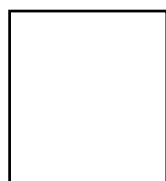# How are small firms financed? Evidence from small business investment companies

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How do firms and financial intermediaries decide how to finance investment projects undertaken by a firm? Some firms fund projects by issuing equity, others by borrowing from investors and/or financial intermediaries. This issue interests researchers and practitioners in corporate finance, as well as public officials whose policies influence the availability of capital and the terms on which capital is provided to firms. Since Modiagliani and Miller's (1958) seminal work demonstrating the conditions under which a firm's value is not affected by the choice between debt and equity to finance its activities (capital structure), research has focused on establishing the analytical and empirical determinants of a firm's capital structure. Three hypotheses, which are not mutually exclusive, are offered to explain the relevance of capital structure. The asymmetric information hypothesis holds that managers and other insiders of a firm are better informed about the current and future prospects of the firm than outside providers of capital. The firm's capital structure, or financing policy, is designed to convey this private information to the capital markets and to minimize any underpricing of the firm's financial instruments due to investors' uncertainty about the quality of the firm. The second hypothesis is based on the differential tax treatment of equity and debt and implies that firms design their financial policy to minimize taxes. In this article, we focus on the third hypothesis, which stems from work in *contracting theory*.

Contracting theory views a firm as a nexus of contracts among its various stakeholders, such as management, shareholders, creditors, suppliers, and customers. From this perspective, the financing policy of a firm is designed to minimize total contracting costs, including potential conflicts of interest among the parties (*agency* conflicts).[1] All of these hypotheses offer predictions about which types of firms should issue which types of securities. Although numerous studies test these predictions, the evidence is not conclusive.[2]

We examine the implications of contracting theory, using a unique, transactions-level dataset on the investment activities of small business investment companies (SBICs), which are private venture capital firms licensed and regulated by the U.S. Small Business Administration (SBA). The SBIC program was established by Congress in 1958 to encourage the provision of long-term private sector capital, both debt and equity, to the nation's small businesses. SBICs are private firms but, in return for accepting some restrictions on the types of investments they undertake, they are eligible to receive government subsidies by

issuing SBA-guaranteed debentures (SBA leverage). Our data contain information about every financing transaction conducted by SBICs between 1983 and 1992, including characteristics of the small firm receiving funds, the type of security used (debt, equity, or some hybrid), and other characteristics of the project and transaction agreement. Thus, instead of using *stock* data to examine the capital structure question, we use *flow* data to consider each financing transaction separately. This permits us to separate the influence of firm, industry, and project characteristics on the decision of whether to use debt in a particular transaction. Furthermore, the data allow us to examine the relationship between the characteristics of investors (SBICs) and the types of securities they purchase. Hence, we can offer evidence on how the agency relationships of SBICs with others affect their investment policy with small firms.

Overall, our results are consistent with the predictions of contracting theory. Our main finding is that business projects that generate tangible assets and allow little management discretion tend to be funded with debt rather than equity. This result is consistent with the view that projects that generate tangible assets minimize the ability of owner/managers to shift funds to riskier projects. We also find that smaller firms are more likely to obtain debt than equity financing and that, over the age range in our sample, the probability of receiving debt financing increases with age, though at a decreasing rate. Characteristics of the recipient firm's industry also matter: Greater growth opportunities and research and development (R&D) intensity are associated with a higher probability of nondebt financing. These results suggest that firms whose value depends on growth opportunities or industry-specific information, such as R&D, are less likely to receive debt financing because the costs of financial distress are likely to be greater for those firms. We also find that characteristics of the SBIC doing the funding are important: SBICs that are highly leveraged and affiliated with nonbank organizations are more likely to provide debt financing than other investment companies.

In the remainder of this article, we discuss the determinants of capital structure, describe the data we use, and estimate an empirical model of security choice.

The determinants of an SBIC's security choice

What determines the type of security used by an SBIC to finance the investment project of a small firm? What characteristics of the project, the small firm, and the SBIC affect whether the SBIC makes a loan or becomes a shareholder?

Agency conflicts

According to contracting theory, firms and their contracts are organized such that the total contracting costs among stakeholders are minimized. One of the main contracting costs is potential conflicts of interest among stakeholders. In financial contracts, the significant stakeholders are the management, shareholders, and creditors of the firm. Conflicts between managers and shareholders may arise because the managers are agents of the shareholders and do not own 100 percent of the firm's equity (Jensen and Meckling, 1976; Jensen, 1986; Harris and Raviv, 1990; Stulz, 1990). Because the managers own only a fraction of the firm, they capture only a fraction of the benefits of their effort. Similarly, if they misuse firm assets, they only bear a fraction of the cost. Furthermore, managers may invest in projects that reduce the value of the firm but enhance their control over its resources. For instance, although it may be optimal for the investors to liquidate the firm, managers may choose to continue operations to enhance their position.

Conflicts between shareholders and creditors may arise because they have different claims on the firm. Equity contracts do not require firms to pay fixed returns to investors but offer a residual claim on a firm's cash flow. However, debt contracts typically offer holders a fixed claim over a borrowing firm's cash flow. When a firm finances a project through debt, the creditors charge an interest rate that they believe is adequate compensation for the risk they bear. Because their claim is fixed, creditors are concerned about the extent to which firms invest in excessively risky projects. For example, after raising funds from debtholders, the firm may shift investment from a lower- to a higher-risk project. Equity holders tend to prefer that the firm invest in profitable but risky projects. If the project is successful, the creditors will be paid and the firm's shareholders will benefit from its improved profitability. If the project fails, the

firm will default on its debt, and shareholders will invoke their limited liability status. In addition to the asset substitution problem between shareholders and creditors, shareholders may choose not to invest in profitable projects (underinvest) if they believe they would have to share the returns with creditors.

Investors can design their contracts with the firm to minimize these potential conflicts of interest. To minimize the adverse effects of asset substitution by shareholders, creditors can require collateral or place restrictive covenants on the loans they make (see Berger and Udell, 1990, 1995; and Hooks and Opler, 1994). Shareholders can limit management's discretion with regard to the firm's resources by requiring regular payments through debt (Jensen, 1986; Stulz, 1990). Debt can also force optimal liquidation decisions by giving creditors the right to liquidate the firm if payments are not made. Furthermore, by increasing the equity stake of management, debt can better align the incentives of management and shareholders.

Monitoring by investors can also be important in mitigating agency conflicts. As residual claimants, equity holders can become what Jensen (1989) terms active investors by getting involved in the day-to-day management of firms (Hoshi, Kashyap, and Scharfstein, 1990a, 1990b, 1991; Pozdena 1991; Berlin, John, and Saunders, 1993; dos Santos, 1995a, 1995b). Equity can also mitigate the underinvestment problem associated with debt, since old and new shareholders have the same incentives to invest in profitable projects. According to contracting theory, the financial policy of a small firm would depend on the types of agency conflicts it faces. Therefore, the characteristics of a firm that are correlated with agency conflicts would affect how it funds its projects. What are those characteristics?

Characteristics of the small firm

Risk of bankruptcy—If a firm operates in a volatile sector and its cash flows vary a lot, the likelihood that it may be unable to meet its debt obligations is high. On the other hand, the firm's income may also be sufficiently high to earn high returns for its shareholders. A firm with a very volatile cash flow is more likely to finance its projects with equity than debt.

Liquidation value—Even if a firm has a high probability of bankruptcy, it can finance its projects with debt if the costs of bankruptcy for creditors are small. Firms with relatively high levels of tangible assets or assets that can be liquidated easily would have relatively low *ex-post* costs of bankruptcy and *ex-ante* costs of issuing debt (Williamson, 1988; Schleifer and Vishny, 1992).[3] Firms with high levels of easy-to-monitor tangible assets and few opportunities to substitute risky assets will have less conflict between debtholders and shareholders and a lower cost of debt (Jensen and Meckling, 1976). As a result, we would expect SBICs to provide more debt to firms with high liquidation value than to firms with low liquidation value.

Growth opportunities—For firms with high growth opportunities, the cost of restricting management's discretion, thereby the likelihood that the firm will not have sufficient funds to invest in profitable projects, is relatively high (Stulz, 1990). Conflicts between shareholders and creditors over the exercise of growth options and the underinvestment problem are also likely to be greater. Therefore, firms with high growth opportunities are more likely to finance their investments with equity than debt.

Profitability—If a firm is profitable, the risk that it would be unable to meet its debt obligations is smaller. Furthermore, the shareholders of profitable firms may be less likely to substitute risky projects for safer ones after a debt contract is written, since they have more to lose if the project fails. Therefore, we would expect profitable firms to finance more of their projects with debt.[4]

Organizational form—Shareholders of corporations and limited partners of firms have limited liability against losses, whereas general partners and owners of sole proprietorships have unlimited liability. Consequently, shareholder–creditor conflicts are more likely among corporations and limited partners than they are for general partners and sole proprietorships. Thus, corporations may be more likely to finance their projects with equity.

Size—Size and the choice of financing instrument may be related in several ways. First, if larger firms are more diversified and therefore less risky, we would expect them to issue more debt. Second, recent work in corporate finance indicates that a positive relationship may exist between firm value and debt issues (Harris and Raviv, 1990). High *ex-post*

liquidation value implies high *ex-ante* firm value, as well as greater likelihood of issuing debt. As a result, to the extent that size is related to firm value, larger firms are more likely to issue debt.

Ease of monitoring—If creditors can easily identify the investment projects of firms, then the likelihood that shareholders can substitute risky assets, hence the cost of issuing debt, would be low. Furthermore, if providing equity capital to a firm allows the investor to get involved in the management of the company (for instance, through board representation), we would expect firms that are otherwise hard to monitor to be financed with equity.

Characteristics of the SBIC

In addition to the characteristics of a firm, the characteristics of the investor are likely to influence what type of financing is used. Because SBICs are agents in their transactions with investors who provide funds to them, they face the same sort of agency conflicts with their shareholders and creditors as small firms. Therefore, the investment policy of SBICs is likely to be influenced by their characteristics. Although the finance literature contains several studies that examine how the principal–agent relationship between the investors and firms may affect firms' financing policy, there is little evidence on how firms' financing policy may be affected by the principal–agent relationship between the investors and their financiers. The results in Brewer and Genay (1994) and the statistics in table 4 (reviewed below) indicate that there are significant differences between SBICs that provide debt financing and those that provide nondebt financing. However, because we have no structural model that examines the effects of multiple agency relationships of investors on their investment policy, we include the characteristics of SBICs as control variables in the following empirical analysis.

SBIC size and age—The venture capital literature offers some evidence that the agency relationship between venture capitalists and their investors may affect the investment strategy of venture capitalists. Specifically, Gompers (1995a) suggests that venture capitalists may encourage a premature initial public offering (IPO) of a firm to develop their reputation and improve their ability to market the next venture fund. He finds that relatively inexperienced

venture capitalists tend to bring companies to the IPO market earlier than more experienced venture capitalists. Similarly, Lerner (1994) finds that experienced venture capitalists can time the IPO market better. If experience of venture capitalists affects how and when they realize the returns on their investments, then experience, as measured by age, of SBICs may similarly affect their choice of securities.

The size of SBICs may also influence their investment strategy. Sahlman (1990) describes the extensive involvement of venture capitalists in their portfolio companies. Venture capitalists sit on the board of directors, are actively involved in evaluating key managers and investment and restructuring decisions, and interact closely with firms' suppliers and customers. Our conversations with the managers of SBICs indicate that SBICs are similarly involved with small firms in which they hold equity stakes. If these investments require more investigation and industry expertise, such activities can be carried out by larger, more experienced investors at a lower cost (for example, due to economies of scale and ability to attract better managers), reducing the relative costs of equity financing. However, size is determined by other policies of SBICs (such as financing policy), as well as by investment policy. Again, lacking a structural model, we cannot determine the *a priori* relationship between SBIC size and investment policy.

SBA leverage—Many SBICs fund their activities by issuing SBA-guaranteed debentures, which are long-term securities. Our previous research (Brewer, Genay, Jackson, and Worthington, 1996) suggests that SBA leverage is more burdensome for SBICs oriented toward equity investments, because leveraged SBICs need to generate sufficient cash flows to make payments on their SBA debt. Similarly, the U.S. General Accounting Office (1993) reports that the SBA leverage of SBICs and their portfolio composition had a significant impact on the likelihood that they would be liquidated. As a result, efficient asset management implies that highly leveraged SBICs should be more likely to make debt investments than are less leveraged SBICs.

Bank-affiliation of SBICs—The SBIC program enlarges the investment activities of banking organizations beyond those typically permitted for their commercial bank and

venture capital units. For example, while traditional bank-owned venture capital units can only own up to 5 percent of a firm's equity, banks' SBIC units can own up to 50 percent of a small firm's equity.[5] By establishing an SBIC unit, banks reveal their preferences for making equity investments, which are likely to complement the loans made by the banks' credit departments and provide opportunities for diversification. In addition, equity investments may enable these firms to spread the costs of monitoring and generating information over several products/services, generate scale economies in monitoring costs, and participate in the profits of companies in which they invest, thus providing compensation for their monitoring activities (Rajan, 1992; Petersen and Rajan, 1993, 1994). We expect bank-affiliated SBICs to be more likely to make equity investments.

SBICs' organizational form—SBICs that are publicly owned companies or partnerships with a predetermined lifetime need to raise funds regularly to finance their investments. Management of these SBICs may be particularly concerned about the short-term performance of the company. There is some evidence that concerns about future ability to raise funds affect the investment strategies of venture capital firms (Gompers, 1995a). On the other hand, as Barry (1994) notes, the captive venture capital firms may face other constraints in how they invest their funds.

Profitability of SBICs—If shareholders of profitable SBICs are less likely to substitute risky assets in order to transfer wealth from the SBIC's creditors to themselves, then we would expect profitable SBICs to make more debt investments, all else being equal.

Overview of SBICs and their investments

Below, we describe our data and provide an overview of SBICs, the types of investments they made, and the characteristics of the firms and projects they financed over the 1983–92 period. We use data from reports of condition of SBICs and their investments, provided by the SBA. The reports of condition provide detailed balance-sheet and income statement information for SBICs over the 1986–91 period.[6] The investment files, which cover the 1983–92 period, provide the name, SIC code, total assets, number of employees, and location of the
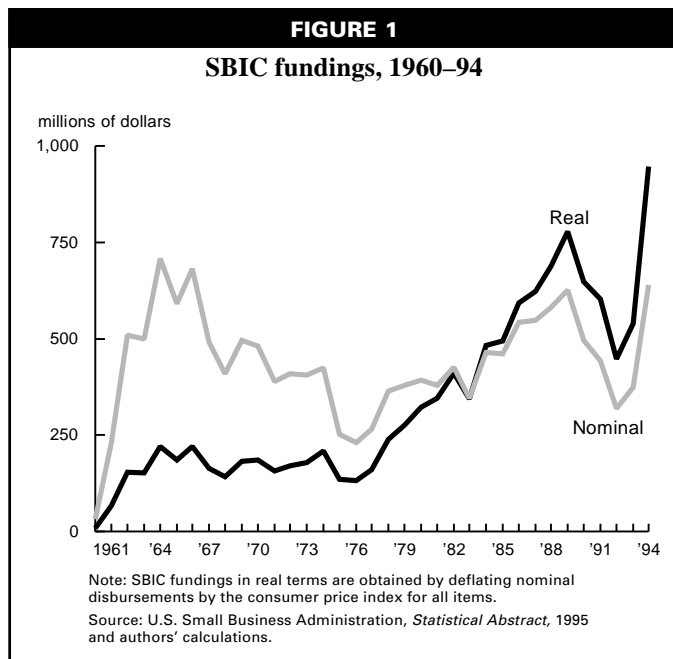
firms being financed; the dollar amount and type of financing provided (loans, equity, or debt with equity features); whether there was a put option on the equity financing, requiring the small firm to repurchase its equity in the future; whether the deal included debt financing; the interest rate charged; the activity that was being financed; and variables that indicate whether the SBIC previously provided financing to the firm.

We augment the SBA data with information from the COMPUSTAT database. Specifically, we construct variables that describe the characteristics of the industry (two-digit SIC) in which sample firms operate, covering the 1986–91 period. We restrict the firms sampled from the COMPUSTAT to those with assets less than $250 million to ensure that we are measuring the characteristics of smaller firms.

The original files on the investments of the SBICs have 20,159 observations; however, many of these observations have no information on the size of the small firm. Restricting the sample to those transactions for which we have data from both the SBICs' reports of condition and the COMPUSTAT files reduces the sample size further. Consequently, we report results using two samples: one sample comprises 12,182 transactions that have data on size of the small businesses; the other comprises 5,881 transactions that also have data on SBIC and industry characteristics.

Figure 1, which is based on data from the SBA's *Statistical Abstract* (1995), shows the time series of overall SBIC investments since the program's inception in 1958. Having grown rapidly in the 1960s, SBIC investments declined in the mid-1970s as SBICs failed and their assets were liquidated. Modest recovery followed the 1974–75 recession, and the 1980s saw significant growth in SBIC funding as the industry expanded again (see Gompers, 1994, for a discussion). SBIC fundings reached their local peak in 1988, then declined, reaching a local trough in 1991. Thus, the period we study, 1983–92, covers much of the recent boom and bust cycle experienced by SBICs. We note that SBICs were responsible for about one-sixth of total venture capital financing over this period.

We wish to emphasize two aspects of our data. First, the firms receiving SBIC funding are *not* a random sample of small

FIGURE 1

SBIC fundings, 1960–94

millions of dollars

Note: SBIC fundings in real terms are obtained by deflating nominal disbursements by the consumer price index for all items.

Source: U.S. Small Business Administration, *Statistical Abstract,* 1995 and authors' calculations.

firms in the United States. Rather, these are firms that successfully applied for SBIC funding. For example, the 5,392 firms represented in our sample are, on average, bigger and more likely to be in the manufacturing or services sectors than the firms sampled by the 1987 National Survey of Small Business Finances (NSSBF) (Elliehausen and Wolken, 1995, table 1.1). Second, though our data contain excellent information on the flow of funds going from an SBIC to a small firm in a particular transaction, they say little about the

recipient firm's (stock) capital structure. This occasionally limits our ability to compare some of our results with other studies.

In the rest of this section, we summarize our transactions data, addressing two principal questions. First, which types of firms received SBIC funding between 1983 and 1992? Second, are there any obvious firm or SBIC characteristics that appear to be related to whether a debt or nondebt security is used?

Table 1 shows the distribution by type of SBIC investments over the 1983–92 sample period and the total dollar value of activity in each investment category, adjusted for inflation. Nondebt securities (equity, debt with equity features, and mixed issues) represent a larger fraction of both the number of financings and the dollar volume of activity than debt securities. Among nondebt securities, equity investments account for the largest portion of transactions and dollar amounts. On average, nondebt financings are larger than debt financings. The average nondebt financing is $271,000, while the average debt financing is $121,000. Among nondebt financings, combinations of equity and debt finance are larger ($570,100) than equity ($276,800) and debt with equity features ($184,500) financings. Though we recognize that there may be important differences between the three categories labeled nondebt in table 1, we believe that examining the simple two-way split between pure debt transactions and all other transactions is a useful first pass at considering the debt-versus-equity question. Thus, in the remainder of this article we consider only the debt/nondebt classification.

Table 2 reports the frequency of debt and nondebt funding, holding constant firm characteristics such as size, age, and organizational form.[7] In broad terms, the table indicates that debt fundings

TABLE 1

Summary statistics on SBIC financings, 1983–92

	Number of financings	Total amount disbursed ($ millions)	Mean size ($ thousands)
Debt	4,982	602.8	121.0
Nondebt	7,200	1,951.3	271.0
Equity	4,105	1,136.4	276.8
Debt with equity features	2,463	454.5	184.5
Equity and debt with equity features	632	360.3	570.1
Total	12,182	2,554.1	209.7

Notes: Sample consists of all transactions over the 1983–92 period for which complete data are available. All dollar figures are deflated by the consumer price index for all items.

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

TABLE 2				
Small business characteristics and security choice, 1983–92				
A. Number of employees	**Debt (% of financings)**	**Nondebt (% of financings)**	**Total number of financings**	**Share of all financings (%)**
1–49	47.9	52.1	8,270	67.9
50–249	28.0	72.0	3,349	27.5
250–499	13.6	86.4	381	3.1
500 and over	17.0	83.0	182	1.5
B. Legal form	**Debt (% of financings)**	**Nondebt (% of financings)**	**Total number of financings**	**Share of all financings (%)**
Corporation	38.0	62.0	11,258	92.4
Partnership	56.6	43.4	350	2.9
Sole proprietorship	88.3	11.7	574	4.7
C. Age	**Debt (% of financings)**	**Nondebt (% of financings)**	**Total number of financings**	**Share of all financings (%)**
< 1 year	33.7	66.3	1,437	11.8
1–5 years	35.2	64.8	5,966	49.0
5–10 years	42.0	58.0	2,604	21.4
Over 10 years	60.0	40.0	2,175	17.8
Total number of financings	**4,982**	**7,200**	**12,182**	

Notes: Sample consists of all transactions over the 1983–92 period for which complete data are available. Nondebt financings include equity, debt with equity features, and combinations of equity and debt with equity features.

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

by SBICs go to smaller, older firms, while nondebt fundings go to larger, younger firms. At first blush, the age effect seems consistent with contracting theory, while the size effect does not. In particular, SBIC fundings to small firms are more likely to be debt than fundings to large firms: 47.9 percent of SBIC financings to the smallest firms, those with fewer than 50 employees, were in the form of debt, compared with just 17.0 percent of financings to the largest firms (over 500 employees) (table 2, panel A). In dollar shares, the figures are 31.7 percent and 13.4 percent, respectively. In contrast, evidence from the 1987 NSSBF indicates that large firms are more likely to have loans outstanding than smaller firms (Elliehausen and Wolken, 1995, table 4.5), suggesting that we might have expected a higher percentage of debt fundings going to large firms than to small firms. We can resolve the apparent contradiction between our findings and contracting theory by noting that the NSSBF also suggests that larger firms are somewhat more likely to have other (non-SBIC) debt outstanding than small firms

(Elliehausen and Wolken, 1995, table 5.5). Thus, large firms in our SBIC sample probably do have debt in their capital structures, but from non-SBIC sources.[8]

Panel C of table 2 shows how firm age affects security choice. In general, SBIC fundings to young firms are less likely to be debt than are fundings to older firms. Among firms less than one year old, 33.7 percent of SBIC financings were in the form of debt, while among firms over 10 years old, the debt share was 60.0 percent; the dollar share figures are 14.5 and 39.2 percent, respectively. For comparison, we note that the 1987 NSSBF (Elliehausen and Wolken, 1995, tables 1.1 and 4.5) suggests that the impact of age on loan usage is nonmonotonic, with the youngest and the oldest firms less likely to use loans than middle-aged firms.

As shown in table 2, the smallest firms accounted for over two-thirds (67.9 percent) of all funding transactions; however, these firms received only half (50.4 percent) the dollars disbursed by SBICs between 1983 and 1992. Similarly, firms less than one year old accounted

TABLE 3

Intended use of funds and security choice, 1983–92

A. Intended use of funds, as reported

	Debt (% of financings)	Nondebt (% of financings)	Total number of financings	Share of all financings (%)
Operating capital	39.9	60.1	8,957	73.5
Plant modernization	83.8	16.2	173	1.4
Acquisition of existing business	24.7	75.3	981	8.1
Consolidation of debts	55.9	44.1	899	7.4
New building or plant construction	78.0	22.0	100	0.8
Acquisition of machinery/equipment	59.8	40.2	440	3.6
Land acquisition	90.6	9.4	139	1.1
Marketing activities	9.1	90.9	121	1.0
Research and development	6.8	93.2	326	2.7
Other	39.1	60.9	46	0.4

B. Intended use of funds, by type

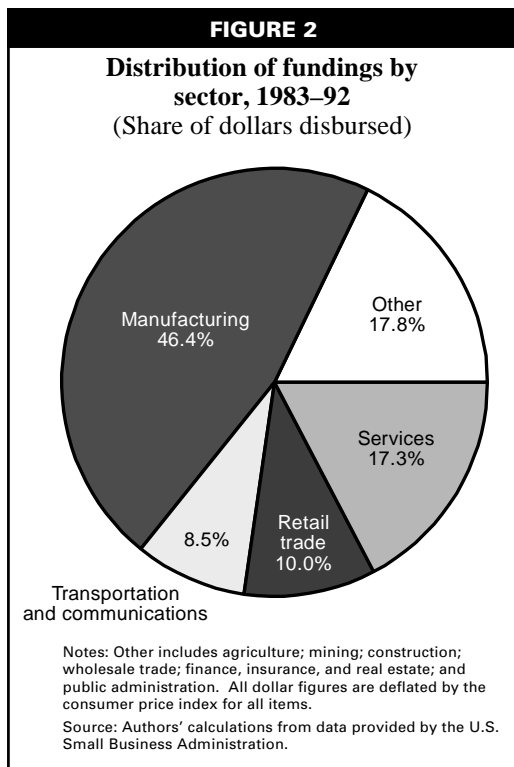|	Debt (% of financings)	Nondebt (% of financings)	Total number of financings	Share of all financings (%)
Operating capital	39.9	60.1	8,957	73.5
Transaction-oriented	63.7	36.3	1,751	14.4
Relationship-oriented	19.9	80.1	1,474	12.1
Total number of financings	**4,982**	**7,200**	**12,182**	

Notes: Sample consists of all transactions over the 1983–92 period for which complete data are available. Nondebt financings include equity, debt with equity features, and combinations of equity and debt with equity features. Transaction-oriented uses include plant modernization, consolidation of debts, new building or plant construction, acquisition of machinery/equipment, and land acquisition. Relationship-oriented uses include the acquisition of an existing business, marketing activities, research and development, and other.

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

for 11.8 percent of all SBIC fundings but 19.6 percent of all dollars invested.

Table 3 reports on the relationship between the intended use of funds and security choice. The most important category for intended use of funds is operating capital, which accounted for 73.5 percent of all financings and 56.8 percent of dollar investments. Other important categories are acquisition of existing businesses, debt consolidation, acquisition of machinery, and research and development. Transactions in which the reported uses of funds included plant modernization, new building or plant, acquisition of machinery, and land acquisition were very likely to be financed by debt, while those linked to the acquisition of an existing business, marketing, or research and development were highly unlikely to be financed

by debt. Panel B of table 3 groups the uses of funds into three categories, operating capital, transaction-oriented uses, and relationship-oriented uses, along lines suggested by Nakamura (1993). Transaction-oriented uses include plant modernization, new building or plant construction, debt consolidation, machinery acquisition, and land acquisition; relationship-oriented uses include the acquisition of existing business, marketing activities, and research and development. This grouping reflects our *a priori* judgement that relationship-oriented projects offer greater scope for insider discretion as to how the assets (funds) are used than transaction-oriented projects, which are likely to require less monitoring and are less subject to asset substitution problems. Furthermore, transaction-oriented uses may involve the purchase

FIGURE 2

Distribution of fundings by sector, 1983–92
(Share of dollars disbursed)

Notes: Other includes agriculture; mining; construction; wholesale trade; finance, insurance, and real estate; and public administration. All dollar figures are deflated by the consumer price index for all items.

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

of assets that have some liquidation value in the case of borrower default. As table 3 shows, fundings for relationship-oriented uses are unlikely to be debt, while fundings for transaction-oriented uses are quite likely to be debt.

We note that the sectoral and geographic distributions of SBIC investments over the 1983–92 period were somewhat concentrated. The manufacturing, services, and retail trade sectors accounted for nearly three-fourths (73.7 percent) of all SBIC investments, with manufacturing alone accounting for 46.4 percent of all dollars invested under the program (see figure 2).[9] Similarly, the top five states in SBIC fundings accounted for over half (51.7 percent) the total dollars disbursed under the program; these five states (California, Connecticut, Massachusetts, New York, and Texas) accounted for only 20.2 percent of total U.S. employment growth between 1983 and 1992.

Table 4 offers some evidence that the SBICs investing in debt securities differ from those investing in nondebt securities. On average, debt transactions involve smaller, older SBICs that have significantly more SBA leverage outstanding than SBICs involved in nondebt transactions. Furthermore, debt transactions are

more likely to involve less profitable, nonbank-affiliated SBICs. These patterns suggest the need to control for intermediary characteristics in the models we estimate in the next section.

An empirical model of SBICs' investment decisions

Given the possible relationships we established between the type of security an SBIC uses to fund a firm and the characteristics of the firm and the SBIC, we relate these characteristics empirically to the probability that an SBIC invests in a small firm through debt. We estimate the following probit model of the probability that the SBIC makes a debt investment in a small firm:

1) $SECCHOICE = F(USETRANS, FIRMAGE, E1–49, CORPORATION, PARTNERSHIP, SAMESTATE, SBICSIZE, SBICAGE, SBICCORP, SBICBANK, SBAPRIV, SBICROA, IND-LIQ, IND-R\&D, IND-MV/BV, IND-INTAN, IND-ROA, IND-SROA) + \varepsilon,$

where SECCHOICE is an indicator variable that is equal to one if the SBIC makes a debt financing, zero otherwise; ε is a mean 0, variance σ^2, normally distributed error term; and all other variables are defined in table 5. Because we do not estimate a structural model of security choice and other policies of small firms and SBICs, we recognize that equation 1 is a reduced-form equation and that we cannot interpret the estimated coefficients as structural ones. Instead, we interpret the coefficients of equation 1 as partial correlations that nonetheless may shed light on the theory of security choice.

Table 5 summarizes definitions and descriptions of the variables in equation 1. We include variables that measure ease of monitoring, ease of asset substitution, firm growth opportunities, and firm risk, as well as a number of control variables, such as SBIC characteristics, industry (of the small firm), and year indicator variables.

Table 5 also summarizes our expectations regarding the signs of the coefficients on the variables in equation 1. The ease of monitoring the small firm and the ease of asset substitution by the small firm are measured by the firm's intended use of funds (USETRANS), organizational form (CORPORATION and PARTNERSHIP), proximity to its funding

TABLE 4		
Characteristics of SBICs, 1986–91		
	Debt financings	**Nondebt financings**
Total assets *(million $)*	35.40	40.48*
Age *(years)*	14.43	12.21*
Corporate *(% of total)*	82.38	69.55*
Bank-affiliated *(% of total)*	23.48	50.02*
SBA leverage *(SBA funds/ private capital)*	1.94	0.99*
Return on assets *(at market value)*	0.07	0.10*
Number of observations	2,594	3,287

*Indicates differences in means are significant at the 5 percent level.

Notes: The numbers are simple means. Sample consists of all transactions over the 1986–91 period for which complete data are available. Bank-affiliated are SBICs in which banking organizations own at least 10 percent of equity. Return on assets is the ratio of unrealized and realized gains to total assets at market value.

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

SBIC (SAMESTATE), the average industry ratio of research and development expenditures to sales (IND-R&D), and the average industry ratio of intangible assets to total assets (IND-INTAN). We expect factors that increase the ease of monitoring (and decrease the ease of asset substitution) to enter equation 1 with positive coefficients, that is, to be positively associated with the probability of using debt in a given transaction. Thus, we expect the coefficient on USETRANS to be positive. Research and development, marketing, and acquisition of existing businesses are risky activities that are difficult to monitor and allow owners/managers a great deal of discretion over the disbursement of funds. On the other hand, plant modernization, new building or plant construction, consolidation of debts, acquisition of machinery, and land acquisition are activities that generate tangible assets and allow little management discretion. Consequently, the agency costs of debt are likely to be lower; fund suppliers can monitor owners/ managers easily, minimizing their ability to shift funds to riskier projects. We expect the coefficients on CORPORATION and PARTNERSHIP to be negative, since the limited liability feature of corporations and limited partnerships tends to increase the incentives of owner/managers to substitute risky assets for safe ones, making debt less attractive to investors. We also expect the coefficients on our

research and development variable, IND-R&D, and our intangible assets variable, IND-INTAN, to be negative, since firms in industries with high values of these variables may be less attractive to debt investors seeking to avoid messy monitoring problems. Finally, we have no prior on the sign of the SAMESTATE coefficient. If monitoring costs are fixed per financing and vary by proximity of the SBIC and the small firm, and if monitoring costs do not differ according to whether debt or nondebt is used, then the coefficient may be positive, reflecting the fact that most debt financings are smaller than nondebt financings (table 1). Hence, fixed monitoring costs are spread out over a larger size deal when the security choice is nondebt as compared to debt. However, if monitoring costs do differ by security type, then the coefficient on SAMESTATE is ambiguous.

Firm risk and growth opportunities are measured by firm age (FIRMAGE), firm size (E1–49), and average industry measures of profitability (IND-ROA), income volatility (IND-SROA), liquidity (IND-LIQ), and growth opportunities (IND-MV/BV). We expect anything that is positively correlated with risk or growth opportunities to enter equation 1 with a negative coefficient, that is, to decrease the probability that debt is used, other things being equal. For example, young firms with little reputational capital may take on riskier projects (Diamond, 1991), and younger firms may have more growth potential than older ones. Thus, we expect the coefficient on FIRMAGE to be positive. Similarly, small firms are likely to be less diversified and to have more volatile earnings, implying a negative coefficient on E1–49. Other bankruptcy risk measures are our profitability and volatility measures, IND-ROA and IND-SROA, and financial liquidity (IND-LIQ). We expect the coefficient on IND-ROA to be positive and that on IND-SROA to be negative. If IND-LIQ is a measure of a firm's short-term ability to meet its debt obligations, then we would expect it to have a positive coefficient in equation 1. However, because firms decide the amount of financial slack as part of their other

TABLE 5

Variable definitions and descriptions

Variable	Definition	Expected sign in security choice equation	Source
Dependent Variable			
SECCHOICE	Indicator =1 if debt transaction, =0 otherwise	N.A.	SBIC transaction data
Measures of asset substitution and/or ease of monitoring			
USETRANS	Indicator =1 if intended use of funds is transaction-oriented, =0 otherwise	+	SBIC transaction data
CORPORATION	Indicator =1 if corporation, =0 otherwise	–	SBIC transaction data
PARTNERSHIP	Indicator =1 if partnership, =0 otherwise	–	SBIC transaction data
SAMESTATE	Indicator =1 if firm and SBIC are in same state, =0 otherwise	?	SBIC transaction data
IND-INTAN	Average industry ratio of intangible assets to total assets	–	COMPUSTAT
IND-R&D	Average industry ratio of R&D spending to sales	–	COMPUSTAT
Measures of firm risk and/or growth opportunities			
FIRMAGE	Age of small firm, in years	+	SBIC transaction data
E1–49	Indicator=1 for firms with < 50 employees, =0 otherwise	–	SBIC transaction data
IND-MV/BV	Average industry ratio of market to book value of assets	–	COMPUSTAT
IND-ROA	Average industry return on assets (ROA)	+	COMPUSTAT
IND-SROA	Average industry standard deviation of ROA	–	COMPUSTAT
IND-LIQ	Average industry ratio of current assets to total assets	+	COMPUSTAT
Control variables			
SBICAGE	Age of SBIC, in years	?	SBICs' financial statements
SBICSIZE	Natural logarithm of SBIC total assets	?	SBICs' financial statements
SBICCORP	Indicator =1 if SBIC is a corporation, =0 otherwise	?	SBICs' financial statements
SBICBANK	Indicator=1 if at least 10% of SBIC's equity is owned by banking organization, =0 otherwise	–	SBICs' financial statements
SBAPRIV	Ratio of SBIC's SBA leverage to its private invested capital	+	SBICs' financial statements
SBICROA	Ratio of realized and unrealized profits of SBIC to market value of total assets	?	SBICs' financial statements

Notes: Unless otherwise noted SBIC transaction data cover 1983 to 1992, while SBICs' financial statements and COM-PUSTAT data cover 1986 to 1991. Nondebt financings include equity, debt with equity features, and combinations of equity and debt with equity features. COMPUSTAT industry averages are computed as unweighted means over firms with less than $250 million in assets in a given two-digit SIC industry, using annual data over the 1986–91 period. IND-SROA is computed as a nine-year rolling average standard deviation of IND-ROA, using data over the 1978–91 period.

Sources: Authors' calculations, U.S. Small Business Administration, and COMPUSTAT.

policies, the relationship between IND-LIQ and the probability of using debt may depend on factors affecting firms' other policies. For instance, because IND-LIQ is also a measure of financial slack, which is most valuable to firms that have ample profitable projects, it may also be a measure of growth opportunities. In that case, we would expect IND-LIQ to have a negative coefficient in equation 1. Finally, as suggested by Gompers (1995b), Barclay and Smith (1995a, 1995b), and others, we include the average industry ratio of market value to book value of assets (IND-MV/BV), which we expect to enter negatively, since it is a measure of growth opportunities likely to face the small firm.

Table 5 also lists our control variables, which describe characteristics of the funding SBICs, including age (SBICAGE), size (SBICSIZE), organizational form (SBIC-CORP), bank ownership status (SBICBANK), SBA leverage (SBAPRIV), and profitability (SBICROA). We expect SBICBANK to have a negative coefficient, reflecting bank–affiliated SBICs' tendency to make equity investments. We also expect SBAPRIV to enter equation 1 with a negative coefficient, for the asset–liability matching reasons outlined above. We have no priors on the signs of the other coefficients.

Empirical results

Tables 6–8 report the coefficient estimates of the determinants of the probability of debt usage using pooled cross-section time-series data.

Small firm characteristics and security choice

The first panel of results in table 6 is estimated over the 1983–92 period, using only the characteristics of small firms (12,182 transactions). The second panel of results is estimated over the period (1986–91), for which we have data on both firm and SBIC characteristics (5,881 transactions). The results in panel A of table 6 indicate that transaction-related projects are more likely to be financed with debt than nondebt securities. Thus, nontransaction-oriented projects tend to increase the likelihood of nondebt financing. This is consistent with the idea that projects of firms that involve intangible assets are more likely to be financed with equity, on average, than projects of firms that produce tangible assets.

The results also suggest that the age of the small business positively affects the probability

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TABLE 6

Security choice using only small firm characteristics

A. Full sample[a]

	Coefficient	Standard error	Marginal prob
FIRMAGE	0.0493*	0.0030	0.0191
$(FIRMAGE)^2 / 100$	−0.0560*	0.0051	−0.0217
E1–49	0.5154*	0.0279	0.1997
CORPORATION	−0.9991*	0.0734	−0.3871
PARTNERSHIP	−0.7373*	0.1007	−0.2857
SAMESTATE	0.2634*	0.0251	0.1021
USETRANS	0.4498*	0.0365	0.1743
Number of observations	12,182		
Log likelihood	−7,008.95		

B. Restricted sample[b]

	Coefficient	Standard error	Marginal prob
FIRMAGE	0.0545*	0.0042	0.0216
$(FIRMAGE)^2 / 100$	−0.0578*	0.0070	−0.0229
E1–49	0.5760*	0.0396	0.2280
CORPORATION	−1.6396*	0.1844	−0.6491
PARTNERSHIP	−1.4152*	0.2086	−0.5603
SAMESTATE	0.3110*	0.0361	0.1231
USETRANS	0.4271*	0.0548	0.1691
Number of observations	5,881		
Log likelihood	−3,337.37		

[a]Sample is all transactions over the 1983–92 period for which complete data are available.

[b]Sample is all transactions over the 1986–91 period for which complete data are available.

*Indicates significance at the 5 percent level.

Notes: The "Marginal prob" column presents the marginal effects of the right–hand–side variables (X) on the probability of debt, computed at the mean values of X. See table 5 for variable definitions. Sector and year indicator variables were included but are not reported in the table.

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

that the firm will obtain debt financing, but the marginal impact of age declines as age rises (positive coefficient on FIRMAGE, negative on $(FIRMAGE)^2$). The coefficients on the age variables imply that the mean effect of raising the firm's age by one year is to raise the probability of debt by about 2.0 percentage points. This result is in line with contracting theory's implication that older firms are more likely to receive debt than nondebt financing. Because younger firms are likely to be riskier and have greater growth opportunities than older firms, they are more likely to be financed by nondebt securities.

The results in table 6 also indicate that the smallest firms are more likely to obtain debt than nondebt financing, as the simple frequencies in table 2 showed: For example, the probability that funding will be debt is about 20.0 percentage points higher for small firms than for large firms (50 or more employees). The simple

frequencies reported in table 2 are consistent with this: Both the largest (500 or more employees) and the next largest (between 250 and 499 employees) firms report very low frequencies of debt financing (17.0 percent and 13.6 percent, respectively), compared with about 48 percent for firms with fewer than 50 employees. As we discussed earlier, we believe that the larger firms in our sample are likely to have debt from other (non-SBIC) sources; hence, our results are not inconsistent with theories suggesting that larger firms are more likely to obtain debt financing than smaller firms.

A firm's organizational characteristics have an important influence on the probability of debt financing. Being incorporated raises the probability of receiving nondebt financing by 39 percentage points relative to sole proprietorships and by about 10 percentage points relative to partnerships. An owner/manager firm has a greater incentive to take on risky projects if it has limited liability. Thus, these firms are more likely to receive nondebt than debt financings to minimize the asset substitution problem.

The results in table 6 also suggest that firms located in same state as the SBIC (SAMESTATE) are more likely to be funded with debt instruments than firms in other states; thus we find that being in the same state raises the probability of a debt security being used in a given financing. Finally, we note that the results in panel B of table 6 are broadly consistent with those in panel A of table 6. Thus, using the smaller sample does not affect the manner in which small firm characteristics are associated with security choice.

Inclusion of SBIC characteristics

Table 7 reports the empirical results of adding the SBIC variables to the specification. The addition of SBIC-specific variables has very little qualitative impact on the estimated coefficients on firm characteristics, including age, size, organizational

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TABLE 7

Security choice using small firm and investment company characteristics

	Coefficient	Standard error	Marginal prob
FIRMAGE	0.0401*	0.0044	0.0159
$(FIRMAGE)^2$ / 100	−0.0384*	0.0074	−0.0152
E1–49	0.4683*	0.0419	0.1854
CORPORATION	−1.5559*	0.1964	−0.6161
PARTNERSHIP	−1.3866*	0.2217	−0.5490
SAMESTATE	0.3187*	0.0381	0.1262
USETRANS	0.3248*	0.0582	0.1286
SBICSIZE	0.1217*	0.0183	0.0482
SBICAGE	0.0109	0.0096	0.0043
$(SBICAGE)^2$ / 100	−0.0160	0.0298	−0.0063
SBICCORP	0.1241*	0.0449	0.0491
SBAPRIV	0.2527*	0.0216	0.1007
SBICROA	−0.8160*	0.1029	−0.3231
SBICBANK	−0.2310*	0.0548	−0.0915
Number of observations	5,881		
Log likelihood	−3,082.79		

*Indicates significance at the 5 percent level.

Notes: The "Marginal prob" column presents the marginal effects of the right–hand–side variables (X) on the probability of debt, computed at the mean values of X. Sample consists of all transactions over the 1986–91 period for which complete data are available. See table 5 for variable definitions. Sector and year indicator variables were included but are not reported in the table.

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

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structure, intended use, and industry classification variables. Intended use of funds still has a strong positive effect on the probability of debt usage, with transaction-oriented uses more likely to be debt financed than other types of projects. Several of the SBIC-specific variables have a statistically significant impact on the probability of debt financing. For example, larger SBICs are more likely to do debt financings than smaller ones, and SBICs with higher SBA leverage are more likely to do debt financings than other investment companies. Bank-affiliated investment companies (SBIC-BANK) are significantly less likely to do debt fundings (negative coefficient). Being bank-affiliated lowers the probability that an SBIC

will do a debt funding by 9 percentage points. Being a partnership raises the probability of providing nondebt financing by about 5 percentage points, compared to a corporation. More profitable investment companies (SBICROA) tend to provide nondebt financing.

Inclusion of COMPUSTAT variables

Table 8 reports the empirical results when the COMPUSTAT variables are added to the specification. The addition of industry-specific variables has very little qualitative impact on the estimated coefficients on small firm- and SBIC-specific variables, most of which maintain their significance. Firms in industries with relatively high IND-MV/BV ratios have a greater chance of receiving nondebt financing than other companies. This result is consistent with the idea that firms with more growth opportunities generally receive more equity financing than others, since potential agency costs associated with firms' investment behavior rise with growth opportunities. Liquidity considerations are important in the choice of financing instruments. Firms in industries with relatively high ratios of current assets to total assets (IND-LIQ) tend to have a lower probability of receiving debt financing, suggesting that it may be measuring the extent of growth opportunities in the industry that is not captured by IND-MV/BV. Firms in industries with more volatile ROA (IND-SROA) have a lower chance of receiving debt financing than other companies. This result is in line with the view that there is a greater risk of firms in industries with more volatile earnings being unable to meet their debt obligations; as a result, such firms are more likely to receive nondebt financing.

Firms in R&D intensive industries are more likely to receive nondebt financing than other firms. R&D intensive industries are likely to accumulate physical and intellectual capital

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TABLE 8

Security choice using small firm, investment company, and industry characteristics

	Coefficient	Standard error	Marginal prob
FIRMAGE	0.0427*	0.0044	0.0169
(FIRMAGE)^2 / 100	−0.0415*	0.0074	−0.0164
E1−49	0.4725*	0.0442	0.1871
CORPORATION	−1.5096*	0.1969	−0.5977
PARTNERSHIP	−1.3902*	0.2223	−0.5504
SAMESTATE	0.3183*	0.0384	0.1260
USETRANS	0.2444*	0.0597	0.0968
SBICSIZE	0.1343*	0.0185	0.0532
SBICAGE	0.0056	0.0097	0.0022
(SBICAGE)^2 / 100	0.0033	0.0301	0.0013
SBICCORP	0.1031*	0.0453	0.0408
SBAPRIV	0.2309*	0.0219	0.0914
SBICROA	−0.8275*	0.1036	−0.3276
SBICBANK	−0.2509*	0.0554	−0.0993
IND-R&D	−0.0135	0.0074	−0.0053
IND-MV/BV	−0.0242*	0.0059	−0.0096
IND-LIQ	−1.2457*	0.1800	−0.4932
IND-ROA	−0.0023	0.0033	−0.0009
IND-SROA	−0.0234*	0.0080	−0.0093
IND-INTAN	1.4979*	0.6419	0.5930
Number of observations	5,881		
Log likelihood	−3,029.64		

*Indicates significance at the 5 percent level.

Notes: The "Marginal prob" column presents the marginal effects of the right–hand–side variables (X) on the probability of debt, computed at the mean values of X. Sample consists of all transactions over the 1986–91 period for which complete data are available. See table 5 for variable definitions. Sector and year indicator variables were included but are not reported in the table.

Sources: Authors' calculations from data provided by the U.S. Small Business Administration and COMPUSTAT.

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that is very industry- and firm-specific. As asset specificity increases, so do expected agency costs in liquidation. Hence, consistent with the predictions of contracting theory, firms in R&D intensive industries are more likely to receive nondebt financing. However, our results also indicate that firms in industries with more intangible assets are more likely to receive debt than nondebt financing. This result is surprising. We believe it may be due to the flow nature of our data: A firm's security choice in a particular transaction may be more closely related to the asset being funded by that transaction than the composition of the firm's stock of assets.

Conclusion

In this article, we use a unique transactions-level dataset of small business financing to examine how firms and investment companies decide on the types of security used to finance firms' investment projects. Our result shows that there is a strong, positive association between the incidence of using debt to fund a small business and using the funds to finance a project likely to generate tangible assets. This relationship shows through our simple frequency tables, as well as our probit analyses of security choice. Thus, we find that business projects that are likely to generate tangible assets and allow little management discretion tend to be funded with debt rather than equity. This result is consistent with the contracting theory view of the firm, which suggests that the security choice of investors and firms is designed to minimize their costs of contracting.

We also find that younger firms are more likely to obtain nondebt than debt financing. This effect conforms with standard theories on capital structure choice, which suggest that young firms with little reputational capital may take on riskier projects and have more growth opportunities than older ones. These agency concerns create incentives for investment companies to provide nondebt rather than debt financing to young firms. In addition, we find that smaller firms are more likely to receive debt financing than larger firms. Although this result appears to conflict with the predictions of contracting theory, it may be explained partially by the fact that larger firms in our

sample may have alternative, non-SBIC sources for credit. The private placement of debt with SBICs by the smallest firms in our sample may indicate that SBICs offer a funding opportunity for these firms. The results also demonstrate that lower market to book ratios and R&D intensities are associated with a greater chance of receiving debt rather than nondebt financing. This is because the agency cost of debt is likely to be lower; and the investment companies can monitor owner/managers easily. Further, we find that characteristics of the funding SBIC and the recipient firm's industry affect security choice. In particular, SBICs using a higher amount of funds and guarantees from the SBA tend to be more likely to do debt than nondebt financing. In addition, SBICs affiliated with banking organizations and those organized as partnerships are more likely to provide nondebt financings. These results suggest that multiple agency relationships of investors may affect how they fund firms.

We plan to extend our work in at least two directions. The first is motivated by previous research and certain features of our dataset. We have information on whether each financing transaction in our dataset is the first such transaction between a particular SBIC and small firm, or whether it is a *repeat* transaction; we can also identify transactions that involve two or more SBICs simultaneously. We intend to examine these transaction characteristics to determine whether the relationships we identified here remain intact, since previous research indicates that the terms and even availability of credit for small businesses can vary with the strength of the relationship between lender and borrower (Petersen and Rajan, 1994; Berger and Udell, 1995).

The second extension of this work will be to model the financing policy of small firms in conjunction with their other policies. For instance, we find that project choice is significantly correlated with financing choice. However, since a firm's project choice is likely to be made simultaneously with the financing arrangements, both project choice and security choice are likely to be endogenous. Developing and testing a structural model along these lines remains a topic for future research.

NOTES

[1] Empirical evidence suggests that information asymmetries are generally important in determining firms' financial policies. However, because firms place their debt and/or equity securities privately with the SBICs and do not issue them in public markets, and because SBICs tend to get involved in the management of the companies they finance, we focus on agency theory explanations of security choice.

[2] For an excellent review of the agency theory and asymmetric information literature, see Harris and Raviv (1992).

[3] The liquidation value of a firm is also related to how specific its assets are to that firm or sector. Firms with assets that are highly industry- and firm-specific would use less debt because the liquidation value of these assets is substantially reduced.

[4] On the other hand, if the current profitability of a firm is an indication of its investment and growth opportunities, then more profitable firms may choose equity over debt financing.

[5] For a more detailed discussion of bank- versus nonbank-owned SBICs, see Brewer and Genay (1994) and Brewer, Genay, Jackson, and Worthington (1996).

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

[7] A similar table, with the share of dollars devoted to debt and nondebt funding, is available on request.

[8] This is an example of how the *flow* nature of our data forces us to be careful when comparing our numbers to those of other studies.

[9] For comparison, we note that these three sectors accounted for 71.3 percent of total U.S. nonfarm payroll employment growth between 1983 and 1992, with the services and retail trade sectors accounting for all of it: Manufacturing employment actually fell modestly over this period.

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