

NOVEMBER/DECEMBER 1996

ECONOMIC PERSPECTIVE

Call for
Papers

1997 Conference on
Bank Structure
& Competition

A review from the
Federal Reserve Bank
of Chicago

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

**CRA and fair lending regulations:
Resulting trends in mortgage lending**

Index for 1996

FEDERAL RESERVE BANK
OF CHICAGO

Contents

**How are small firms financed?
Evidence from small business
investment companies. 2**

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

This article examines the investment decisions of small business investment companies (SBICs). The results indicate that potential costs of contracting among SBICs, small firms, and others may have significant effects on how small firms are funded. For instance, projects generating tangible assets and firms operating in industries with few growth opportunities are more likely to be financed with debt than nondebt.

**CRA and fair lending regulations:
Resulting trends in mortgage lending. 19**

Douglas D. Evanoff and Lewis M. Segal

This article provides background on the evolution of Community Reinvestment Act (CRA) and fair lending regulations, summarizes the relevant economic literature, and evaluates the effectiveness of the regulations by analyzing recent trends in mortgage lending activity. Are the trends in line with the intent of the regulations? Can the trends be attributed to the regulations?

Call for papers. 47

Index for 1996. 48

ECONOMIC PERSPECTIVES

November/December 1996, Volume XX, Issue 6

President

Michael H. Moskow

Senior Vice President and Director of Research

William C. Hunter

Research Department

Financial Studies

Douglas Evanoff, Assistant Vice President

Macroeconomic Policy

Charles Evans, Assistant Vice President

Microeconomic Policy

Daniel Sullivan, Assistant Vice President

Regional Programs

William A. Testa, Assistant Vice President

Administration

Anne Weaver, Manager

Editor

Helen O'D. Koshy

Production

Rita Molloy, Kathryn Moran, Yvonne Peeples,

Roger Thryselius, Nancy Wellman

ECONOMIC PERSPECTIVES is published by the Research Department of the Federal Reserve Bank of Chicago. The views expressed are the authors' and do not necessarily reflect the views of the management of the Federal Reserve Bank.

Single-copy subscriptions are available free of charge. Please send requests for single- and multiple-copy subscriptions, back issues, and address changes to the Public Information Center, Federal Reserve Bank of Chicago, P.O. Box 834, Chicago, Illinois 60690-0834, telephone (312) 322-5111 or fax (312) 322-5515.

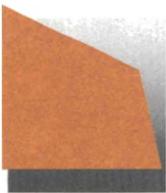
ECONOMIC PERSPECTIVES is also available on the World Wide Web at <http://www.frbchi.org>.

Articles may be reprinted provided the source is credited and the Public Information Center is sent a copy of the published material.

ISSN 0164-0682

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

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



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 Modigliani 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

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

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

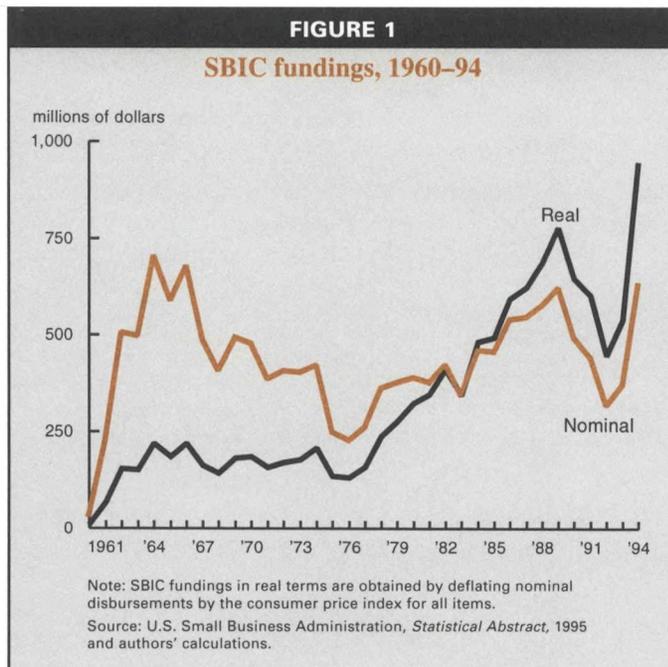
firms being financed; the dollar amount and type of financing provided (loans, equity, or debt with equity features); whether there was a put option on the equity financing, requiring the small firm to repurchase its equity in the future; whether the deal included debt financing; the interest rate charged; 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



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	

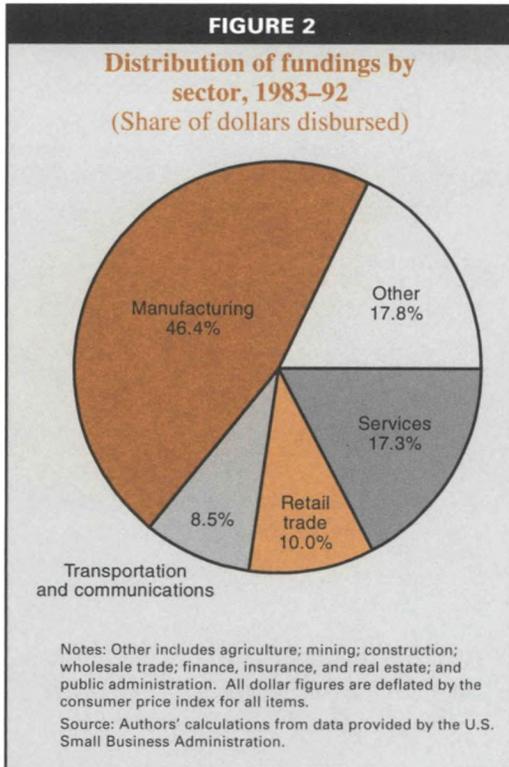
Notes: Sample consists of all transactions over the 1983–92 period for which complete data are available. Nondebt financings include equity, debt with equity features, and combinations of equity and debt with equity features. Transaction-oriented uses include plant modernization, consolidation of debts, 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



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:

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

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 (<i>million \$</i>)	35.40	40.48*
Age (<i>years</i>)	14.43	12.21*
Corporate (<i>% of total</i>)	82.38	69.55*
Bank-affiliated (<i>% of total</i>)	23.48	50.02*
SBA leverage (<i>SBA funds/private capital</i>)	1.94	0.99*
Return on assets (<i>at market value</i>)	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 COMPUSTAT 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 non-debt 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

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

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.

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

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.

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

¹Empirical 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.

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

³The 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.

⁴On 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.

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

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

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

⁸This 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.

⁹For 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.

REFERENCES

Barclay, Michael J., and Clifford W. Smith, Jr., "The maturity structure of corporate debt," *Journal of Finance*, Vol. 50, No. 2, 1995a, pp. 609–631.

_____, "The priority structure of corporate liabilities," *Journal of Finance*, Vol. 50, No. 3, 1995b, pp. 899–917.

Barry, Christopher B., "New directions in research on venture capital finance," *Financial Management*, Vol. 23, No. 3, 1994, pp. 3–15.

Berger, Allen N., and Gregory F. Udell, "Collateral, loan quality, and bank risk," *Journal of Monetary Economics*, Vol. 25, No. 1, 1990, pp. 21–42.

_____, "Relationship lending and lines of credit in small firm finance," *Journal of Business*, Vol. 68, No. 3, 1995, pp. 351–381.

Berlin, Mitchell, Kose John, and Anthony Saunders, "Should banks hold equity in borrowing firms?" New York University, Stern School of Business, working paper, 1993.

Brewer III, Elijah and Hesna Genay, "Funding small businesses through the SBIC program," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 18, No. 3, May/June 1994, pp. 22–34.

Brewer III, Elijah, Hesna Genay, William E. Jackson III, and Paula R. Worthington, "Performance and access to government guarantees: The

case of small business investment companies," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 20, No. 5, September/October 1996, pp. 16–32.

Diamond, Douglas, "Monitoring and reputation: The choice between bank loans and directly placed debt," *Journal of Political Economy*, Vol. 99, No. 4, 1991, pp. 688–721.

dos Santos, Joao Cabral, Bank capital and equity regulations: Implications for banks financing small firms, Federal Reserve Bank of Cleveland, working paper, 1995a.

_____, "Debt and equity as optimal contracts," Federal Reserve Bank of Cleveland, working paper series, No. 9505, 1995b.

Eliehausen, Gregory E. and John D. Wolken, "Descriptive statistics from the 1987 *National Survey of Small Business Finances*," Board of Governors of the Federal Reserve System, June 1995.

Gompers, Paul A., "The rise and fall of venture capital," *Business and Economic History*, Vol. 23, No. 2, 1994, pp. 1–26.

_____, "Grandstanding in the venture capital industry," University of Chicago, working paper, 1995a.

_____, "Optimal investment, monitoring, and the staging of venture capital," *Journal of Finance*, Vol. 50, No. 5, 1995b, pp. 1461–1489.

Harris, Milton, and Artur Raviv, "Capital structure and the informational role of debt," *Journal of Finance*, Vol. 45, No. 2, 1990, pp. 321–349.

_____, "Financial contracting theory," in *Advances in Economic Theory: Sixth World Congress*, Vol. 2, Jean Jacques Laffont (ed.), Cambridge: Cambridge University Press, 1992.

Hooks, Linda, and Tim Opler, "What determines businesses' borrowing from banks?" *Financial Industry Studies*, August 1994, pp. 15–23.

Hoshi, Takeo, Anil Kashyap, and David Scharfstein, "Bank monitoring and investment: Evidence from changing structure of Japanese corporate banking relationship," in *Asymmetric Information, Corporate Finance, and Investment*, R Glenn Hubbard (ed.), Chicago: University of Chicago Press, 1990a.

_____, "The role of banks in reducing the cost of financial distress in Japan," *Journal of Financial Economics*, Vol. 27, 1990b, pp. 67–88.

_____, "Corporate structure, liquidity, and investment: Evidence from Japanese industrial groups," *Quarterly Journal of Economics*, Vol. 106, 1991, pp. 33–59.

Jensen, Michael C., "Agency costs of free cash flow, corporate finance, and takeovers," *American Economic Review*, Vol. 76, 1986, pp. 323–329.

_____, "The eclipse of the public corporation," *Harvard Business Review*, September 1989, pp. 323–329.

Jensen, Michael C., and William H. Meckling, "Theory of the firm: Managerial behavior, agency costs, and ownership structure," *Journal of Financial Economics*, Vol. 3, 1976, pp. 305–360.

Lerner, Joshua, "Venture capitalists and the decision to go public," *Journal of Financial Economics*, Vol. 35, No. 3, 1994, pp. 301–318.

Lerner, Josh, "Venture capitalists and the oversight of private firms," *Journal of Finance*, Vol. 50, No. 1, 1995, pp. 301–318.

Modigliani, Franco, and Merton H. Miller, "The cost of capital, corporation finance, and the theory of investment," *American Economic Review*, Vol. 48, 1958, pp. 261–297.

Nakamura, Leonard, "Recent research in commercial banking: Information and lending," *Financial Markets, Institutions, and Instruments*, Vol. 2, No. 5, 1993, pp. 73–88.

Petersen, Mitchell A., and Raghuram G. Rajan, "The effect of credit market competition on firm-creditor relationships," University of Chicago, working paper, 1993.

_____, "The benefits of firm-creditor relationships: Evidence from small business data," *Journal of Finance*, Vol. 49, No. 1, 1994, pp. 3–37.

Pozdena, Randall J., "Why banks need commerce powers," *Economic Review*, Federal Reserve Bank of San Francisco, Summer 1991, pp. 18–30.

Rajan, Raghuram G., "Insiders and outsiders: The choice between informed and arm's-length debt," *Journal of Finance*, Vol. 47, No. 4, 1992, pp. 1367–1400.

Sahlman, William A., "The structure and governance of venture-capital organizations," *Journal of Financial Economics*, Vol. 27, No. 2, 1990, pp. 473–521.

Schleifer, Andrei, and Robert W. Vishny, "Liquidation values and debt capacity: A market equilibrium approach," *Journal of Finance*, Vol. 47, No. 4, 1992, pp. 1343–1366.

Stulz, René M., "Managerial discretion and optimal financing policies," *Journal of Financial Economics*, Vol. 26, No. 1, 1990, pp. 3–28.

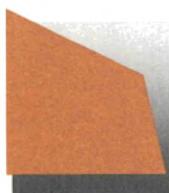
U.S. General Accounting Office, *Financial Health of Small Business Investment Companies*, report to the chairman of the U.S. Senate Committee on Small Business, Washington, DC: GAO, No. GAO/RCED-93-51, 1993.

U.S. Small Business Administration, Investment Division, *SBIC Program Statistical Package*, Washington, DC: SBA, 1995.

Williamson, Oliver, "Corporate finance and corporate governance," *Journal of Finance*, Vol. 43, 1988, pp. 567–591.

CRA and fair lending regulations: Resulting trends in mortgage lending

Douglas D. Evanoff and Lewis M. Segal



In response to concerns that banks were not adequately serving the credit needs of their local communities and not treating all applicants fairly, during the 1960s and 1970s Congress passed the fair lending laws and the Community Reinvestment Act (CRA).¹ These laws, aimed at eliminating discriminatory lending practices and encouraging lending to low-income individuals and in low-income areas, have been controversial since their inception. Community advocates argued that the acts were either inadequate or inadequately enforced and that banks continued to channel deposits away from local communities, resulting in inadequate financing for the areas most in need. Bankers argued that they treated applicants fairly and the acts smacked of credit allocation that could adversely affect bank safety and soundness.

Although there continues to be significant disagreement regarding these regulations, recently there has been a wave of positive reviews of their effectiveness.² The regulations have been given credit for encouraging banks to implement special loan programs aimed at lower-income communities and for effectively channeling funds toward previously underserved areas and minority groups. Community advocates argue that significant progress has been made and continued enforcement will reap additional benefits. Some bankers state that in responding to the CRA they have discovered new, profitable, previously untapped lending opportunities. These opportunities have come

at a most convenient time as the demand in traditional lending markets has slowed.

While the arguments for the fair lending laws and the CRA are essentially ones of equity, there may also be economic arguments for constraining private market behavior and channeling funds to underserved areas. It may be that these credit flows produce positive externalities which, from a societal perspective, generate a total return greater than that received by the providers of the credit.³ That is, although society reaps the full benefits of providing this credit, the service provider (a bank in this case) may not. While this provides economic justification for channeling credit to particular markets, it does not necessarily warrant doing so through the banking system.

In this article, we examine the evolution of the fair lending regulations and the CRA. We then summarize the economic literature that pertains to these regulations. Finally, we evaluate the effectiveness of the fair lending laws and the CRA by analyzing recent trends in mortgage lending activity and discussing whether these trends are in line with the intent of the regulations. We ask whether the trends can be attributed to the regulations and whether the data suggest that the regulations have been successful.

Douglas D. Evanoff and Lewis M. Segal are economists at the Federal Reserve Bank of Chicago. They would like to thank John Bergstrom, Raphael Bostic, Paul Calem, Glenn Canner, and Lorrie Woos for helpful comments on earlier drafts, and Pat Dykes for her generous data support. They also acknowledge the technical assistance of Jonathan Siegel.

Evolution of the CRA and the fair lending laws

Although it is common to group together the Fair Housing Act, the Equal Credit Opportunity Act (ECOA), and the CRA, they are more accurately classified into two groups: the fair lending laws and the CRA. The fair lending laws are aimed at eliminating lending discrimination based on the inherent attributes of the borrower, such as race or gender. The CRA primarily addresses geographic discrimination, that is, failing to serve the credit needs of the local community in which the bank was chartered. The Home Mortgage Disclosure Act (HMDA) provides information on lending to individuals and locations, supporting the enforcement of both the fair lending laws and the CRA.

Fair lending laws

The Fair Housing Act was approved by Congress in 1968 as part of the Civil Rights Act of that year. It prohibits discrimination in residential real estate transactions based on race or color, religion, national origin, gender, handicap, or family status.⁴ The ECOA encompasses a broader array of transactions. Passed in 1974, it prohibits discrimination with regard to any aspect of a credit transaction (consumer, commercial, or real estate loan) based on race or color, religion, ethnic origin, gender, marital status, age, and receipt of public assistance.⁵

It has been argued that fair lending enforcement prior to the 1990s was generally unaggressive.⁶ The techniques employed to detect discrimination (reviewing whether internal policies were followed and performed uniformly across the protected factors) typically detected only the most blatant cases of discrimination. Since that time, in response to growing public concern about lending discrimination and well-publicized research that reported evidence of discrimination, regulatory agencies and the U.S. Department of Justice have stepped up their enforcement efforts. For example, a 1988 study of mortgage discrimination in Atlanta led the Justice Department to initiate an investigation into fair lending practices by depositories in that market.⁷ The investigation resulted in the first major lawsuit filed by the department against an institution for violating fair lending laws.⁸ This is in sharp contrast to the number of suits filed for civil rights violations in other areas, for example,

housing and employment. Congress also responded to repeated claims of lending discrimination by amending the Fair Housing Act in 1988 to allow private parties to originate mortgage discrimination lawsuits more easily. The ECOA was amended in 1991 to require bank regulators to refer cases to the Department of Justice instead of handling them independently, sending a signal that the department was going to be more aggressive in the prosecution of such cases. Perhaps most significantly, the 1975 HMDA was amended in 1988, 1989, and 1991 to develop a database that would provide regulators and the public with data to analyze depository institution lending patterns.

As originally enacted, HMDA required depository institutions and their subsidiaries to provide the total number and dollar value of mortgages originated and purchased in the local market, typically segmented by census tract. The 1989 amendment required lenders to report information at the loan application level regarding race, gender, and income, along with details on the disposition of the application (deny/accept/withdraw, reason for denial, etc.).⁹ Banks were required to make the data publicly available. These expanded data have enabled regulators to complement their manual reviews of loan files with systematic statistical analysis.¹⁰ The additional data also allow the public to more closely scrutinize lending patterns of depository institutions.

There have also been recent efforts by bank regulators to help depository institutions comply with fair lending regulation by clarifying the compliance requirements. While the purpose of fair lending laws and regulations is relatively straightforward, there have been problems in implementation, and disagreements have arisen between regulatory agencies and lenders as to interpretations of the law. To provide guidance, a 1994 interagency task force representing the federal depository regulators released guidelines as to what could constitute discriminatory lending practices.¹¹ Under these fair lending guidelines, a lender may not, because of a prohibited factor:

- Fail to provide information or services or provide different information or services regarding any aspect of the lending process, including credit availability, application procedures, or lending standards;

- Discourage or selectively encourage applicants with respect to inquiries about or applications for credit;
- Refuse to extend credit or use different standards in determining whether to extend credit;
- Vary the terms of credit offered, including the amount, interest rate, duration, or type of loan;
- Use different standards to evaluate collateral;
- Treat a borrower differently in servicing a loan or invoking default remedies;
- Use different standards for pooling or packaging a loan in the secondary market;
- Express, orally or in writing, a preference based on these prohibited factors, or indicate that it will treat applicants differently based on these factors; or
- Discriminate because of the characteristics of a person associated with a credit applicant or the prospective occupants of the area where property to be financed is located.¹²

While blatant discrimination may be obvious to most parties, there are times when sound business practices may result in an unintended discriminatory practice against a protected group. To emphasize to lenders the need to avoid unintended effects in setting underwriting criteria, the interagency task force also listed the forms of discrimination that the courts had previously recognized as illegal. These include: *overt discrimination*—the lender openly discriminates; *disparate treatment*—the lender treats applicants differently based on one of the prohibited factors (whether or not it is motivated by prejudice or intent to discriminate); and *disparate impact*—the lender applies a practice uniformly to all applicants, but the practice has a discriminatory effect and cannot be justified by business necessity.

As a result of the increased scrutiny of lending practices by regulators, there has been a significant increase in the number of ECOA violations referred to the Department of Justice by the regulatory agencies and in the number of suits filed by the department for violation of the fair lending laws. Most of the suits have been settled through well-publicized consent agreements, which relayed the message of stringent enforcement of the fair lending laws.

In evaluating the effect of the fair lending laws on mortgage activity, therefore, one would expect to see more of an impact on lending patterns in the 1990s, as institutions respond to increased regulatory pressure.¹³

The CRA

The major impetus for the 1977 passage of the CRA was concern by community groups that banks and thrifts were not responding adequately to the credit needs of local communities. Depository institutions were accused of discriminating against individuals based on the characteristics of their neighborhood, that is, redlining. This was seen as having a particularly adverse impact on minority groups and contributing to the deterioration of inner-city neighborhoods. However, the emphasis of the act was on adequately preserving communities and not on channeling credit based on race. Community groups argued that it was common for banks to reinvest a relatively small portion of deposits generated from local communities back into those markets.¹⁴

The initial community reinvestment bill was much more intrusive to banks than the final act. The initial proposal argued that banks were chartered institutions with access to a government safety net and, as such, had a formal responsibility to perform social functions in addition to pursuing the objectives of a private enterprise. The proposal defined the bank's relevant local market from which it received deposits and required it to focus on satisfying credit demands in this market prior to *exporting* funds to other areas. Banks argued that such behavior would run counter to existing safety and soundness regulation and constituted overt credit allocation without regard to the credit quality of applicants in different geographic areas.

The final act omitted the explicit credit allocation criteria. It required financial institutions to serve the *convenience and needs* of the communities in which they were chartered without mandating how this was to be accomplished. Additionally, it emphasized the need for bank management to be conscious of community credit needs and stressed that this was to be done without sacrificing safety and soundness.

The mandate of the CRA, to have institutions serve the needs of the community in which they are chartered, was actually already in place.

The 1935 Banking Act required banks to meet the convenience and needs of their communities, as did the 1956 Bank Holding Company Act and the bank charter itself. The fair lending laws, while not explicitly outlawing redlining, addressed similar concerns. Finally, while HMDA provided no mechanism for imposing sanctions on depository institutions, the data were being collected precisely for the purpose of monitoring lending patterns and detecting neighborhood redlining. The real thrust of the CRA was to reemphasize the need for good lending practices, to shift the emphasis on reinvestment away from the liability side of the balance sheet (deposit gathering) to the asset side (credit generation), and to put the onus squarely upon regulators to monitor the lending patterns of financial institutions and encourage investment in local communities.

In the early years of the CRA, regulatory agencies required banks to specify their local community; develop a public statement, including the local community definition and listing the type of credit instruments the bank intended to provide; post a list of consumer rights under the CRA; and maintain a file of public comments for public inspection. These procedural requirements were relatively straightforward. In addition, regulators performed an evaluation to "assess the institution's record of meeting the credit needs of the entire community, including low- and moderate-income neighborhoods, consistent with the safe and sound operation of each institution" (Regulation BB).

To assess the institution's performance in satisfying this requirement, the regulators developed 12 assessment factors grouped into five performance categories:¹⁵

Category A: Ascertainment of community credit needs

1. Communication with members of the community to ascertain credit needs; and
2. Extent of involvement by the board of directors in the CRA activities.

Category B: Marketing and types of credit offered and extended

3. Marketing efforts to make the types of credit offered known in the community;
4. The extent of loans originated in the community; and
5. The extent of participation in government loan programs.

Category C: Geographic distribution and record of opening and closing offices

6. The geographic distribution of credit applications, approvals, and denials; and
7. The record of office openings and closings and extent of service provided at the offices.

Category D: Discrimination and other illegal credit practices

8. Practices to discourage credit applications; and
9. Discriminatory or other illegal practices.

Category E: Community development

10. Participation in community development projects or programs;
11. The institution's ability to meet community credit needs; and
12. Other relevant factors which could bear upon the extent to which the institution is helping to meet the credit needs of the community.

For each of the assessment factors, the examiner was to assign a grade of 1 (exceptional) to 5 (significantly inferior), similar to the CAMEL rating given for safety and soundness evaluation. Later, to avoid confusion with safety and soundness ratings, the CRA rating was changed to a four scale grading system: outstanding, satisfactory, needs to improve, or substantial noncompliance.

The regulations did not impose explicit sanctions on institutions found not to have adequately served the needs of their communities. Instead, the regulator was to consider the CRA rating along with other factors, such as safety and soundness, when ruling on an application for a geographic expansion of facilities through a merger or acquisition, the introduction of new branches, an office change, etc. However, there are additional costs from having a poor CRA rating or being accused of poor CRA performance, even if the application is ultimately approved. For example, the application process can be significantly lengthened and complicated if community groups protest the application. In a period in which banks were aggressively expanding geographically, the potential for lost deals, delays in expansion, and negative public relations could be quite burdensome.

Following passage of the act, bankers frequently complained about the vagueness of the requirements, including the lack of a specific ranking or weighting scheme for the assessment factors to guide the allocation of resources. Regulatory agencies would periodically issue policy statements providing guidance to institutions as to how the assessment criteria were scored and discussing elements of effective CRA programs. Most of these statements emphasized effort, and the documentation of such effort, instead of performance. In the late 1980s, Congress amended the act to have the assessments made public and increased public scrutiny of banks and regulators.

As with the fair lending laws, enforcement of the CRA intensified in the early 1990s. Denials of merger or acquisition applications based on poor CRA performance became more common. Although the ratings were not made public prior to 1990, evidence suggests that regulators have tightened enforcement and have been more strict in assigning CRA ratings.¹⁶ To stress the commitment to low-income financing, Congress passed the Federal Housing Enterprises Financial Safety and Soundness Act in 1991. This act put the Federal National

Mortgage Association and the Federal Home Loan Mortgage Corporation under an affirmative obligation to facilitate financing of low- and moderate-income housing. It also established mortgage purchasing goals for these agencies relating to low- and moderate-income families for affordable housing and for the central city. Bankers continued to complain about the vagueness of CRA requirements and the resulting regulatory burden. Community groups continued to complain that banks were inadequately serving the credit needs of their local communities and that regulators were inadequately enforcing the act.

After much public and congressional debate, new CRA regulations were issued in 1995 for implementation over the following two years. The new regulations stressed performance over effort in meeting CRA requirements and introduced a new evaluation system, replacing the previous 12 assessment factors with three new tests: *lending*, *investment*, and *service*. For each test a bank is assigned one of five grades from outstanding to substantial noncompliance. There is also an overall composite rating for CRA compliance.¹⁷

The lending test evaluates whether a bank has a record of meeting the credit needs of its local community. The regulator evaluates the number, amount, and distribution across income groups and geographic areas of mortgage, small business, small farm, and consumer loans in the assessment area(s) or communities.¹⁸ The regulator also considers the innovativeness of the bank in addressing the credit needs of low- or moderate-income individuals or areas and in generating community development loans. As illustrated in table 1, the lending test carries a disproportional weight in determining the composite rating. A bank cannot receive a composite rating of satisfactory or better unless it receives a minimum of low satisfactory on the lending test.¹⁹

The investment test evaluates how well a bank satisfies the credit

TABLE 1			
CRA test ratings			
Component test ratings are assigned to reflect the bank's lending, investment, and services.			
Component test ratings	Lending	Investment	Service
Outstanding	12	6	6
High satisfactory	9	4	4
Low satisfactory	6	3	3
Needs to improve	3	1	1
Substantial noncompliance	0	0	0
Preliminary composite rating is assigned by summing the three component test ratings and referring to the chart below.			
Points	Composite assigned rating		
20 +	Outstanding		
11-19	Satisfactory		
5-10	Needs to improve		
0-4	Substantial noncompliance		
Note: Adjustments to preliminary composite rating—no bank may receive a composite assigned rating of satisfactory or higher unless it receives at least low satisfactory on the lending test.			

needs of its local neighborhoods through qualified community investments that benefit the assessment area. Again, the bank's innovativeness in responding to community development needs is also taken into account.

Finally, the service test evaluates how well the credit needs of the community are met by the bank's retail service delivery systems. This includes the distribution of branches across areas serving low- to moderate-income individuals and geographies, as well as alternative delivery systems, such as ATM, telephone, computer, and mail. The delivery systems and services should be directed at meeting the needs of the local community, for example, low-balance checking accounts and extended lobby hours. Again, the innovativeness of the bank in using these alternative delivery systems to serve the low- and moderate-income individuals and neighborhoods within the community is taken into consideration.

Although it is too early to determine the effectiveness of the revisions to the CRA, a recent Government Accounting Office review of the new guidelines argued that regulators may face significant challenges in implementing the reforms.²⁰ The potential problems are similar to those which existed before the reforms, namely:

- A continued need for excessive documentation of effort and process;
- Inconsistency in ratings and uncertainty about the performance criteria;
- Incomplete consideration of all relevant material in determining the performance of the institution; and
- Dissatisfaction with regulatory enforcement (depending on one's perspective, too stringent or too lax).

To minimize potential problems, the report recommended that significant efforts be made to provide improved examiner training, improve the quality of the data used in evaluating performance, and increase the use of public disclosure of the ratings.

Evidence of discrimination in mortgage lending

The CRA was introduced because redlining was believed to be a common practice by banks. The fair lending laws were passed because there

was a perception that certain borrowing groups were not being treated equitably. However, there continues to be significant disagreement as to the extent of these problems.

Housing and mortgage discrimination has been a topical issue since the 1960s, when community groups argued that neighborhoods were deteriorating as a result of practices by mortgage originators. The originators were accused of using noneconomic criteria to limit funding to non-white applicants and/or non-white neighborhoods. Research in this area has intensified in recent years as amendments to HMDA reporting requirements have increased the availability of data used to compare lending patterns across race and ethnic groups, income groups, and geographic areas. However the data exclude many of the more relevant variables used in the credit evaluation process.²¹ The most meaningful studies of the role of race and neighborhood effects in mortgage lending incorporate information beyond HMDA data and evaluate discrimination based either on the neighborhood of the applicant or the characteristics of the individual applicant. These studies are divided into four classes: neighborhood redlining studies, application accept/reject studies, studies of default rates, and performance of institutions specializing in loans to low-income individuals or in low-income neighborhoods. Below, we summarize the studies to emphasize the ongoing controversies in this area of research.

Redlining studies

Redlining is the practice of having the loan decision based on, or significantly influenced by, the location of the property without appropriate regard for the qualifications of the applicant or the value of the property. As a result, the neighborhood's financial needs are not adequately served and the region is unable to develop economically. Redlining studies typically take the neighborhood as the unit of observation, evaluating whether the aggregate supply of funds made available is related to the racial composition of the area.

Early analysis of differences in loan originations across markets found significant differences based on the racial composition of the neighborhood. However, these studies attributed all market differences to the race variable.²² The findings from a number of recent studies,

which either directly or indirectly addressed the redlining issue and attempted to explicitly account for market differences, are summarized in box A.

Although improvements have been made in redlining studies, inherent methodological problems remain. First, in a number of redlining studies *the unit of observation may be too large*. To the extent redlining occurs, it could be for a relatively small area, such as two or three city blocks. In larger areas, such as metropolitan statistical areas (MSA), redlining may not be detectable in the aggregate data. Additionally, assuming some lenders redline and others do not, if borrowers eventually find the non-redlining lender, data at the broader level will imply that no redlining has occurred. The unit of observation should, therefore, be relatively small. There may also be a significant *omitted variable bias*. Exclusion of variables correlated with race may produce a significant coefficient for race even in the absence of discrimination. A standard criticism of redlining studies is that they inadequately account for demand factors. Thus, it is impossible to attribute differences in mortgage activity across markets to an inadequate supply of funding (redlining) or to a lower demand from potential borrowers. The creditworthiness of the applicant pool is also important since the riskiness of the loan will obviously be a determining factor in the underwriting decision. Additional variables to account for differences in borrower credit demand and creditworthiness that have been included in the recent studies are neighborhood average income, percent of owner-occupied houses, changes in property values, poverty and welfare rates, percent of housing units vacant, crime rates, wealth measures, mobility rates, average age of population and housing stock, total housing units, duration of residency, and the stock of conventional mortgages.

Typically, studies that have accounted for these market characteristics more comprehensively have reported a less significant impact of racial composition than that found in earlier studies. For example, when Holmes and Horvitz (1994) excluded measures of risk in their analysis of the Houston market, they found that the flow of mortgage credit was negatively associated with minority status, consistent with redlining. When the risk measure was includ-

ed, minority status was not found to influence the flow of credit.²³ Studies which employ a single-equation model to explain the amount of credit made available in a neighborhood will be mixing elements of both supply and demand for credit. Redlining will affect the supply loans. However, with the single-equation approach the supply and demand effects cannot be separated (Yezer, Phillips, and Trost, 1994). Arguing that the race variable represents discrimination requires that there be no demand-side effects. As mentioned above, a number of studies have shown this to be incorrect. Finally, *model specification* has been shown to drive some results (Horne, 1997). Concern with model specification argues that one should use a relatively flexible financial form which has the more commonly used alternative forms nested within it.

Some researchers have argued that the problems associated with the above credit flow type of redlining studies are too large to overcome and, as a result, these studies cannot adequately identify the role of racial composition of the neighborhood in loan decisions. An alternative approach, which addresses the problem of individuals eventually finding the non-redlining lender, is to directly survey individuals who were active in the mortgage market. Benston and Horsky (1992, 1979) surveyed home sellers and buyers to gather information on credit difficulties encountered in attempting to sell or purchase homes in several U.S. cities. Instead of viewing only the mortgages approved, the survey gathered information on individuals who requested credit but were unable to obtain it (for reasons such as redlining), in areas in which charges of redlining had been made and in control areas. If obtaining credit was a problem, additional information as to the reason for the problem was obtained—for example, unemployment, inadequate down payment, or location of the house. The survey explicitly asked home buyers if either a lending institution or real estate agent had stated or implied that obtaining a mortgage might be difficult because of the neighborhood in which the home was located. In both studies, the authors were unable to detect evidence of discrimination or unmet demand. The bottom line appears to be that there is little convincing evidence to suggest that redlining explains lending patterns in low-income neighborhoods.

Accept/Reject studies

Given the above criticisms of credit flow studies, the availability of more detailed HMDA data since 1990, and a desire to more directly address the discrimination issue, recent research has taken a more microeconomic approach. Accept/reject studies take individual application data and evaluate the determinants of the lender's decision. They estimate a probability of rejection function based on various risk factors and include a race variable to account for discrimination.²⁴ While these studies can also be used to test for redlining, their focus is on discrimination with respect to individual applicants. (For a sample of these studies, see box B.)

Prior to the availability of HMDA data, Black et al. (1978) used special survey data to determine the economic variables important to the lending decision and whether personal variables such as race played a role. After accounting for economic variables and terms of the loans, they found that, although the personal characteristics did not significantly add to the power of their model in explaining the accept/denial decision, race was significant. Black applicants had a higher probability of denial at the 90 percent significance level.

In a well-publicized accept/reject study, Munnell et al. (1992) used HMDA data augmented with survey information about the creditworthiness of borrowers to analyze lending behavior in Boston. A variable to account for the racial composition of the market was not found to affect the lender's accept/reject decision, but applicant race was found to be statistically related to the decision. Minorities were rejected 56 percent more often than equally qualified whites.

The Boston study has been criticized for a number of reasons.²⁵ First, as with the credit flow studies, there is the potential for omitted variable bias. If omitted variables are associated with the race variable, the coefficient on race will account for the true effect of race plus that of the omitted variable(s). The Boston study included several variables to account for borrower risk. However, not all risk factors could be captured, and some researchers argue that the race coefficient is actually capturing the riskiness of the applicant. Race would appear significant in an analysis which fails to account for wealth if, as has been shown elsewhere, minorities have lower levels of wealth.

There was also little consideration of the characteristics of the property and credit history of the applicant. Second, the study has been criticized for data errors. These potential data errors include monthly incomes that are inconsistent with annual levels, negative interest rates, loan to value ratios exceeding one, loan to income ratios outside reasonable ranges, the inclusion of black applicant denials because of over-qualification for special lending programs, and a number of extreme outliers. Brown and Tootell (1995) and Munnell et al. (1996) contend that even after accounting for the data concerns, the fundamental result remains—minorities are more likely to be denied mortgages than similarly qualified whites.

Other follow-up studies have shown mixed results. Using data from Munnell et al. (1992), Zandi (1993) found no race effect, while Carr and Megbolugbe (1993) found the effect remains after "cleaning the data," as did Glennon and Stengel (1994). Using a model similar to that in Munnell et al. to evaluate the Boston and Philadelphia markets, Schill and Wachter (1993) found evidence consistent with redlining and discrimination. When variables are included to proxy for neighborhood risk, the neighborhood racial composition became insignificant, although racial status still significantly decreased the probability of acceptance. Stengel and Glennon (1995) also found that it is important to use bank-specific guidelines in the analysis to capture unique, but economically based, underwriting criteria. Using a more generic market model, for example, secondary market criteria, can lead to misleading results.²⁶ Using cleansed data from Munnell et al. (1992), Hunter and Walker (1996) did not find evidence of discrimination via higher underwriting standards for all minorities. They contend that race matters only in the case of *marginally qualified* applications. Needless to say, there is little uniformity of view.

Yezer (1995) and Rosenblatt (1997) argue that fundamental problems in the use of accept/reject models to evaluate discrimination result from the informal prescreening of applicants. Both applicants and lenders only want to proceed with applications that appear likely to qualify for a loan because denials are costly for both parties. Thus, during the initial lender-borrower contact, the lender and borrower decide whether the application warrants pursuing. Then, the formal application takes place, and

denials occur only in those cases in which information not available in the initial contact affects the decision (for example, bad credit history). Therefore, denial may be as closely related to communication skills and cultural background as to economic variables. *Sophisticated* underqualified potential applicants will not reach the formal application process because they realize they will not be accepted, while *unsophisticated* candidates will follow through only to be denied. Thus, there is a significant selection bias problem in the formal application stage which may explain the race differentials. To support this view, Rosenblatt (1997) cites evidence that education levels are strongly predictive of credit approvals. The argument, therefore, is that the information in denial rate data may not be what researchers perceive it to be.

Default rate studies

An alternative means of evaluating lender discrimination is to examine the default rates of borrowers thought to be discriminated against relative to other borrowers. Researchers have compared default rates across groups based on the theory that if minorities are overtly discriminated against, the average minority borrower should be of higher credit quality than the average nonminority borrower.²⁷ This should be reflected in mortgage default rates and resulting loss rates; for minority loans, both should be lower. However, studies have not found evidence of lower default rates for minority holders of mortgages. In critiquing the Boston study, Becker (1993) cited data indicating the default rates were equal for white and minority sections of the Boston market, which was not consistent with overt discrimination.²⁸ A more recent study by Berkovec et al. (1996) also tests for discrimination using default rates. Controlling for various loan, borrower, and property related characteristics, the authors evaluated the default rates and resulting losses for FHA-insured loans and found a higher likelihood of default on the part of black borrowers and higher loss rates. These results suggest that lenders, perhaps as a result of regulatory pressure, may have over-extended credit to minorities.

However, this line of research has also been criticized. First, if discrimination occurs, while the marginal minority borrower may be better qualified than the marginal white applicant, inferences about the average borrower

cannot be made without making assumptions about the distribution of creditworthiness across the two groups of potential borrowers, for example, Ferguson and Peters (1995). The distributions could be significantly different. Additionally, minorities may also be treated differently once they are in default. Default studies typically use data on foreclosures. Bank forbearance in defaults favoring one of the two groups could bias the results.²⁹

Performance studies

There are two general areas of research relating bank performance to the CRA and fair lending regulations. The first deals with the profitability associated with lending in low-income markets. If such lending is not profitable, regulation requiring it should adversely affect performance. The second area of research addresses the implications of mortgage discrimination on bank performance. If some banks are choosing to discriminate and forego profitable lending opportunities, other banks that do not discriminate should be able to exploit these opportunities.

During the debate prior to the enactment of the CRA, critics argued that economics was driving lending patterns and the CRA might either have no impact, but be costly to implement, or actually generate bad loans. From the banks' perspective it would be a tax and, if lending patterns did not change, it would be without benefits. If increased lending in the low-income market did occur, but was not as profitable as that in alternative markets, then the CRA would act as a tax and a credit redistribution mechanism. The argument in favor of the CRA was that banks were foregoing profitable opportunities because of discriminatory behavior or market failure, and performance could be enhanced if they became more actively involved in this market (although performance could be adversely affected in the short run as start-up costs were incurred).

There have been a limited number of studies evaluating the effect on performance of lending in the low-income market. Canner and Passmore (1996) offered a number of testable hypotheses concerning the potential impact on profitability and the relationship between the extent of the bank's activity in this market and performance. They found no evidence of lower profitability at banks specializing in the low-income market, consistent with the view that,

once start-up cost are incurred, lending in this market can be just as profitable as in other markets.³⁰ Beshouri and Glennon (1996) evaluated the relative performance of credit unions that specialize in the low-income market and found that while these specialized firms have greater return volatility, higher delinquency rates, charge-off rates, and operating costs, they are compensated for these differences and generate similar rates of return. Similarly, in analyzing the performance of low-income and minority lending, Malmquist, Phillips-Patrick, and Rossi (1997) found that while low-income lending was more costly, lenders were compensated with higher revenues, making profits similar for both low- and high-income lending. Finally, Esty (1995) evaluated the performance of Chicago's South Shore Bank, which has been held up as the model community development bank with the dual objectives of making a profit and aiding in the development of the local community. Esty's analysis found the economic return of the bank to be substandard. Shareholders, however, appeared to be willing to trade off the lower return for the social return received from community improvement. That is, the shareholders' objectives were apparently aligned with the dual objectives of the bank.³¹ In interviews with shareholders and employees, Lash and Mote (1994) found similar evidence of a willingness to trade off economic profit to emphasize the development objective. While the behavior of South Shore's management and shareholders may be admirable, if Esty's analysis is correct, it is not obvious that this model can be implemented across the entire industry.

The second performance-related area of research deals with the profit implications of discrimination. If an institution overtly discriminates, it will deliberately forego profitable lending opportunities. This implies that lenders that do not discriminate will be the beneficiaries of this behavior. Assuming that minority-owned banks do not discriminate against minorities, one might expect them to outperform the discriminating-banks. Calomiris, Kahn, and Longhofer (1994) developed a model of *cultural affinity* to explain differences in minority denial rates. Their basic argument is that because of a general lack of familiarity with the culture of minority applicants, the typical white loan officer may not be as accommodating with these applicants as he would with a white

applicant. For the minority applicant, the loan officer will rely more heavily on low-cost, objective information instead of making the extra effort, as with the white applicant, to obtain additional information to improve the chances of approval. There is some empirical support for this argument (see Hunter and Walker, 1996). Again, this implies that minority-owned banks should benefit, since they will not lack a cultural affinity with minority applicants.³²

If discriminatory banks forego profitable opportunities, *ceteris paribus*, minority-owned banks should have superior profitability, lower minority denial rates, and lower bad loans. However, the empirical evidence does not support this. A number of studies have found that minority-owned banks have lower profits (Bates and Bradford, 1980, Boorman and Kwast, 1974, and Brimmer, 1971). There is also evidence of higher loan losses at minority-owned banks (Kwast, 1981). Additionally, there is evidence that bank ownership shifts from white to black control result in fewer loans being generated (Dahl, 1996). Generally, there is evidence that minority-owned banks do not have particularly good performance or lending records and have relatively poor CRA ratings (Kwast and Black, 1983, Clair, 1988, and Black, Collins, and Cyree, 1997). This evidence is not consistent with overt discrimination.

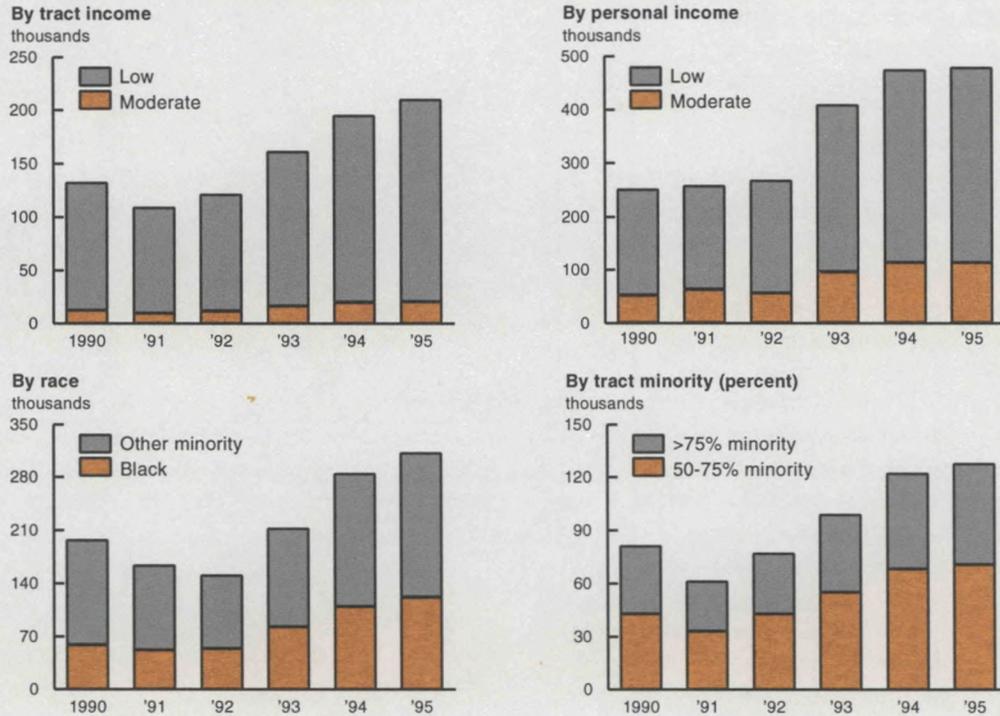
In summary, the findings for the various forms of discrimination are quite mixed. While some studies have found race to be a factor in loan decisions, the evidence is far from conclusive. Additionally, methodological problems bring into question the validity of many studies. Parties on either side of the issue frequently draw uncritically on the studies that align with their own position. Additional research is needed before we can draw meaningful conclusions about race and the credit decision.

Recent trends in mortgage activity: The effect of regulation

How successful has the recent enforcement of the CRA and the fair lending laws been? Headlines proclaiming surges in credit to minority groups suggest that the stricter enforcement of the CRA and fair lending laws during the 1990s has been successful. Most of these claims are based on recent trends in lending to low-income individuals or in low-income neighborhoods, such as those presented in figure 1.³³

FIGURE 1

Mortgage originations—1-4 family, owner-occupied



Note: See footnote 33 for the definition of income groups and footnote 40 for an explanation of inclusion of data in the sample. Source: Home Mortgage Disclosure Act data, various years.

Between 1990 and 1995 the annual number of mortgage originations to low- and moderate-income households, in low- and moderate-income census tracts, and to minorities almost doubled. New loans in census tracts where minorities accounted for at least half the population also grew significantly. As figure 1 shows, there was a considerable increase in the number of loans to individuals targeted by fair lending and CRA regulations. Some bankers argue that the regulatory mandate to increase lending in low-income neighborhoods and to low-income individuals has actually been a blessing in disguise as it has opened up new, lucrative, previously untapped markets. Others continue to criticize the regulations.³⁴

A full assessment of the success of the CRA and the fair lending programs would require a comprehensive cost-benefit analysis. Accurately quantifying the cost is difficult.³⁵ It is also difficult to quantify the success of these programs because of the vagueness of the legislation and the regulations enforcing it. The mandate to banks was to use the proper criteria

in making loan decisions and to reach out to the local community, including low- and moderate-income neighborhoods and individuals. Based on this mandate, success may not require any change in lending patterns. Another problem with associating recent lending patterns with regulation is the lack of a control group. The issue is not whether lending to the targeted groups increased, but whether it increased as a result of the regulations,

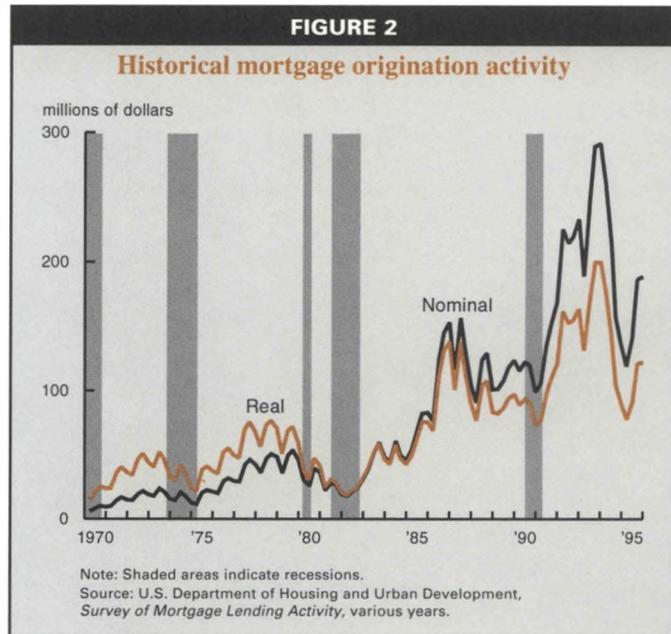
There are, however, a number of credit flow measures often associated with the CRA and fair lending laws. Concerning redlining, one would want to analyze changes in the volume and dollar value of loans flowing into low-income or minority neighborhoods. The number of applications in these areas could also be considered if redlining resulted in applications not being accepted from these areas. Some argue that the purpose of the regulations was to increase the flow of credit to specific groups of borrowers (based either on income or race), therefore, credit flows to those particular groups could be analyzed. It has also been

argued that the elimination of differences in denial rates may be desirable.³⁶ Concerning fair lending, one would want to analyze changes in lending to minority individuals and/or denial rates.

Although data limitations hamper the degree to which rigorous analysis of the regulatory impact can be undertaken, we can evaluate lending patterns and check for trends consistent with what are typically perceived to be desired changes. We use three different control group specifications. First, we compare lending patterns pre- and post- the recent regulatory changes. Second, we compare the degree of lending to targeted groups (minority and low-income individuals and neighborhoods) with lending to nontargeted groups. Last, we compare the lending behavior of more heavily regulated depository institutions with that of less regulated mortgage companies.

Below, we present evidence on these credit flows and discuss how they align with the goals of the legislation. We would expect the CRA and fair lending reforms of the late 1980s and early 1990s to have increased lending to minority and low-income individuals and low-income neighborhoods. We would also expect that most of the impact would be concentrated in recent years as regulatory, legal, and public scrutiny intensified and the cost of failing to satisfy the requirements increased. We analyze two potential effects. If the regulations were successful in getting lenders to expand their business into new markets, this might influence the overall level of mortgage activity. Alternatively, we may see distributional effects as lenders allocated a larger share of the credit pool toward the new markets.

To analyze the effect on the aggregate level of mortgage activity, we used a nominal dollar measure of all mortgage activity for 1970 through 1995, combining originations and refinances, from the Survey of Mortgage Lending Activity issued by the U.S. Department of Housing and Urban Development (see figure 2). Figure 2 suggests considerable growth in mortgage originations over the 1990s, in particular 1993–94. Can the high rate of



growth in the 1990s be attributed to regulatory-induced changes in lending behavior or to other factors related to the aggregate demand for housing credit? Three pieces of evidence suggest that the latter hypothesis may be more accurate. First, there is considerable growth throughout the entire period, even in real terms as indicated by the colored line depicting the dollar value of mortgage originations deflated by the Consumer Price Index for Urban Workers. The colored line also highlights the procyclical and seasonal nature of mortgage originations. Second, there is a substantial decline in the number of mortgage originations after the 1993 peak, which might be due to a curtailment of refinance activity.³⁷ Clearly, there is no regulatory explanation for this decline. There are probably a number of factors beyond regulation that affect the number of originations and increase the difficulty of graphically detecting a structural break. To address this, we use a regression model of the quarterly growth rate of originations, controlling for the growth rate of gross domestic product (GDP), the change in mortgage rates, and the growth rate of the consumer price index.³⁸ Quarterly indicators are included to absorb the seasonality in the dependent variable. Table 2 displays the regression results. In column 1, over 50 percent of the variation in the growth of originations is explained by the right-hand-side variables. The coefficients suggest that an increase in

TABLE 2

Model of aggregate growth in U.S. mortgage activity

	Model 1	Model 2	Model 3	Model 4
Intercept	-10.01** (4.66)	-6.98 (5.37)	-7.88 (5.35)	-6.75 (5.13)
Growth of real GDP chain weighted	3.18** (1.58)	2.71* (1.64)	2.92* (1.62)	2.90* (1.58)
Change in mortgage rates	-11.84** (2.91)	-11.24** (2.95)	-11.41** (2.96)	-11.04** (2.94)
Growth of CPI-U	-2.15 (2.11)	-3.27 (2.33)	-3.02 (2.37)	-3.53 (2.30)
Quarter 2 seasonal	35.66** (4.19)	35.47** (4.18)	35.52** (4.20)	35.39** (4.16)
Quarter 3 seasonal	16.49** (4.08)	16.31** (4.08)	16.37** (4.09)	16.29** (4.06)
Quarter 4 seasonal	1.66 (4.07)	1.47 (4.07)	1.53 (4.08)	1.46 (4.05)
1990 and beyond		-4.2 (3.72)		
1991 and beyond			-3.27 (4.02)	
1992 and beyond				-6.24 (4.21)
Error degrees of freedom	91.00	90.00	90.00	90.00
Adjusted R ²	0.54	0.54	0.54	0.55
Durbin Watson	2.21	2.19	2.20	2.22
** Indicates a t-statistic greater than or equal to 1.96.				
* Indicates a t-statistic greater than or equal to 1.64.				
Note: Standard errors are in parentheses.				

mortgage rates corresponds to a decrease in the growth of mortgage originations, while an increase in the growth rate of GDP corresponds to an increase in the level of originations. The controls for seasonality, the quarterly indicator variables, suggest faster growth in mortgage originations in the second and third quarters than in the first and fourth. Column 2 of the table presents the regression model with the addition of a binary variable to capture a structural shift in the post-1990 period. The coefficient of the post-1990 indicator variable is actually negative, but is significant at only the 74 percent confidence level. Therefore, the regression model is unable to support the hypothesis that mortgage originations were stronger in the period following the recent regulatory changes. Tests for structural breaks for post-1992 and post-1993, columns 3 and 4, produced similar results.

Although we find the recent growth in mortgage lending is consistent with earlier

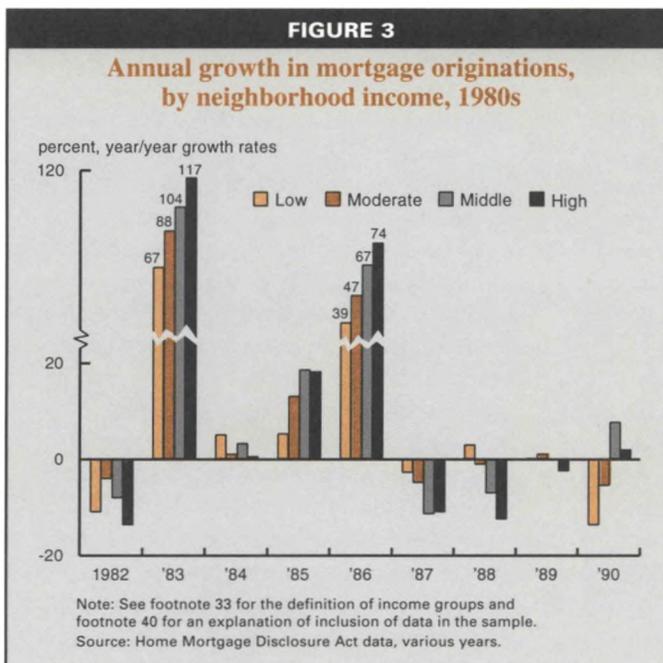
patterns, the regulations may have resulted in distributional changes in lending patterns.³⁹ That is, there may be a shift in lending emphasis away from traditional markets toward low- or moderate-income groups and individuals. To evaluate this, we assembled HMDA data for depository institutions and their affiliates over the 1982-95 period and decomposed the data by income groups and, when possible, racial groups.⁴⁰

To the extent that regulations influence lending patterns, we have argued above that the effect would be most evident in recent years, because of increased scrutiny, and most pronounced among low-income and minority borrowers and neighborhoods. We therefore divided total lending activity into four income categories and evaluated growth trends in the number of mortgage applicants, originations, and dollar value of originations for the 1990s. We also developed data for the number and dollar value of originations for the 1980s by neighborhood income levels.⁴¹ Table 3 shows

TABLE 3			
Base mortgage lending data, 1990			
	Applications	Acceptances	Dollars
	(000s)	(000s)	(billion)
Total Applications	1,491.35	1,276.16	127.72
Tract income/MSA income shares			
Low income	0.01	0.01	0.01
Moderate income	0.10	0.09	0.08
Medium income	0.57	0.57	0.49
High income	0.31	0.33	0.43
Applicant income/MSA income shares			
Low income	0.05	0.04	0.01
Moderate income	0.17	0.16	0.08
Medium income	0.27	0.28	0.20
High income	0.50	0.53	0.71
Race shares			
White	0.82	0.84	0.82
Black	0.06	0.05	0.04
Other minority	0.11	0.11	0.13

Source: HMDA data, see footnotes 33 and 40.

the 1990 levels and relative shares of mortgage activity on which our analysis is based. The targeted groups received a relatively small portion of the applications, originations, and dollars. Low- and moderate-income tracts account for approximately 10 percent of the applications and loans and slightly less of the

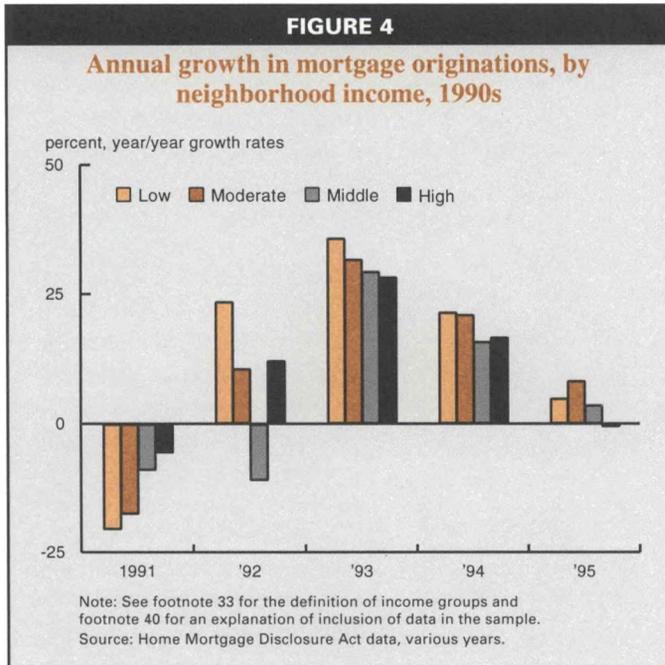


dollars lent. Low- and moderate-income individuals, as opposed to home purchases in low- and moderate-income tracts, represent nearly 20 percent of applications and originations, but still less than 10 percent of the dollars lent. Roughly 80 percent of mortgage activity (applicants, originations, and dollars) involved white applicants. These figures demonstrate that the targeted populations are a relatively small share of the aggregate, which may explain why increases may not be observable in the aggregate data.

The year-over-year growth rates for the number of loans originated by neighborhood income groups for the 1980s and 1990s are presented in figures 3 and 4, respectively. For the 1980s, growth in the low- and moderate-income groups lagged that in other areas. For four of the years in the 1980s, the low-income tracts showed the slowest growth and the moderate-income tracts also showed relatively slow growth. In these years, growth in the overall market was quite robust. Thus, for the 1980s overall, growth in loan volume was not particularly concentrated in the low- and moderate-income groups.

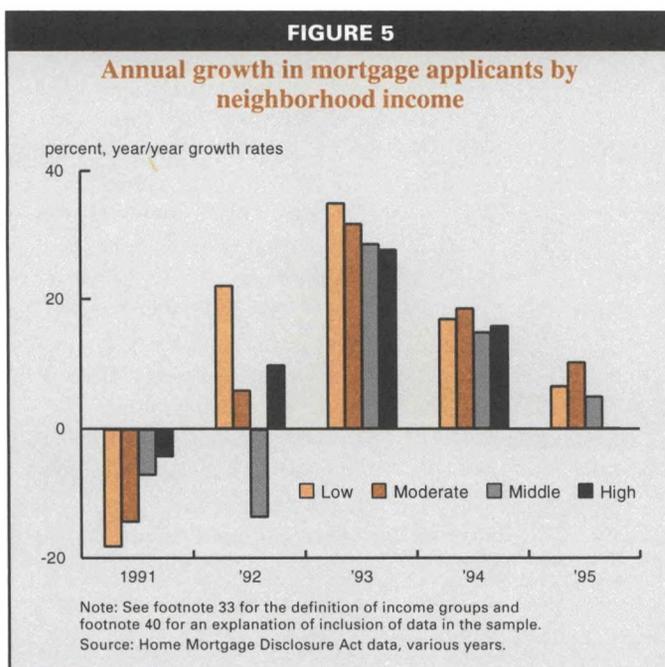
Originations to the low- and moderate-income groups grew more than 40 percent between 1985 and 1986, exceeding growth for these groups for any single year throughout the 1990s. However, the 1986 growth of mortgage originations in middle- and upper-income tracts still exceeded that of the low- and moderate-income groups.

Things changed in the 1990s. After 1991, growth was relatively fast in the two lowest income groups, particularly in the years when overall market growth was greatest. This finding suggests that banks have responded to the CRA and have made significantly more loans in the low- and moderate-income markets. The change is



overwhelmingly statistically significant based on a test of whether the share of loans in each income category is constant throughout the 1990s. We conclude that the growth in mortgage originations has not been uniform throughout the 1990s, consistent with the 1992 through 1994 growth spurt in lending to low- and moderate-income groups.

Figure 5 presents data for recent mortgage applications.⁴² After 1991, low- and moderate-

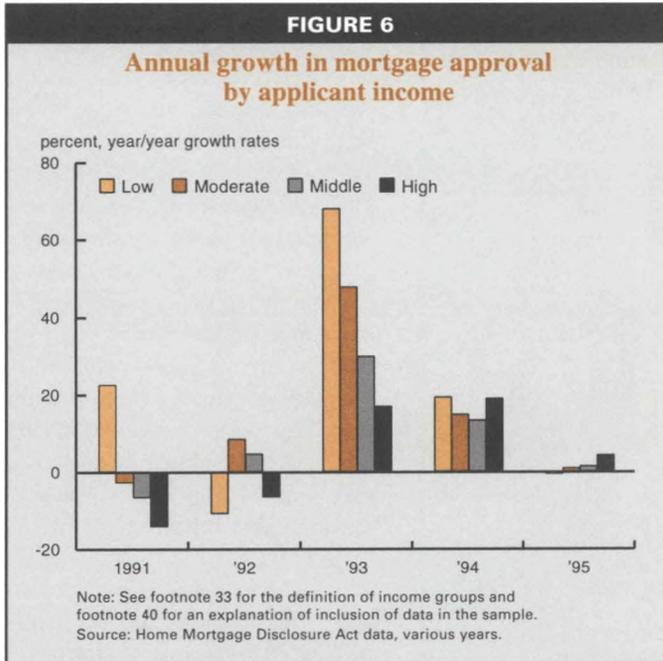


income neighborhoods saw significantly stronger growth than occurred in other areas. Growth in the middle-income group, where the majority of mortgage activity is occurring (see table 3), saw the slowest increase over this period. These trends are consistent with the view that banks have been making a significant effort to encourage applications from lower-income neighborhoods and with statements by community groups that progress is being made in less affluent neighborhoods. The test of differences across categories is again highly statistically significant.⁴³

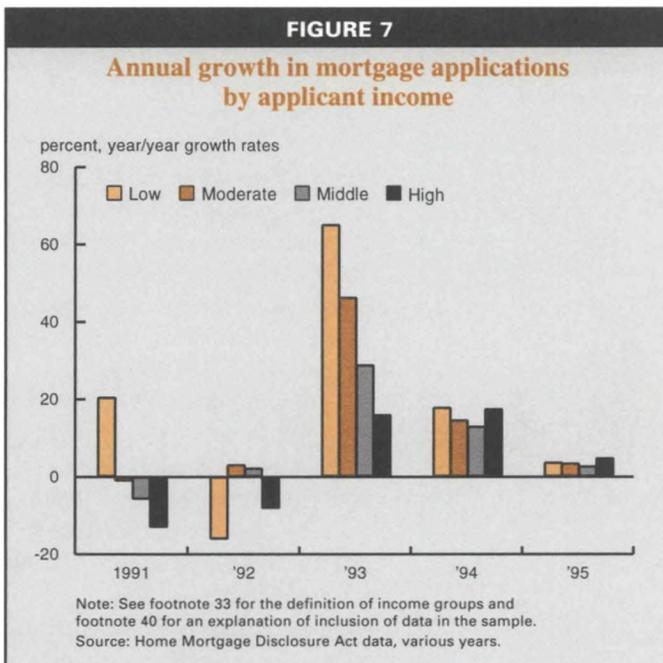
Figures 6 and 7 analyze mortgage activity by the income level of the borrower instead of the neighborhood in which the property is located.

While not quite as pronounced as the neighborhood data, figure 6 shows growth in mortgage activity to low- and moderate-income individuals, particularly for the years in which overall growth was greatest. The mortgage application data in figure 7 tell a similar story. Overall, the data suggest an increase in the growth of loan applications and loans approved for low- and moderate-income individuals, with much of the growth coming after 1992. However, the differences are only significant at the 46 percent and 54 percent confidence levels, respectively, for originations and applications. Thus, based on this test, lending to low- and moderate-income individuals was uniform throughout the 1990s. Data on applicant income were not collected for the 1980s so we cannot compare the two periods.

Figures 8 and 9 show loan activity by applicant race. While neither the CRA nor the fair lending laws explicitly require lenders to change underwriting criteria and affirmatively pursue additional minority mortgage business, lenders may believe that doing so will help them avoid charges of discrimination and be looked upon



more favorably during their regulatory assessment. The growth in minority applications and originations during the 1990s has been high relative to that for nonminorities. The increase in applications and originations among blacks is even more significant.⁴⁴ Figures 10 and 11 present a similar analysis based on the minority proportion of the census tract as opposed to the minority status of the applicant. Since 1991,



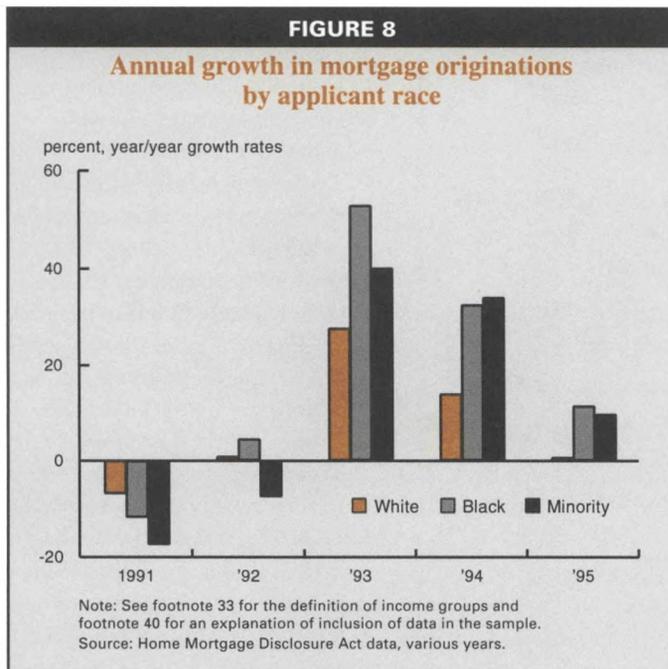
growth appears to have been relatively similar across the groups.

Several of the results in figures 3–11 are consistent with efforts by banks to target low- and moderate-income individuals and neighborhoods in their mortgage business. This observation is based not on the level of loans made but on the fact that the growth in lending to the targeted groups exceeded that to the non-targeted groups. One could argue, however, that the improvements are somewhat diminished, being from such a small base (see table 3). Lending in low- and moderate-income neighborhoods constitutes approximately 10 percent of total originations and even less of the dollar value of loans originated. Based on in-

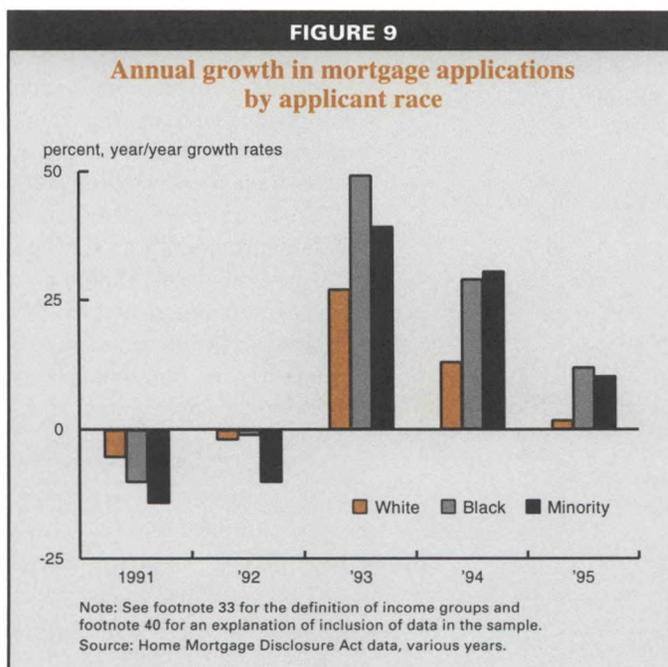
come alone, we would expect the demand for mortgages in these neighborhoods to be relatively low. Mortgage activity among low-income individuals constitutes approximately 20 percent of the market. However, the 31 percent growth in mortgage originations in low- and moderate-income tracts from 1993 to 1994 corresponds to nearly 35,000 loans and approximately \$2.7 billion. If all of this

change is attributed to the regulations, it translates to just over 100 loans and \$8 million per MSA.

In addition to the number of loans and applications, we evaluated denial rates for ethnic groups. Minorities have typically been shown to have higher denial rates than other applicants. One of the common debates in the literature and popular press is whether the differences across racial groups can be explained by economic characteristics.⁴⁵ We present two measures of differences in denial rates. The first is a standard odds ratio: Based on the loan decision, we calculate the odds of a minority applicant being denied a loan relative to the odds of a nonminority applicant being



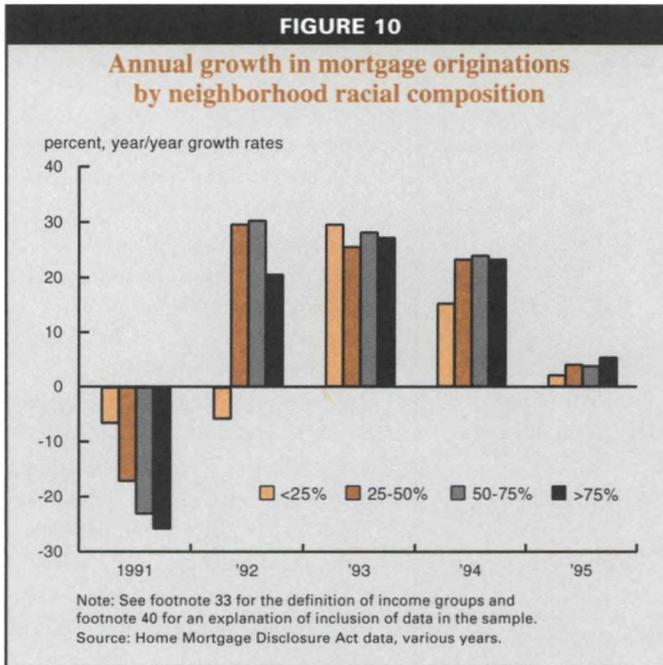
denied.⁴⁶ An odds ratio of 1 corresponds to equality of the denial odds for white and minority applicants; values above 1 correspond to more minority denials. If minority status is associated with lower creditworthiness, we would expect the odds ratio to be higher because of the differences in qualifications. To partially account for this, we also calculated an odds ratio conditioned on income and loan value.⁴⁷



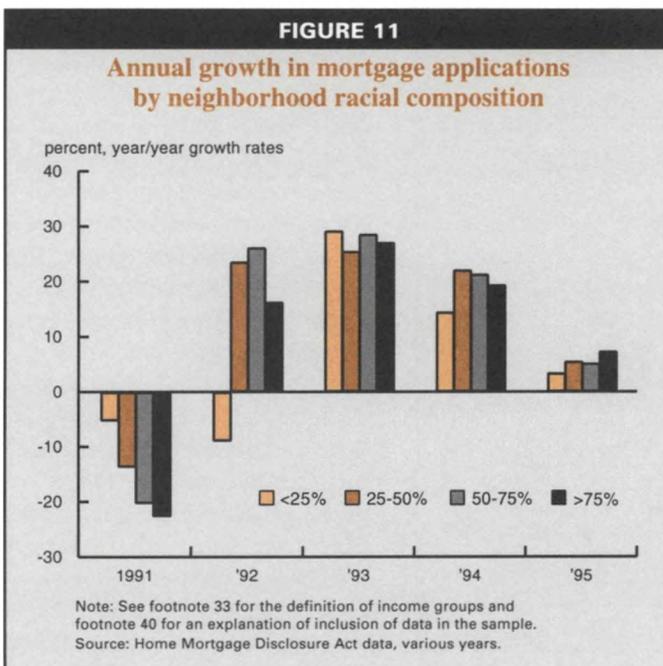
The odds ratios are presented in table 4.⁴⁸

Interpretation of the odds ratios as evidence of discrimination is difficult due to the small number of variables collected in the HMDA data. Instead, we focus on the changes in the ratio over time. Under the assumption of constant quality of the applicant pools, changes in the ratios may be attributed to changes in lender behavior. Cyclical economic changes, however, are likely to affect the creditworthiness of the applicant pool. To account for this, we also calculated the two odds ratio measures for a sample of independent mortgage companies. These are typically thought to be less stringently regulated with respect to the CRA, but they still report for HMDA purposes through HUD. Thus, we use these as a control group that we can contrast with the regulated banks to distinguish the effect of regulation.

As table 4 indicates, for depository institutions the unconditioned odds ratio is relatively stable during the 1990s.⁴⁹ The odds of a minority applicant being denied a mortgage request are approximately twice those of a nonminority applicant. The odds ratio and trend estimates are statistically different from 0 at the 99 percent confidence level. Differences between years are typically statistically significant at conventional levels. The conditioned ratio for banks is somewhat similar to the unconditioned measure, but declines throughout the period. The additional information embedded in the conditioned measure does explain part of the difference between the two borrowing groups; however, it leaves much unexplained. Additional information on the creditworthiness of the applicant and any discriminatory effects would be needed to explain the remainder. The declining trend in the odds ratio, after conditioning on a flexible specification



of loan amount and applicant income, suggests a change in the treatment of minority applicants relative to nonminority applicants over the 1990–95 period. Essentially, lenders became more accommodating to minorities. The effect is more apparent in the last two columns of the table, where we repeat the analysis using black/white odds ratios. These results are consistent with more stringent regulations



producing a change in lender behavior, assuming that the unobserved characteristics of the applicant pool remain constant over time.

The odds ratios for the independent mortgage companies are also presented in table 4. The ratios for these less regulated companies are much more erratic, but display a similar downward trend. Disparities between minority and nonminority applicants and between black and white applicants decline over time for both sets of institutions, suggesting that the change may not be the result of the regulations.⁵⁰

Another way to assess the extent to which the supply of mortgage credit to minorities increased in the mid 1990s is to examine

home ownership rates over time. The relaxation of binding credit constraints should cause minority originations and home ownership rates to increase. Figure 12 displays home ownership rates from 1970 to 1994 for white, black, and other minority households. Recent home ownership rates are still well below the rates observed in the early to mid-1980s. Recall that blacks experienced the strongest growth in mortgage originations in 1993 and 1994, yet there was little effect on home ownership. Within our sample, mortgage originations to blacks increased by 23,000 loans from 1992 to 1993 and another 4,000 from 1993 to 1994. In 1994 there were roughly 11.3 million black households in the U.S., implying that 113,000 new loans would be necessary to move the home ownership rate a single percentage point. Viewed this way, the 1993–94 changes appear small.

Summary and conclusions

In this article, we have provided background on the evolution of the CRA and fair lending regulations, summarized the economic literature which pertains to this type of regulation, and presented evidence on the effectiveness

TABLE 4

Comparison of mortgage denial rates

Non-HUD regulated

	Denial rates			Odds ratio		Conditioned odds ratio	
	White	Black	Minority	Black	Minority	Black	Minority
1990	0.12	0.29	0.22	2.98	1.98	2.68	2.06
1991	0.14	0.31	0.25	2.78	2.05	2.52	2.09
1992	0.11	0.27	0.22	2.85	2.20	2.58	2.18
1993	0.11	0.25	0.22	2.72	2.25	2.39	2.15
1994	0.10	0.23	0.20	2.62	2.13	2.22	1.98
1995	0.11	0.23	0.20	2.42	2.00	2.02	1.84
Trend				-0.10	0.01	-0.13	-0.05

HUD regulated

	Denial rates			Odds ratio		Conditioned odds ratio	
	White	Black	Minority	Black	Minority	Black	Minority
1990	0.10	0.26	0.20	3.27	2.27	3.13	2.27
1991	0.26	0.36	0.28	1.62	1.11	1.43	1.37
1992	0.14	0.26	0.22	2.20	1.73	2.03	1.83
1993	0.13	0.24	0.20	2.19	1.70	1.98	1.75
1994	0.14	0.23	0.19	1.72	1.40	1.53	1.44
1995	0.20	0.26	0.23	1.40	1.19	1.33	1.27
Trend				-0.13	0.03	-0.11	-0.09

Source: HMDA data, see footnotes 33 and 40.

of these regulations by analyzing recent trends in mortgage lending activity. The literature review indicated mixed results.

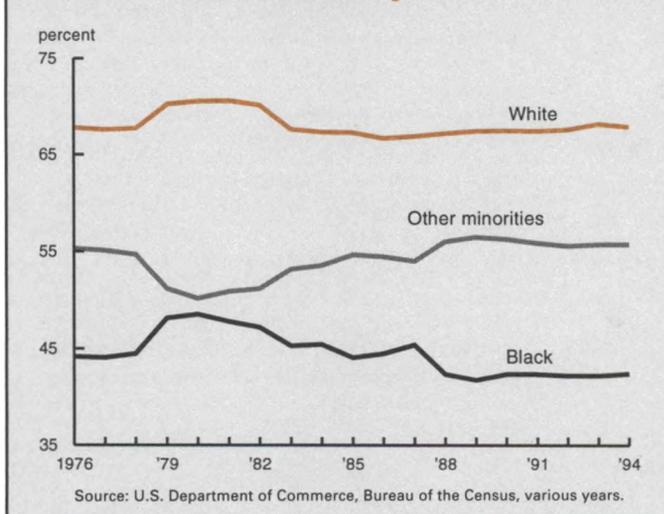
Although early studies appear to find evidence of redlining, more recent studies do not support this finding.

Concerning disparate treatment based on the race of the applicant, some studies have found differences in the probability of a loan application being denied that are not explained by economic characteristics. However, these studies have been criticized as having methodological and data problems.

Our major purpose, however, is to provide the reader with a review of the literature and not to take a position on the merits of the various positions concerning whether there is a need for the CRA and fair lending regulations. Regardless of one's position, the regulations do exist and are being enforced. We evaluated how the regulations may alter lending behavior, using a variety of measures

FIGURE 12

Home ownership rates



of changes in lending patterns. We found that over the 1990–95 period (particularly 1993–94), loan applications and originations increased significantly to groups targeted by the CRA and fair lending legislation. Additionally, it appears there may have been a compositional shift toward blacks and a minor shift toward low-income groups. These changes appear large in terms of growth rates, but they started from a very small base. The changes appear smaller when measured in dollars rather than the number of loans or applications.

It is difficult to attribute the increase solely to the strengthening of the regulations. We assessed the regulatory impact in three ways. First, we used historical trends as a control group. After accounting for economic conditions, we found that aggregate lending in recent years has not been unusually strong. Second, we considered changes in the composition of mortgage activity by examining year-to-year growth rates of applications and mortgage originations. We used the nontargeted groups as controls. The analyses presented some evidence of a change toward increased lending to minority and low-income individuals and neighborhoods. Last, we compared recent trends in denial disparity measures, black/white and

minority/nonminority odds ratios over time between depository institutions and mortgage companies. Typically thought to be less stringently regulated, mortgage companies might depict the market result in the absence of additional regulation. Our analysis shows a decline in the odds ratio for both depository and nondepository institutions, suggesting that the effect may not be the result of increased regulatory scrutiny.

Overall, our results are mixed. There is some evidence of changes in lending patterns, and some of the evidence is consistent with changes related to the new regulatory environment. However, the growth rates are not unprecedented and, if entirely attributed to the regulations, translate to approximately 100 loans and \$8 million per MSA. We would emphasize that we have not addressed the cost of implementing the regulations relative to the benefits. In addition, we have not addressed the question of whether these credit market regulations are the most effective way of changing the fundamental economic status of the targeted groups. As the regulation of credit markets continues to evolve, it remains important to continually revisit these issues.

NOTES

¹Throughout we use the term bank in a generic sense to encompass all depository institutions.

²See, for example, Coplan (1996), Lindsey (1996), Seiberg (1996a, 1996b), or Wilke (1996).

³For a discussion of potential information externalities, see Nakamura (1993) and Calem (1996).

⁴Gender was added as a protected category through 1974 amendments, and handicap and family status were added by amendment in 1988.

⁵A number of these protected categories were added by amendments in 1976.

⁶See Hula (1991) and GAO (1996).

⁷See Dedman (1988).

⁸For a discussion and examples of increased scrutiny by regulators in more recent years, see Garwood and Smith (1993) and Macey and Miller (1993).

⁹The reporting requirement now extends beyond depository institutions to, generally, all lending institutions with assets of more than \$10 million with an office in a metropolitan statistical area (MSA) (for depositories) or loan activity in MSAs (for nondepositories).

¹⁰For a description of the process by which the Federal Reserve Banks use statistical models to test for disparate treatment of applicants, see Bauer and Cromwell (1994) and Avery, Beeson, and Calem (1997 forthcoming). For discussion of the use of statistics in detecting mortgage discrimination, see Yezer (1995).

¹¹See Interagency Regulatory Task Force (1994). Represented in the interagency group were the Department of Housing and Urban Development, Department of Justice, Comptroller of the Currency, Office of Thrift Supervision, Federal Reserve System, Federal Deposit Insurance Corporation, Federal Housing Finance Board, Federal Trade Commission, and National Credit Union Administration.

¹²Again, although the fair lending laws and the CRA are different, there is significant overlap as evidenced in the last of these items. This is very close to an anti-redlining statement—the very reason for the passage of the CRA.

¹³For examples of enforcement activities by the Department of Justice and bank regulatory agencies, see Macey and Miller (1993) and GAO (1996). For a discussion of alternative strategic responses by banks to the increased regulatory pressure from fair lending and CRA regulations, see Evanoff and Segal (1997 forthcoming).

¹⁴This argument was also being made at the time to contest the liberalization of bank branching laws. The concern was that banks would export deposits through their branch network to other, more lucrative, markets.

¹⁵Regulation BB of the Code of Federal Regulations describes the requirements of the community reinvestment regulation.

¹⁶See Macey and Miller (1993) and U.S. Congress (1989).

¹⁷There are alternative tests for wholesale or limited purpose banks, still another streamlined test for small banks, and another for banks choosing to develop and be held accountable for a strategic plan which details how the banks intend to satisfy CRA requirements.

¹⁸Consumer loans will be considered if the bank collects data on this activity and requests that they be considered in the evaluation, or if regulators determine that this activity constitutes a substantial portion of the institution's business.

¹⁹The explicit weight assigned for each test and grade addresses a criticism of the earlier rating system under which bankers frequently complained about the uncertainty as to how they should allocate resources to improve their CRA rating. Emphasizing the lending test also addresses criticisms of the earlier grading scheme by being less process-oriented and more results-oriented.

²⁰See GAO (1995).

²¹For example, HMDA data does not contain information on credit history, wealth, and employment stability of the applicant, or the value or purchase price of the property. Adverse credit history is the most common reason given in the HMDA data for denying loans. For discussions of lending trends in HMDA data, see Canner and Passmore (1994, 1995a, 1995b).

²²A review of much of the early literature can be found in Benston (1981) and Canner (1982).

²³Canner, Gabriel, and Woolley (1991) reported similar findings after controlling for market characteristics. The inclusion of variables to capture risk factors, however, may not resolve the endogeneity problem since their values may be supply induced.

²⁴Some studies have addressed whether minority groups are "discriminated" against in that they are more likely to receive a particular type of loan which may have less favorable terms. For example, Canner, Gabriel, and Woolley (1991) found minorities are more likely to obtain an FHA loan than are nonminorities.

²⁵See Horne (1994, 1997 forthcoming), Liebowitz (1993), and Day and Liebowitz (1996).

²⁶The authors find considerable differences in underwriting standards across banks concerning threshold values for debt ratios, loan-to-value ratios, etc. The authors realize that unlike the more generic market model, regressions with an emphasis on bank-specific underwriting standards will not allow for a direct test of disparate impact.

²⁷Becker (1971) is typically cited as the source of this argument.

²⁸Although Becker actually used data from the Boston study, it is questionable if the data are appropriate for critiquing the Boston study based on default rates. The data were for loans originated prior to the period discussed in the Boston study and the analysis was a comparison of default rates across geographic areas based on racial composition. From the data, one cannot conclude how racial default rates compare.

²⁹For a discussion of these concerns see Tootell (1993) and Ross (1996).

³⁰The authors, however, emphasize the limitations of their analysis. For example, information on the profitability of low-income lending is not available. Thus, the authors are comparing overall profit levels across banks with different levels of low-income lending although this lending is typically a relatively small portion of the overall portfolio. There have also been concerns expressed recently about the growing number of special lending programs to accommodate the targeted groups and the resulting high default rates, see Seiberg (1996b).

³¹Esty also evaluated the impact South Shore had on the local community and argued that there was no evidence of any unique positive relative impact on the local community.

³²One could make the argument that banks with a significant number of minority loan officers could also benefit from a cultural affinity. We do not have data to directly test for this.

³³Low-income neighborhoods are defined as census tracts where the median income is less than 50 percent of the MSA median income. The moderate-income category corresponds to greater than or equal to 50 and less than 80 percent, the middle-income category corresponds to greater than or equal to 80 percent and less than 120 percent, and the upper-income category corresponds to at least 120 percent of the MSA median income. Similar break points define the categories for applicant income relative to MSA income. Tracts are also classified by minority composition into low (less than 25 percent minority), moderate (25 percent to 50 percent), middle (50 percent to 75 percent) and high (75 percent to 100 percent).

³⁴See, for example, Wilke (1996), Seiberg (1996), or Lindsey (1996).

³⁵Barefoot et al. (1993) attempt to quantify the compliance cost associated with consumer protection regulations including the CRA. They note that bankers find the CRA to be one of the most onerous regulations faced by banks.

³⁶A narrowing of denial rate differentials is frequently cited in the popular press as a measure of progress in fair lending, for example, Coplan (1996). Lawmakers have also argued that although some differential may be warranted based on credit quality, the current differences are too great and imply some discrimination is being undertaken: for example, in U.S. Congress (1989), see Illinois Senator Dixon's opening comments during hearings on the CRA.

³⁷Refinancing and new originations cannot be separated in the HUD data.

³⁸Changes in mortgage rates measure the contract rate on 30-year fixed rate conventional mortgage commitments reported by the Federal Home Loan Mortgage Corporation.

³⁹For critiques of the CRA as a means of accomplishing this redistribution, see Lacker (1995), Macey and Miller (1993), and White (1993).

⁴⁰It is important to emphasize that our sample may differ from HMDA data reported elsewhere because, unless noted, we are viewing lending activity *only* for depository institutions or their affiliates, and we are screening out observations that cannot be classified into income and racial subgroups which we expect to be affected by the regulation. By analyzing this group of institutions, we have a homogenous group through

time. Certain mortgage originators were only added to the HMDA in recent years. Our sample consists of loan applications for one-to-four family, owner-occupied properties where the mortgage is valued between \$1,000 and \$1 million, the applicant's income is less than \$1 million, and the loan-to-income ratio is less than five. For the 1980s these requirements were imposed on market (census tract) averages since individual loan data were not available on HMDA until 1990. We only consider mortgages for properties in MSAs, and we require complete data on the location of the property—state, county, MSA, and census tract—to allow us to combine HMDA data with census information concerning neighborhood income and composition. Reporting institutions must report on applications for property located in an MSA where they have an office. If the property is outside of an MSA or in an MSA in which the institution does not have an office, it has the option of reporting the MSA information. Thus, some loans made in MSAs will be omitted from our sample because the bank chose not to include the information. The MSA information is necessary to merge the data with census information. Finally, the data must pass the validity checks (Board of Governors 1995).

⁴¹The data are not precisely comparable to that for the 1990s because mortgage originations for purchase and refinancing were not separated during this earlier period. However, the role played by “refis” in the 1980s is not expected to be nearly as erratic as in the 1990s. All analysis of the 1990s excludes refinances.

⁴²Application data are not available for the 1980s.

⁴³We reject the hypothesis that shares by income categories are constant over the 1990–95 period based on a chi-square test statistic of 53 with 15 degrees of freedom.

⁴⁴The increase in mortgage activity for blacks was also spread across all income levels. The 1990–95 growth rates for blacks in low-, moderate-, middle-, and upper-income neighborhoods were 157 percent, 129 percent, 99 percent, and 101 percent, respectively. In their evaluation of redlining Holmes

and Horvitz (1994) found that, after accounting for neighborhood characteristics including risk, more credit was being made available in certain minority neighborhoods. They found a systematic preference on the part of insured lenders (the FHA) toward lending in areas of high or growing minority populations. They attribute this to the pressures created by the CRA and community groups to increase lending in these areas. Similarly, Malmquist, Phillips-Patrick, and Rossi (1997 forthcoming) found that while low-income lending was more expensive, lenders were also compensated with higher revenues making profits similar for both low- and higher-income loans. However, the authors found that profits were inversely related to the share of mortgages originated to blacks. They suggest this is a result of firms “bending over backwards” to yield to regulatory pressures to make more minority loans.

⁴⁵Minorities are defined as non-whites. Asians are an exception and typically do not have high denial rates.

⁴⁶Odds are defined as the ratio of the probability of denial to the probability of acceptance.

⁴⁷We calculate this based on a logit regression which includes, in a flexible functional form, applicant income, loan size, and race.

⁴⁸The denial rates may be related to other factors, for example, geographic differences. In our analysis, we emphasize changes through time and assume the effects from other factors are constant across time.

⁴⁹The mortgage company data should be interpreted cautiously, since these institutions do not go through the same rigorous editing process and resubmission of revised data as the depository institutions.

⁵⁰Alternatively, these “nonregulated” firms can be prosecuted by the U.S. Department of Justice for fair lending violations, so they may not be immune to this regulation.

REFERENCES

Ahlbrandt, Jr., Robert S., “Exploratory research on the redlining phenomenon,” *AREUEA Journal*, Vol. 5, 1977, pp. 473–481.

Art, Robert C., “Social responsibility in bank credit decisions: The Community Reinvestment Act one decade later,” *Pacific Law Journal*, Vol. 18, July 1987, pp. 1071–1139.

Avery, Robert B., Patricia E. Beeson, and Paul S. Calem, “Using HMDA data as a regulatory screen for fair lending compliance,” *Journal of Financial Services Research*, Vol. 11, 1997 forthcoming.

Avery, Robert B., Patricia E. Beeson, and Mark S. Sniderman, “Underserved mortgage markets: Evidence from HMDA data,” Federal Reserve Bank of Cleveland, working paper, No. 94-16, 1994.

Avery, Robert B., and Thomas M. Buynak, “Mortgage redlining: Some new evidence,” *Economic Review*, Federal Reserve Bank of Cleveland, Summer 1981, pp. 18–32.

Barefoot, Marrianan & Associates, Inc., A.V. Thakor, and J. C. Beltz, “Common ground: Increasing consumer benefits and reducing regulatory costs in banking,” Herbert V. Prochnow Educational Foundation, monograph, 1993.

Bates, T., and W. Bradford, “An analysis of the portfolio behavior of black-owned banks” *Journal of Finance*, Vol. 35, 1980, pp. 753–768.

Bauer, Paul W., and Brian A. Cromwell, “A Monte Carlo examination of bias tests in mortgage lending,” *Economic Review*, Federal Reserve Bank of Cleveland, Quarter 3 1994, pp. 27–44.

Becker, Gary S., *The Economics of Discrimination*, Chicago: University of Chicago Press, 1971.

_____, “The evidence against banks doesn’t prove bias,” *Business Week*, April 19, 1993.

Benston, George J., “Mortgage redlining research,” *Journal of Bank Research*, Vol. 12, Spring 1981, pp. 8–23.

Benston, George J., and Dan Horsky, "Redlining and the demand for mortgages in the central city and suburbs," *Journal of Bank Research*, Vol. 10, Summer 1979, pp. 72–87.

_____, "The relationship between the demand and supply of home financing and neighborhood characteristics: An empirical study of mortgage redlining," *Journal of Financial Services Research*, Vol. 5, 1992, pp. 235–260.

Berkovec, James A., Glenn B. Canner, Stuart A. Gabriel, and Timothy H. Hannan, "Mortgage discrimination and FHA loan performance," *Proceedings of a Conference on Bank Structure and Competition*, Chicago: Federal Reserve Bank of Chicago, May 1995, pp. 218–237.

_____, "Mortgage discrimination and FHA loan performance," *Cityscape*, Vol. 2, February 1996, pp. 9–24.

Beshouri, Christopher P., and Dennis C. Glennon, "CRA as 'market development' or 'tax': An analysis of lending decisions and economic development," *Proceedings of a Conference on Bank Structure and Competition*, Chicago: Federal Reserve Bank of Chicago, 1996 forthcoming, pp. 556–585.

Black, Harold, M. Cary Collins, and Ken B. Cyree, "Do black-owned banks discriminate against black borrowers?" *Journal of Financial Services Research*, Vol. 11, 1997 forthcoming.

Black, Harold, Robert L. Schweitzer, and Lewis Mandell, "Discrimination in mortgage lending," *American Economic Review*, Vol. 68, May 1978, pp. 186–191.

Board of Governors of the Federal Reserve System, "Regulation BB, community reinvestment," *Federal Reserve Regulatory Services Handbook*, Vol 3, 1995, section 228.

_____, "Processing procedures for Home Mortgage Disclosure Act," technical memo, No. 96, 1995.

Boorman, J. T., and Myron L. Kwast, "The start-up experience of minority-owned commercial banks: A comparative analysis," *Journal of Finance*, Vol. 29, 1974, pp. 1123–1142.

Bradbury, Katherine, Karl E. Case, and Constance R. Dunham, "Geographic patterns of mortgage lending in Boston, 1982–87," *New England Economic Review*, Federal Reserve Bank of Boston, September/October 1989, pp. 3–30.

Brimmer, A.I., "The black banks: An assessment of performance and prospects," *Journal of Finance*, Vol. 26, 1971, pp. 379–405.

Browne, Lynn Elaine, and Geoffrey M. B. Tootell, "Mortgage lending in Boston—A response to

the critics," *New England Economic Review*, Federal Reserve Bank of Boston, September/October 1995, pp. 53–78.

Calomiris, Charles W., Charles M. Kahn, and Stanley D. Longhofer, "Housing-finance intervention and private incentives: Helping minorities and the poor," *Journal of Money, Credit, and Banking*, Vol. 26, August 1994, pp. 634–674.

Canner, Glenn B., "Redlining: Research and federal legislative response," Board of Governors of the Federal Reserve System, staff study, No. 121, 1982.

Canner, Glenn B., Stuart A. Gabriel, and J. M. Woolley, "Default risk and mortgage redlining: A study of the FHA and conventional loan markets," *Southern Economic Journal*, Vol. 58, July 1991, pp. 249–262.

Canner, Glenn B., and Wayne Passmore, "Residential lending to low-income and minority families: Evidence from the 1992 HMDA data," *Federal Reserve Bulletin*, Vol. 80, February 1994, pp. 79–108.

_____, "Home purchase lending in low-income neighborhoods and to low-income borrowers," *Federal Reserve Bulletin*, Vol. 81, February 1995a, pp. 71–103.

_____, "Credit risk and the provision of mortgages to lower-income and minority home buyers," *Federal Reserve Bulletin*, Vol. 81, November 1995b, pp. 989–1016.

_____, "The relative profitability of commercial banks active in lending in lower-income neighborhoods and to lower-income borrowers," *Proceedings of a Conference on Bank Structure and Competition*, Chicago: Federal Reserve Bank of Chicago, 1996 forthcoming, pp. 531–555.

Carr, James H., and Isaac F. Megbolugbe, "The Federal Reserve Bank of Boston study on mortgage lending revisited," *Journal of Housing Research*, Vol. 4, 1993, pp. 277–314.

Clair, Robert, "The performance of black-owned banks in their primary market areas," *Economic Review*, Federal Reserve Bank of Dallas, 1988, pp. 11–20.

Coplan, Stephen, "HUD offers minority lending data on Internet," *American Banker*, August 6, 1996, p. 11.

Dahl, Drew, "Ownership changes and lending at minority banks: A note," *Journal of Banking and Finance*, Vol. 20, August 1996, pp. 1288–1301.

Day, Ted, and Stanley J. Liebowitz, "Mortgages, minorities, and HMDA," University of Texas at Dallas, unpublished manuscript, March 18, 1996.

- Dedman, William**, "The color of money," *Atlanta Constitution*, four-part series, May 1-4, 1988.
- Esty, Benjamin C.**, "South Shore Bank: Is it the model of success for community development banks?" *Proceedings of a Conference on Bank Structure and Competition*, Chicago: Federal Reserve Bank of Chicago, May 1995, pp. 192-217.
- Evanoff, Douglas D., and Lewis M. Segal**, "Strategic responses to bank regulation: Evidence from HMDA data," *Journal of Financial Services Research*, Vol. 11, 1997 forthcoming.
- Ferguson, Michael F., and Stephen Peters**, "What constitutes evidence of discrimination?" *Journal of Finance*, Vol. 50, June 1995, pp. 739-748.
- General Accounting Office**, *Community Reinvestment Act: Challenges Remain to Successfully Implement CRA*, Washington: Government Printing Office, 1995.
- _____, *Fair Lending: Federal Oversight and Enforcement Improved but Some Challenges Remain*, Washington: Government Printing Office, 1996.
- Garwood, Griffith L., and Dolores S. Smith**, "The Community Reinvestment Act: Evolution and current issues," *Federal Reserve Bulletin*, Vol. 79, April 1993, pp. 251-267.
- Glennon, Dennis, and Mitchell Stengel**, "An evaluation of the Federal Reserve Bank of Boston's study of racial discrimination in mortgage lending," Comptroller of the Currency, working paper, No. 94-2, 1994.
- Holmes, Andrew, and Paul Horvitz**, "Mortgage redlining: Race, risk, and demand," *Journal of Finance*, Vol. 49, March 1994, pp. 81-99.
- Horne, David K.**, "Evaluating the role of race in mortgage lending," *FDIC Banking Review*, Vol. 7, 1994, pp. 1-15.
- _____, "Mortgage lending, race, and model specification," *Journal of Financial Services Research*, Vol. 11, 1997 forthcoming.
- Hula, Richard C.**, "Neighborhood development and local credit markets," *Urban Affairs Quarterly*, Vol. 27, 1991, pp. 249-267.
- Hunter, William C., and Mary Beth Walker**, "The cultural affinity hypothesis and mortgage lending decisions," *Journal of Real Estate Finance and Economics*, Vol. 13, 1996, pp. 57-70.
- Hutchinson, Peter M., James R. Ostas, and J. David Reed**, "A survey and comparison of redlining influences in urban mortgage lending markets," *AREUEA Journal*, Vol. 5, 1977, pp. 463-472.
- Interagency Regulatory Task Force**, "Policy statement on discrimination in lending," *Federal Register*, April 15, 1994, pp. 18266-18274.
- Kwast, Myron L.**, "New minority-owned commercial banks--A statistical analysis," *Journal of Bank Research*, Vol. 12, 1981, pp. 37-45.
- Kwast, Myron L., and Harold A. Black**, "An analysis of the behavior of mature black-owned commercial banks," *Journal of Economics and Business*, Vol. 35, 1983, pp. 41-54.
- Lacker, Jeffrey M.**, "Neighborhoods and banking," *Economic Quarterly*, Federal Reserve Bank of Richmond, Spring 1995, pp. 13-37.
- Lash, Nicholas, and Larry R. Mote**, "Early evidence on banking in low- and moderate-income minority areas: A case study," paper presented at the Western Economics Association, Vancouver British Columbia, June 29, 1994.
- Liebowitz, Stanley J.**, "A study that deserves no credit," *Wall Street Journal*, September 1, 1993.
- Lindsey, Lawrence B.**, "Home ownership opportunities in a deregulatory environment," *Marketwise*, Federal Reserve Bank of Richmond, No. 1, 1996, pp. 20-27.
- Macey, Jonathan R., and Geoffrey P. Miller**, "The Community Reinvestment Act: Economic analysis," *Virginia Law Review*, Vol. 79, March 1993, pp. 291-348.
- Malmquist, David, Clifford Rossi, and Fred Phillips-Patrick**, "The economics of lending to low-income mortgages," *Journal of Financial Services Research*, Vol. 11, 1997 forthcoming.
- Megbolugbe, Isaac F., and Man Cho**, "An empirical analysis of metropolitan housing and mortgage markets," *Journal of Housing Research*, Vol. 4, 1993, pp. 191-223.
- Munnell, Alicia H., Geoffrey M. B. Tootell, Lynn E. Browne, and James McEneaney**, "Mortgage lending in Boston: Interpreting HMDA data," Federal Reserve Bank of Boston, working paper, No. 92-7, 1992.
- _____, "Mortgage lending in Boston: Interpreting HMDA data," *American Economic Review*, Vol. 86, March 1996, pp. 25-54.
- Perle, Eugene D., Kathryn Lynch, and Jeffrey Horner**, "Model specification and local mortgage market behavior," *Journal of Housing Research*, Vol. 4, 1993, pp. 225-243.
- Rosenblatt, Eric**, "A reconsideration of discrimination in mortgage underwriting with data from a national mortgage bank," *Journal of Financial Services Research*, Vol. 11, 1997 forthcoming.

Ross, Stephen L., "Flaws in the use of loan defaults to test for mortgage discrimination and FHA loan performance," *Cityscape*, Vol. 2, February 1996, pp. 41–48.

Schill, Michael H., and Susan M. Wachter, "A tale of two cities: Racial and ethnic geographic disparities in home mortgage lending in Boston and Philadelphia," *Journal of Housing Research*, Vol. 4, 1993, pp. 245–275.

Seiberg, Jaret, "Efforts to halt mortgage bias seen finally bearing fruit," *American Banker*, July 31, 1996a, p. 1.

_____, "HMDA: Five years later," *American Banker*, 4-part series, September 16–20, 1996b.

Shlay, Anne B., "Not in that neighborhood: The effects of population and housing on the distribution of mortgage finance within the Chicago SMSA," *Social Science Research*, Vol. 17, 1988, pp. 137–163.

_____, "Financing community: Methods for assessing residential credit disparities, market barriers, and institutional reinvestment," *Journal of Urban Affairs*, Vol. 11, 1989, pp. 201–223.

Stengel, Mitchell, and Dennis Glennon, "Evaluating statistical models of mortgage lending discrimination: A bank-specific analysis," Comptroller of the Currency, working paper, No. 95-3, 1995.

Tootell, Geoffrey, "Defaults, denials, and discrimination in mortgage lending," *New England Economic Review*, Federal Reserve Bank of Boston, September/October 1993, pp. 45–51.

U.S. Congress, Senate Committee on Banking, Housing, and Urban Affairs, "Discrimination in home mortgage lending," hearing before the 101st Congress, first session, Washington: Government Printing Office, October 24, 1989, p. 1.

White, Lawrence J., "The Community Reinvestment Act: Good intentions headed in the wrong direction," *Fordham Urban Law Journal*, Vol. 20, November 1993, pp. 281–292.

Wilke, John R., "Mortgage lending to minorities shows a sharp 1994 increase," *American Banker*, February 13, 1996, p. 1.

Yezer, Anthony M. J., *Fair Lending Analysis: A Compendium of Essays on the Use of Statistics*, Washington: American Bankers Association, 1995.

Yezer, Anthony M. J., Robert F. Phillips, and Robert P. Trost, "Bias in estimates of discrimination and default in mortgage lending: The effects of simultaneity and self-selection," *Journal of Real Estate Finance and Economics*, Vol. 9, November 1994, pp. 197–215.

Zandi, Mark, "Boston Fed's bias study was deeply flawed," *American Banker*, August 19, 1993, p. 13.

Mortgage redlining studies: Credit flows to geographic areas

Author cite	Period analyzed	Data sources	Dependent variables	Race variables	Redlining conclusions
Ahlbrandt (1977)	1973–74 Pittsburgh	City Planning Dept. and 1960–70 Census	Mortgage loans and dollar value of mortgage loans per occupied housing unit in census tract	% black Change in % black	% black is not related to loans or dollar value of loans; author concludes there is no evidence of redlining. However, the change in % black is positively associated with dependent variable in some specifications.
Hutchinson, Ostas & Reed (1977)	1975 survey of 4 S&Ls in Toledo Ohio SMSA, 123 census tracts	Local survey and 1960–70 Census	No. of mortgage loans in owner occupied houses, No. of insured loans, % and no. of conventional loans, % and no. of home improvement (HI) loans accepted	% black % black squared Change in % black	Finds evidence consistent with redlining. Total number of loans unaffected by race but racially mixed areas receive more government insured loans and HI loans. Lower acceptance rate for HI loans.
Avery & Buynak (1981)	1977–79 Cleveland (Cuyahoga county, by 335 census tracts)	HMDA, 1970 Census of Housing and County Auditor records	Percent of title transfers financed by banks, S&Ls, mortgage bankers, total mortgages and home equity loans (total value of mortgage and HI loans) / (value of owner occupied housing)	7 categories from largely white to largely black	Finds no redlining with total sample but this is due to the lending by mortgage bankers, suggesting that banks and S&Ls lend less in minority areas (consistent with redlining).
Holmes & Horvitz (1994)	1988–91 Houston	Census, HMDA	No. of loans, owner occupied units	% black, % Hispanic	No redlining for conventional loan once risk factors are accounted for.
Perle, Lynch & Horner (1994)	1982 Detroit	Michigan Financial Institutions Board, Census	No. of loans/(year-round housing units)	% black households	Using traditional method finds evidence consistent with redlining. It disappears when a more comprehensive model is used. Authors argue that traditional methods say little about redlining.
Shlay (1988)	1980–83 Chicago SMSA	Census, HMDA, HUD	Number and dollar value of loans in market	% Hispanic % black	Conventional: % black and % Hispanic negatively influence the number of loans. FHA: % black negatively influences number and dollar value of loans.
Benston & Horsky (1979, 1992)	1976–82 Indianapolis, Cincinnati, and Nashville; 1974–76 Rochester, NY	Special Survey			Finds no evidence of unmet demand for mortgage credit. No evidence of redlining.

BOX A (CONT.)

Author cite	Period analyzed	Data sources	Dependent variables	Race variables	Redlining conclusions
Bradbury, Case & Dunham (1989)	1982–87 Boston	Suffolk County Registry of Deeds, Census of Population and Housing Survey of Consumer Finance	Number of loans in market per 100 housing structure	% black in the neighborhood statistical area (NSA) % Other minority in NSA	Minority status of NSA associated with fewer loan originations. 10% difference in the black race variable corresponds to 1.7 fewer loans per 100 structures.
Shlay (1989)	Baltimore city and suburbs	Census, HMDA	Number and dollar value of loans in market	% black	Lending inversely related to the racial variable.
Canner, Gabriel & Woolley (1991)	1983 National Sample	Survey of Consumer Finance, 1980 Census of Population and Housing	Binary for loan delinquency, binary for conventional versus FHA loan	Black or Hispanic applicant % minority census in census tract	Finds strong positive relationship between FHA use and minority status. However, this is shown to be driven by economic characteristics of the applicant and not the racial composition of the neighborhood. No evidence of redlining.
Hula (1991)	1981–87 National Data	Census, HMDA	No. and dollar value of loans in Census tracts	Central city binary % minority population	Little evidence of discrimination.
Megolugbe & Cho (1993)	1991 U.S. MSAs (less NY, LA)	Census, HMDA	Number of loans per housing stock in metropolitan area	% black	The race variable is positively related to FHA volume. No relationship is found for conventional loan volume.
Avery, Beeson, Sniderman (1994)	1990–91 National Data	HMDA, Census	Accept/deny binary	Minority binary	Probability of denial is higher for all minorities, particularly blacks. However, the probability of denial is not related to the racial composition of the neighborhood.

Microeconomic lending studies: Credit flows to individuals

Author cite	Period analyzed	Data sources	Dependent variables	Race variables	Conclusions
Black, Schweitzer, and Mandell (1978)	1976–77	Special Survey	Accept/reject binary	Black binary	Race appears to be a determinant of the loan decision.
Munnell et al. (1992)	Boston 1990	HMDA, Special Survey	Accept/reject binary	Black and Hispanic binary	Race is found to influence the loan decision. Alternative specification (B5) rejects redlining hypothesis.
Carr and Megbolugbe (1993)	Boston 1990	Munnell et al. data	Accept/reject binary	Black and Hispanic binary	Confirms Munnell et al. results.
Schill & Wachter (1993)	1990 Boston & Philadelphia	HMDA, Census, FFIEC	Accept/reject binary	Percent of households headed by a black. By a Hispanic. A binary for black applicants. For Hispanic applicants.	Evidence of redlining disappears when risk variables are included.
Berkovec, Canner, Gabriel & Hannan (1994)	1986–89	HUD, Census	Default binary, % loss in event of default	Racial binaries	Default is not related to racial composition of neighborhood. There is a higher likelihood of default for black borrowers. Losses are greater for loans extended to blacks and for loans in areas with a larger proportion of blacks.
Glennon & Stengel (1994)	Boston 1990	Munnell et al. data	Accept/reject binary	Black and Hispanic binary	“Cleaned” Munnell et al. data and found their results were robust.
Hunter & Walker (1996)	Boston 1990	HMDA and Survey data	Accept/reject binary from Munnell et al.	Minority binary (also interacted with various borrower characteristics).	Race is important (1996) for the credit decision, but only when the candidate is marginally (un)qualified.
Black, Collins, Cyree (1997)	1992–93	HMDA, Census, Call Reports	Accept/reject binary	Black binary	HMDA data suggest that both black- and white-owned banks may utilize applicant race in the mortgage process. However, after incorporating neighborhood characteristics from the census data from the call reports, only black-owned banks appear to utilize race in the credit decision.

Technology

//www:Policy.implications.for.the.future.of.financial.services/com

The Federal Reserve Bank of Chicago invites submissions for its 33rd annual Conference on Bank Structure and Competition to be held at the Westin Hotel in Chicago, Illinois, April 30–May 2, 1997. For over 30 years the conference has served as a forum for the discussion of current policy issues related to the financial services industry. In keeping with this tradition, we welcome the submission of papers on a wide range of issues related to public policy and financial structure.

We are especially interested in papers that examine the impact of technology on the financial services industry. Banks and other financial institutions are just beginning to tap the potential benefits of current and projected technology. Technology changes are altering the cost of providing financial products and services and redefining barriers to entry. What does this developing technology imply for financial service delivery systems? Has the physical bank branch become obsolete just as banks have obtained the legal right to expand on an interstate basis? What are the implications for marketing? For industry entry barriers and the future industry structure? For risk management? For asset valuation? For the traditional view that banks are unique because of the special (informational) relationship they have with customers? Technology is also drastically altering the regulatory landscape. As a result of technology, the composition of the industry may be altered to include nontraditional providers, and the financial services industry will be transformed into an international market. The ability of existing industry participants and new entrants to use technological innovations to avoid financial regulation raises questions about the need to alter regulatory structures.

Industry participants disagree on how quickly the changing technology will be incorporated and, therefore, how different the industry will look in the future. Will stored value cards be commonplace? Cyber-banking on the Internet? What are the implications for monetary policy? How willing are consumers to utilize the new technology? Some are concerned that changes will happen so quickly that banks that are making wrong decisions on technology will quickly fade into obscurity. Others expect more gradual changes.

These questions and related issues will be addressed at the 1997 conference. We would like to stress, however, that all scholarly research related to the financial services sector and public policy will be given full consideration for presentation. Additional topics include: Optimal regulatory structures; Industry consolidation and antitrust issues; Risk management and derivatives; Payments system issues; Regulatory competition; Credit availability; and Corporate governance and bank behavior.

If you would like to present a paper at the conference, please submit four copies of the paper or abstract with your name, address, telephone number, and e-mail address, and those of coauthors, by December 18th. Preference will typically be given to more complete papers.

Address correspondence to: Conference on Bank Structure and Competition, Research Department, Federal Reserve Bank of Chicago, 230 South LaSalle Street, Chicago, IL 60604-1413.

For further information call Douglas Evanoff at 312-322-5814 or e-mail him at devanoff@frbchi.org.

Conference on Bank Structure and Competition
April 30–May 2, 1997
Federal Reserve Bank of Chicago

ECONOMIC PERSPECTIVES—INDEX FOR 1996

Article	Issue	Pages
BANKING AND FINANCE		
Management efficiency in minority- and women-owned banks Iftekhar Hasan and William C. Hunter	Mar/Apr	20–28
Performance and access to government guarantees: The case of small business investment companies Elijah Brewer III, Hesna Genay, William E. Jackson III, and Paula R. Worthington	Sep/Oct	16–32
How are small firms financed? Evidence from small business investment companies Elijah Brewer III, Hesna Genay, William E. Jackson III, and Paula R. Worthington	Nov/Dec	2–18
CRA and fair lending regulations: Resulting trends in mortgage lending Douglas D. Evanoff and Lewis M. Segal	Nov/Dec	19–46
INTERNATIONAL ECONOMICS		
A supply-side explanation of European unemployment Lars Ljungqvist and Thomas J. Sargent	Sep/Oct	2–15
MONETARY POLICY AND MACROECONOMIC ISSUES		
Some comments on the role of econometrics in economic theory Martin Eichenbaum	Jan/Feb	22–31
Monetary policy shocks and long-term interest rates Wendy Edelberg and David Marshall	Mar/Apr	2–17
Identification and the liquidity effect: A case study Lawrence J. Christiano	May/June	2–13
Soft landings on a bumpy runway Francesca Eugeni and Charles L. Evans	May/June	14–27
REGIONAL ISSUES		
State-local business taxation and the benefits principle William H. Oakland and William A. Testa	Jan/Feb	2–19
Formal and informal financing in a Chicago ethnic neighborhood Philip Bond and Robert Townsend	Jul/Aug	3–27

Copies of the 1996 *Economic Perspectives* can be obtained by contacting

Public Affairs Department
Federal Reserve Bank of Chicago
P.O. Box 834, Chicago, IL
60690-0834

Telephone: (312) 322-5111

Fax: (312) 322-5515

Web Site: <http://www.frbchi.org>

ECONOMIC PERSPECTIVES

Public Information Center
Federal Reserve Bank of Chicago
P.O. Box 834
Chicago, Illinois 60690-0834

Do not forward

Address correction requested

Return postage guaranteed

Mailing label corrections or deletions

Correct or mark **Delete from mailing list** on the label and fax it to 312-322-2341, or send to:

Mail Services
Federal Reserve Bank of Chicago
P.O. Box 834
Chicago, Illinois 60690-0834

BULK RATE
U.S. POSTAGE
PAID
CHICAGO, ILLINOIS
PERMIT NO. 1942

FEDERAL RESERVE BANK
OF CHICAGO