equity-oriented SBICs, the effect of their interest expenses on their return on investment was even more pronounced. Because the data used in our analyses generally covered, at most, 4 years of operation, we cannot know the extent to which the differences between active and liquidating SBICs were due to differences in business strategies adopted over the SBICs' lifetimes or were due to impending liquidations. For example, a liquidating SBIC might have had high interest expenses in general or, nearing liquidation, it might have written off some investments, which increased the influence of interest expenses on its realized yield on investment.

SBICs that were in liquidation because of poor financial performance had poor liquidity. That is, with few exceptions, they could not pay their interest expenses with cash income generated from investments, and as they increased their leverage, their ability to pay interest with cash income generally further declined. For SBICs in liquidation, the level of interest expenses as a percentage of cash income was almost 6 times that for active SBICs. At three of the five liquidating SBICs we visited, new leverage

<sup>7</sup>Our measures of return on investment did not include any unrealized gain on securities.

was used to pay off the principal of and interest on previous leverage. SBA officials noted that this practice would be expected because SBICS normally “roll over” leverage—exchange new leverage for old. Other measures of liquidity, including the median cash flow and median total expenses to cash income, were also worse for liquidating SBICS than for active SBICS. Again, because of the limitations of the data we used, we cannot know the extent to which these differences regarding liquidity were due to differences in general business strategies or impending liquidation.

Interest expenses have affected the performance of both equity- and debt-oriented SBICS. For equity-oriented SBICS, their investments take time to mature and produce income, but the SBICS still had to pay the semiannual interest on SBA-guaranteed debentures. According to one official from an equity-oriented SBIC, the SBIC had to rely on funds from its parent company and income generated from prematurely selling investments in order to pay its debt owed to SBA.

For debt-oriented SBICS, financial performance depends on the spread between the interest they pay SBA on leverage and the interest they receive on loans they make to small businesses. However, because the interest due on leverage from SBA is fixed and because this leverage could not be prepaid until after the first 5 years, these SBICS have had little flexibility to adjust to changes in market rates for loans to small businesses.<sup>8</sup> In fact, in comparison with active SBICS, debt-oriented SBICS that were in liquidation because of poor financial performance had a narrower median spread between the interest they were charging small businesses and the interest rate they were paying on leverage from SBA. Finally, officials at four of the five SBICS we visited attributed their investment companies’ poor financial performance primarily to the semiannual interest expenses they paid on leverage from SBA. (See app. II for a more detailed comparison of the financial performance of active SBICS and SBICS that were in liquidation for financial reasons.)

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<sup>8</sup>As mentioned earlier, since June 1992, SBA has allowed SBICS to prepay new debentures during the first 5 years. Debt-oriented SBICS can now pay off high-cost debt and, therefore, better manage the spread between the interest they pay SBA and the interest they charge small businesses.



## SBICs' Leverage and Types of Investments Were Associated With Liquidations

To analyze the relationship between various characteristics of SBICs and the likelihood of liquidation, we developed two types of regression models.<sup>9</sup> The first tested whether several factors that described characteristics of SBICs and their investments correlated with liquidations. These factors included an SBIC's leverage, investment orientation (whether the SBIC was debt- or equity-oriented or balanced), and size, among other things. The second model examined whether these same factors were related to the general financial performance of SBICs. The models examined SBICs that were active or liquidated from 1988 through 1990.

From our first model, we found that two factors—the leverage an SBIC had (more specifically, the ratio of its debt owed SBA to its private capital) and its investment orientation—consistently correlated with the likelihood of liquidation. In particular, we found that the greater the leverage of an SBIC, the greater the likelihood of its liquidation. Also, the greater the extent to which an SBIC was equity-oriented, the greater the likelihood of liquidation.<sup>10</sup>

The first model's results can be used to estimate the change in the likelihood of liquidation as the value of a factor changes. For example, we found that, overall, the "typical" SBIC had a 5.4-percent chance of liquidating in a given year across the 3 years of our analysis.<sup>11</sup> However, if the value for leverage was 20 percent above the mean level, the probability that the SBIC would liquidate in a given year rose to 8.5 percent. Similarly, if the value of equity orientation alone was 20 percent above the mean for that variable, the probability that the SBIC would liquidate in a given year rose to 8.1 percent. Conversely, when the levels of leverage and equity orientation were 20 percent below the mean levels, the risk of liquidation in a given year fell to 3.3 percent and 3.5 percent, respectively.

The second model, which examined SBICs' financial performance, found that in addition to leverage and investment orientation, the size of an SBIC and the length of time it had been in the program were also consistently associated with financial performance. Specifically, larger SBICs and those that had been in the program for a longer time appeared to perform better

<sup>9</sup>A regression model is a type of statistical model that investigates relationships among variables. For this study, we used regression analysis to explore which factors are associated, or correlated, with SBICs' liquidations and financial success. However, the models do not indicate the causes of SBICs' liquidations and financial condition.

<sup>10</sup>For our models, we also created a variable that simultaneously accounted for the leverage and investment orientation of an SBIC. We found that while each of these factors independently correlated with liquidations, the interaction between these factors helped explain liquidations.

<sup>11</sup>We defined a "typical" SBIC as having the mean value for each of the factors measured.

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financially. In some versions of the model, bank-dominated SBICS (those owned primarily by banks) and those that had invested in a more diverse portfolio of industries also appeared to be healthier financially. (See app. III for a more detailed technical discussion of the models and their results.)

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## Conclusions

The intent of the SBIC program is to make long-term investments—in the form of equity and debt—in small businesses, particularly those starting up. However, SBICS without adequate capital, can encounter cash flow problems in reconciling the objective of making long-term investments with the requirement of making short-term semiannual interest payments.

SBICS that made equity investments in small businesses while at the same time paying SBA fixed semiannual interest payments on their leverage were more likely to perform poorly financially and ultimately to be liquidated. In addition, up until June 1992, during periods of declining interest rates, highly leveraged SBICS that made debt investments could not prepay their loans from SBA during their initial 5 years. The combination of these factors constrained SBICS' ability to match (1) the income received on the loans they made to small businesses with (2) the fixed semiannual interest payments made to SBA.

Recognizing the difficulty that SBICS were having in financing long-term equity investments in small business by using currently payable debt, the Congress enacted the Small Business Equity Enhancement Act of 1992. This act allows equity-oriented SBICS to obtain leverage in the form of a participating preferred security that, in effect, requires interest payments only when the SBICS make profits. The act also reduces the maximum allowable leverage ratio and increases the statutory minimum amount of private capital required of SBICS. In addition, SBA now allows SBICS to prepay on debentures the first 5 years. Together, these changes respond to the financial problems we have identified in this report.

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## Agency Comments

We discussed the contents of this report with responsible officials in SBA's Investment Division. The officials concurred with our findings and conclusions, and we have incorporated their comments where appropriate. As agreed with your office, we did not obtain written agency comments on this report.

Our work was conducted between November 1990 and September 1992 in accordance with generally accepted government auditing standards. To identify the factors associated with SBICs' liquidations, we performed several analyses. First, to determine the agency's rationale for liquidating SBICs, we reviewed the agency's files for each SBIC whose liquidation began between January 1986 and March 1991. Second, for each of the SBICs that were being liquidated because of poor financial performance, we used the agency's data to analyze selected characteristics of financial performance. Third, we performed a regression analysis of key measures of the financial performance and characteristics of SBICs that were liquidated from 1988 through 1990 and of SBICs that were active during those years. Fourth, we visited five judgmentally selected SBICs that entered liquidation during the same period. We interviewed venture capital experts from the National Association of SBICs; Venture Economics, Inc.; and private venture capital companies and current and former SBA officials responsible for the SBIC program. Our methodology was reviewed by SBA officials, as well as by other venture capital experts. (See app. IV for a more detailed description of our work.)

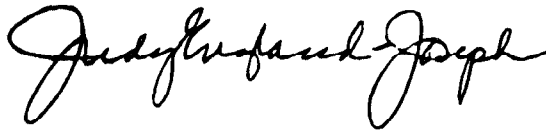
Because our analysis relied heavily on SBA's automated data, we discussed, with representatives of SBA's Investment Division, the policies and procedures the agency employs for maintaining its data bases, and we assessed the data's accuracy and completeness. We found the data to be reliable for our purposes. (See app. V for our assessment of the reliability of SBA's data.)

We are providing copies of this report to the House Committee on Small Business, the Administrator of SBA, the Director of the Office of Management and Budget, and other interested parties. Copies are available to others upon request.

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Please contact me on (202) 512-7631 if you or your staff have any questions about this report. Major contributors to this report are listed in appendix VI.

Sincerely yours,



Judy A. England-Joseph  
Director, Housing and Community  
Development Issues

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**Abbreviations**

GAO	General Accounting Office
SBA	Small Business Administration
SBIC	Small Business Investment Company
SSBIC	Specialized Small Business Investment Company

# Small Business Administration's Reasons for Liquidating Small Business Investment Companies

As shown in table I.1, 126 small business investment companies (SBICs) entered liquidation between January 1986 and March 1991. For 81, or 64 percent, of these, liquidation was initiated because of poor financial performance. That is, the Small Business Administration (SBA) initiated the SBICs' liquidation in whole or in part for regulatory violations that involved their overall financial performance. Another 16 entered liquidation for other regulatory violations, such as making ineligible investments and being inactive. Seven SBICs surrendered their license voluntarily. Because files were unavailable, we were unable to determine why the remaining 22 SBICs entered liquidation.

SBICs that entered liquidation because of poor financial performance posed the greatest risk of financial loss to SBA. Generally, the SBICs had a greater amount of outstanding debt owed to SBA when they entered liquidation and did not appear to be paying back their debt as quickly as other SBICs being liquidated. These SBICs also financed more small businesses than did other SBICs in liquidation. For those reasons, our analysis focused on SBICs that entered liquidation because of poor financial performance.

**Table I.1: SBICs' Liquidations** (Initiated Jan. 1986 Through Mar. 1991)

Reason for liquidation <sup>b</sup>	Number of SBICs	Leverage			Financings made by SBICs <sup>a</sup>	
		Amount due SBA when liquidation began		Amount repaid	Number	Amount
		Total	Median			
Poor financial performance <sup>c</sup>	81	\$337.9	\$1.9	\$61.6	4,329	\$555.6
Other regulatory violations	16	25.5	1.0	9.6	408	55.2
Surrender of the license	7	12.9	1.5	7.9	81	12.1
Unknown <sup>d</sup>	22	59.6	1.8	13.8	76	7.9
<b>Total</b>	<b>126</b>	<b>\$435.9</b>		<b>\$92.9</b>	<b>4,894</b>	<b>\$630.8</b>

<sup>a</sup>The figures include only those financings, or investments, made between 1983 and 1989 for SBICs that entered liquidation from January 1987 through March 1991.

<sup>b</sup>Reasons cited by SBA for initiating liquidation come from SBA's case files and/or SBA officials responsible for liquidating SBICs.

<sup>c</sup>Financial performance category includes regulatory violations that involve overall financial performance—capital impairment, default, and bankruptcy.

<sup>d</sup>Because files were unavailable, we could not identify the reasons why SBA liquidated these SBICs.



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**Appendix I  
Small Business Administration's Reasons for  
Liquidating Small Business Investment  
Companies**

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SBICS liquidating for financial reasons, with few exceptions, were "capitally impaired" and/or had defaulted. According to SBA's policy, an SBIC is "capitally impaired" if its cumulative losses are greater than one-half of its private capital (three-quarters for specialized SBICS). An SBIC has defaulted if it has not met the terms of its leverage agreement (e.g., by not making required payments on leverage). For SBICS liquidating for other regulatory violations, SBA cited many types of violations, including making ineligible investments, maintaining more than 25 percent of their capital in the form of idle funds (inactivity), and paying dividends while losing money. With one possible exception, SBICS that sought liquidation in order to voluntarily surrender their license did so to avoid making interest payments to SBA and incurring the penalty for prepaying outstanding debt owed the agency. According to SBA's procedures, an SBIC cannot voluntarily surrender its license unless it can repay its debt to SBA in full immediately or otherwise provide an acceptable plan for paying off its debt. If these requirements cannot be met, the SBIC must work out a plan with SBA for liquidating its assets to pay off the debt owed the agency. Table I.2 presents more details on why SBICS entered liquidation.

**Appendix I  
Small Business Administration's Reasons for  
Liquidating Small Business Investment  
Companies**

**Table I.2: Reasons Cited by SBA for  
Initiating SBICs' Liquidation (Jan. 1986  
Through Mar. 1991)**

<b>Reason</b>	<b>Number of SBICs</b>
<b>Poor financial performance<sup>a</sup></b>	
Capital impairment	51
Default	27
Bankruptcy	3
<b>Total</b>	<b>81</b>
<b>Other regulatory violations</b>	
Ineligible investments	4
Inactivity	4
Payment of dividends while losing money	3
Failure to submit form 468 (financial statement)	2
Conflict of interest	3
Prohibited use of funds	2
Diversion of funds	1
Reduced amount of private capital	1
Maintaining a controlling interest in a small business	2
Noncompliance with SBA's requirements concerning debentures	1
Investing more than 20 percent of private capital in one small business	2
No full-time managers	1
Change in ownership	1
Other	5
<b>Total<sup>b</sup></b>	<b>32</b>
<b>Surrender of the license</b>	
To avoid interest payments and penalty for prepaying debt	6
Unknown reason	1
<b>Total</b>	<b>7</b>

<sup>a</sup>Category includes regulatory violations involving overall financial performance.

<sup>b</sup>The number of violations (32) exceeds the number of SBICs that we identified as being in liquidation for "other regulatory violations" (16) because some SBICs had more than one violation.

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# Financial Performance of SBICs

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In comparison with active SBICs, SBICs that entered liquidation for financial reasons in recent years had a lower median net realized return on their invested capital, mostly because of their high expenses. Interest expenses were a particularly important influence on SBICs' net realized return, especially for equity-oriented SBICs. SBICs liquidating for financial reasons—particularly equity-oriented SBICs—had poor liquidity. Officials of two liquidating equity-oriented SBICs that we visited explained that their equity investments could not produce the short-term revenue necessary to meet interest expenses.<sup>1</sup>

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## Effect of Interest Expenses on Net Return

A SBIC's net realized return on investment is the gross realized return on investment less the expenses incurred. Interest expenses account for a significant portion of these. Table II.1 compares the median returns on invested capital for active SBICs and those in liquidation because of poor financial performance. Active SBICs and SBICs in liquidation had a similar gross realized return on investment—9 percent and 7 percent, respectively. Once interest expenses are subtracted, the difference between active and liquidating SBICs becomes dramatic: Active SBICs' median gross realized return declines to 7 percent, but liquidating SBICs' median gross realized return drops to -2 percent. For equity-oriented SBICs, the effect of interest expenses was even more dramatic, reducing median gross realized return from 3 percent to -5 percent. The net realized return on invested capital reflects the effect of all expenses. Active SBICs had a median net realized return of 2 percent, while liquidating SBICs had a median net realized return of -8 percent. Fifty-six of the 60 SBICs in liquidation had a net realized return on invested capital that was lower than the median for active SBICs.

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<sup>1</sup>We should note that the data available for our analyses generally covered, at most, the last 4 years of operation for liquidated SBICs and the 4 most current years for active SBICs. Consequently, the performance we observed may not be representative of the performance of SBICs over their entire lifetime.

**Table II.1: Median Realized Return on Invested Capital of Active SBICs and of SBICs in Liquidation for Financial Reasons**

Type of return	Median returns (percent)			
	Investment orientation			All
	Debt	Equity	Balanced	
<b>Active SBICs</b>				
Gross realized return on invested capital	11	7	8	9
Gross realized return minus interest expenses	8	5	6	7
Net realized return on invested capital (Gross realized return minus total expenses)	3	1	1	2
<b>SBICs in Liquidation</b>				
Gross realized return on invested capital	7	3	7	7
Gross realized return minus interest expenses	1	-5	-1	-2
Net realized return on invested capital	-5	-7	-8	-8

Notes: A dominant objective of a business is to earn a satisfactory return on investment, which is an indication of the firm's profitability. The return, generally expressed as a percentage, is calculated by dividing income (revenue minus costs) by investment. For SBICs, we have defined net realized return on investment as net investment income plus the realized gain (loss) on securities sold, divided by the invested capital. Invested capital is the sum of long-term debt plus current maturities on long-term debt, plus total capital, less the unrealized gain on securities held, if positive. We have defined gross realized return on investment as gross investment income plus the realized gain (loss) on securities sold, divided by the invested capital. Gross realized investment income is derived by adding total expenses back into net realized investment income.

In analyzing the returns of SBICs in liquidation for financial performance reasons, we included only those liquidating SBICs for which the financial statement data base included at least 1 year's data. Consequently, we examined the returns of 60 SBICs in liquidation for financial performance reasons. For these 60 SBICs, which were placed in liquidation between January 1987 and March 1991, at least 1 year's data were available.

Our analysis was based on SBICs' financial statements for fiscal years 1986 through 1990.

### Effect of Interest Expenses on the Performance of Equity-Oriented SBICs

The interest expenses arising from SBA's debentures concerned the managers of the liquidating SBICs we visited. Specifically, officials of four of the five SBICs attributed their SBIC's poor financial performance primarily to these expenses. However, the effect of the interest expenses on the SBIC's performance varied depending on the form of the SBIC's investments.

An equity-oriented SBIC receives income from small businesses through dividends and the sale of equity investments. However, equity investments take time to mature and, therefore, generally do not immediately produce income. Nevertheless, until late in our review, the SBIC still had to pay the semiannual interest on SBA's debentures. According to officials of two equity-oriented SBICs, their form of investment (equity) did not provide the short-term revenue necessary to meet their interest expenses. According to an official of one SBIC, it relied on funds from its parent company and

prematurely sold investments at lower prices in order to pay its debt owed to SBA.

### Effect of Interest Expenses on the Performance of Debt-Oriented SBICs

A debt-oriented SBIC receives income primarily from the interest it charges on the loans it makes to small businesses. In order for the SBIC to use this income to pay interest expenses on SBA's debentures as well as other expenses, the interest rate the SBIC charges small businesses should exceed the interest rate the SBIC pays SBA. The difference between the two rates is the interest rate spread. The interest rates SBICs pay on SBA-guaranteed debentures is generally locked in for a 10-year period, reflecting the term of the debentures. In addition, until recently, an SBIC was penalized for prepaying debentures. The interest rates that SBICs may charge small businesses, however, are generally limited to 6 to 7 percentage points above the interest rate on debentures when the loan is made, and small businesses may voluntarily prepay a loan. Therefore, the SBIC has not always been able to pass on to its borrowers the interest it pays on debentures, especially during periods of declining interest rates. We found that liquidating debt-oriented SBICs had a narrower median spread between the interest they charged small businesses and the interest they paid on debt owed SBA than was the case for active debt-oriented SBICs—3.0 percentage points versus 3.4 percentage points. For one liquidated SBIC we visited that had initially mostly made loans to small businesses, the interest rate spread was -7.7 percentage points. According to an official from this SBIC, the interest rate on SBA's debentures became too high to pass on to small businesses financed with debt. Specifically, the official stated that when the interest on new leverage increased to rates that could not be paid by small businesses, the SBIC started to finance small businesses with equity. This strategy did not work, however, because many of these investments were in small companies, whose stock declined when the stock market crashed in October 1987. The SBIC's loss of potential profits from these investments coupled with the high interest rate on leveraging from SBA caused the company to become capitally impaired and then to enter liquidation.

### Liquidity of SBICs

The effect of interest expenses on financial performance is also demonstrated by the ability of SBICs to meet their financial obligations (liquidity). In addition to using the measures of return discussed above, we used three measures of liquidity—cash flow, the ratio of interest expenses to cash income, and the ratio of total expenses to cash income (called "burn ratio")—in our analysis of SBICs. Cash flow is the difference between

cash income and cash expenses.<sup>2</sup> If an SBIC does not generate a positive cash flow from operations, then there must be an outside source of funds for the SBIC to meet its expenses; otherwise, it will lose money. In comparison with active SBICs, the great majority of liquidating SBICs had poorer liquidity. Specifically, 48 of the 60 liquidating SBICs we reviewed had a negative cash flow, and 52 of the 60 had a median cash flow that was lower than the median for active SBICs.

Forty-eight of the 60 liquidating SBICs we reviewed had a ratio of interest expenses to cash income that was higher than the median for active SBICs. That is, these 48 SBICs were less able to pay interest expenses with cash income than active SBICs typically were. Finally, 42 SBICs had a ratio of total expenses to cash income that was higher than the median for active SBICs. That is, these 42 SBICs were less able to pay total expenses with cash than active SBICs typically were. (For 11 SBICs, there were insufficient data to calculate the ratio of total expenses to cash income.)

Table II.2 compares the liquidity of active SBICs and SBICs in liquidation. Liquidating SBICs had poorer liquidity than active SBICs. For example, while active SBICs had a median cash flow of about \$61,000, SBICs in liquidation had a median cash flow of about -\$143,000. For equity-oriented SBICs, the difference was even more striking: While active equity-oriented SBICs had a median cash flow of about \$18,000, liquidating equity-oriented SBICs had a cash flow of about -\$422,000. In addition, for SBICs in liquidation, the level of interest expenses as a percentage of cash income was almost 6 times that of active SBICs. Furthermore, the level of total expenses as a percentage of cash income, or the burn ratio, was about twice that of active SBICs. For all three measures of liquidity, equity-oriented SBICs that were in liquidation had the poorest liquidity.

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<sup>2</sup>Specifically, SBA defines cash flow as gross cash investment income plus realized gains from the sale of securities less total cash expenses.

Appendix II  
Financial Performance of SBICs

**Table II.2: Median Measures of Liquidity of Active SBICs and of SBICs in Liquidation for Financial Reasons**

Measure of liquidity	Median values of liquidity			
	Investment orientation			All
	Debt	Equity	Balanced	
<b>Active SBICs</b>				
Cash flow	\$87,638	\$18,160	\$40,572	\$60,531
Interest expenses to cash income (percent)	23	<sup>a</sup>	12	14
Total expenses to cash income, or burn ratio (percent)	82	137	117	96
<b>SBICs in Liquidation</b>				
Cash flow	-\$78,701	-\$421,810	-\$123,460	-\$142,652
Interest expenses to cash income (percent)	76	122	76	82
Total expenses to cash income, or burn ratio (percent)	216	427	212	228

Notes: An SBIC's liquidity improves with increases in cash flow and decreases in the other two measures.

In analyzing the liquidity of SBICs in liquidation for financial performance reasons, we examined 60 such SBICs whose liquidation began between January 1987 and March 1991 and for which at least 1 year's data were available. In analyzing active SBICs, we examined those active as of March 1991.

Our analysis was based on SBICs' financial statements for fiscal years 1986 through 1990.

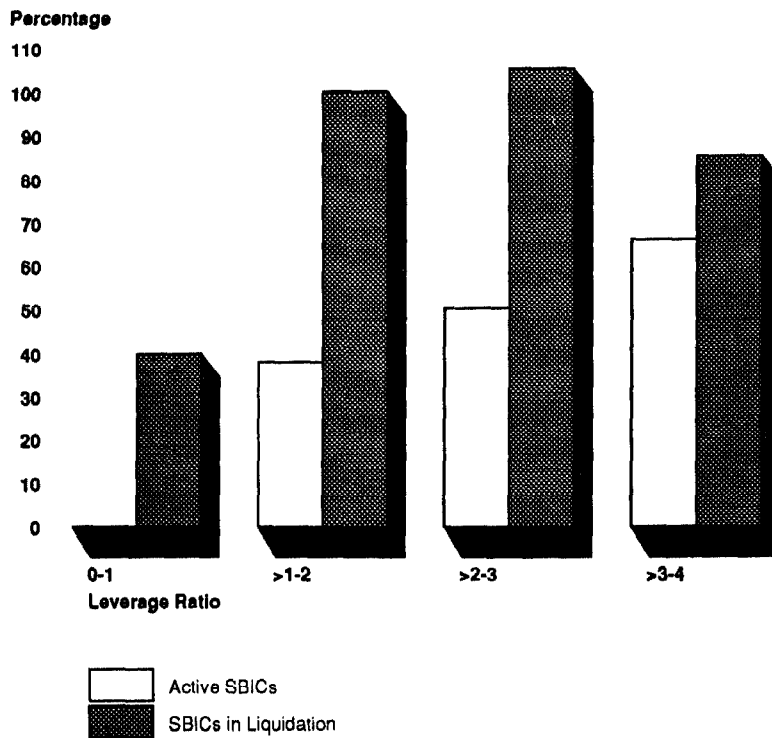
<sup>a</sup>Less than 1 percent.

As mentioned above, the interest expenses of SBICs result from the leverage they receive in the form of SBA-guaranteed debentures. With little exception, whether SBICs were active or in liquidation for financial reasons, as the investment companies took on greater leverage, the interest expenses they owed SBA constituted a greater drain on their income. For example, active SBICs with a ratio of leverage to private capital—leverage ratio—greater than 1 but less than or equal to 2 had median interest expenses that constituted about 40 percent of cash income, but active SBICs with a leverage ratio greater than 3 had interest expenses that constituted about 65 percent of cash income. (See fig. II.1.) For liquidating equity-oriented SBICs, interest expenses accounted for an even greater proportion of their income than was the case for other SBICs. At three of the SBICs we visited, new leverage was used in whole or in part to pay off the principal and interest on previous leverage. Specifically, for one of the SBICs, 100 percent of the new leverage was used to pay off the principal and/or interest owed on existing leverage. For the other two

**Appendix II  
Financial Performance of SBICs**

SBICs, about 48 percent and 36 percent of their new leverage was used to pay off the principal and/or interest owed on existing leverage.

**Figure II.1: SBICs' Median Interest Expense as a Percentage of Cash Income, by SBICs' Leverage Ratio**



**Notes:**

In analyzing the relationship between interest expenses and leverage of SBICs in liquidation for financial performance reasons, we included only those liquidating SBICs for which the financial statement data base included at least 1 year's data. Consequently, we examined the returns of 60 of the SBICs in liquidation for financial performance reasons. For these 60 SBICs, which were placed in liquidation between January 1987 and March 1991, at least 1 year's data were available. Active SBICs include SBICs that were active as of March 1991.

Our analysis was based on SBICs' financial statements for fiscal years 1986 through 1990.



# Regression Analysis

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This appendix discusses the regression models we developed to examine factors associated with SBICS' liquidations and financial performance. The first model we developed examined which of several independent factors that describe characteristics of SBICS and their investments were correlated with liquidations from 1988 through 1990. In order to broaden the analysis, we also developed a model to examine the relationship between the same set of independent factors and the general financial performance of SBICS.

We found that the investment orientation and leverage of SBICS were associated with liquidations. Specifically, the more equity-oriented an SBIC was in terms of the investments that it made, the more likely it was to liquidate. Additionally, the greater an SBIC's leverage, the greater the likelihood of liquidation. Although these were the only factors that we found to be consistently associated with SBICS' liquidations, we also found that several other factors we examined in our models were related to SBICS' general financial performance. In particular, larger SBICS and those that had been in the program for a longer time appeared more likely to perform well financially. Some evidence also indicates that SBICS primarily owned by banks and those investing in a diverse set of industries tended to be in better financial health.

This appendix (1) discusses the purpose and limitations of the regression analysis; (2) reviews the sources of data used and the processing necessary to build the data set used for the regressions; (3) outlines the structure of the models, including the factors we examined, and explains our expectations about the models' results; and (4) presents the results and our interpretations of them.

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## Purpose and Limitations of This Analysis

During the 1980s, SBICS were liquidated in increasing numbers. This trend towards more liquidations may have been influenced in part by various macroeconomic factors. However, we believe that, in part, SBICS' liquidations were associated with the policies of the SBIC program, the organizational structure of individual SBICS, and the nature of the investments that SBICS were making. The regression models explained in this appendix were designed to identify and examine such factors internal to the SBIC program that were associated with SBICS' liquidations and financial performance.

In deciding which factors to include in these models, we relied on economic reasoning about SBICS' liquidations and financial performance.

That is, we had an underlying theoretical rationale for the factors that we included in the models, and we therefore had expectations regarding the relationship of these factors with liquidations and financial performance. However, the models were not rigorously derived from a theory of SBICS' liquidations and are not, therefore, "structural" models. The models may not have included some factors that might have affected SBICS' liquidations and financial performance. Moreover, because SBICS engage in the risky undertaking of investing in small businesses, there is probably a large random component to SBICS' performance that cannot be systematically explained. Because the models were not structural, we cannot specifically draw conclusions about the causes of liquidations or about the determinants of financial performance, but we can help to identify factors correlated with liquidations and financial performance.

The following example illustrates some of the limitations of the models. We included a variable to describe the investment orientation of an SBIC and expected that an equity-oriented SBIC would be more likely to be liquidated. However, it could be that as an SBIC nears liquidation, it sells certain types of its assets, causing it to become more equity-oriented. Thus, it is impossible to know whether the equity orientation caused the liquidation or an impending liquidation caused a greater equity orientation. Despite such problems in interpreting our models' results, we believe that this analysis is useful for explaining problems that were inherent in the structure and application of the SBIC program.

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## Sources of Data and Processing

In order to build the data set necessary for our models, we obtained four data bases from SBA that contain information on SBICS—the History, Directory, Financings, and Financial Statement data bases. (See app. IV for a detailed description of each of these data bases.) From these four data bases, we developed a data set that included yearly observations for each SBIC for fiscal years 1988 through 1990. This time period was chosen largely because of the data that were available to us. In particular, since we obtained data on SBICS' investments made from 1983 on, we believed that we could not study liquidations prior to 1988 because investments made before 1983 could still have been prominent in SBICS' portfolios. And, the most recent data available to us at the time we began our study were for 1990.

Only SBICS that were either active or in liquidation from 1988 through 1990 were included in the analysis. SBICS that obtained their license during that time were excluded. Each observation included in the data set we

developed represented an SBIC's status during 1 year and included information about the SBIC's financial structure and outstanding investments at the time of the observation.<sup>1</sup> Thus, for an SBIC that was active throughout the 3-year period, there were three observations in the data set, but the information contained in those observations differed as the SBIC's investment and financial structure changed over the 3 years. If an SBIC was liquidated in 1988, there would be an observation for 1988, classifying the SBIC as active; an observation for 1989, classifying the SBIC as liquidated; but no observation at all for 1990.<sup>2</sup> In total, for the 3-year period, we had 1,022 observations in the data set we generated which included 971 active observations and 51 liquidated observations. This represented a total of 359 SBICs.

In the regressions, we weighted each observation according to the reciprocal of the number of observations there were for a particular SBIC in the data set. That is, if there were three observations for a particular SBIC in the data set (1988, 1989, and 1990), each observation was weighted one-third, but for an SBIC with only two observations in the data set, each observation was weighted one-half. Thus, in the analysis, the weight of each SBIC was exactly 1.

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## Structure of the Models and Our Expectations

To examine which of several factors are correlated with SBICs' liquidations and financial performance, we used two types of regression models. The first was a logistic regression model designed to examine the independent factors associated with SBICs' liquidations. The second was an ordinary least squares regression model that used a continuous measure of SBICs' financial performance as the dependent variable. This section describes the two dependent variables used in this analysis and each of the independent factors that we hypothesized could be correlated with SBICs' liquidations and financial performance. Throughout, we discuss our expectations about the models' results for each of the independent factors.

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## Dependent Variables

Our primary model was the logistic regression model. In it the dependent variable is a 0-1 dummy variable that takes a value of 1 if the SBIC was liquidated in the year of the observation and takes a value of 0 otherwise. The results of this model allowed us to determine which factors were

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<sup>1</sup>Investments made prior to 1983 (and therefore not included in our data base) could have been in an SBIC's portfolio.

<sup>2</sup>Using an alternative methodology, we averaged the values of the independent variables over however many years the SBIC was included in the original data set. Under this methodology if the SBIC was liquidated in any of the 3 years, it was classified as liquidated. The results of the regressions using this alternative methodology were not substantively different from results discussed later in this appendix.

associated with liquidations and to show how a change in the value of one of the statistically significant independent factors would have altered the probability of liquidation in a given year.

A liquidation is a discrete event. Thus, using a dummy variable for liquidated and active SBICs allowed us only to categorize an SBIC's performance in two ways. In reality, we know there is a wide range of performance: An SBIC could be doing very poorly for many years but may never liquidate. Therefore, developing an alternative dependent variable that describes the more general financial health of an SBIC allowed us to run an ordinary least squares regression examining factors associated with an SBIC's financial performance.

After examining several possible measures of the financial performance of an SBIC, we determined that the most useful measure for this analysis was one used by SBA to determine when an SBIC may be in financial distress. The measure, used at SBA to determine "capital impairment," is the cumulative retained net investment income and capital gains or losses of an SBIC, divided by the privately invested capital.<sup>3</sup> When SBA uses this ratio, the agency is concerned about the degree to which an SBIC may have lost money, and therefore the agency calculates the ratio for the purpose of flagging SBICs with a negative value. We, on the other hand, were interested in the full range of values that the variable could have taken—both positive and negative. Given our use of the variable, the phrase "capital impairment" is somewhat of a misnomer because SBICs with positive values were not "impaired" at all, but rather were successful to some degree. Nevertheless, for simplicity, we maintained SBA's name for the variable.

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## Independent Variables

### Investment Orientation

Investment orientation is the degree to which an SBIC has made debt versus equity investments. We used information from the 468 financial form, which has data on aggregate investments of the SBIC at a given time, to derive a variable for the percentage of the SBIC's portfolio that was interest-bearing investments. In its data base, SBA classified investments as either loans (likely to be the least risky type of investment), debt security, or equity interest. Using the data on these investments, we defined

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<sup>3</sup>Net unrealized losses are included in the numerator, but because valuations of currently held assets are not considered reliable, SBA takes a conservative approach and does not include unrealized gains in calculating capital impairment.

investment orientation to be the ratio of the total dollars that the SBIC has invested in loans divided by all of the dollars it has invested.<sup>4</sup> We used the dollar values of investments at cost. That is, we did not take into account any stated unrealized gains or losses in the portfolio.

### Leverage

Leverage is measured by dividing the dollar value of the debt that an SBIC owes to SBA by the sum of the private paid-in capital and paid-in surplus of the SBIC.<sup>5</sup> We expected that the higher the leverage, the more likely the SBIC would have trouble repaying its obligations. Therefore, we expected higher values of leverage to be associated with a greater likelihood of liquidation. Because greater leverage may enable some SBICs to earn higher returns, it was less clear what the relationship between leverage and the financial performance of an SBIC would be.

### Portfolio Balance

Because we believed that the relationship between an SBIC's leverage ratio and its investment orientation may be important, we developed a variable that simultaneously takes both of these factors into account. In other words, we developed a variable that measures the degree of correspondence between the sources and uses of funds. The numerator of this variable equals the value of the outstanding debt investments (at cost) that the SBIC had made minus the value of the debt that the SBIC owed to SBA. The value of the numerator is then divided by the size of the SBIC, as measured by its total assets at cost. Our expectation was that a higher value for portfolio balance would mean that the SBIC organized its financial structure to have income-generating investments (loans to small businesses) outweigh fixed obligations (leverage owed to SBA) more so than was true of other SBICs. Therefore, we expected that an SBIC with a high value for portfolio balance would be less likely to fail or to do poorly financially.

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<sup>4</sup>As an alternative measure of investment orientation, we used information on individual investments from the financings data base. The information on individual investments included in that data base disclosed whether each financing was pure debt, debt with equity features, or pure equity. Our alternative variable was the dollar value of pure debt investments divided by the dollar value of all investments made by the SBIC. Results were not sensitive to this change in the construction of the variable.

<sup>5</sup>As an alternative measure of leverage, we used the value of all of an SBIC's debt (both debt owed to SBA and other sources) in the numerator. In the logistic regressions, this change did not alter any of the results. However, in some of the ordinary least squares regressions, the alternative variable for leverage was not statistically significant.

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SBIC's Size	We measured the total size of an SBIC as its current total assets at cost (not accounting for unrealized appreciation or depreciation). <sup>6</sup> We believed that larger SBICS would be more likely to have professional managers with considerable expertise. Thus, we expected better performance by larger SBICS.
Bank Domination	We included a dummy variable that takes a value of 1 if the firm was primarily owned by a bank and takes a value of 0 otherwise. We believed that bank-dominated SBICS may have had better management and, consequently, a lesser likelihood of liquidating or having serious financial problems.
Organizational Structure (Partnership or Corporation)	We included a dummy variable that takes a value of 1 if the SBIC was a partnership and 0 if it was a corporation. We viewed this as an important control variable because of these two organizational structures' different legal status and handling of investments. In partnerships, policies about the timing and amounts of distributions of realized earnings, for example, are often driven by contractual agreements, while in corporations, management has more discretion in determining how earnings are distributed. We did not have specific expectations about the sign of the coefficient for this variable.
Ownership (SSBIC or SBIC)	We included a dummy variable that takes a value of 1 if an SBIC is a specialized SBIC but takes a value of 0 otherwise. Our expectations about the sign of this coefficient were uncertain because, on the one hand, SSBICS are offered preferable financing options by SBA, but, on the other hand, SSBICS are expected to make investments in businesses that are owned by persons who are socially or economically disadvantaged—investments that are potentially riskier than the ones made by SBICS.
Stage of Business	We included a variable that measures the weighted average (by dollars of investment) of the age of the businesses in which an SBIC had made investments. The variable controls for the degree to which a given SBIC invested in start-up or more mature businesses. Because investments in start-up businesses, generally less than 1 year old, are likely to be riskier, we expected that SBICS investing mostly in such businesses would have a greater likelihood of liquidation.
Industrial Diversity	Using the two-digit standard industrial classification code to classify each investment that an SBIC made, we developed an index for diversity of

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<sup>6</sup>We also ran estimations with alternative measures of size, including the total capital of the SBIC—the private paid-in capital plus leverage, and private paid-in capital only. Our results were not sensitive to the definition of an SBIC's size.

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investments across industries. We took the share of dollars invested in the businesses of each industry classification and squared that figure, and then added up the squared shares. We then took the inverse of this value.<sup>7</sup> This process yielded an index of the diversity of the SBIC's investments. Our expectation was that investing in a greater diversity of industries would be correlated with better financial performance by the SBIC.

**Locational Diversity**

We also included an index of how diversified an SBIC's investment portfolio was across geographic (Census) regions of the country. Our expectation was that SBICs with greater regional diversity in their investments would perform better financially and have a lesser likelihood of liquidation. To derive this index, we used the same methodology described previously for the industrial diversity index.

**SBIC's Age**

We included a variable that measures the age of an SBIC. We believed that older SBICs may have done better because their management was more experienced and, perhaps, more conservative in making investment/financial decisions. Essentially, these are the SBICs that had passed the "test of time."

**SBIC's Newness**

Although we expected older SBICs to perform better, we believed that very new SBICs had had little chance to either make or lose money and, therefore, would have had little chance of liquidation. Therefore, we included a dummy variable for those SBICs that came into the program during the 2 years just before the period of our analysis.

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**Results and Interpretation**

Table III.1 presents the results of two specifications of the logistic regression model. As mentioned earlier, the dependent variable is a dummy variable that takes a value of 1 if the SBIC liquidated in the year of the observation and takes a value of 0 otherwise. All continuous variables are in natural logarithms. While the first specification includes variables for investment orientation and leverage, the second specification excludes these variables and replaces them with the variable for portfolio balance.

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<sup>7</sup>Essentially, we developed a measure of the concentration of investment dollars that is like a Herfindahl index. To make our measure more intuitive as a measure of diversity, we inverted the Herfindahl measure.

**Appendix III  
Regression Analysis**

**Table III.1: Estimates of Parameters for Logistic Regression**

Explanatory factor	Coefficients	
	Specification one	Specification two
Intercept	-1.743 (1.09)	-1.250 (0.77)
Investment orientation	-2.213 <sup>a</sup> (2.39)	<sup>b</sup>
Leverage	2.506 <sup>a</sup> (3.94)	<sup>b</sup>
Portfolio balance	<sup>b</sup>	-3.154 <sup>a</sup> (4.84)
SBIC's size	-0.634 <sup>c</sup> (2.06)	-0.451 (1.46)
Bank domination	-0.193 (0.26)	-0.869 (1.24)
Organizational structure	-0.129 (0.22)	-0.257 (0.43)
Ownership	-0.358 (0.56)	-0.052 (0.08)
Stage of business	0.043 (0.10)	0.302 (0.68)
Industrial diversity	-0.174 (0.44)	0.011 (0.03)
Locational diversity	-0.083 (0.11)	-0.140 (0.18)
SBIC's age	-0.115 (0.28)	-0.116 (0.28)
SBIC's newness	-1.552 (0.85)	-2.218 (1.12)
<b>Summary statistics</b>		
n	1,022	1,022
-2 log likelihood	37.3 with 11 DF	47.3 with 10 DF
Concordant	79.9%	87.1%

Notes: All continuous variables are expressed in natural logarithmic form. The t-statistics are in parentheses.

<sup>a</sup>This figure is statistically significant at the 1-percent level.

<sup>b</sup>This factor was not included in this specification.

<sup>c</sup>This figure is statistically significant at the 5-percent level.



The results in table III.1 indicate that only investment orientation and the leverage ratio have a statistically significant association with SBICs' liquidations in both specifications. The results for both of these variables (or for the portfolio balance measure that replaces them in the second specification) conform to our expectations. With the exception of the variable measuring the size of the SBIC, which is statistically significant in the first specification of the logistic model, none of the other independent factors included in the model appear to be associated with SBICs' liquidations.

The negative coefficient for investment orientation indicates that higher values of this variable—that is, less risky investment portfolios—put an SBIC at lower risk of liquidating. The coefficient for leverage, on the other hand, is positive, indicating that higher levels of leverage were associated with a greater likelihood of liquidation. Finally, the results for the portfolio balance variable in the second specification conform to our expectations because, as discussed earlier, higher values for this variable indicate a financial structure and/or investment plan that is more prudent. As expected, higher values for portfolio balance were associated with a lesser likelihood of liquidation.

Both specifications of the logistic model, as indicated by the values of the log likelihood test as well as the percentage of observations that are concordant, have some explanatory power. However, the explanatory power for the second specification is quite a bit higher than for the first. It appears, therefore, that while both investment orientation and leverage are independently associated with liquidations, the relationship between the financial structure of an SBIC and its portfolio of investments is also associated with liquidations.

The results of the logistic regression can be used to calculate how the likelihood of liquidation will change as the value of one of the independent variables changes. That is, we can use these results to estimate how a given change in, for example, the leverage ratio will alter the likelihood of liquidation. To do this, we used the mean values across our sample for each of the independent variables to define an SBIC with "typical" characteristics. For the dummy variables, we used the modal value across the sample.<sup>8</sup> Combining the average X values with the coefficients estimated in the regression allowed us to calculate the probability that a

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<sup>8</sup>For all four of the dummy variables included in this model, the modal value was zero.

“typical” SBIC would be liquidated in a given year.<sup>9</sup> To see how the probability of liquidation will change as the value of one of the independent variables changes, we recalculated the probability of liquidation, using the regression coefficients and the mean values of all the variables except for the one independent factor whose value we wanted to alter. For that variable, we changed the X value to some other relevant value.

Using this methodology, we found that overall, the typical SBIC had a 5.4-percent chance of liquidating in a given year across the 3 years of our analysis. If the value of leverage is increased by 20 percent above its mean level, however, the probability that such an SBIC will liquidate in a given year rises to 8.5 percent. Conversely, if the variable for investment orientation is increased by 20 percent above its mean level, the probability of liquidation in a given year falls to only 3.5 percent.<sup>10</sup>

Table III.2 presents results for the ordinary least squares regression, in which the dependent variable is a continuous measure of financial performance, known as the capital impairment ratio. The specifications shown on this table include the same independent variables as those in table III.1; however, in this case, the continuous variables are not in natural logarithms.

<sup>9</sup>When running the logistic model we estimate the logit transformation  $\ln(p/(1-p)) = \Sigma(X_i * B_i)$ , where p is the probability of liquidation, the Xs are the values of the independent variables, and the Bs are the parameters to be estimated in the regression. Using the mean values for the X variables and the estimated parameters, we can calculate  $\Sigma(X_i * B_i)$ , and can derive the value of p, or the probability of liquidation. The following algebraic transformation shows how to isolate the value of p:

$$\ln(p / (1-p)) = \sum_1^k (X_i * B_i)$$

$$p = \exp(\sum_1^k (X_i * B_i)) * (1-p)$$

$$p = \exp(\sum_1^k (X_i * B_i)) - p(\exp(\sum_1^k (X_i * B_i)))$$

$$p = \exp(\sum_1^k (X_i * B_i)) / (1 + \exp(\sum_1^k (X_i * B_i)))$$

<sup>10</sup>In the case of both the leverage ratio and the investment orientation ratio, a 20-percent change above the mean levels is less than a one standard deviation in the value of the variables.

**Appendix III  
Regression Analysis**

**Table III.2: Estimates of Parameters for Least Squares Regression**

Explanatory factor	Coefficients	
	Specification one	Specification two
Intercept	-0.392 <sup>a</sup> (5.97)	-0.464 <sup>a</sup> (8.24)
Investment orientation	0.254 <sup>a</sup> (5.31)	
Leverage	-0.053 <sup>a</sup> (2.74)	
Portfolio balance	<sup>b</sup>	0.554 <sup>a</sup> (12.08)
SBIC's size	0.005 <sup>a</sup> (7.08)	0.004 <sup>a</sup> (7.12)
Bank domination	0.118 <sup>a</sup> (2.51)	-0.004 (0.10)
Organizational structure	0.155 <sup>a</sup> (3.09)	0.179 <sup>a</sup> (3.83)
Ownership	-0.047 (1.12)	-0.183 <sup>a</sup> (4.52)
Stage of business	-0.001 (0.22)	-0.004 (0.89)
Industrial diversity	0.006 (1.25)	0.015 <sup>a</sup> (3.39)
Locational diversity	-0.023 (1.56)	-0.021 (1.53)
SBIC's age	0.016 <sup>a</sup> (7.41)	0.015 <sup>a</sup> (7.51)
SBIC's newness	0.153 <sup>a</sup> (2.62)	0.075 (1.35)
<b>Summary statistics</b>		
n	1,022	1,022
R <sup>2</sup>	16.3	24.7

Note: The t-statistics are in parentheses.

<sup>a</sup>This figure is statistically significant at the 1-percent level

<sup>b</sup>This factor is not included in this specification.

Although the variables for investment orientation, leverage, and portfolio balance are statistically significant and of the expected signs, as they were in the logistic regression, some other variables are also significant in this

regression.<sup>11</sup> In particular, larger SBICS and those that had been in the program longer appear to have done better financially. Additionally, according to the results in the first specification, bank-dominated SBICS appear to have been less likely to become capitally impaired. Finally, the evidence in the second specification suggests that SBICS whose investments were well diversified across industries had a greater likelihood of doing well financially.

Not surprisingly, the overall explanatory power of the model is low, with R-squared values of only 16.3 and 24.7 in the first and second specifications, respectively. As we mentioned earlier, there are a variety of factors that are likely to affect financial performance—factors both internal and external to the program—that could not be accounted for in this model or that may not have been measured in the most appropriate way. For example, one of the most important internal factors is the quality of management, which is, for the most part, an immeasurable factor. Additionally, we had no data on the size of the business to which an investment was made, although the size of the business is probably an important factor regarding the riskiness of an investment. Instead, we measured the riskiness of an SBIC's portfolio by looking at its debt or equity orientation, but that accounts for only one aspect of risk. Among the many factors potentially affecting SBICS' performance that are external to the program and that we did not account for in the model are macroeconomic conditions and current tax laws. Furthermore, SBICS' investments, being in small businesses, are risky, so there may be a large random component to SBICS' success or failure. Finally, as with many cross-sectional regression analyses, there is undoubtedly a significant random component regarding SBICS' financial performance.

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<sup>11</sup>The expected signs of most of the variables are the opposite of one another in the two types of regressions because the dependent variable in the logistic regression takes a value of 1 if the SBIC liquidated in a given year, while in the least squares regression, higher values for the capital impairment ratio indicate better financial performance.

# Objectives, Scope, and Methodology

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At the request of the Chairman, Senate Committee on Small Business, we reviewed the SBIC program and, in particular, identified factors associated with SBICS' liquidations and financial performance. In performing our work, we (1) reviewed SBA's case files for reasons SBICS entered liquidation from January 1986 through March 1991, (2) analyzed selected financial ratios for both active and liquidating SBICS, (3) performed a regression analysis of active and liquidating SBICS, and (4) conducted case studies of five SBICS in the process of liquidation. We limited the scope of our work to the period of January 1986 through March 1991 because 1986 was the year in which the number of SBICS entering liquidation, as well as the outstanding debt owed to SBA and the losses to SBA, substantially increased. We chose March 1991 as the ending date because it was the latest data available when we conducted our analysis covered up through that time.

To determine the reasons SBA initiated SBICS' liquidations, we first identified liquidating SBICS using SBA's History data base. We then reviewed SBA's Investment Division case files to determine the reasons SBA transferred these SBICS into liquidation. Using SBA's data on liquidating SBICS, we gathered information on the outstanding debt these SBICS owed SBA when they entered liquidation and how much of their debt they had paid SBA as of March 1991.

For each SBIC that was being liquidated for regulatory violations involving overall financial performance, we analyzed selected financial ratios (including return and liquidity ratios) to measure the extent to which the performance of the SBIC could be attributed to the yield on its investments and/or to its expenses. We used the performance of active SBICS as a benchmark.

We relied on three measures of return on invested capital (gross realized return on invested capital, gross realized return minus interest expenses and gross realized return minus total expenses). Using these measures for the active SBICS and SBICS in liquidation allowed us to determine how both income and expense affect SBICS' performance by comparing returns before and after expense is factored in.

To measure differences in the liquidity of SBICS in liquidation and active SBICS, we relied on three measures (cash flow; interest expenses to cash income; and total expenses to cash income, or the burn ratio). The first measure indicates how much cash an SBIC has available over the period measured (a negative amount would indicate that the SBIC does not generate adequate cash to cover expenses). The second and third

measures show whether the SBIC is generating sufficient cash to pay expenses; however, the second measure indicates the SBIC's ability to meet interest expenses only, and the third measure indicates the SBIC's ability to meet all expenses. Comparing these measures for the active SBICs and SBICs in liquidation allowed us to determine the impact of interest expense on the SBIC's liquidity.

We relied on several sources to select and interpret these ratios, including SBA's guidance on financial analysis of SBICs, text books, and studies of financial analysis techniques. Before making our selections, we discussed them with financial analysts at SBA, as well as a consultant familiar with the SBIC program. We used data from SBA's data base of SBICs' financial statements to calculate the financial ratios. For each SBIC, we calculated these ratios using its average performance from September 30, 1986, through September 29, 1990 (the period covered by the data base of financial statements). For each ratio, we used one observation for each SBIC, and this observation was derived by calculating the average ratio for as many financial statements as the SBIC filed during the period covered. In most cases, the average was weighted, calculated by summing the values comprising the numerator and summing the values comprising the denominator. Using the weighted average allowed us to control for extreme variation in performance in any given year. In comparing the overall performance of SBICs in liquidation and active SBICs, we used the median values of assessed factors for each group to minimize the effects of extreme outliers in the data. Finally, because the data available for our analyses generally covered, at most, the last 4 years of operation for liquidated SBICs and the 4 most current years for active SBICs, we must note that the performance we observed may not be representative of the performance over SBICs' entire lifetime.

We used regression analysis to determine the statistical relationship between various characteristics of SBICs and the likelihood of liquidation and poor financial performance. To conduct this analysis, we developed a model to determine which of several independent factors that describe SBICs and their investments correlated with SBICs' liquidations begun from 1988 through 1990. We also developed a second model to examine the relationship between the same set of independent factors and the financial performance of the SBICs. (For a detailed description of the regression analysis, see app. III.)

We performed five case studies of SBICs in the process of liquidation to learn SBA officials' and SBIC managers' views on why these SBICs were

liquidating. Furthermore, we wanted to discern what decisions these managers made that ultimately led to liquidation. The cases were judgmentally selected to include equity-oriented, balanced, and debt-oriented SBICS and large and small SBICS. Our selection was, of course limited to those SBICS whose managers were available to meet with us.

To perform our analysis, we relied on several data bases maintained by SBA's Investment Division, including the Financings, Financial Statement, History, and Directory data bases. We also used liquidations data SBA maintains on a spreadsheet file. We discussed SBA's policies and procedures for maintaining the agency's data bases and the liquidations data with key representatives of the Investment Division and assessed the accuracy and completeness of three of the four data bases and of the data on the liquidations spreadsheet. Because we recently tested the Financings data base for previous GAO reports, Small Business: Evaluation of Investment Companies' Financing Activities (GAO/RCED-91-142BR) and Small Business: Profiles of Venture Capital Financing, 1983 Through 1987 (GAO/RCED-89-68BR), we did not once again test the reliability of this data base. Also, we did not assess the accuracy and completeness of the Directory data base because we only used one data element from this data base—the ownership code. We did not believe that it was cost-effective to check this code.

We conducted our work at SBA headquarters in Washington, D.C., as well as at five SBICS (in California, Florida, Massachusetts, and New York).

# Assessments of the Reliability of the Data Used

Because the analysis contained in this report depended to a large extent on SBA's data bases and files, we took specific steps to ensure that the data used were reliable.

As noted in SBA's SBIC Digest issued in 1990 and 1991, about 9.4 percent and 10.7 percent of the SBICS did not report financial statements (form 468) to the SBA for fiscal years 1989 and 1990, respectively. According to SBA, most of the nonreporting SBICS were new licensees lacking 12 months of financial data. We checked 50 financial statements submitted by SBICS during fiscal years ending September 30, 1989, through September 30, 1990. To test the completeness of the data, we checked if the 50 forms were present in the data base. We found no forms unaccounted for in the data base. To test the accuracy of the data, we compared 62 pieces of information on each form with the corresponding information in the data base. We found only nine errors among the 3,100 pieces of information.

In addition to testing sample data, we used computer-assisted audit techniques to review, compare, and reconcile the different data bases. We used the Statistical Analysis System software package to generate frequencies and other measures of the various fields we were using in our analyses to become familiar with the data and to screen for obvious errors.

As previously mentioned for the Financings data base, we relied on tests we performed for prior GAO reports: Small Business: Evaluation of Investment Companies' Financing Activities (GAO/RCED-91-142BR) and Small Business: Profiles of Venture Capital Financing, 1983 through 1987 (GAO/RCED-89-68BR). For a description of the tests performed on this data base, see the reports described earlier.

For the Financings data base, History Data Base, and the Liquidations spreadsheet data, we compared data from the different data bases to determine if the files were reasonably complete and consistent with one another. For example, we compared SBICS listed in the Financings data base with those listed in the History data base, which contains one record for each SBIC licensed since 1976. We found no SBICS listed in the Financings data base missing from the latter data base. We also compared the SBICS listed in the Financial Statement data base as having submitted financial statements for fiscal years ending September 30, 1986, through September 29, 1990, with the SBICS listed in the History data base and found no SBICS that were listed in the former to be missing from the latter. We compared the SBICS identified as liquidated in 1987 through 1990 in the History data base with those listed in the Liquidations spread sheet. We



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**Appendix V**  
**Assessments of the Reliability of the Data**  
**Used**

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reconciled several differences between the listings after meeting with SBA officials. In addition, when the same SBIC had different license numbers in different data bases, we made a correction so that we could successfully match the computer files for our analyses.

From our various assessments, we found that SBA's automated data used in our analyses are sufficiently accurate and complete.

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