

Bank Loan-Loss Accounting: A Review of Theoretical and Empirical Evidence

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THE TOPIC OF BANK LOAN-LOSS ACCOUNTING JUMPED INTO THE NEWS IN THE FALL OF 1998 WITH THE DISCLOSURE THAT THE SECURITIES AND EXCHANGE COMMISSION (SEC) WAS QUESTIONING THE LOAN-LOSS ACCOUNTING OF SUNTRUST BANKS, INC. AT THE TIME OF THE SEC INQUIRY, SUNTRUST HAD AGREED TO ACQUIRE CRESTAR FINANCIAL CORPORATION AND

had a common-stock registration statement pending before the SEC. As part of its agreement with the SEC to obtain approval for the registration statement, SunTrust agreed to restate prior years' financial statements to reduce its loan-loss provisions in each of the three years 1994 through 1996, resulting in a cumulative reduction in its allowance for loan losses of \$100 million.

The SEC's move to force a bank to change its loan-loss accounting was foreshadowed in a speech by the SEC's chief accountant, Michael H. Sutton (1997). Sutton expressed concern about banks' loan-loss accounting, noting that the SEC had received "a number of inquiries, both domestically and internationally, that suggest that allowances for loan losses reported by U.S. banks may be overstated."¹ He then proceeded to remind his audience of the basic rules for loan-loss accounting.²

Some bank analysts criticized the SEC's action in the SunTrust case and argued that the bank was

merely following conservative financial practices. Sean J. Ryan, an analyst at Bear, Stearns, and Company, said, "In our view, SunTrust's record of earnings stability is a function of a conservative credit culture and fast-growing markets" (quoted in Brooks 1998).

Bank regulators may also have cause for concerns about the issue of banks' loan-loss accounting. If a bank's loan-loss allowance exceeds its expected credit losses, the bank can absorb more unexpected losses without failing and imposing losses on the Federal Deposit Insurance Corporation (FDIC) if all else is held constant. Conversely, loan-loss allowances less than expected losses will ultimately reduce the bank's equity capital. Such a deficit in the loan-loss allowance implies that a bank's capital ratio overstates its ability to absorb unexpected losses.

Finally, banking organizations are worried that they might be caught in a conflict between bank regulators and the SEC. Bank regulators may demand higher

loan-loss allowances to provide a larger cushion should economic conditions weaken, and the SEC may require reduced loan-loss allowances to lessen an organization's ability to manage reported earnings during such a downturn. To provide banks with some guidance about appropriate reserves, the SEC and bank regulators issued joint interagency letters in November 1998 and in March and July 1999.³ The three letters stress that depository institutions should have "prudent, conservative, but not excessive, loan-loss allowances that fall within an acceptable range of estimated losses." The March 1999 letter goes on to promise a number of steps that the agencies would take as a group as well as measures they would try

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to take in cooperation with the Financial Accounting Standards Board (FASB) and the American Institute of Certified Public Accountants. In the July 1999 letter, the SEC also committed to "consult with the appropriate banking regulators as a part of the SEC's process in determining whether to take a significant action in its review of the accounting for a

financial institution's loan-loss allowance."

This article reviews the issues and available evidence on bank loan-loss accounting. It begins with a discussion of the differing philosophies that color approaches to loan-loss accounting and then reviews underlying accounting rules and their justification. An important theme is that recent SEC actions on bank loan-loss accounting are consistent with the philosophy underlying generally accepted accounting principles (GAAP) applied to all U.S. firms, including those principles that apply to loan-loss accounting. Next, the discussion considers the role of loan-loss accounting from a bank-supervisory perspective, focusing particularly on the importance of building up the loan-loss allowance under current regulatory capital-adequacy standards. A review of the relevant theoretical and empirical research follows. The article concludes with an analysis of the policy issues involved in bank loan-loss accounting.

Philosophies of Loan-Loss Accounting

The analysis identifies at least three different philosophies on loan-loss accounting. First, the economist's view of loan-loss allowance is

that it is intended to capture expected future losses that will occur if a borrower does not repay according to the loan contract. In contrast, the primary concern of the FASB is the measurement of a firm's net income over a given period. Thus, the FASB focuses on losses expected to result from events during a given period and explicitly excludes the expected effect of future events; economists, on the other hand, are concerned with expected future events. A third philosophy views loan losses as a type of capital that should be built up during good times to absorb losses during bad times. This perspective differs from that of the economist or the FASB in that it recommends maintaining loan-loss allowances greater than expected losses during good times. This philosophy of loan-loss accounting is implicit in existing capital regulations, which include part of the loan-loss allowance as an element of capital. If loan-loss allowances are determined only in relation to expected future losses, then banks with higher loan-loss allowances do not have the capital necessary to absorb unexpected losses. These banks merely have higher expected losses.

Which philosophy is most advisable depends upon one's purpose.⁴ The economist's view is most relevant in pricing pools of loans to be sold on the secondary market. This perspective is also implicit in any attempt that relies on historic price data to value loans or estimate their riskiness. Arguably, reported values based on the FASB's philosophy allow investors to determine the riskiness of a company's earnings more effectively. The philosophy upon which capital regulations are based may be superior at reducing bank failures if it does indeed result in an increased capacity for banks to absorb unexpected losses.

Although investors and regulators may prefer an accounting philosophy tailored to their needs, ultimately a bank's reported loan-loss allowance is largely under its managers' control, and managers are likely to use any available discretion to attain their own goals. Thus, the real key to evaluating the different philosophies is the extent to which investors and regulators can combine the reported loan-loss numbers and other information to obtain reasonable estimates of the loan-loss measure that best meets their needs. If such estimates are possible, then the prevailing philosophy used to produce that number may not be very important. If the information is available, what is really critical is that investors and regulators understand any differences between the philosophy underlying reported loan-loss allowances and the approach most relevant to their respective concerns.

The largest firms routinely provide investors with a wide range of information about their loan portfolios. Sophisticated investors can use, currently do use, and will almost surely continue to use this information to evaluate the adequacy of banking organizations' loan-loss allowances, regardless of how banks are required to account for loan losses on their financial statements. Thus, requiring banks to provide investors with loan-loss allowances that more accurately track current financial reporting requirements will, at best, provide marginal gains to investors in the form of more accurate estimates or lower costs of analysis. Similarly, bank regulators combine public financial information with their own analysis of each bank's confidential records to evaluate the adequacy of the loan-loss allowance. If regulators determine that a bank's cushion for absorbing losses is inadequate given the risks in its portfolio, they have ample authority to require a bank to increase the cushion or take less risk. Moreover, the interests of investors and bank regulators are not necessarily in opposition. Both investors and regulators benefit if banks follow consistent procedures in setting loan-loss allowances that facilitate comparability of earnings and allowances across banks and through time. Moreover, bank regulators have the ability to prevent banks from declaring dividends to shareholders or paying interest on subordinated debt; they may even close a bank if they judge it to have inadequate capital. If bank regulators judge a bank to have an inadequate loan-loss allowance, this assessment is important information for investors even if a bank has an adequate loan-loss allowance by accounting standards.

The Perspective of the Standards for Financial Accounting

The value of a business enterprise is ultimately determined by the extent to which its cash inflows exceed its cash outflows.⁵ Thus, the

information that investors ultimately need relates primarily to the net cash flow of the firm. However, merely reporting cash inflows and outflows may be misleading because the period in which cash expenditures occur is often different from the period in which cash revenues are received. For example, a bank that takes in a money market deposit on which it pays interest in one year may lend the funds to a borrower who will not be required to make either interest or principal payments until the following year. Reporting income on a cash basis in this case would be misleading. Firms that issue publicly traded securities are therefore required to follow what is called accrual accounting, in which revenue and the expenses associated with generating that revenue are recognized in the same period.

Accrual accounting requires that loan losses be recognized in the period in which they occur, even if an individual loan is not charged off until a subsequent period. For example, suppose that a textiles plant, the primary employer in a rural town with no other nearby sources of employment, closes on December 1, 2000. Even though on December 31, 2000, none of the loans made by a bank in that town have defaulted, the bank knows that because of the plant closing, a major portion of the loans will not be repaid. Under accrual accounting, the bank is obligated to recognize a reduction in the value of these loans, in turn reducing the bank's accounting earnings for the calendar year 2000.

The specific procedure used to account for loan losses is a multistep process. First, a bank compares the value of its loan-loss allowance (an adjustment of the value of its loans, which constitutes a contra-asset account) with the losses it expects to incur based on current economic conditions. If, as is normally the case, the expected losses due to past events exceed the amount in the allowance, the bank increases its loan-loss allowance and reports the increase on its income statement as its loan-loss provision (a noncash expense).⁶ As loans go bad

1. A brief review of the SEC's recent concern about bank loan-loss accounting is also provided in Baskin (1999) and Levitt (1999).
2. Although no bank has been directly accused of earnings management, excessive or deficient loan-loss allowances may be used to manage earnings. Earnings management is a practice that has attracted considerable SEC attention (see Levitt 1998). Also, see Loomis (1999) for a discussion of the SEC's overall efforts to reduce corporate earnings management.
3. The agencies issuing the joint interagency letters include the SEC, the Federal Deposit Insurance Corporation, the Federal Reserve Board, the Office of the Comptroller of the Currency (OCC), and the Office of Thrift Supervision (OTS). For the text of these interagency letters, visit the SEC's Web site at <http://www.sec.gov/news/presarch.htm>.
4. A framework for viewing the conflicting policy positions being taken by the SEC and bank regulators is provided by Wall and Eisenbeis (forthcoming).
5. The timing of the cash flows and the probability distribution of the cash flows (risk) are also important in valuing firms.
6. The expected losses due to past events would normally exceed the loan-loss allowance for two reasons. The first reason would be in recognition of the expected losses on loans made during the period. Second, the loan-loss allowance would have been reduced over the course of the period as specific bad loans from prior periods were written off.

during the course of the next period, the loans are not charged off directly against net income but instead reduce the balance in the loan-loss allowance.⁷ At the end of the accounting period, the cycle renews as the bank again compares the expected losses on outstanding loans due to past events with the balance in its loan-loss allowance.

Key in determining the accounting value of a bank's loan-loss provision is the assessment of the appropriate loan-loss allowance at the end of each period. Which procedure banks should use to arrive at the appropriate loan-loss allowance is at the heart of the SEC's discussions with SunTrust and other banks. Accounting procedures are also a critical concern of

bank regulators. A detailed discussion of the financial accounting standards for loan losses (with references) is presented in the box on page 6. This examination of accounting methods reveals that the SEC is not imposing a new standard on banks but rather appears to be trying to induce banks to follow long-standing accounting guidance. The discussion that

follows presents the highlights of the more detailed analysis provided in the box.

The SEC has the authority to set the accounting procedures for financial reporting by publicly traded firms, and sometimes it establishes procedures directly. However, in most cases the SEC defers to the FASB, which the SEC has designated as the private-sector organization responsible for setting the standards of financial accounting and reporting.

The FASB has established a set of broad principles for financial accounting by all publicly traded firms in its Statements of Financial Accounting Concepts. In its Statements of Financial Accounting Standards, the FASB has applied these concepts to a variety of specific accounting problems, including that of loan-loss accounting. The specific guidance provided by the FASB and the SEC with regard to loan-loss accounting generally follows the principles laid out in the concepts papers.

Some bank regulators would prefer more conservative, future-oriented loan-loss accounting procedures that better serve regulators' goals of maintaining bank safety and soundness. The principles laid out in the Statements of Financial Ac-

counting Concepts argue against setting financial accounting standards to attain the bank regulators' goals, contending that accounting standards should be geared to the needs of general-purpose users, such as equity investors, who cannot compel firms to meet their specific need for information. Bank regulators can and do compel banks to divulge detailed financial information and, hence, do not need financial accounting standards tailored to their needs.

The FASB principles also stipulate that financial statements should fairly present the income produced within the current reporting period. Thus, financial statements should not anticipate future events. The SEC has taken this principle to its logical limit, telling lenders, for example, that their loan-loss allowance at the end of 1999 should not anticipate losses due to computer programming errors that failed to properly handle the century date change (commonly known as the Y2K problem). Further, conservative assessments of a firm's assets are not a virtue in financial reporting since conservative estimates of asset values in one period generally result in the overstatement of the net income in future periods.

The Perspective of Bank Supervisors

Several key bank regulators, including Comptroller John D. Hawke, FDIC Chairman Donna A. Tanoue, and Office of Thrift Supervision Director Ellen Seidman, have expressed concern that the effect of the SEC's actions on loan-loss accounting may be to reduce bank loan-loss allowances. A reduction in the allowance "could have a profound effect on the continued safety and soundness of America's banking system and would not, in our judgment, be in the best interests of American taxpayers."⁸

High loan-loss allowances are thought to increase banks' ability to absorb losses without becoming financially distressed or failing if all else is held constant. However, the direct consequence of an increase in a bank's loan-loss allowance is merely that an accounting entry is made increasing the allowance and reducing reported net income (by increasing the expense account called provision for loan losses). The reduction in net income has the direct effect of reducing a bank's retained earnings and, thus, its owners' equity. Therefore, the ultimate effect of an increase in the loan-loss allowance is merely to increase the allowance on paper while decreasing both reported net income and owners' equity.

Any contribution of an increase in a bank's loan-loss allowance must occur indirectly through its effect on either a bank's risk exposure or by inducing a bank to increase its equity capital. One chan-

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nel through which an increase in the loan-loss allowance may eventually boost capital is by reducing a bank's ability to pay dividends. The dividend payments of all banks with national charters and many state banks are limited to the current year's reported accounting earnings plus retained earnings from recent years (two years in the case of national banks). An increase in the loan-loss allowance reduces both reported net income and the transfer to retained earnings. This constraint is most likely to be binding during periods of recession and, thus, would generally not limit banks during periods of sustained economic growth such as the late 1990s.

A second channel through which higher loan-loss provisions could affect banks is through banks' ability to comply with regulatory capital guidelines. Current U.S. standards are a combination of an international agreement on risk-based capital (the Basle Accord) and additional domestic leverage (or total assets) limits. The narrower measure of capital is called tier 1 capital and includes a variety of equity capital accounts including common stock, perpetual preferred stock, and retained earnings. Total capital includes not only tier 1 capital but also other types of accounts (tier 2 capital) that would absorb losses before they were borne by depositors. Such accounts include limited-life preferred stock, subordinated debt, and the loan-loss allowance to the extent that it is not allocated for losses on specific loans. The risk-based standards set minimum ratios for both tier 1 and total capital whereas the leverage constraint sets a minimum ratio only for tier 1 capital.⁹

Inclusion of the loan-loss allowance in total capital may seem undesirable if loan-loss accounting is based on the philosophies of expected losses espoused by economists and by the FASB, which perceives the intent of capital regulations as being

to provide a cushion to absorb unexpected losses. However, many banks have historically maintained a loan-loss allowance in excess of expected losses.

Compliance with the regulatory capital requirements is an important issue for U.S. banks. Banks with regulatory capital ratios judged insufficient by regulators may be refused permission to acquire other firms. Banks classified as undercapitalized may not pay dividends to their shareholders, may not pay management fees to their holding company, and are required to provide an acceptable plan for raising their capital ratios. Banks classified as critically undercapitalized (with equity capital less than 2 percent of assets) may be closed by the regulators even though their accounting capital could be positive and they are otherwise able to repay creditors in a timely manner.

If a bank increases its loan-loss allowance, the effect is to increase tier 2 capital while reducing tier 1 capital. If the transfer causes the tier 1 constraint to become binding, the bank would be required to issue more capital or reduce its measured risk. At present, tier 1 ratios are generally not binding for large U.S. banking organizations that must issue public financial statements complying with GAAP. Most of these banking organizations have capital ratios well in excess of the regulatory requirements and thus appear to have their own target tier 1 ratios.¹⁰ Increases in the loan-loss allowance at these banks may cause them to issue more capital or reduce their risk as measured under the risk-based capital standards of the Basle Accord.

Bank regulators stress the importance of building up the allowance during good times to reduce the financial stress on banks during periods of high loan losses. If a bank's capital ratio falls below regulatory requirements during a recession, the bank has two

7. If the bank unexpectedly recovers part of a loan that it had previously charged off, the recovery is added back to the loan-loss allowance. See Sinkey (1998) and Walter (1991) for a further explanation of the process for setting loan-loss reserves as well as a discussion of various ways the reserve has been historically determined.

8. The quote is taken from Barancik (1999). A review of the history of FASB, SEC, and bank regulatory guidance from the perspective of the bank regulators is provided by Tanoue (1999).

9. The capital requirements for state-chartered banks that are members of the Federal Reserve are provided in Regulation H. Appendixes A, B, and E discuss the measures of capital adequacy, and Subpart D of the regulation implements the provisions of prompt corrective action for state member banks. Prompt correction action defines five categories of capital adequacy (well capitalized, adequately capitalized, undercapitalized, significantly undercapitalized, and critically undercapitalized) and provides a series of discretionary and mandatory actions as a bank's capital falls through the categories. State nonmember banks, national banks, and thrifts are subject to similar regulations promulgated by the FDIC, the OCC, and the OTS, respectively. Bank holding companies are also subject to minimum capital adequacy standards. The measures of bank holding company capital adequacy are defined in Appendixes A–E of Regulation Y. Bank holding companies are not directly subject to prompt corrective action. However, the primary assets of most bank holding companies are their banking subsidiaries. Thus, the continued viability of most bank holding companies would be in doubt if a relatively large banking subsidiary were closed due to inadequate capital.

10. The higher target ratios may reflect management's desire to maintain a buffer in case an unexpected growth opportunity arises or unexpected losses occur.

Financial Accounting Standards for Loan Losses

All banks must file financial statements with bank regulators that conform to regulatory accounting principles. The SEC further requires that all publicly traded bank holding companies report to investors using generally accepted accounting principles (GAAP).¹ The accounting rules under regulatory accounting principles are not necessarily the same as those of GAAP; in fact significant differences have existed in the past, particularly the regulatory accounting principles rules issued by the Federal Home Loan Bank Board for savings and loans. However, most of the differences between regulatory accounting principles and GAAP have been eliminated, in part because bank regulators were instructed by Congress to require that regulatory reports “shall be uniform and consistent with generally accepted accounting principles” by Section 121 of the Federal Deposit Insurance Corporation Improvement Act (FDICIA). Nonetheless, bank regulators need not always follow GAAP. If GAAP is “inconsistent” with minimizing the cost of resolving failed banks, the banking agencies may “prescribe an accounting principle which is no less stringent than generally accepted accounting principles.”

Although bank regulators could prescribe more stringent standards, in practice they have chosen to require banks’ loan-loss accounting to follow GAAP. Thus, to understand banks’ loan-loss accounting, one needs to understand the relevant pronouncements of the FASB. Two types of FASB pronouncements help explain GAAP accounting for loan losses. One is a series of Statements of Financial Accounting Concepts that explains the broad principles underlying GAAP as applied to all publicly traded U.S. corporations. The other is a number of Statements of Financial Accounting Standards that apply the broad principles to specific accounting issues.

Broad Principles

The FASB’s concept statements address several issues that are central to the debate on bank loan-loss accounting. In particular, arguments frequently advanced by bank regulators suggest that regulators’ goals of maintaining safety and soundness would be best served by requiring loan losses that are (1) forward-looking and (2) conservative. The concept statements argue against the regulators’ position for each of the issues raised by the regulators.

Statement of Financial Accounting Concepts No. 1: *Objectives of Financial Reporting by Business Enterprises*, issued by the FASB in November 1978, notes in paragraph 24 that there are many users of corporate financial statements and that the various users may have different needs. In paragraph 26, the paper argues that some users of the financial statements may have specialized needs but these users also have the power to obtain the information. One example is government authorities that set taxes or the rates charged by firms. Paragraph 28 indicates that the objectives of the statement “stem primarily from the informational needs of external users who lack the authority to prescribe the financial information they want from an enterprise.”² The focus on investors in the concept statement matches the SEC’s focus on investor protection. This focus also suggests that when a conflict arises between investors’ needs and bank regulators’ needs, GAAP should focus on investors because bank regulators can compel banks to provide them with any required information.

A second important issue raised by the regulators is the extent to which expected future economic conditions should be considered in setting an appropriate loan-loss allowance. For example, economic conditions in 1999 were in many ways extremely favorable for the financial condition of borrowers. A combination of technological developments, domestic macroeconomic policies, and the slowdown in some Asian countries in 1999 combined to produce a year of rapid economic growth with low inflation. While such strong economic conditions are possible and perhaps even likely in 2000, historical experience would suggest that any change in economic conditions would be likely to have adverse implications for banks’ loan losses. Thus, banks would probably report higher loan-loss allowances if they took weighted averages of the possible scenarios for 2000. However, the Statements of Financial Accounting Concepts emphasize that accrual accounting focuses on the events that occur within a reporting period. For example, paragraph 44 of Statement of Financial Accounting Concepts No. 1 states, “Accrual accounting attempts to record the financial effects on an enterprise of transactions and other events and circumstances that have cash consequences for an enterprise in the periods in which those transactions, events, and circumstances occur.”

The third issue raised by the regulators is whether financial statements should place higher priority on conservative estimates of the value of the firm's assets or on providing accurate measures of their income. At one time, accountants emphasized conservative estimates of earnings and assets. In May 1980 the FASB issued its Statement of Financial Accounting Concepts No. 2: *Qualitative Characteristics of Accounting Information*, which states in paragraph 93, "The convention of conservatism, which was once commonly expressed in the admonition to 'anticipate no profits but anticipate all losses,' developed during a time when balance sheets were considered the primary (and often only) financial statement and details of profits or other operating results were rarely provided outside business enterprises. To the bankers or other lenders who were the principal external users of financial statements, understatement for its own sake became widely considered to be desirable, since the greater the understatement of assets the greater the margin of safety the assets provided as security for loans or other debts." However, firms have since been required to provide additional financial information, and the users of financial statements now often include investors in equity and debt obligations who are primarily concerned with the cash flow of the firm. Such investors may find earnings to be a more helpful indicator. Paragraph 43 of Statement of Financial Accounting Concepts No. 1 states, "The primary focus of financial reporting is information about an enterprise's performance provided by measures of earnings and its components." Paragraph 94 of Statement of Financial Accounting Concepts No. 2 continues, "Once the practice of providing information about periodic income as well as balance sheets became common, however, it also became evident that understated assets frequently led to overstated income in later periods." Paragraph 96 adds, "The Board emphasizes that any attempt to understate results consistently is likely to raise questions about the reliability and integrity of information about those results and will probably be self-defeating in the long run. . . . As a

result, unjustified excesses in either direction (conservative or unconservative) may mislead one group of investors to the possible benefit or detriment of others." Consistent application of these Statements of Financial Concepts to loan-loss accounting would require banks to place priority on accurate estimates rather than conservative estimates of expected losses due to past events when establishing their loan-loss allowance.

Accounting for Loan Losses

The general standard for setting loan losses is established by Statement of Financial Accounting Standards No. 5: *Accounting for Contingencies* (1990a). Paragraph 8 of Statement 5 sets two standards for accruing an estimated loss from a loss contingency (including losses on loans): "(a) Information available prior to issuance of the financial statements indicates that it is probable that an asset had been impaired or a liability had been incurred at the date of the financial statement. It is implicit in this condition that it must be probable that one or more future events will occur confirming the fact of loss. (b) The amount of the loss can be reasonably estimated." Further guidance for measuring and disclosing losses on loans that "are *individually* deemed to be impaired" is offered in Statement of Financial Accounting Standards No. 114: *Accounting by Creditors for Impairment of a Loan* (1993) according to Leonard, Lucas, and Seidman (1999; emphasis in original).³

The conditions for recognizing a loan loss in Statement of Financial Accounting Standards No. 5 are consistent with the subsequent Statement of Financial Accounting Concepts in several ways. Statement 5 focuses on the requirements of general purpose users of financial statements who need "accurate" reported net income rather than those of creditors, who might benefit from conservative valuations. The statement requires not merely that losses must stand a significant chance of occurring but additionally stipulates that losses must be "probable." Moreover, Paragraph 59 of

1. Banks are specifically exempt from SEC disclosure requirements. However, nonbank firms that control banks—bank holding companies (BHCs)—are not exempt from SEC requirements. This structure gives the SEC direct power over banks' accounting since virtually all major banking organizations are organized as BHCs and issue publicly traded securities.
2. While creditors and equity investors cannot compel the production of information, this restraint does not imply that they have no influence over the information they receive about the firm. Potential creditors demand a higher rate of return and potential equity investors pay a lower price for the stock of firms that they believe are providing inadequate information.
3. Statement 114 was subsequently amended by Statement of Financial Accounting Standards No. 118: *Accounting by Creditors for Impairment of a Loan—Income Recognition and Disclosures* (1994).

Statement 5 is clear in stating that loan-loss provisions should reflect events occurring within the reporting period and not anticipate future events: “Further, even losses that are reasonably estimable should not be accrued if it is not probable that an asset has been impaired or a liability has been incurred at the date of an enterprise’s financial statements because those losses relate to a future period rather than the current or a prior period. Attribution of a loss to events of the current or prior periods is an element of asset impairment or liability incurrence.”

The SEC has interpreted this statement to mean that banks should not even take account of known events that will affect loan losses if these events occur outside the period. For example, in accounting for increases in loan losses due to disruptions arising from the Year 2000 computer-programming problems, the SEC has told companies that their loan losses for 1999 should be based on events in 1999 only. Since the “event” that causes the losses happens in the year 2000, the SEC pronouncement implies that the associated loan losses should be recognized in the year 2000 (see SEC 1998).

In terms of identifying loan losses, Statements 5 and 114 provide some further guidance. Statement 5 defines probable as “the event or events are likely to occur.” Statement 5 does not require that all of the loan-loss allowance be associated with specific loans. Paragraph 22 permits loan losses “even though the particular receivables that are uncollectible may not be identified.” Statement 114 provides some guidance on how to measure the amount of the loss.

The guidance provided by Statements 5, 114, and 118 is supplemented by specific suggestions to banks for estimating loan losses in the publication *Audit and Accounting Guide for Banks and Savings Institutions*

by the American Institute of Certified Public Accountants (1999). This publication suggests a number of factors that banks may consider in setting loan-loss allowances, but it does not provide an exact formula for calculating the loan-loss allowance. Management must use its judgment in selecting the right factors to consider for individual loans or groups of loans. Further, management’s analysis may point to a range of losses rather than indicate a single figure, and management must use its judgment to select a figure from the range.

The SEC provided further guidance to banks with Financial Reporting Release 28 (FRR-28), *Accounting for Loan Losses by Registrants Engaged in Lending Activities*. FRR-28 requires that banks have a systematic process for establishing a range of loan losses. Further, the loan-loss allowance reported by a bank should fall within the range of loan losses estimated by the procedure. Chief Accountant of the SEC Lynn E. Turner stated in a February 10, 1999, speech, “While the staff understands that the determination of the allowance is a process that involves judgment, we believe that there should be documentation . . . which clearly supports the estimated range of credit losses inherent in the portfolio. We would question instances where the recorded allowance is outside (*higher or lower*) of this estimated range of probable credit losses” (emphasis in original).

FRR-28 also calls for disclosure of the process used to estimate loan losses and stipulates that the reported allowance be consistent with the discussion in the Management Discussion and Analysis section. Speaking to the AICPA Bank and Savings Institutions Annual Conference, Turner (1998) states, “You cannot have it both ways: significant issues requiring higher levels of allowances require full and fair disclosure of those issues to investors.”

options for significantly raising its tier 1 capital ratio in the short run: (1) issue new equity capital or (2) reduce its risk exposure as measured by the Basle Accord. From the regulators' viewpoint both of these responses are problematic. Banks experiencing losses and falling capital are likely to have relatively low stock prices, and their managers may be unable or, more likely, unwilling to issue new stock at what they perceive as a distressed price. Yet the alternative—reducing measured risk exposure solely to comply with the capital requirements—may lead to decreased lending solely to lessen measured risk exposure. Such a reduction in lending may cut loans to otherwise creditworthy borrowers, potentially creating a credit crunch that might worsen an economic downturn.¹¹

Further, building up the loan-loss allowance account during good times and using part of the increase to absorb losses during economic downturns is not necessarily manipulating income from a regulatory perspective. Regulators believe that most bad loans are made during good economic times.¹² A strong economy that helps banks increase earnings also encourages banks to relax their underwriting standards and take greater risks. During economic downturns some of these bad loans are revealed. Thus, requiring banks to bolster their allowances during good times is merely forcing them to acknowledge that they are probably making problem loans that will not be revealed until the next recession. Allowing banks to operate with low allowances that do not reflect the buildup of weak loans exacerbates the problem of less strenuous underwriting standards by increasing the reported profitability associated with risky lending.

Theory and Evidence on Bank Loan-Loss Accounting Practices

Numerous studies have examined the recent use of accounting policies to manage earnings. Some studies address the broad issue of management of reported earnings. Others focus specifically on the use of loan-loss accounting as a tool for managing reported earnings and capital. This literature addresses several important questions: (1) Do banks use loan-loss accounting to manage reported capital and earnings? (2) Have bank regulators been consistent in requiring banks to follow conservative accounting policies on loan losses?

(3) If banks manage earnings, does doing so generate costs for investors or firms? (4) If banks manage earnings, does doing so generate additional costs for the bank regulatory system? In brief, the literature provides conflicting evidence on the nature of bank earnings management and suggests that bank regulators had not consistently required banks to follow conservative policies before FDICIA; that investors can see through loan-loss accounting but that earnings management may nevertheless generate costs; and that even though bank regulators may see through loan-loss accounting, individuals overseeing the regulators may sometimes be deceived.

Is Loan-Loss Accounting Used to Manage Earnings and Capital? If financial and managerial labor markets were strong-form efficient, in the sense that prices fully reflected all information, and if regulators relied on market-value information, banks would have no incentive to manage their reported financial statements. Financial statements would not affect how markets or regulators evaluate banks or their managers. Thus, a good starting point for assessing the management of loan-loss accounting is with a consideration of what incentives firms might have to manage earnings and capital. If it is established that firms have incentives to manage earnings, then the next step is to look for evidence that loan-loss accounting is managed to obtain earnings or capital targets.

Incentives to Manage Earnings and Capital. One requirement for financial and labor markets to be strong-form efficient is that the marginal cost of obtaining and analyzing information must be zero. If either is costly, decisionmakers (investors and boards of directors) must weigh the costs against gains. Further, incentives arise to find ways of structuring information production to obtain the most efficient disclosure and analyses. For example, Dye (1988) provides a model in which earnings management may maximize shareholder wealth for two reasons: (1) the cost-minimizing contract that spurs managers to maximize firm value may also encourage earnings management, and (2) the firm may be able to improve the terms of its contracts with outsiders by managing earnings.

DeGeorge, Patel, and Zechhauser (1999) discuss psychological evidence that all humans use thresholds in evaluating information. For example, people may use rules of thumb to reduce transaction costs,

11. See Hancock and Wilcox (1998) and the sources cited therein for a discussion of the literature on the credit crunch. Also see Eisenbeis (1998) for a critique of Hancock and Wilcox (1998).

12. See, for example, comments by Federal Reserve Bank of New York President William J. McDonough as quoted by Cope (1999).

in this case the costs of obtaining and processing information.¹³ The authors note that three thresholds may be relevant for reported earnings: zero earnings, prior year's earnings per share, and stock analysts' earnings expectations.

These thresholds may be important to investors. For example, Barth, Elliott, and Finn (1999) demonstrate that firms able to sustain increases in reported earnings per share over several years have higher price-earnings ratios than other firms. These firms also experience larger stock price declines relative to earnings multiples at other firms when they report an earnings decrease after a previous pattern of increases. Holthausen, Larcker, and Sloan (1995)

and Guidry, Leone, and Rock (1999) further show that managers respond to the earnings target in their compensation contracts.

Firms may have an incentive not only to manage accounting earnings but also to manage accounting capital. Whether loan-loss accounting influences the market's evaluation of a bank's capital adequacy is

unclear. However, reported accounting capital plays an important role in the regulator's evaluation of a bank's capital adequacy as noted above. Wall and Peterson (1987; 1995) find further evidence that in most cases regulatory capital adequacy constraints are binding on a bank's management of its capital adequacy ratios.

Theory of Earnings and Capital Management.

If firms could costlessly attain their targets for reported income and capital, they would always attain these targets. However, even a casual review of the business press suggests that firms sometimes miss their targets, which in turn suggests that firms are not able to manage earnings costlessly. Given that earnings management is costly over some range, a question arises as to exactly how firms should use their discretion over reported earnings.

DeGeorge, Patel, and Zechhauser (1999) provide a two-period model in which managers manage reported earnings to maximize their own compensation, which is a function of reported earnings.¹⁴ Their model does not distinguish between managing via the timing of real actions (investment, sales, expenditures, or financing) and managing via con-

trol over the reporting of discretionary elements of accounting. The starting point of their analysis is with "latent earnings," which are the earnings the firm would report if its loan-loss provision were set to its correct value. In their model, the firm's latent earnings may reflect one of three situations: (1) The firm may be so far below the threshold that trying to reach it via managing earnings would be too costly. In this case, the firm seeks to report earnings less than its latent earnings, an approach they call "saving for a better tomorrow." (2) If the firm is below its target but reaching the target is not too costly, managers use their influence to boost reported earnings and achieve the target, a process they describe as "borrowing for a better today." (3) Firms above the target reduce their current reported earnings (up to some point) to be able to report higher earnings in the next period, a process they call "reining in." Both the amount of saving for tomorrow and the amount by which earnings are reined in are capped in their model with certainty.

Koch and Wall (1999) focus more specifically on the use of accounting expense accruals to help manage reported earnings. They develop a two-period model of the use of accounting accruals in which managers seek to maximize their own expected discounted earnings subject to constraints imposed by auditors. Four different outcomes are possible in their model, depending upon the parameters of the managerial compensation function.¹⁵ One outcome, which is identical to the results of DeGeorge, Patel, and Zechhauser, is called the Occasional Big Bath. A second outcome is that firms always move toward their reported earnings target in the first period, a result they call Income Smoother. A third possible outcome is that the firm always minimizes its loan losses to report the highest possible income, an outcome that they call Live for Today.¹⁶ The fourth possibility, called Maximize Variability, may result in firms moving away from their current earnings target.

Evidence of Earnings and Capital Management. While this analysis focuses on how banking organizations manage earnings via their loan-loss provisions, the SEC is concerned with the use of accounting discretion to manage earnings in general and not just in the use of such discretion by banks. Two studies of the distributions of firms' reported earnings provide substantial evidence that firms in general are managing their earnings. Burgstahler and Dichev (1997) look at firms' earnings in relation to two thresholds: zero earnings and last year's earnings per share. Their sample consists of all firms on the annual industrial and research Compustat databases for the years 1976 to 1994, excluding only banks, financial institutions, and

The key to evaluating the different accounting philosophies is the extent to which investors and regulators can combine the reported loan-loss numbers and other information to obtain reasonable estimates of the loan-loss measure that best meets their needs.

firms in regulated industries (utilities). They plot histograms of the distribution of earnings scaled by market value and find a statistically significant dip in the plots immediately below both of their thresholds. This dip is consistent with the hypothesis that firms manage their earnings. Specifically, should their underlying or latent accounting earnings prove slightly less than a firm's threshold, the firm undertakes measures to boost reported income.

DeGeorge, Patel, and Zechhauser (1999) look at the distribution of earnings in relation to the earnings expectations of stock analysts as well as the two thresholds examined in Burgstahler and Dichev (1997). DeGeorge, Patel, and Zechhauser's sample consists of 5,387 firms providing partial or complete data over the period from 1974 to 1996. They plot earnings per share around some critical thresholds but fail to find evidence of a dip prior to the threshold, a result that they argue represents methodological differences with Burgstahler and Dichev. However, they do find statistically significant evidence of a pileup of observations at exactly the threshold, which is also consistent with earnings management.

The results presented by these analysts do not prove that the firms in the sample were using discretionary accounting policies to hit their earnings targets. Indeed, Burgstahler and Dichev (1997) found evidence that firms were managing cash flow from operations and changes in working capital but not through accruals merely to attain their earnings thresholds. Although the concern about earnings management is not limited to banks, these results do not necessarily apply to banks, which were excluded from their sample.

A number of studies have focused specifically on the issue of firms' use of accruals to manage reported

earnings. These studies, which are summarized in Table 1, typically model banks' loan-loss allowances as a linear function of some fundamental explanatory variables, such as total loans and nonperforming loans, and of an earnings and capital target. These empirical models, which generally predate the theoretical models, implicitly assume that banks are always moving toward their earnings target and thus implicitly are based on a model similar to Koch and Wall's (1999) "Income Smoother."

Although these analyses reach somewhat similar conclusions, they also reveal important differences, as shown in Table 1. These studies estimate the amount of the loan-loss provision required to cover expected losses and treat the remaining provision as what is called discretionary loan-loss provision. Each of the studies that has examined capital has concluded that banks use their loan-loss accounting to manage capital. However, they do not reach a consensus about the direction of this effect. Collins, Shackelford, and Wahlen (1995), Beaver and Engel (1996), and Ahmed, Takeda, and Thomas (1999) conclude that the discretionary loan-loss provision is negatively related to capital; Beatty, Chamberlain, and Magliolo (1995) conclude that discretionary loan-loss provision is positively related to capital. Disagreement also exists about whether banks use discretionary loan-loss provision to manage earnings: Collins, Shackelford, and Wahlen and Beaver and Engel find that they do; Beatty, Chamberlain, and Magliolo and Ahmed, Takeda, and Thomas find that they do not. One possible explanation for the differences is that the studies used different sample periods. If incomplete managerial discretion over the loan-loss provision is a factor or if the asymmetry in costs is important, then the results may depend on the sample period. For example, if the

13. Another interpretation of the use of thresholds may be loosely based on Persons's (1997) argument that managerial lying may sometimes be efficient. In his model, managers sometimes provide false reports to reduce inefficient monitoring and contract renegotiation. In the context of financial reporting, one possibility is that a firm's board of directors and investors expect management to use its accounting discretion to attain at least a particular threshold. Truthful accounting could lead to excessive monitoring given that the threshold is somewhat arbitrary and that accounting data contain some noise. Instead, the manager may be allowed limited discretion in managing accounting earnings given the common knowledge that failure to attain the threshold would induce additional monitoring by the directors and a drop in stock price in financial markets. In such a case, failure to attain the threshold would be a bad signal, suggesting that the firm's underlying performance fell so far below the threshold (in that period or cumulatively over several periods) that the firm lacked sufficient discretion to attain its threshold. If everyone shared this set of beliefs, then additional monitoring by the board of directors (possibly leading to reduced managerial compensation or even termination) and a substantial drop in the firm's stock price would be justified.
14. Healy (1985) provides an earlier model that generates similar results with a variable bonus for exceeding the target. The key to the similarity of results is that Healy imposes a cap on the magnitude of the variable bonus.
15. The model also permits the existence of interior solutions that depend on neither discontinuities in the managerial compensation function nor outside constraints on managerial discretion. However, nothing in the model guarantees the existence of such interior solutions.
16. This outcome is possible if the manager places a very high discount rate on next period's income.

TABLE 1 Summary of Loan-Loss Studies

Study	Sample Period	Capital Management	Earnings Management
Beatty, Chamberlain, and Magliolo (1995)	1986–89	Positive	Yes
Collins, Shackelford, and Wahlen (1995)	1971–91	Negative	No
Beaver and Engel (1996)	1977–84	Negative	No
Ahmed, Takeda, and Thomas (1999)	1987–95	Negative pre-1991	Yes

difference between book loan-loss allowance and economic loan-loss allowance is near the auditors' maximum allowable discrepancy, firms may not be able to reduce their reported loan-loss provision to obtain earnings targets. The auditor may insist on minimum levels of loan-loss provision to maintain the loan-loss allowance at acceptable levels. Similarly, if the expected costs of missing the capital target during certain periods are large relative to the costs of missing the earnings target (such as when banks generally have low capital ratios), managers may choose to forgo attaining earnings targets if necessary to achieve their capital targets.

Evidence that firms manage reported earnings to help attain regulatory capital standards is provided by Moyer (1990) and Scholes, Wilson, and Wolfson (1990). Moyer finds that reported loan charge-offs, the loan-loss provision, and the securities gains or losses are all managed to help attain regulatory capital adequacy guidelines. Scholes, Wilson, and Wolfson find evidence consistent with the hypothesis that banks choose to realize gains and defer losses to increase their regulatory capital.

Summary of Evidence on Management via Loan-Loss Accounting. More work is needed to fully understand both the theory and practice of banks' loan-loss accounting. However, the available evidence clearly suggests that banks have an incentive to use loan-loss accounting to help manage reported earnings and capital. Further, the evidence suggests that banks in general are using loan-loss accounting to help manage the earnings and capital they provide in their financial statements.

Have Bank Regulators Consistently Required Conservative Loan-Loss Accounting?

One defense of requiring banks to follow GAAP accounting is that past deviations from GAAP have been very costly. Harvey J. Goldschmid, General Counsel of the SEC, made this argument in testimony before the U.S. House of Representatives Subcommittee on Financial Institutions and Consumer Credit of the Banking Committee and Financial Services Committee (1999). In particular, he made numerous references to the problems that arose for the Federal Savings and Loan Insurance

Corporation (FSLIC) when thrifts were allowed to follow regulatory accounting principles that allowed them to report higher capital than would have been permitted under GAAP. Goldschmid was correct in arguing that thrifts' regulatory accounting principles in the 1980s were less stringent than GAAP and that providing funds to honor the FSLIC's commitments imposed a substantial cost on the U.S. Treasury. However, failure to adhere to GAAP for loan-loss accounting was not the principal problem, and adherence to GAAP may not have eliminated the losses to the Treasury. A substantial part of the problem was that thrifts were allowed by (indeed, required by) GAAP to carry long-term, fixed-rate mortgages on their books at historic cost even after the market value of these loans had dropped substantially due to a large jump in market interest rates.

A better example of how deviations from GAAP accounting for loan losses can create a misleading picture of banks' financial condition over an extended period is provided by the way in which large banks accounted for loans to less developed countries (LDCs) in the 1980s. Indeed, former FDIC Chairman L. William Seidman stated that "U.S. bank regulators, given a choice between creating panic in the banking system or going easy on requiring banks to set aside reserves for Latin American debt, had chosen the latter course. It would appear the regulators made the right decision" (1993, 127). After the fact, it appears that regulators made the "right decision" because the affected banks were able to generate enough earnings to allow them to report adequate capital levels when they finally did acknowledge the losses. This example of regulatory forbearance in loan-loss accounting did not result in the Treasury actually bearing losses. However, if banks had been unable to generate sufficient earnings and had taken increased risk to boost their capital ratios, the cost to the Treasury from this forbearance might have been substantial.

Today the Federal Deposit Insurance Corporation Improvement Act gives regulators explicit directions to follow GAAP unless more stringent accounting would better protect the deposit insurance

fund. Thus, one could argue that even if the regulators had exercised forbearance in the past, they would not do so after FDICIA. Fortunately the banking environment has been relatively benign since the passage of FDICIA, so this requirement is, as yet, untested.¹⁷

Does the Management of Loan-Loss Accounting Increase Costs to Investors or Managers?

Evidence that banks' management of loan-loss accounting deceives investors would provide important support for the SEC's concern about the management of reported loan-loss allowances. The available evidence, however, suggests that investors understand that banks may use their loan-loss accounting to manage their financial reports. Anecdotal evidence that investors see through banks' loan-loss accounting is provided by R. Harold Schroeder, a senior equity analyst in the research group at Keefe, Bruyette & Woods, in his testimony before the U.S. House of Representatives Subcommittee on Financial Institutions and Consumer Credit of the Banking Committee and Financial Services Committee. He argues that "investors generally are able to separate 'true core earnings' from 'earnings management.'" He states that "over time banks develop a reputation based on past loss experiences that the market can readily assess and take into consideration in evaluating the quality of a specific bank's earnings" (1999, 327).

Empirical studies generally support the claim that investors see through the use of loan-loss accounting to manage earnings and capital. One set of tests looks at investors' responses to announcements that imply higher loan losses between financial reports. If investors are able to reasonably accurately anticipate losses before banks announce their loan-loss provisions, then the provisions may not add much to investors' information set. Tests focusing on banks' stock market returns around the time of announcements related to loans to less-developed countries (principally Latin American countries) in the 1980s are consistent with this conjecture. Musumeci and Sinkey (1990b) analyze the case of the Brazilian debt moratorium in 1987. They note that in 1987 banks provided information about their exposure in Brazil to investors and reported that an active secondary market existed in LDC debt. They find that investors acted rationally in responding to Brazil's actions and thus reduced banks' stock prices in proportion to their individual exposure in Brazil—prior

to the release of the banks' financial statements. Thus, the market formed estimates of banks' losses on these loans prior to their recognition on the banks' financial statements.

The announcement of a debt moratorium by Mexico in 1982 provided another test of financial market response to news of loan quality problems. While investors knew that many publicly traded banks were making loans to Mexico and other LDCs, banks were not disclosing their exposure to individual countries nor did they acknowledge a secondary market in LDC debt. Nevertheless, studies by both Bruner and Simms (1987) and Smirlock and Kaufold (1987) find that the risk-adjusted returns of bank stocks accurately reflected their exposure to Mexico within, at most, a few days of the announcement of the debt moratorium.

Addressing the question of banks' loan-loss accounting more specifically, Musumeci and Sinkey (1990a) examine bank stock returns around the time of Citicorp's announcement (and subsequently by other large banks) to increase

loan-loss allowances to provide for losses associated with loans to LDCs. They find significant positive, abnormal stock returns after the Citicorp announcement. Such a market response would be almost impossible to rationalize if one believed that the large banks' accounting for the LDC loans had deceived investors. However, if the market had already adjusted Citicorp's earnings and capital for the unrecognized loan losses, the positive reaction may be rationalized in a variety of ways. For example, the increased allowance may have been taken as a signal that the bank would restructure to boost earnings or take a more aggressive approach to collecting the loans to LDCs.

Empirical analysis of security prices and returns in relation to banks' loan-loss accounting also provides evidence that investors see through banks' management of their loan-loss accounting. Beaver and Engel (1996) estimate the nondiscretionary

Both investors and regulators benefit if banks follow consistent procedures in setting loan-loss allowances that facilitate comparability of earnings and allowances across banks and through time.

17. Kane (1997) argues that the incentive structure facing regulators is an important determinant of their behavior. He suggests that prior to FDICIA many of the incentives provided to regulators encouraged them to exercise forbearance on large, financially weak banks. He argues that FDICIA only partially corrects the problem.

part of banks' loan-loss allowance by regressing the allowance on a variety of fundamental variables including charge-offs and nonperforming loans. The difference between the actual and estimated allowance is assumed to be discretionary (plus a random, mean-zero error). Beaver and Engel then regress the market value of the bank on several variables, including net income, loan-loss allowance, and discretionary loan-loss allowance. They find that the coefficient on the total loan-loss allowance is significantly negative (higher allowance implies lower market value) but that the coefficient on the discretionary part of the loan-loss allowance is insignificant. This finding suggests that mar-

Empirical evidence suggests that banks' loan-loss accounting policies reflect more than just anticipated future losses. Thus, investors would generally benefit from forming their own estimates of each bank's expected loan losses.

ket participants see through the reported loan-loss allowance and place different values on the discretionary and nondiscretionary portions.

Even if investors see through earnings management without incurring costs, it is not necessarily costless to firms and their investors. Stein (1989) develops a model in which managers may borrow from future

earnings to boost the current period's reported net income and managers' compensation. This process of borrowing from future earnings reduces the net present value of the firm. Investors know that managers can and do borrow from future earnings, but they cannot determine the extent of borrowing if it is constrained within some limits. Even though borrowing from future earnings is irrational in the sense that it reduces the expected returns to both managers and investors, shareholders anticipate earnings management such that a firm reporting low earnings is assumed to have low permanent earnings. Therefore, if earnings management is anticipated and managers care about their firm's share price in the short run, individual managers will predictably attempt to borrow, and the market's expectations are correct.

A firm's management of loan-loss accounting is not equivalent to borrowing from future earnings in Stein's (1989) model. Nevertheless, such management could impose costs on firms and investors. For example, earnings management could be costly to banks if their loan collection efforts were influenced by accounting policies. Musumeci and Sinkey

(1990a) interpret Citicorp's LDC loan provisioning in 1987 as a measure that allowed it to take a tougher negotiating stance with LDC borrowers. MacDonald (1999) provides evidence that earnings management may be costly to analysts and investors. MacDonald quotes Michael Mayo, a bank analyst at First Boston, as saying, "The reported profits number is now considered an accounting fiction." She reports that a number of stock analysts are reducing the importance of reported earnings and substituting an estimate of cash flow. While finance theory suggests that investors should be concerned about cash flows, the increased emphasis on cash flows creates problems. Because the cash account is subject to substantial manipulation, as noted in the section on financial accounting standards, stock analysts do not literally look at changes in it. Instead, they take pretax net income and adjust it for items that do not have direct cash flow implications, such as depreciation, to obtain a cash-earnings estimate. There is nevertheless no common way of calculating cash flow. The resulting confusion may increase costs to investors attempting to evaluate the stock recommendations of different analysts.

Does the Management of Loan-Loss Accounting Increase Costs to Bank Regulators or Those Overseeing the Regulators? If regulators were deceived by banks' loan-loss accounting, it could have serious implications for their ability to reduce losses to the FDIC from bank failure. However, such deception appears unlikely given that regulators regularly send examiners to review individual banks' loan portfolios. Supporting evidence that examiners are not deceived is provided by Dahl, O'Keefe, and Hanweck (1998), who find that bank examiners use their independent analysis of bank loan portfolios to influence the timing of a bank's loan-loss recognition.

A bigger concern is that misleading loan-loss accounting may confuse taxpayers and their representatives in Congress. Kane (1997) suggests that government regulators should be viewed as self-interested agents serving both the regulatees and the taxpayers. He observes that regulatees will pressure regulators in a variety of ways not to impose discipline on the industry, including job offers to "good regulators" and public criticism of "bad regulators," and that regulatees will also circulate misinformation to discourage proactive regulatory intervention. Kane argues that senior regulators often have incentives to cooperate with the industry in putting out disinformation to discourage intervention by taxpayers and their representatives. In particular, he points to the savings and loan debacle:

the problem developed over many years, but its existence was first denied, and then its magnitude was underestimated.

A partial solution to the issues discussed by Kane (1997) is to provide the public with information that does not underestimate taxpayers' exposure to loss. One important aspect of such information is banks' loan-loss allowances. If taxpayers are to assess their exposure accurately, they need reasonable estimates of expected loan losses. Kane's analysis provides some support for a policy of preventing banks from using their loan-loss accounting to manage earnings and capital. However, his analysis does not provide unqualified support for the position of the financial accounting authorities. Taxpayers underestimate their exposure to loss in Kane's analysis when banks' allowances understate expected losses arising in response to events in any period. Allowances that somewhat exceed expected losses may not cause them to underestimate their exposure. Further, taxpayers' interest in loan losses is not limited to those precipitated only by events prior to the end of a reporting period—the approach currently required by GAAP. Taxpayers risk exposure from all sorts of losses, including those that occur because of expected future events. Thus, while banks' adherence to GAAP for loan-loss accounting may be an improvement over their loan-loss accounting practices in some prior periods, taxpayers' interest may be even better served if banks' loan-loss accounting were more conservative and forward-looking than GAAP permits. Moreover, GAAP accounting prohibits the recognition of losses due to changing interest rates for a large part of banks' portfolios.

Public Policy Issues

If banks follow the loan-loss accounting procedures designed to meet regulators' needs most effectively, the outcome would be substantial income smoothing when compared with the FASB's approach, which measures income as the result of events happening during the period ending on the date of the financial statements.¹⁸ Conversely, if loan-loss accounting follows the approach advocated by the FASB, banks may have a smaller cushion for absorbing expected losses arising because of expected future events. Taking the comments of the respective sides at face value provides a potential public policy dilemma. Two unsatisfactory options present themselves: (1) to provide investors with

the information they need to value firms and force banks to be underreserved and, hence, possibly undercapitalized or (2) to allow banks to “build a cushion” during good times at the cost of misleading investors about the true variability of earnings. An important question in evaluating the two policy alternatives is determining whether this dilemma is unavoidable or whether it is a consequence of the two sides' positions on the importance of reported net income and the process of measuring capital adequacy.

Net Income. Empirical evidence suggests that banks' loan-loss accounting policies reflect more than just anticipated future losses. Thus, investors would generally benefit from forming their own estimates of each bank's expected loan losses. Available evidence suggests that investors form such an estimate for each bank using publicly available information about non-performing loans, the growth rate and composition of the loan portfolio, the “credit culture” as evidenced by a bank's historic loan losses, and economic conditions. The issue is not whether the SEC's actions are required for investors to be able to form reasonably accurate estimates of banks' expected loan losses. Banks already provide substantial information for investors to form their own estimate of expected provisions. Rather, the issue is whether investors would form more accurate estimates of loan-loss provisions, allowances, and net income at lower cost as a result of recent SEC actions.

Whether investors would significantly reduce their efforts to calculate a true loan-loss allowance if banks strictly followed the SEC's guidelines is unclear. The SEC's guidelines, which direct banks to adopt a consistent methodology, would lessen, but not totally eliminate, banks' ability to manage their loan-loss provisions. While the SEC calls upon banks to set loan-loss provisions that are within the range of reasonable provisions indicated by the guidelines, it has not required banks to adopt a formula that would result in a single number to be used as a

The question of whether changes in banks' loan-loss accounting would threaten their safety and soundness tends to overlook regulators' ability to require banks to substitute higher capital for lower provisions.

18. For a general review of the literature on earnings management and the implications of the findings for public policy, see Healy and Wahlen (1999).

requirement. A “cookie cutter” approach that applies a single formula is unlikely to be optimal because difficult-to-quantify factors may cause variations in the best estimate of appropriate provisions across both banks and time for individual banks. Yet, any discretion allowed to banks in setting provisions may be used to manage reported earnings and capital.

Further, investors not only care about changes in loan values due to events that occurred within a reporting period but also about changes in loan values due to events that are expected after a period ends. For example, in valuing a bank’s securities investors might be as interested in changes in loan losses resulting from, say, changes in bankruptcy

laws taking effect next year or from anticipated changes in macroeconomic conditions as they would be in losses resulting from the failure of a firm in the current year. Existing accounting guidelines nevertheless require banks to ignore the implications of expected future events on the current period’s reported provisions and allowance even if the

future event is virtually certain to occur. Thus, investors could not rely on the reported loan-loss allowance to incorporate all information on a bank’s expected losses based on past and future events under existing accounting guidelines.

Capital Adequacy. The question of whether changes in banks’ loan-loss accounting would threaten their safety and soundness tends to overlook regulators’ ability to require banks to substitute higher capital for lower provisions. Implicit in current U.S. capital regulations is the assumption that banks’ allowances generally incorporate total expected losses, including those arising from future events.

If the assumption that part of the loan-loss allowance represents “extra” provisioning for unexpected losses is incorrect, the treatment of the allowance for capital adequacy purposes is inappropriate. U.S. regulators could revise the definition of tier 2 capital to exclude the loan-loss allowance.

If the assumption that the loan-loss allowance fully captures expected future losses is faulty, regulators should consider measures to require banks to increase their cushion to absorb losses. Although

this assumption appears to be inaccurate under existing accounting standards, the FASB’s trend toward requiring fair value accounting for financial instruments may address regulatory concerns about expected future losses. The FASB has already required the use of fair values for financial reporting in two capital statements.¹⁹ Further, in testimony before the U.S. House of Representatives Subcommittee on Financial Institutions and Consumer Credit of the Banking Committee and Financial Services Committee on June 16, 1999, Timothy S. Lucas, director of research and technical activities at the FASB, stated that the FASB is currently working on a project that would require all financial instruments, including loans, to be carried at full value. He stated that the FASB believes in fair-value accounting for all financial instruments once certain issues are addressed, adding that the board plans to issue a “preliminary views document” in the fourth quarter of 1999.²⁰ If banks were required to recognize the fair value of loans in their financial statements, losses due to expected future events would be incorporated into financial statements because investors do not draw a distinction between likely losses due to past events and likely losses due to future events.

If fair-value accounting for loans is not required, bank regulators need to adjust their accounting or capital guidelines to ensure that banks are maintaining an allowance that incorporates expected future events. One way of doing so would be to change regulatory accounting principles, which currently follow the GAAP definition, so that loan-loss allowance is based on all expected credit losses on a bank’s portfolio. Alternatively, regulators might change the capital adequacy guidelines to require additional capital equal to the difference between expected losses due to past and future events and expected losses due solely to past events.

Conclusion

The current debate over banks’ loan-loss accounting is sometimes portrayed as a choice between providing investors with vital information and maintaining banks’ capital adequacy. The previous analysis suggests that both positions are overstated. Using currently available data, investors can and do form estimates of the “economically true” amount of banks’ loan-loss allowances, provisions, net income, and equity capital. Strict adherence to SEC guidelines may improve the quality of the data, at least in some periods, but the guidelines may not eliminate the benefit or reduce the cost for investors making their own estimates. Conversely, the effectiveness

Bank regulators use their measures of capital adequacy to determine whether one banking organization may acquire another, whether a bank may pay dividends, or even whether a bank will be allowed to continue in operation.

of the current capital adequacy regulations may be reduced by strict adherence to SEC guidelines. However, bank regulators have ample power to adjust their regulations to reflect whatever definition of loan-loss allowance the SEC requires for reporting to investors.

Given that bank regulators may achieve their desired policy outcome regardless of the way in which the loss allowance is calculated, a better question is which definition of the loan-loss allowance best serves the interests of investors. On the one hand, adherence to the SEC's position may aid investors seeking to compare reported accounting results across industries. If accounting figures meant the same thing in each industry, such reporting could reduce the costs to investors of analyzing firms in different industries. However, like banks, other industries' reported net incomes are virtually

always subject to differences between reported net income and economic net income, especially in accounting for intangible assets and depreciation. Thus, the ability to compare across industries is less valuable than it may first appear.

On the other hand, bank regulators use their measures of capital adequacy to determine whether one banking organization may acquire another, whether a bank may pay dividends, or even whether a bank will be allowed to continue in operation. Thus, investors have a strong interest in regulators' judgments about the adequacy of a bank's loan-loss allowance and capital adequacy. If regulatory judgments regarding the adequacy of a bank's loan-loss allowance differ from those obtained under GAAP, investors would also need to know or estimate the regulators' evaluation.

19. Statement No. 107 (1991) requires firms to disclose, but not recognize in their financial statements, the fair value of those financial instruments for which it is practicable to provide an estimate. Statement of Financial Accounting Standards No. 105: *Accounting for Derivative Instruments and Hedging Activities* (1990b) requires firms to recognize the fair value of their derivatives contracts in their financial statements.
20. The Financial Accounting Standards Board issued *Preliminary Views on Major Issues Related to Reporting Financial Instruments and Certain Related Assets and Liabilities at Fair Value* on December 14, 1999.

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Central Bank Forecasting: An International Comparison

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FORECASTS, WHETHER EXPLICIT OR IMPLICIT, ARE AT THE HEART OF POLICY MAKING. IN CONSIDERING FORECASTING FOR MONETARY POLICY, THIS ARTICLE CONTRASTS THE FORECASTING PROCESS AT THREE CENTRAL BANKS—THE RESERVE BANK OF NEW ZEALAND, THE BANK OF ENGLAND, AND THE U.S. FEDERAL RESERVE. THESE BANKS' PROCESSES ARE CHOSEN FOR

discussion not only because they are fairly well documented but also because it could be argued that their forecast procedures are representative of those of other central banks.

An obvious initial question that arises when considering central bank forecasting is that of whose forecasts are being discussed. This article concentrates mostly upon the forecasting process of policy advisers rather than that of policymakers, even if there may be considerable overlap. In the United States staff forecasts are presented to policymakers as a basis for policy discussions, but these forecasts need not represent the forecasts of an individual policymaker (see Reifschneider, Stockton, and Wilcox 1997). The influence of these staff forecasts on policy decisions is largely unknown. It is clearly not zero, but a reading of some of the Federal Open Market Committee (FOMC) discussions shows that individual U.S. policymakers' responses to the projections of policy advisers can vary a great deal (see

Edison and Marquez 1998).¹ In other cases, such as at the Bank of England, there is an official published forecast that is the outcome of an explicitly defined interaction between the bank staff and the policy committee (George 1997). These forecasts therefore come much closer to representing those of the policymakers. A similar, but less formal, interaction takes place at the Reserve Bank of New Zealand, which publishes forecasts on a regular basis under the name of the governor, although the projections themselves are based on staff models (Drew and Frith 1998).

The next section of the article sets out a number of common elements in the forecasting processes of central banks. The discussion then summarizes the forecasting procedures at the Reserve Bank of New Zealand, the Bank of England, and the Board of Governors of the U.S. Federal Reserve System, with particular attention given to the differences and similarities among the core models used by staff at

these institutions. The conclusion suggests that there is considerable similarity across central banks in the basic mechanics in producing forecasts. However, there are differences in the emphasis given to model-based forecasts relative to judgmental forecasts and those based on expert opinion. Banks with mandated inflation objectives have tended to favor model-based approaches as part of a strategy of ensuring that policy decisions are consistent with their inflation objectives and are as transparent to the public as possible.

Some Forecasting Issues

What Needs to Be Forecast and for How Long? For monetary policy decisions, forecasts of inflation and aggregate output growth are the obvious candidates, but policymakers may also want to examine forecasts of variables such as investment, consumer spending, and wages as well as projections for the global outlook. Even so, this list is rarely exhaustive, simply because the construction of a forecast for, say, inflation may require a forecast of other variables such as productivity. These intermediate forecasts may or may not be presented to the policymakers, but they are often implicitly provided when discussing the environment surrounding a forecast. A second reason why a relatively large number of variables may need to be forecast is that a policy adviser needs to provide an explanation of the forecasts. For example, a forecast of aggregate demand may need to be separated into consumption and investment components since the current economic environment may suggest that these are likely to evolve in different directions. As Dawes (1999) observes, it is easier to be convincing about a forecast's validity if one can provide a plausible economic interpretation, and some degree of disaggregation may aid this process. Policymakers would need to weigh the plausibility of the aggregate forecasts against their own beliefs about the constituent parts. Disaggregation creates problems, however; some components are inherently more difficult to predict compared with either the aggregate or other components. One example is the relative ease in forecasting the output of the manufacturing sector, for which data are relatively accessible, compared with forecasting the quantitatively more important service sector, for which reliable data are sparse. Also, the degree of disaggregation cannot be too extreme as it can easily become hard to present a consistent story about the whole picture.

The length of the forecast horizon will depend in large part on how long it is believed to take for changes in policy instruments to affect the economy. Generally, households and firms seem to respond

with sufficient inertia to require forecasts with a one- to three-year horizon.

The Use of Models. Perhaps the main factor in favor of a central bank using models relates to the issue of what is called transparency. Even if a model and its forecasts are only one element in the thinking behind a policy action, examining its structure can be very useful in educating and informing markets about the reasoning behind changes in policy instruments. In order to focus on key issues and to avoid being distracted by excessive detail, most central banks appear to have adopted relatively small-scale econometric models as the main vehicles for their medium-term forecasting exercises.²

There also appears to be a growing tendency in central banks to use information from more than one type of model. For example, although a detailed model may give a relatively precise short-term forecast of inflation, a simpler and more stylized model may be of greater use for understanding the longer-term relation between the instruments of policy and targets such as output growth and inflation. In part this characteristic reflects the fact that models are used in the policy process for other purposes, such as estimating the likely effects of alternative policy prescriptions or changes in the way inflation expectations are formed. These types of simulations may be difficult to implement in the primary forecasting model. Even if it is feasible, there is often a desire to provide consistency checks on the simulations using smaller theoretically based models. Moreover, it is doubtful that policymakers place great emphasis upon the point forecasts presented to them, frequently seeing the forecasting process instead more as an aid to bolstering their understanding of the available options.

There are, of course, many private forecasting agencies that produce forecasts, and these forecasts are relatively easily accessible to central banks. All this information might be collated and used; one motivation for doing so would be that one would thereby acquire information from a wide variety of "models," something that policymakers might find attractive. The main disadvantage of relying strictly on pooled information is the lack of a consistent story that can be associated with the resulting forecasts. This lack of a comprehensive picture is an obvious impediment to use of this kind of information by policymakers, but it is also of limited value for policy advisers, as the latter generally need to address policy meetings and so must have formed some view on the economic rationale for a particular forecast outcome.

What then are the types of models central banks use? The Bank of England (1999) details five types

of models that contribute to decisions made by its Monetary Policy Committee, and their categories are useful for commenting briefly on the nature of models used in forecasting in a monetary policy environment.

The “Core” Model. Most policy-setting institutions have a “core” model that summarizes the main relationships within the macroeconomy and is the reference point for forecasting and policy evaluation in the medium term. These models usually contain about 30–50 stochastic equations and determine another 100–200 variables through identities. The modeling philosophy often involves selecting a set of long-run relations such as a constant labor share and debt-to-output ratio, a production function, and a constant long-run real exchange rate. A variety of mechanisms is then invoked to relate the short run and the long run, with departures from the long-run equilibrium values being an important factor in the adjustment process. Of course, this philosophy is now a very standard one in macroeconomic modeling, finding its most precise expression in error correction models.³ Even though there is a shared vision in these models, there are also significant differences, particularly in regard to the relative roles played by expectations in determining nonfinancial variables, such as the rate of inflation or levels of expenditure.

Core models often do not generate the most accurate forecasts, particularly at a fairly short-term horizon. Nonetheless, when the forecast horizon lengthens and one wishes to look at the sensitivity of outcomes to a policy change, it is hard to find a better alternative. The importance of a core model depends largely on the relative mix of scenario analysis and forecasts in the making of policy decisions. Well-designed core models can have some specific features that may be of assistance in formulating policy. One of these is a steady-state solution that can be consulted to view the long-run consequences of a policy action. Another, once values for variables not determined within the model are incorporated, is the

generation of medium-term equilibrium paths, that is, the core model’s prediction of where the economy is heading in the medium term.

Small, Forward-Looking Models. These models embody what has sometimes been referred to as the central bank model (see McCallum 1999 and Clarida, Gali, and Gertler 1999). They contain a so-called IS curve that relates growth in gross domestic product (GDP) to factors such as interest rates, expected inflation, and past and expected output growth. They also contain a Phillips curve that connects inflation to past and expected future inflation as well as the deviation of output from “capacity” levels. The small, forward-looking models also usually contain some mechanism for setting policy. If money supply is the instrument, then a money demand function needs to be appended to the system, but in most cases the system is closed with a simple interest rate rule. These models differ

from the core models in terms of the degree of aggregation. However, they also often tend to place greater emphasis upon forward-looking behavior in the IS curve and the wage-price sector than do the larger-scale models. It is probably true that these models are used more for simulating policy actions than for forecasting per se, but the distinction is a fine one. The Batini-Haldane model discussed in Bank of England (1999) is a good example of an open-economy version of this framework that augments the fundamental elements above with an uncovered interest-parity condition. The Reserve Bank of New Zealand has developed a similar model

Some institutions favor a forecasting approach that is structured explicitly within a model framework. Others place much greater emphasis upon the judgments of sector experts and the experience of policy advisers.

1. It should be noted that Federal Reserve disclosure policies permit public examination of official forecast documents only with a five-year delay. Hence, some of the discussion in the article may not accurately describe current practice by the staff of the Board of Governors. The Bank of England, the Reserve Bank of New Zealand, and other central banks release current forecast documents on a quarterly basis.
2. The role of judgment in forecasting is one important aspect of the forecasting process that will not be discussed systematically in what follows basically because it is hard to get specific information on how it is used. One thing that is clear, however, is that monetary policy institutions rarely, if ever, rely solely on mechanical model-based forecasts. If the science of forecasting is the model, then the art of forecasting is the judgment that is applied by the individuals involved.
3. Error correction equations relate current growth rates to past deviations from equilibrium and lagged growth rates. However, some models describe the out-of-equilibrium behavior of nonfinancial variables either in terms of so-called polynomial adjustment cost (Brayton and others 1997) or target-seeking behavior (Coletti and others 1996). The resulting equations differ from standard error correction equations by also including discounted expected future equilibrium values. This forward-looking aspect is a key feature of the core models of all the central banks discussed in this article.

(Hargreaves 1999). Because of the relatively small size of this type of model, it is relatively easy to experiment with alternative assumptions and altered parameter settings. Hence, they can provide a useful cross-check on the policy simulations from the core model. However, the high degree of aggregation and the tendency to have a simplified dynamic structure means that they may not be very useful for either short-term forecasting or for explaining sources of business cycle variation.

Vector Autoregressions. Vector autoregression (VAR) models are used primarily to explore specific

questions such as the role of monetary aggregates in predicting inflation and output growth.⁴ As such, VAR models are rarely used as the core model. One difficulty in using them for policy analysis is that they treat policy as partly unexpected (exogenous) events and partly as determined by the history of the variables appearing in a VAR. It is

true that an exogenous policy shock may be identified through a VAR with some loose economic reasoning, but such shocks are rarely easy to relate to actual policy events (see Rudebusch 1998). Moreover, in practice VARs ascribe most of the variation in policy instruments to systematic behavior. A user of VAR forecasts therefore has to accept that the policy instrument will vary continuously over the forecast horizon, something that is not easy to explain to policymakers who are considering whether to make a change in a policy instrument that they feel will be sustained over the forecast horizon.⁵ Such reservations mean that VARs tend to be used simply as forecasting devices and not for policy analysis. In the former role the emphasis can be placed upon their statistical characteristics, and this characteristic perhaps accounts for why the most popular versions have been Bayesian VARs. The latter involve approximate prior restrictions upon the coefficients that might be regarded as plausible given the nature of many economic time series (see, for example, Robertson and Tallman 1999). Even in that role they have the disadvantage that it is hard to isolate the story that underlies any predictions made with them (see Meyer's 1999 comment in this vein).

Fundamentally, the case for a VAR in prediction relies on the fact that prediction can be based on recognition of regularities in data without requiring explanation of these regularities.

Single-Equation Regression Models. Examples of single-equation regression models are Phillips curve models and relations summarizing the connection between the exchange rate and the terms of trade (or commodity prices) in open economies. The main advantages of such models are their simplicity and that they can be readily used to calculate forecasts conditional on a range of alternative paths for the explanatory variables. In some cases the conditional forecasts might be used as cross-checks on the forecasts from the core model, and sometimes the purpose is to give policymakers some feel for longer-term relationships in the economy.

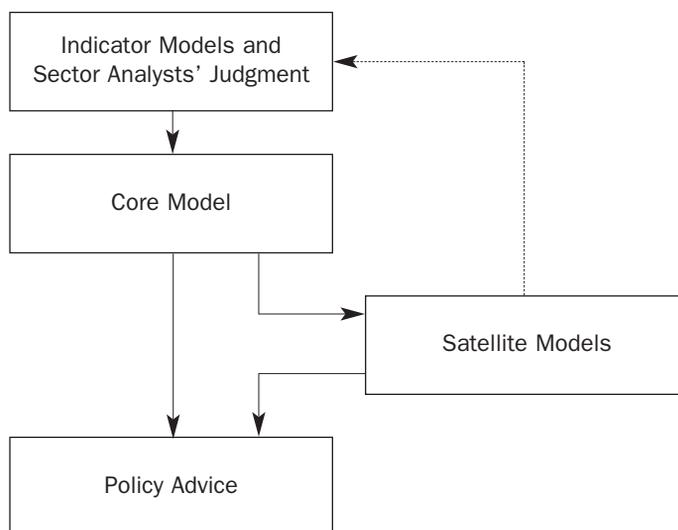
Dynamic Optimizing Models. Often it is necessary to form a view about the likely economic consequences of a particular structural change or an atypical shock. One general problem with using regression-based models for this task is that their coefficients are functions of underlying preferences and technology as well as government policy, and it is usually difficult to predict the effect that a change in these parameters would have for the estimated coefficients. Largely because of their stronger structural basis, dynamic optimizing models tend to be the mainstay of the academic literature. They rarely produce forecasts directly but can be an ingredient in a forecast and are sometimes important in producing an understanding of forecasts. Models in this class range from dynamic stochastic general equilibrium models and asset pricing models to more deterministic versions such as McKibbin and Wilcoxon's (1995) G3 model.

The Reserve Bank of New Zealand

Monetary policy at the Reserve Bank of New Zealand is conducted in the context of an explicit inflation target (currently 0–3 percent in a consumer price index that excludes interest payments) and is implemented via the Bank's influence on overnight interbank cash rates. There are eight interest rate reviews each year. The governor of the Bank makes policy decisions after advice from an internal monetary policy committee. The forecasts published in the quarterly *Monetary Policy Statement* are actually issued under the governor's name. These institutional arrangements are similar to those of the Bank of Canada. Indeed, the forecasting and policy system implemented at the Reserve Bank of New Zealand was inspired by the Bank of Canada's so-called quarterly projection system and was built under contract by some of the Canadian system's developers.

Most central banks appear to have adopted relatively small-scale econometric models as the main vehicles for their medium-term forecasting exercises.

CHART 1
Basic Structure of the Reserve Bank of New Zealand's Forecasting and Policy System



Source: Breece and Cassino (1998, figure 1)

Forecasts for a wide range of variables in the New Zealand economy, not just output and inflation, are published each quarter. In particular a forecast is given for the ninety-day bill rate. By doing so, the central bank is effectively also providing a statement about the anticipated future course of policy. It seems that the Reserve Bank of New Zealand is unique among central banks in providing such a statement on a regular basis.

As described in Drew and Frith (1998) and Drew and Hunt (1998b), the forecasting round begins with previous baseline and updated forecasts of exogenous variables taken from a number of outside sources. Indicator models are then used to produce forecasts over the monitoring quarters, and these become the starting points for producing forecasts from the core model for the longer horizons. Modifications are then made through intercept adjustments or “add” factors in each of the equations of the model until a central scenario emerges, which then forms the basis of the published forecasts.

The Core and Related Models. In terms of dividing the forecasting process into four elements, the forecasting and policy system explicitly deals

with three of them: (1) indicator models to handle short-run predictions (up to two quarters); (2) a core model used to produce medium-term (one- to two-year) forecasts and to perform policy analysis; and (3) satellite models that disaggregate the forecasts from the core model. The basic structure of the forecasting and policy system can be summarized in the schematic in Chart 1.⁶

The indicator models used within the bank are not publicly documented but are designed to capture the short-term time series characteristics of detailed macroeconomic data and to utilize the sector analyst’s judgment. For example, data for tons of cement produced are found to have a close relationship to data for commercial construction (Drew and Frith 1998, 318).

The core model contains the key features that were present in the Bank of Canada Canadian Policy Analysis Model (Black and Rose 1997); that is, it contains a well-defined steady state, explicit stock-flow accounting and budget constraints, endogenous monetary policy with an inflation target as the nominal anchor, and the separation of dynamic adjustments in nonfinancial sectors into “expectational”

4. VAR models used for forecasting in a policy environment are described in Zha (1998). Basically, a VAR model attempts to describe the mathematical expectation of future values for a set of variables as a linear function of current and recent past values of these variables. The adequacy of the description is usually measured in terms of forecast accuracy.

5. Of course, nothing precludes one from doing forecasts by constructing shocks that keep the monetary policy instrument on some given path (Leeper and Zha 1999). However, in order to be consistent with the notion of rational expectations, the required shock sequence would have to be not too persistent and not too large.

6. It seems reasonable to suppose that a similar schematic summarizes the forecasting system at the Bank of Canada.

and “intrinsic” components. Monetary policy is accounted for with a policy reaction function based on forward-looking inflation control targets with a six- to seven-quarter horizon. Numerical values of parameters in the model are set to produce “reasonable” responses rather than being estimated directly from time series data. Because the short-term forecasts are not generated directly from the core model, the model’s short-term fit to historical data is not used as a criterion for adequacy.

Most of the nonfinancial sector of the forecasting and policy system core model is specified using a framework that describes out-of-equilibrium behavior in terms of adjustment costs. For example,

growth in consumption by forward-looking consumers converges to its equilibrium value subject to an adjustment structure as well as to the influence of certain special disequilibrium effects. The specification of the price adjustment mechanism in the forecasting and policy system model departs from this approach, however, and instead resembles more the

type of Phillips curve equation common to the small forward-looking models described earlier. In particular, price inflation for domestically produced and consumed output is driven primarily by current and past deviations between the demand for goods and services and the productive capacity of the economy (the so-called output gap).⁷ Inflation expectations also play an important role, with expectations assumed to have both a backward-looking and a forward-looking, model-consistent component and with most weight on recent inflation and near-term expected inflation. Changes in the costs of production inputs also influence inflation even if there is no output gap. These costs include wage growth and changes in indirect taxes. The direct effects from exchange rates and changes in the foreign dollar price of imported consumption goods are added to domestic prices to derive consumer price inflation.

The forecasting and policy system core model is simulated to produce paths for the main macroeconomic variables, including policy variables, that are consistent with the Bank’s inflation targets. Three satellite models are then used to translate this projection into implications for more disaggregated

variables. The method used for disaggregation is to first prescribe an equilibrium share on the basis of some idea about where particular components are headed. The dynamics around the equilibrium path for variables in the satellite models are then derived from estimated “autoregressive” functions. The adjustment rate is not constant but is modified according to variables such as relative prices and disequilibrium in stocks and flows. In practice the equilibrium paths are derived using a detrending procedure that converges to a fixed steady-state share (Breece and Cassino 1998). The main advantages of this process are that it allows the dynamics of the core model to be kept relatively simple and the satellite models are quite transparent and amenable to modification by sector specialists. In addition to its role in providing a framework for the preparation of economic forecasts, the forecasting and policy system core model has been used as a policy analysis tool. The basic technique of analysis is stochastic simulation (see Drew and Hunt 1998a and Ha 2000).

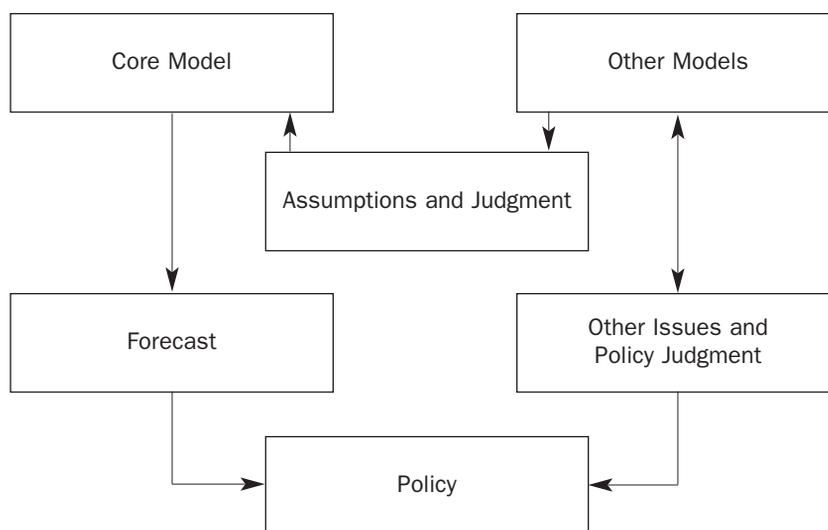
Auxiliary Models. A smaller forward-looking, demand-side model has been developed by Hargreaves (1999) and denoted as the SDS-FPS model. Designed to produce simulations even more cheaply than the larger forecasting and policy system core model, it is nonetheless calibrated to replicate the dynamic properties of the core model for key aggregates. The heart of the SDS-FPS model is an IS curve, a Phillips curve, an exchange rate equation, and a monetary policy reaction function. It also contains additional equations to determine the relative prices of consumption goods, inflation and exchange rate expectations, interest rates, and the prices of exports and imports. A VAR model was constructed in Drew and Hunt (1998a) that is mainly used to produce shocks that could be fed into the forecasting and policy system and SDS-FPS models for stochastic simulation purposes.

The Bank of England

In the United Kingdom monetary policy is set by the *Monetary Policy Committee*, which is composed of three Bank of England representatives and six non-Bank members. This committee meets monthly. It has a stated inflation target of 2.5 percent in a retail price index (with a reporting range of plus or minus 1 percent). Forecasts of inflation and output have been presented quarterly in the Bank’s *Inflation Report* since February 1993. These forecasts are meant to summarize the views of the Monetary Policy Committee members and, as such, are intended to explain any policy actions. The current forecasting process at the Bank of England and

Monetary policy at the Reserve Bank of New Zealand is conducted in the context of an explicit inflation target and is implemented via the Bank’s influence on overnight interbank cash rates.

CHART 2
The Bank of England's Forecasting Process



Source: Vickers (1999)

the resulting inflation and output “fan charts” represent an explicit attempt to map the policymaker’s uncertainty about alternative economic assumptions onto a distribution of future outcomes via a combination of models and judgment. Chart 2, taken from Vickers (1999), provides a schematic summary of the forecasting process and how it relates to policy decisions.

As described in Britton, Fischer, and Whitley (1998) and in Vickers (1999), a series of meetings takes place between the Monetary Policy Committee and the Bank of England’s forecasting staff, beginning about one month before the *Inflation Report* is published. At the first meeting, current issues, key assumptions, and an initial assessment of the relative likelihood of various future paths for the economic variables are discussed. Following these discussions the forecasting staff prepares central (most likely) forecast paths together with forecast distributions constructed to reflect as accurately as possible the Monetary Policy Committee’s assessment of relative risks (skewness) and the overall uncertainty (variability). These forecast distributions might be revised following subsequent meetings between the committee and Bank staff. If the Monetary Policy Committee judges that the distribution is inconsistent with its assessment of the issues, then the staff will be asked to make changes. For example, the type of assumptions, their probability, or perhaps

the core model itself might be changed. Notably, two sets of forecasts are published in the *Inflation Report*. The first is based on the assumption of unchanged U.K. short-term interest rates during the forecast period while the second allows interest rates to follow the Monetary Policy Committee’s assessment of market expectations.

The Core Model. The Bank of England maintains a suite of models and has made descriptions of the various models publicly available (Bank of England 1999). However, exactly what relative weights are ultimately given to these models in the committee’s published forecast is unknown. Speeches of Monetary Policy Committee members have not shed a great deal of light upon this question. The core model, termed MM (Bank of England 1999), involves about 20 behavioral relations and 130 variables in total. In some respects the MM model can be categorized as having been constructed from a “bottom-up” (equation-by-equation) perspective rather than the “top-down” philosophy that is a feature of the Reserve Bank of New Zealand core model. Also, unlike the New Zealand model, the parameters of the MM are estimated econometrically from time series data.

The underlying structure of the MM involves the specification of (1) a long-run equilibrium in real variables that is independent of the price level and exhibits no long-run inflation trade-off; (2) a

7. The inflation dynamics also depend on an asymmetric output gap term from which the positive effect of excess demand on inflation is stronger than the negative effect of the equivalent degree of excess supply.

nominal variable equilibrium determined via an inflation target and a feedback rule for short-term nominal interest rates; and (3) a sluggish adjustment to shocks due to both real and nominal rigidities. The explicitly forward-looking expectation aspects of the MM are limited to the foreign exchange market, and the dynamics of nonfinancial sectors are generally determined by conventional error correction mechanisms. Thus, for example, a forward-looking Phillips curve cannot be derived

The current forecasting process at the Bank of England attempts to map the policymaker's uncertainty about alternative economic assumptions onto a distribution of future outcomes via a combination of models and judgment.

analytically from the wage-price system within MM. In equilibrium, retail prices are set as a markup over marginal costs, with marginal costs a weighted average of unit labor costs and import prices. Retail price inflation adjusts slowly, and it responds to past deviations from equilibrium as well as to changes in wages, import prices, and the level of capac-

ity utilization. As part of preparations for the forecast in which alternative risks are assessed, the MM is used extensively to estimate the effects of various exogenous shocks such as a shift in the inflation target or a temporary change in short-term interest rates.

Auxiliary Models. The Bank also maintains some small, forward-looking models, of which the leading example is that based on Batini and Haldane (1999). This model is a less-detailed but more theoretically consistent version of MM, and its estimated parameters are chosen to satisfy numerous theoretically motivated constraints. The smaller size makes it more tractable, and the results are often easier to interpret in economic terms. Also, because there are fewer equations and parameters it is easier to experiment with alternative behavioral assumptions, such as the degree of forward-looking behavior in agents' decision making. Against these advantages is that the higher level of aggregation means that the smaller model is not necessarily as accurate or reliable a forecasting tool as the larger-scale version, particularly at short horizons.

Bank of England staff have also used various single-equation Phillips curve models to investigate the relationship between inflation and summary measures of disequilibrium in the real economy and to simulate the implications for inflation of alternative

unemployment rate paths. Along with VAR models, these are used as a cross-check on the inflation forecasts produced by the core model.

The U.S. Federal Reserve

Monetary policy in the United States is set by the Federal Open Market Committee (FOMC) and consists of twelve voting members: seven members of the Board of Governors of the Federal Reserve System and the presidents of five of the twelve Reserve Banks ("regional Feds").⁸ The staff of the Board of Governors prepares forecasts of U.S. and international economic activity prior to each of the eight FOMC meetings held each year. Independently, the staff of each of the regional Feds may also produce forecasts as part of briefing their Bank's president prior to an FOMC meeting. The various Board and regional Fed forecasts are not made publicly available until several years after an FOMC meeting. However, a summary of the outlook of the policymakers is contained in the forecasts of GDP, inflation, and unemployment documented in the Humphrey-Hawkins testimony on monetary policy submitted to Congress twice each year. The focus here is on the forecasting system implemented at the Board of Governors.

Information available to the FOMC policymakers comes from a number of sources. First, each Federal Reserve Bank gathers anecdotal information on current economic conditions in its district through reports from directors of the bank and its branches and interviews with key business contacts, economists, market experts, and other sources. The so-called *Beige Book* summarizes this information. In addition the Board receives information directly from various advisory councils that can provide an assessment of recent economic developments. Second, staff at the Board of Governors produce several documents for FOMC meetings. One is titled "Current Economic and Financial Conditions" and is commonly referred to as the *Greenbook* because of its green cover. The *Greenbook* lays out the staff's assessment of recent developments in the domestic macroeconomy together with an analysis of financial and international developments. The *Greenbook* also presents quarterly point forecasts for key aggregates in the domestic economy such as the broad components of GDP, unemployment, and prices and wages. The forecast horizon in the *Greenbook* is as much as two years ahead although it is sometimes as short as six quarters. Another document, the *Bluebook*, contains model simulations to examine alternative strategies for monetary policy over a longer period, often up to five years. These simulations are presented formally at least twice each year.

Published accounts of the forecasting system suggest that, despite its role in the overall policy-making process, a core macroeconomic model is not the tool used for producing the *Greenbook* forecasts (Reifschneider, Stockton, and Wilcox 1997). In fact, the forecasts are primarily judgmental in nature, relying heavily on the expertise of sector specialists and senior advisers. The process of generating a *Greenbook* forecast begins with a forecast coordinator who provides the conditioning assumptions and initial forecasts for several key aggregates such as inflation and output.⁹ Staff experts on various sectors of the economy then quantify how their sector-specific forecasts are affected by the aggregate baseline forecast as well as data that has become available since the last FOMC meeting. Each sector specialist would potentially use a range of econometric models relevant to their sector for guidance in preparing their forecasts. The sector forecasts are then blended by the coordinator into revised aggregate forecasts, which are returned to the sector specialists who may again adjust their sector forecasts in view of the new aggregate baseline. After some iteration, the “consensus” forecast is reported in the *Greenbook*.

High-frequency time series data (monthly, weekly) are used to tune the short-range forecasts by providing better estimates of initial conditions. For example, a newly available monthly labor market report or retail sales report might affect the assessment of current-quarter GDP growth. Several statistical models are used to filter the high-frequency data. Anecdotal evidence also plays a potentially important role in identifying trends that may not yet have shown up in official statistics.

The Core Model. The Board maintains a core domestic model, known as the FRB/US model. This model contains around forty behavioral equations (see Brayton and Tinsley 1996 and Brayton and others 1997 for overviews). There is no money supply and demand relationship with short-term interest rates determined by policy rules that can be toggled on or off. The FRB/US model is the successor to the larger so-called MPS model that was used up until the early 1990s and is distinguished from its predecessor mainly by its explicit separation of the macrodynamics of the nonfinancial sector into adjustment costs and expectations-formation components. In particular, most nonfinancial sector variables are assumed to move gradually to eliminate

past disequilibria (deviations of actual from desired levels) and also respond to the path that the equilibrium is expected to follow in the future. This forward-looking “target-seeking” feature is also common to the nonfinancial sectors of the models used at the Bank of Canada and the Reserve Bank of New Zealand, except for the wage/price block as described below. The financial sector of FRB/US is based on various instantaneous arbitrage equilibria. For example, long-term interest rates are determined via the expected path of short rates plus a time-varying term premium while the real value of the stock market is determined via the discounted expected future flow of dividend payments. Like the Bank of England’s core model, the parameters of the FRB/US model are estimated econometrically from time series data.

In the FRB/US model the price-wage system contains an equilibrium condition in which firms set the profit-maximizing price of their output as a markup over marginal costs, with marginal costs a weighted average of unit labor and energy costs. The equilibrium price level of domestic production is also assumed to vary inversely with the degree of slack in the economy as measured by the gap between the actual unemployment rate and the rate of unemployment that is believed to be consistent with nonaccelerating inflation. The dynamic process for inflation depends on the distance between the actual and targeted price level, the intrinsic rate at which inflation adjusts over time, and expectations. The specification gives a little more weight to past price inflation than to unit costs expected to prevail in the future. An increase in the current or expected future unemployment gap has a negative impact on inflation rates because it foreshadows increasing labor market tightness. Finally, consumption prices depend on direct effects due to changes in relative nonoil import prices and energy prices. Thus, apart from the special disequilibrium factors, the price (and

While the Federal Reserve Board of Governors primarily uses an expert-based system for producing baseline forecasts, they rely on a detailed core macroeconomic model for policy analysis.

8. The President of the Federal Reserve Bank of New York is a permanent member of the FOMC; the other presidential members rotate on a prespecified annual basis.
 9. The key conditioning assumptions, such as the path for the federal funds rate and fiscal policy as well as stock and energy prices, are discussed in the text of the *Greenbook* although generally not in detail.

wage) block of the FRB/US model is modeled in the same manner as the rest of the nonfinancial system.

The FRB/US model is used as input to the *Greenbook* forecasting system, primarily as a check on the plausibility of the forecasts, and for identifying the sources of any discrepancy. Also, if a major change in underlying assumptions occurs between meetings, then the FRB/US model may be used to provide a new benchmark baseline. In practice the core model is add-factored in order to replicate the final *Greenbook* forecasts over the forecast horizon. This adjusted version of the core model is then used

for various exercises, such as generating intervals around the *Greenbook* forecasts based on stochastic simulations and occasionally for producing forecasts at horizons beyond two years. The core model also appears to play an important role in simulation experiments such as predicting the effects of alternative policy paths or alternative assumptions

about exogenous variables. The simulation results are typically presented in the *Bluebook*.

Conclusion

This article summarizes some of the basic issues that arise when forecasting is being conducted in the context of a monetary policy decision and describes some of the responses that three central banks have made to these issues. Broadly speaking, the basic mechanism of the forecasting process might be summarized as comprising four elements:

- a series of models or methods that are used to produce short-run (current quarter and one–two quarters ahead) forecasts;
- a relatively small core model that produces forecasts of major aggregates of interest over a one- to three-year horizon;
- a method for disaggregating the aggregated forecasts from the core model to incorporate the insights of sector specialists;
- a collection of auxiliary models that are designed to provide information about policy actions (such as policy simulations) or yield information relating to forecasts that are hard to analyze with the core model (such as the effects of unusual events).

These elements are part of most of the forecasting systems studied in this article although the emphasis given to each differs across institutions. Moreover, the way each component is implemented varies a great deal—for example, the degree to which the core model is closely linked to data versus how much theoretical structure is imposed. Additional theoretical structure might reduce the model's forecast accuracy but will generally aid its economic interpretability.

Some institutions appear to favor an approach that is structured explicitly within a model framework. Of the central banks studied, the Reserve Bank of New Zealand appears to be representative of this approach. Others, such as the Board of Governors, place much greater emphasis upon the judgments of sector experts and the experience of policy advisers in generating forecasts and evaluating policy choices. In some ways the distinction is really between those favoring relatively formal methods of forecasting and those who find the use of expert systems appealing. Of course, the distinction is not a sharp one. For example, while the Board of Governors primarily uses an expert-based system for producing baseline forecasts, they rely on a detailed core macroeconomic model for policy analysis as well as a cross-check on the economic plausibility of the baseline forecasts. At the Bank of England a core model is used to produce forecasts, but the policymakers assign subjective weights to various alternative assumptions in producing a forecast distribution. Ultimately, even if no institution relies entirely on econometric models to produce forecasts, they do use economic models of some variety to provide the rationale for the forecast numbers. It is also perhaps not surprising that there is a greater reliance on models at central banks that have explicit inflation objectives, such as the Bank of England and the Reserve Bank of New Zealand. In those cases it is particularly important that the policymakers ensure that policy decisions are consistent with the inflation objectives and are as transparent to the public as possible.

Although this article has focused on only three central banks it appears that, in general, banks that have moved toward inflation-targeting objectives have also tended to put greater emphasis on producing timely and publicly available model-based forecasts. In doing so these banks have made the monetary policy-making process increasingly transparent. However, even then there can be differences in the nature of the published information. For example, as the discussion shows, the Bank of England publishes point forecasts that are conditional on no change to the policy instrument over

There is a greater reliance on models in producing forecasts at central banks that have explicit inflation objectives, such as the Bank of England and the Reserve Bank of New Zealand.

the forecast horizon. But because this course might not be considered the most likely one for future policy, an associated forecast distribution is used to convey the relative risks to the conditional projection. In contrast, the point forecasts published by the Reserve Bank of New Zealand appear to directly

condition on a policy instrument path that is consistent with its inflation objectives. In this case an objective-consistent instrument path is conveyed directly to the public rather than being implicit in the shape of the forecast distribution.

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Are Displaced Workers Now Finished at Age Forty?

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IN RECENT YEARS, THE MEDIA HAS DEVOTED CONSIDERABLE ATTENTION TO THE EFFECTS OF DOWNSIZING AND CORPORATE RESTRUCTURING ON WORKERS, FOCUSING IN PARTICULAR ON THE PLIGHT OF LAID-OFF MIDDLE-AGED WORKERS. FOR EXAMPLE, A COVER STORY IN *FORTUNE* MAGAZINE DECLARED THAT DISPLACED WORKERS ARE NOW “FINISHED AT FORTY,” WITH GROWING NUMBERS OF LAID-OFF

workers over age forty unable to find jobs that pay as much as their former positions (Munk 1999). Similarly, the business press characterized the downturn in the early 1990s as “much tougher than past ones on older workers” (Labich 1993). A series on corporate downsizing in the *New York Times* (1996) reported that the share of laid-off workers aged 30–50 rose from 44 percent in 1981–83 to 56 percent in 1991–93.

Workers who are permanently involuntarily dismissed from their jobs are called displaced (or downsized) workers.¹ These workers have been the focus of considerable attention from economists as well as the media. Economists have focused particular attention on whether displacement has increased over time in the United States, and whether job security has concomitantly declined. The fraction of workers who are displaced tends to move with the business cycle; however, the displacement rate (the fraction of workers displaced during a given interval) did not fall as much as usual

during the earlier phases of the current expansion, leading to concerns that job security had permanently declined (Valletta 1997b; Aaronson and Sullivan 1998).

The magnitude of displacement is sizable. During 1995–96, about 2.2 million workers were displaced from jobs they had held for three or more years, or about 3 percent of workers with at least three years of tenure (Hipple 1999).

Many displaced workers incur significant costs, including wage losses. Among workers displaced during 1981–95 who found other jobs, real (inflation-adjusted) weekly postdisplacement earnings were 13 percent less than predisplacement earnings (Farber 1997). Several factors underlie these earnings losses. Other employers are unlikely to value job- or employer-specific skills gained on the lost job, so displaced workers are no longer compensated for those skills. In addition, displaced workers lose any seniority-related benefits that accrued with tenure at their previous employer.

Displaced workers also incur the costs of searching for a new job, including a period of nonemployment for many. Of the 2.2 million workers displaced during 1995–96 from jobs they had held for at least three years, only 83 percent were reemployed in February 1998 (Hipple 1999). These economic costs make the displacement rate and the effects of displacement on workers of concern to policymakers.

The probability and costs of displacement are traditionally believed to vary with age because older workers tend to have more firm-specific human capital than do younger workers. The theory of specific human capital posits that a firm and a worker share the cost of a worker acquiring job- or firm-specific

skills, skills that raise a worker's productivity at that particular firm but not at other firms (Becker 1975). The firm recoups its investment because the worker is more productive, and over time the worker gains the benefits of his or her investment in specific human capital.² Wages then are observed to rise with tenure at the firm.

The acquisition of specific human capital lowers the likelihood that a worker will be displaced because the firm would no longer be able to recoup its investment if the worker is laid off. In addition, the firm would have to pay part of the cost of a new employee gaining the specific skills held by the displaced worker. Firms should therefore be less likely to lay off experienced, older workers who have more specific human capital than less experienced, younger workers (Topel 1991).

Although specific human capital may help protect older workers from displacement, a worker's investment in firm-specific skills raises his or her costs of displacement. Because workers' earnings on the lost job incorporated the value of job- or firm-specific skills that other employers will not value, older and more experienced workers tend to incur higher earnings losses after displacement than do younger and less experienced workers (Valletta 1991). Older displaced workers also tend to experience a longer period of nonemployment before finding another job than do younger displaced workers (Valletta 1991). An increase in the number of older workers who are displaced would raise the social and private costs of

displacement, making it important to assess whether the likelihood of displacement has increased over time for older workers.

This article examines whether the likelihood of displacement has risen for older workers relative to younger workers over the 1980s and 1990s. It also examines whether the likelihood that older displaced workers will find another job has declined relative to reemployment trends among younger displaced workers and whether earnings losses among older displaced workers who find other jobs have increased over time relative to losses experienced by their younger counterparts. Data from the 1984–98 Displaced Worker Surveys indicate that displacement rates tend to decline with age.³ However, relative displacement rates appear to have risen over time for workers in their 40s and 50s. After job loss, older workers tend to have lower reemployment rates and larger earnings losses than do younger workers. The results do not indicate that the costs incurred by older displaced workers have risen significantly over time, except for relative earnings losses for middle-aged managerial and professional workers.

Why Might the Age Profile of Displacement Have Changed?

There are several potential reasons the age distribution of displaced workers and the effects of displacement on workers of different ages may have changed over time. Adoption of new technologies, changes in the age distribution of the labor force, and increased cost-cutting pressures may have led to differential changes across age groups in the likelihood of displacement and in the costs of displacement.

Advances in technology may have shifted the age distribution of displaced workers. As computer use has increased, the specific human capital that traditionally shielded older, more experienced workers from displacement may have become less valuable to employers.⁴ As Aaronson and Housinger (1999) discuss, firms may replace older workers with younger workers because older workers may be more expensive to train in new technologies than younger workers; in addition, firms will have a longer time to recoup the costs of training younger workers than older workers. Similarly, postdisplacement outcomes may have worsened over time for older workers if their skills have not kept pace with increases in employers' demand for computer and other technical skills.

Demographics may also have contributed to any changes in the age structure of displacement. The aging of the baby boomers may account for the much-hyped increase in the number of middle-aged

The conventional wisdom that middle-aged workers face an increased risk of being displaced and increased difficulties after displacement is partially borne out by this analysis.

displaced workers even if the likelihood that a middle-aged individual is displaced has not risen over time. Indeed, Rodriguez and Zavodny (2000) find that almost two-thirds of the shift in the age distribution of displaced workers is due to the aging of the labor force.

The gradual shift from a manufacturing-based to a service-based economy may also be a factor in shifts in the age distribution of displaced workers. Older workers may be more concentrated in declining manufacturing industries than are younger workers. Rodriguez and Zavodny (2000) report that industry shifts have played a small role in changes in the age structure of displacement.

Anecdotal evidence also suggests that cost-cutting pressures have prompted firms to replace older, higher-paid workers with younger workers who earn lower salaries. Labich (1993) declared that “companies have shut their doors to older workers” and quoted a displaced 54-year-old manager who asked why a company would hire him when “they can get someone in their 20s for half the price.” Similarly, Munk (1999) quoted a 41-year-old as saying, “For my salary the company could hire two twenty-somethings.” The cost savings from hiring a younger worker may outweigh the value of an older worker’s years of experience.

Previous research indicates that older workers are less likely to be displaced than are younger workers. Data on involuntary job loss from 1968 to 1992 indicates that the likelihood of involuntary job loss is higher among younger men than among older men with the same educational attainment (Boisjoly, Duncan, and Smeeding 1998). The probability of displacement also declines with age when data on both sexes are used (Farber 1993, 1997).

Although displacement rates decline with age, older workers tend to experience more difficulties after displacement than do younger workers. Data from 1981 to 1995 indicate that displaced workers aged 45–64 are less likely to find another job within a few years after they are displaced than are displaced workers aged 20–24; workers aged 35–44, however, are more likely to be reemployed than are workers aged 20–24 (Farber 1997). In addition, the difference between pre- and postdisplacement earnings among workers who find other jobs increases monotonically with age, indicating that older displaced workers experience larger wage losses than do younger workers (Farber 1997).

Although older workers have always been less likely to be laid off, their probability of displacement may have increased over time. The evidence is mixed.⁵ Farber (1993) reports that displacement rates for workers aged 40–59 were significantly higher in 1990–91 than in 1982–83 relative to workers aged 20–24. Using data from the Panel Survey of Income Dynamics, Polsky (1999) finds a sizable increase from 1976–81 to 1986–91 in the probability that a separation was involuntary for men aged 45–54 relative to men aged 25–34, but the effect is significant only at the 10 percent level. Gottschalk and Moffitt (1999) find that the proportion of exits that were involuntary increased significantly over the 1980s and 1990s for older workers; however, the probability of involuntary termination did not rise over time.

Previous studies have found little support for anecdotal claims that the effects of displacement have worsened over time for older workers. Farber (1993) reports that reemployment rates among older displaced workers were unchanged between

1. Workers who are temporarily laid off, quit, or fired for cause are not viewed as displaced workers. Temporarily laid-off workers expect to be recalled to their jobs whereas workers who quit voluntarily leave their jobs. Workers who are fired for cause are not viewed as displaced because the dismissal is due to the workers’ poor performance; displaced workers are those who permanently lose their jobs for reasons unrelated to their own performance, such as their firms closing.
2. The costs are shared instead of having either the firm or the worker bear all of the cost. If the firm bears all of the cost, it has no assurance that the worker will not quit before the firm has recouped its investment; the employee has an incentive to stay if the firm raises his or her wage over time. If the worker bears all of the cost, he or she has no assurance that employment with the firm will continue long enough for the worker to recoup the gains from specific skills; the firm has an incentive to keep the worker if the firm has partially paid for specific training.
3. Displaced Worker Surveys are supplements to the Current Population Surveys, which are conducted monthly by the Bureau of Labor Statistics.
4. Krueger (1993) reports that the fraction of workers who use a computer at work declines across the 25–39, 40–54, and 55–65 age groups. Addison, Fox, and Ruhm (1996) and Aaronson and Housinger (1999) find that the likelihood of displacement increases with investment in computer technology. However, Aaronson and Housinger (1999) find little evidence that the relationship between computer investment and displacement varies across age groups.
5. Studies of retention rates have also reached mixed conclusions. Diebold, Neumark, and Polsky (1997) and Neumark, Polsky, and Hansen (1999) report that four-year job retention rates for younger workers relative to older workers declined from 1983–87 to 1987–91 and rose from 1987–91 to 1991–95. (Job retention rates encompass quits as well as involuntary job loss.) Gottschalk and Moffitt (1999) similarly find that the likelihood that a job will end declined over 1981–92, with the largest declines occurring for older workers.

1982–83 and 1990–91 relative to trends among younger displaced workers. Polsky (1999) reports that the probability of reemployment fell for displaced workers aged 35–44 relative to workers aged 25–34 between 1976–81 and 1986–91, but the decline is not statistically significant. Polsky’s results also do not indicate that the relative probability of reemployment has changed over time for displaced workers aged 45–54. Neither study examined changes over time in the difference between pre- and postdisplacement earnings across age groups.

Displaced Worker Data

The Displaced Worker Survey supplements to the Current Population Survey are the primary source of data on displaced workers

Workers in their 40s are relatively more likely to be displaced in the 1990s than in the 1980s. However, their reemployment and earnings losses have not changed significantly over time relative to younger workers.

in the United States. The Current Population Survey is a large, nationally representative survey of labor market status and related variables that is conducted monthly. In January of even-numbered years from 1984 to 1992 and February of even-numbered years from 1994 to 1998, the Current Population Survey included a special supplement

that asked individuals about displacement. Individuals are included in the Displaced Worker Survey if they answered that they lost or left a job for one of six reasons:

- their plant or company shut down or moved;
- their company had slack or insufficient work;
- their position or shift was abolished;
- a seasonal job was completed;
- a self-operated business failed;
- some other similar reason.

This study focuses on the first three displacement categories, which more closely correspond to most people’s idea of displacement.⁶ Displacements due to company closure or insufficient work are demand-driven phenomena, reflecting the business cycle, while corporate restructuring is likely to result in positions being abolished.

The Displaced Worker Survey asks workers about characteristics of the lost job, including weekly earnings. The survey also includes questions about individuals’ current employment status and weekly

earnings in the current job, allowing an examination of postdisplacement outcomes at the time of the survey.

The Displaced Worker Survey has several limitations, including that it records only one job loss per worker. Workers who were displaced more than once during the displacement window are instructed to answer questions for the predisplacement job with the longest tenure. The Displaced Worker Survey therefore leads to an underestimate of the number of displacement incidents during a given period. The data are better regarded as yielding estimates of the fraction of individuals displaced at least once during a given period and of their characteristics relative to workers who report not being displaced than as a count of the total number of displaced workers.

Another limitation of the surveys is a change in the displacement interval. The 1984–92 surveys asked whether individuals were displaced during the previous five years, but the 1994–98 surveys asked about displacement during the previous three years. In the 1984–92 Displaced Worker Surveys, workers who were displaced during the first or second year of the five-year displacement window and then were displaced again during the next three years would report the first displacement episode if they had longer tenure on the first lost job than on the subsequent lost job. As noted above, the result is potential undercounting, in this case for the three years prior to the survey. In the 1994–98 Displaced Worker Surveys, such workers would always report the more recent lost job and be counted as displaced during the previous three years. This study includes only workers who report being displaced within the three years prior to the survey. In the analysis of displacement rates, the change in the Displaced Worker Survey displacement interval is corrected for using the method developed by Farber (1997).⁷

An additional shortcoming of the surveys is a change in the way data were collected for workers with different reasons for displacement. The 1994–98 Displaced Worker Surveys did not follow up with questions about jobs reported lost because of a seasonal job ending, self-employment failing, or other reasons. Workers in those categories were not asked what year they were displaced or their earnings on the lost job, for example. Because of the incomplete information in the surveys, this analysis does not include workers displaced for those three categories of reasons. As Kletzer (1998) and Farber (1997) discuss, the fraction of workers displaced from seasonal jobs or self-employment has remained fairly constant over time; however, workers dis-

placed for other reasons account for an increasing share of displaced workers over time.⁸

This study uses data on individuals aged 20–64 at the time of the survey (not at the time of displacement).⁹ Workers over age 64 are not included because retirement decisions may influence their postdisplacement behavior differently than for workers under age 64 and because retirement behavior may have changed over time.¹⁰

Descriptive Statistics on Displacement

This study evaluates displacement rates across age groups and examines whether older workers are more likely to be displaced than are younger workers. It also examines whether two postdisplacement outcomes, the probability of reemployment and the difference between pre- and postdisplacement earnings, vary across age groups. The analysis focuses on whether the incidence and costs of displacement have changed over time across age groups.

There has been a dramatic shift in the age composition of displacement, as shown in Chart 1. Chart 1 shows kernel density estimates of age-displacement profiles for the 1984, 1990, and 1998 Displaced Worker Surveys. Kernel density estimates are essentially smoothed histograms and provide a useful means of summarizing changes in a distribution over time.¹¹ These figures display the distribution of displaced workers by age at the time of the surveys; the plot for 1984 in Chart 1, for example, shows the age distribution of workers displaced during the survey period of 1981 to 1983. The fraction of displaced

workers who are middle-aged has clearly risen over time. In the 1984 Displaced Worker Survey, the age of displaced workers is concentrated in the late 20s, whereas the distribution is considerably more evenly spread across ages in the 1998 survey. The chart suggests that much of the “flattening of the hump” occurred in the 1990s.

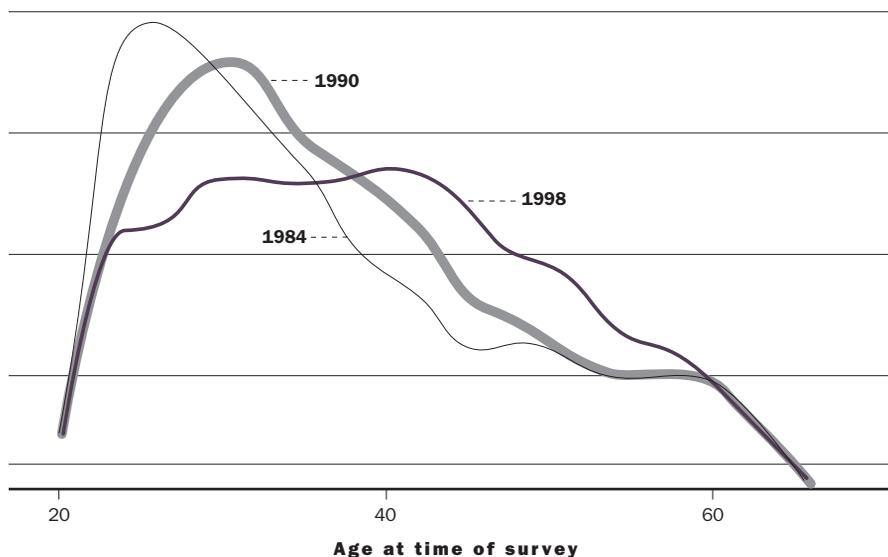
There are several potential explanations for the shift in the age-displacement profile shown in Chart 1. As discussed above, changes in the age distribution of the labor force may account for the increase in the fraction of displaced workers who are middle-aged. Increased emphasis on computer and other technical skills may have contributed to the shift if older workers’ skills are poorer or outdated relative to those of younger workers. The concentration of older workers in declining industries or an increase in cost-cutting pressures also may have contributed to the shift in the age distribution of displaced workers.

Table 1 reports three-year displacement rates for five-year age groups for each Displaced Worker Survey.¹² About 13.6 percent of workers aged 20–24 were displaced during 1981–83, for example, compared with 7.6 percent of workers aged 40–44. Although displacement rates are countercyclical for all age groups, displacement rates are more variable across the business cycle for younger workers than for older workers.

The displacement rates provide some support for the hypothesis that the likelihood of displacement may have risen over time for middle-aged workers relative to younger workers. The recession in the early 1990s appears to have been tougher on

6. Aaronson and Housinger (1999) discuss the limitations of the Displaced Worker Survey categories of reasons for displacement.
7. Using data from the Panel Survey of Income Dynamics, Farber (1997) calculated that workers displaced in a given year have a 0.3017 percent probability, on average, of being displaced again over the next three years. For workers displaced a year ago, the average probability of being displaced again during the next three years is 0.2705. Workers displaced four and five years ago are assigned these probabilities of being displaced in the three years prior to the survey.
8. Abraham (1997) notes that only 24 percent to 31 percent of workers who said in the 1996 Displaced Worker Survey that they were displaced for “other” reasons should be categorized as displaced, based on follow-up interviews.
9. Approximate age at the time of displacement could be backed out using the year of displacement and the age at the survey, but the age at displacement can only be bracketed within a three-year window.
10. The mean age at withdrawal from the labor force in the United States declined from 62.9 in 1980–85 to 62.2 in 1990–95 for men and from 62.9 to 62.7 for women (Gendell 1998).
11. See Valletta (1997a) for a nontechnical discussion of kernel density estimation or Silverman (1986) for a more technical discussion. The estimates presented here used an Epanechnikov kernel and a bandwidth of 1.4795799, which is the optimal bandwidth for the combined 1984, 1990, and 1998 Displaced Worker Survey samples.
12. The numerator is the number of workers who report being displaced because of plant closure, position abolished, or slack work in the last three years of each survey. As mentioned earlier, Farber’s 1997 method is used to correct for the change in the displacement window. The denominator is the number of persons who were employed during that three-year period, based on the Current Population Survey outgoing rotations group data. The Current Population Survey final weights were used to calculate the number of displaced workers and employed persons. Because the Displaced Worker Survey reports age at survey, not age at displacement, the workers in the denominator are “aged”; the denominator for 20–24 year-olds in the 1984 Displaced Worker Survey calculation is the average of the number of 18–22 year-olds employed in 1981, 19–23 year-olds in 1982, and 20–24 year-olds in 1983.

CHART 1
Age Distribution of Displaced Workers, 1984, 1990, and 1998



Source: Author's calculations from Displaced Worker Survey data

middle-aged workers than was the recession in the early 1980s. Among workers aged 40–59, displacement rates were higher during 1989–91 than in 1981–83. Among workers aged 20–39, however, displacement rates were lower in 1989–91 than in 1981–83. The displacement rates reported in Table 1 also suggest that the 1990s recovery may have initially been more sluggish for workers in their 40s than younger workers.

Although displacement rates appear to have been relatively high among middle-aged workers during the early and mid-1990s, it is not clear whether middle-aged workers were more likely to be laid off during the most recent period than were younger workers. As Table 1 reports, displacement rates among workers aged 40–54 during 1995–97 were similar to their levels in 1985–87. Workers aged 20–24 were more likely to be displaced in 1995–97 than in 1985–87, while displacement rates were lower in 1995–97 than in 1985–87 for workers aged 25–34. Whether displacement rates remained relatively high for middle-aged workers during the most recent period depends on which comparison group is used.

Among workers who were displaced, reemployment rates differ across age groups. Table 2 reports the fraction of displaced workers who are employed at the time of the survey by five-year age intervals. The fraction of displaced workers who find new jobs is cyclical, with reemployment rates higher during expansions than during recessions. Reemployment rates generally appear to rise with age until age

40–44 and then decline. The decline in reemployment rates among older displaced workers may reflect voluntary withdrawal from the labor force (retirement) or may indicate that displaced workers in their 50s and early 60s have more difficulty finding new jobs than do workers in their 30s and 40s.

Reemployment rates do not appear to have worsened over time for older workers. During the downturn in the early 1990s, reemployment rates for displaced workers in their 40s were higher than during the 1980s recession; about 64 percent of displaced workers aged 40–44 were reemployed at the time of the 1992 Displaced Worker Survey, for example, compared with 59 percent in the 1984 survey. Reemployment rates for workers in their 20s, in contrast, were lower in 1989–91 than in 1981–83, and they were about even for workers in their 30s. Displacement rates during the economic recovery in the 1990s are higher than in the 1980s for all age groups. The rates reported in Table 2 thus do not indicate that reemployment rates have declined among displaced workers in their 40s and 50s relative to displaced workers in their 20s and 30s, as suggested by the media.

The descriptive statistics on reemployment also are not consistent with the popular perception that older downsized workers have been increasingly forced into involuntary retirement over time. If older displaced workers want to find new jobs but are not able to do so, they may withdraw from the labor force before their preferred retirement age. However, the reemployment rates in Table 2 do not

TABLE 1 Three-Year Displacement Rates, by Age

Age	1981–83	1983–85	1985–87	1987–89	1989–91	1991–93	1993–95	1995–97
20–24	.136	.099	.080	.070	.111	.102	.104	.087
25–29	.132	.100	.090	.077	.106	.104	.101	.076
30–34	.112	.095	.083	.074	.093	.095	.082	.071
35–39	.092	.083	.070	.064	.088	.086	.085	.066
40–44	.076	.067	.066	.058	.080	.086	.076	.066
45–49	.075	.065	.063	.051	.079	.074	.079	.061
50–54	.066	.063	.057	.047	.075	.078	.062	.060
55–59	.067	.061	.054	.048	.071	.075	.062	.065
60–64	.070	.058	.055	.053	.064	.072	.058	.053
All	.099	.082	.073	.063	.088	.088	.082	.068

Note: Shown is the ratio of workers displaced during the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work to the average number of workers in that age group employed during that three-year period.

TABLE 2 Reemployment Rates of Displaced Workers, by Age

Age	1981–83	1983–85	1985–87	1987–89	1989–91	1991–93	1993–95	1995–97
20–24	.602	.632	.674	.689	.561	.627	.691	.722
25–29	.657	.668	.736	.724	.636	.675	.743	.793
30–34	.627	.680	.702	.756	.630	.744	.757	.814
35–39	.630	.690	.686	.737	.634	.704	.724	.786
40–44	.592	.660	.741	.749	.643	.713	.747	.820
45–49	.561	.642	.660	.673	.649	.693	.754	.786
50–54	.519	.561	.625	.673	.517	.609	.657	.743
55–59	.377	.519	.583	.563	.541	.598	.573	.668
60–64	.302	.376	.417	.504	.389	.408	.458	.477
All	.589	.639	.682	.706	.604	.672	.715	.767

Note: Data include only workers displaced during the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work. Observations are weighted using the Current Population Survey final weights. Each column is estimated from a separate Displaced Worker Survey.

suggest an increased trend toward involuntary retirement among older displaced workers.¹³

Table 3 shows the average percentage difference between pre- and postdisplacement real weekly earnings for displaced workers who were employed at the time of the survey.¹⁴ Almost all age groups incurred wage losses after displacement in each survey. Wage losses show a cyclical pattern, with the difference between pre- and postdisplacement earnings rising during recessions and shrinking during expansions. The average weekly earnings loss after displacement, given reemployment, tends to increase with age, perhaps indicating that older dis-

placed workers have more difficulty earning as much per hour in their new jobs than do younger workers or reflecting a relative decline in hours worked per week among older displaced workers.

The sample means reported in Table 3 provide little evidence that wage losses increased over time for older displaced workers relative to younger workers. The youngest displaced workers, those aged 20–24, experienced earnings losses during recessions and the early stages of economic recoveries but actually experienced earnings increases after displacement in the later phases of the 1980s and 1990s expansions. Workers aged 25–29 who

13. The Displaced Worker Survey data are not ideal for examining whether workers have been forced or pressured into retiring from their jobs before their preferred age of retirement. If such workers view themselves as involuntarily displaced, they would presumably be included in the survey. However, such workers may not view themselves as displaced if they received an early retirement compensation or incentive package from their employers.

14. The wages are deflated using the consumer price index (CPI) for urban workers. The wage at the time of the survey is deflated using the CPI for the survey month, and the predisplacement wage is deflated using the CPI annual average for the year of displacement.

TABLE 3 Average Percentage Change in Real Weekly Earnings, by Age

Age	1981–83	1983–85	1985–87	1987–89	1989–91	1991–93	1993–95	1995–97
20–24	–.062	–.005	.044	.048	–.097	–.069	.045	.144
25–29	–.128	–.090	–.047	–.082	–.125	–.060	.022	–.001
30–34	–.106	–.119	–.112	–.108	–.106	–.096	–.071	–.039
35–39	–.143	–.133	–.147	–.085	–.234	–.166	–.144	–.124
40–44	–.186	–.180	–.152	–.131	–.235	–.244	–.181	–.081
45–49	–.243	–.145	–.119	–.108	–.208	–.235	–.197	–.084
50–54	–.274	–.304	–.328	–.308	–.203	–.169	–.189	–.103
55–59	–.290	–.404	–.320	–.288	–.264	–.443	–.275	–.164
60–64	–.587	–.374	–.627	–.187	–.409	–.576	–.357	–.340
All	–.146	–.128	–.116	–.099	–.173	–.161	–.104	–.056

Note: Shown are the mean values of the natural log of real postdisplacement earnings minus the natural log of real predisplacement earnings for each age group. Data include only workers displaced during the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work who are reemployed at the time of the survey. Observations are weighted using the Current Population Survey final weights. Each column is estimated from a separate Displaced Worker Survey.

were displaced in 1993–95 or 1995–97 also do not appear to experience earnings losses. Although displaced workers aged 30 and older continue to experience a decline in earnings after displacement, the magnitude of the average loss is smaller for age 30-plus workers displaced in the mid-1990s than for those displaced in the mid-1980s.

The descriptive statistics suggest that the likelihood of displacement may have risen over time for middle-aged workers, relative to younger workers, particularly during the 1990s recession. The sample means do not suggest that postdisplacement outcomes have worsened for older workers relative to younger workers. However, other factors that affect postdisplacement outcomes, such as tenure or education, may have changed differently across age groups and may mask a change in postdisplacement outcomes across age groups. The next section uses a multivariate framework to examine differences across age groups in the probability of displacement and in postdisplacement outcomes.

Regression Analysis Methods

The likelihood that a worker is displaced because of plant closure, position abolished, or slack work is estimated using probit regressions.¹⁵ The dependent variable is one if a worker reports being displaced during the three years prior to the survey and zero otherwise, and a separate regression is estimated for each Displaced Worker Survey.¹⁶ The probability that a displaced worker is reemployed at the time of the survey is similarly estimated using a separate probit regression for each survey year, where the dependent variable is one if a displaced worker has found a new job and zero otherwise. The ordinary least squares (OLS) regression method is used to estimate the

determinants of the percentage difference between pre- and postdisplacement earnings among workers who are reemployed.

This study focuses on the effect of age, which is measured using five-year age intervals. If the probability of displacement has risen over time for older workers, the estimated relationship between the likelihood of displacement and the age indicator variables should increase over time for older workers relative to younger workers. Similarly, the estimated relationship between the probability of reemployment or earnings losses and the age indicator variables should decline over time for older workers relative to younger workers if the consequences of displacement have worsened over time for older workers. The 20–24 age group is omitted in the regressions for identification, so the estimated coefficients on the other age variables are relative to workers aged 20–24.

The regressions include other variables that are likely to affect postdisplacement outcomes and may vary over time within age groups. For example, the likelihood of displacement may decrease with education, and the probability of reemployment may increase with education. If the educational composition of workers within five-year age groups has changed over time, the coefficients on the age variables might reflect changes in education if the regressions do not control for education. The regressions include indicator variables for three of four educational categories as well as female, non-white, and married indicator variables.¹⁷

The postdisplacement outcomes regressions also control for reason for displacement and years since displacement. Reason for displacement may affect the likelihood of reemployment because plant closure or slack work may indicate an industry down-

turn, which affects the likelihood of finding another job in the same industry. Earnings losses tend to be larger if a displaced worker switches industries (Jacobson, Lalonde, and Sullivan 1993), which may be more likely if the reason for displacement is plant closure or slack work. The longer the period since displacement, the more time workers have had to find another job and to receive raises on a new job.

The postdisplacement outcomes regressions also control for years worked at the predisplacement job (tenure) because job security may have changed over time. The earnings losses experienced by displaced workers tend to increase with the level of tenure on the predisplacement job (Topel 1991; Farber 1993). If tenure levels have fallen over time among older workers who are displaced, earnings losses among older displaced workers may fall over time because of changes in tenure, not because of changes in earnings losses directly due to age.¹⁸ In addition, the relationship between tenure and wages may have weakened over time. Older workers tend to have higher tenure levels than younger workers, a tendency that partially underlies the age-earnings gap. If the relationship between tenure and wages has weakened over time, older workers may not be earning as much in predisplacement jobs relative to younger workers. The observed age gap in earnings losses would then narrow over time if tenure is not controlled for in the regressions. Tenure at the lost job is measured using a linear variable.¹⁹

For the displacement and reemployment probit regressions, the marginal coefficients, evaluated at the sample means, are presented for ease of interpretation. For the age-group indicator variables, the coefficients indicate the estimated change in the probability of reemployment if the indicator variable changes from zero to one. Observations are weighted using the Current Population Survey final weights.

Results

The likelihood that a worker is displaced generally declined with age in the 1980s. As Table 4 shows, the probability that a worker aged 40–44 was displaced in 1981–83 was 3.5 percent lower than the probability for a 20–24 year-old. Among workers aged 45–54, the relative probability of displacement was 4.4 percent lower than for workers aged 20–24. The negative relationship between displacement and age holds through the period 1989–91; however, the coefficients generally become less negative through the 1980s, suggesting that the relative probability of displacement increased for middle-aged workers during the 1980s.

The negative relationship between the probability of displacement and age is less evident in the 1990s. During the 1991–93 period, workers aged 35–44 were more likely to be displaced than workers aged 20–24, in sharp contrast to the previous period. In another change from previous trends, workers above age 44 were as likely to be displaced as workers aged 20–24 during 1991–93. During 1993–97, middle-aged workers did not regain the relatively protected status they enjoyed during the 1980s; workers aged 35–49 remained as likely to be laid off as workers aged 20–24. These results indicate that the likelihood of displacement has increased for older workers relative to workers aged 20–24.

In results not reported in Table 4, women are significantly less likely to be displaced than are men, but the relationship weakens over time. There is no

The data presented in this article suggest that much of the concern about displacement may soon begin to abate. Displacement rates during 1995–97 returned to levels similar to those during the 1980s expansion.

15. A regression gives the mathematical relationship between a dependent variable and a set of independent variables. A probit regression has a dependent variable that equals zero or one.

16. The displacement sample includes individuals who were displaced in the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work and nondisplaced individuals who are employed at the time of the survey. As in Farber (1997), the weights of individuals who were displaced four or five years ago are adjusted to reflect the probability of being displaced in the three years prior to the survey.

17. There are four educational categories: less than high school diploma, high school diploma only, some college, and college degree or higher.

18. The evidence on changes in tenure over time is mixed, with some studies suggesting a small decline in tenure (Aaronson and Sullivan 1998; Marcotte 1999; Neumark, Polsky, and Hansen 1999).

19. The tenure question changes slightly across the Displaced Worker Surveys. In 1984–92, the survey asks, “How many years had [the displaced worker] worked continuously there when that job ended?” The 1994 survey asks, “How many years had you worked for that employer when you lost that job?” The 1996–98 surveys ask, “How long had you worked for [that employer] when that job ended?” and displaced workers were asked to specify the periodicity (days/weeks/months/years) of their answer. The 1996–98 answers were converted into years for this analysis.

TABLE 4
Regression Estimates of Probability of Displacement, by Age

Covariate	1981–83	1983–85	1985–87	1987–89	1989–91	1991–93	1993–95	1995–97
Age 25–29	.008* (.004)	.008* (.004)	.015** (.004)	.013** (.004)	.007 (.004)	.019** (.005)	.009* (.005)	.005 (.004)
Age 30–34	–.002 (.004)	.007 (.004)	.011** (.004)	.012** (.004)	–.005 (.004)	.017** (.005)	–.001 (.004)	.005 (.004)
Age 35–39	–.019** (.004)	–.003 (.004)	.001 (.001)	.005 (.004)	–.009* (.004)	.010* (.005)	.001 (.004)	.001 (.004)
Age 40–44	–.035** (.003)	–.017** (.004)	–.002 (.004)	–.001 (.004)	–.012** (.004)	.012** (.005)	–.005 (.004)	–.001 (.004)
Age 45–49	–.038** (.004)	–.021** (.004)	–.009* (.004)	–.009* (.004)	–.017** (.004)	.001 (.005)	–.003 (.005)	–.004 (.004)
Age 50–54	–.044** (.003)	–.023** (.004)	–.014** (.004)	–.013** (.004)	–.020** (.004)	.004 (.005)	–.016** (.005)	–.005 (.004)
Age 55–59	–.044** (.004)	–.025** (.004)	–.016** (.004)	–.012** (.004)	–.024** (.005)	.004 (.005)	–.016** (.005)	–.001 (.005)
Age 60–64	–.037** (.002)	–.023** (.004)	–.013** (.005)	–.005 (.005)	–.027** (.005)	.010 (.007)	–.018** (.006)	–.009 (.006)
N	65,153	66,023	65,697	66,606	65,716	63,958	54,898	56,247

* significant at the .05 level
** significant at the .01 level

Note: Shown are the marginal probit coefficients evaluated at the sample means. The dependent variable is one if a worker reports being displaced in the three years prior to the survey because of plant closure, position abolished, or slack work and zero otherwise. Other variables in the regressions are indicator variables for female, nonwhite, married, and three of four educational categories (less than high school, some college, college graduate). The omitted age category is 20–24, so the other age groups are relative to workers aged 20–24. Observations are weighted using the Current Population Survey final weights. Each column is from a separate regression.

TABLE 5
Regression Estimates of Probability of Reemployment after Displacement, by Age

Covariate	1981–83	1983–85	1985–87	1987–89	1989–91	1991–93	1993–95	1995–97
Age 25–29	.015 (.022)	–.006 (.026)	.037 (.026)	.003 (.028)	.046 (.025)	.018 (.026)	.023 (.028)	.057* (.025)
Age 30–34	–.017 (.024)	–.003 (.027)	–.015 (.028)	.040 (.028)	.035 (.026)	.077** (.025)	.018 (.029)	.061* (.026)
Age 35–39	–.014 (.027)	.013 (.028)	–.055 (.031)	.014 (.030)	.029 (.027)	.016 (.028)	–.022 (.030)	.027 (.028)
Age 40–44	–.037 (.031)	–.009 (.033)	–.005 (.032)	.032 (.031)	.029 (.029)	.005 (.029)	–.011 (.032)	.061* (.026)
Age 45–49	–.040 (.034)	–.008 (.036)	–.080* (.037)	–.032 (.038)	.049 (.031)	–.007 (.032)	.001 (.031)	.028 (.030)
Age 50–54	–.106** (.036)	–.078* (.040)	–.128** (.042)	–.029 (.043)	–.088* (.037)	–.078* (.036)	–.118** (.041)	–.002 (.034)
Age 55–59	–.237** (.037)	–.099* (.043)	–.164** (.047)	–.102* (.048)	–.066 (.041)	–.106** (.041)	–.217** (.049)	–.098* (.043)
Age 60–64	–.339** (.037)	–.273** (.048)	–.376** (.048)	–.181** (.054)	–.222** (.047)	–.301** (.047)	–.313** (.056)	–.294** (.060)
N	5,251	4,175	3,833	3,342	4,905	4,565	3,667	3,178

* significant at the .05 level
** significant at the .01 level

Note: Shown are the marginal probit coefficients evaluated at the sample means. The dependent variable is one if a displaced worker is reemployed at the time of the survey and zero otherwise. Other variables in the regressions are indicator variables for female, nonwhite, married, three of four educational categories (less than high school, some college, college graduate), years since displacement (two or three), reason for displacement (plant closed or slack work), and a linear variable for tenure on the predisplacement job. The omitted age category is age 20–24. Observations are weighted using the Current Population Survey final weights. Each column is from a separate regression.

TABLE 6
Regression Estimates of Percentage Change in Real Weekly Earnings, by Age

Covariate	1981–83	1983–85	1985–87	1987–89	1989–91	1991–93	1993–95	1995–97
Age 25–29	-.094* (.041)	-.108** (.039)	-.076 (.040)	-.147** (.046)	-.031 (.042)	.013 (.058)	-.005 (.050)	-.119 (.064)
Age 30–34	-.072 (.045)	-.141** (.042)	-.140** (.042)	-.159** (.047)	-.017 (.044)	-.009 (.057)	-.096 (.051)	-.126* (.063)
Age 35–39	-.098* (.049)	-.151** (.044)	-.155** (.046)	-.127* (.050)	-.125** (.045)	-.063 (.060)	-.142** (.052)	-.176** (.064)
Age 40–44	-.119* (.058)	-.176** (.051)	-.147** (.049)	-.156** (.053)	-.109* (.048)	-.118 (.063)	-.155** (.055)	-.129* (.064)
Age 45–49	-.151* (.063)	-.126* (.057)	-.088 (.054)	-.139* (.064)	-.073 (.052)	-.093 (.068)	-.159** (.055)	-.105 (.069)
Age 50–54	-.136 (.076)	-.253** (.065)	-.262** (.062)	-.301** (.069)	-.043 (.061)	-.007* (.077)	-.151* (.066)	-.071 (.076)
Age 55–59	-.129 (.084)	-.312** (.071)	-.241** (.070)	-.267** (.081)	-.083 (.067)	-.223* (.090)	-.189* (.080)	-.139* (.087)
Age 60–64	-.421** (.099)	-.313** (.092)	-.528** (.090)	-.172 (.095)	-.255** (.094)	-.448** (.123)	-.305** (.104)	-.274* (.120)
N	1,948	2,212	2,197	1,917	2,397	2,065	2,205	2,058

* significant at the .05 level

** significant at the .01 level

Note: The dependent variable is the natural log of real postdisplacement earnings minus the natural log of real predisplacement earnings. Other variables in the regressions are indicator variables for female, nonwhite, married, three of four educational categories (less than high school, some college, college graduate), years since displacement (two or three), reason for displacement (plant closed or slack work), and a linear variable for tenure on the predisplacement job. The omitted age category is age 20–24. Observations are weighted using the Current Population Survey final weights. Each column is from a separate regression.

clear relationship between race and the probability of displacement, and married individuals are less likely to be displaced than are unmarried workers. The likelihood of displacement declines monotonically with educational attainment.

Table 5 presents the reemployment probit regression results. Displaced workers aged 50 and older are significantly less likely to find new jobs than are workers aged 20–24 in most of the Displaced Worker Surveys. Workers aged 50–54 who were displaced in 1981–83, for example, are 10.6 percent less likely to have been reemployed at the time of the survey than workers aged 20–24. In general, workers in their 30s and 40s are as likely to find other jobs as are workers aged 20–24. In results not shown in Table 5, women are less likely to find new jobs than are men, and nonwhites are less likely to be reemployed than are whites. Reemployment probabilities increase with education and with time elapsed since displacement. In most survey years, workers who were displaced because of slack work are significantly less likely to find new jobs than workers displaced because their jobs were abolished.

The results do not indicate that the relative probability of finding other jobs has deteriorated over time for older displaced workers. The estimated coefficients do not become significantly more negative over

time for any age group; indeed, relative reemployment probabilities generally appear higher for workers displaced in 1995–97 than for workers of the same age displaced in the 1980s. These results provide little evidence for the hypothesis that displaced workers over age 40 face increased difficulties finding new jobs. Instead, they suggest that the likelihood of reemployment among older workers may be more sensitive to the business cycle than it is among younger workers. As the economy boomed during the mid-1990s, older displaced workers appear to have had relatively little difficulty finding new jobs.

Table 6 shows the results of the OLS regressions for the percentage change in real weekly earnings among displaced workers who are reemployed at the time of the survey. The first entry in column 1, for example, indicates that earnings losses of workers aged 25–29 who were displaced in 1981–83 are 9.4 percent larger than the earnings losses among workers aged 20–24. Earnings losses generally increase with age, although the relationship is not monotonic. In results not reported in the table, earnings losses decrease with educational attainment, and earnings losses increase by 1.1 to 1.9 percent for each year of tenure on the lost job.

Older displaced workers who find new jobs do not appear to experience larger earnings losses in

the 1990s than in the 1980s relative to the youngest displaced workers. Earnings losses for middle-aged workers displaced in 1993–95 appear higher than in the surrounding periods, but the differences are not significant. These results do not indicate that relative earnings losses have risen over time for middle-aged workers.

Middle-Aged Managers

Middle-aged managers and professionals have been the focus of many media reports about corporate downsizing. The *New York Times* noted in 1996, for example, “Increasingly the jobs that are disappearing are those of higher-paid, white-collar workers, many at large corporations, women as well as men, many at the peak of their careers.” Farber (1997) reports that rates of job loss among managers rose substantially over 1987–89 to 1991–93 but then fell during 1993–95.

Chart 2 displays displacement rates for private-sector middle-aged managerial and professional workers, blue collar workers, and all workers aged 40–54. Displacement rates of managerial and professional workers are considerably lower than displacement rates for blue-collar workers, but the difference is not constant over time. As Farber (1997) notes, the 1990s recession was more evenly spread across occupations than the 1980s recession, which was concentrated among blue-collar workers.

During the 1990s, displacement rates among blue-collar workers have declined more than have displacement rates among managerial workers.

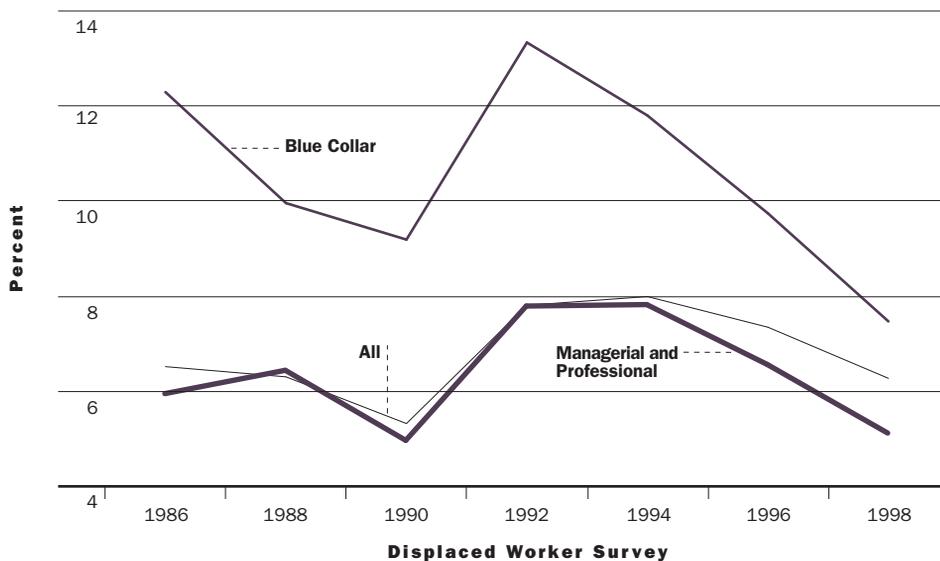
Reemployment rates do not appear to have worsened over time for managerial and professional workers who are displaced relative to other workers. As Chart 3 indicates, reemployment rates have risen during the 1990s for all workers aged 40–54, and the trends are similar for blue-collar and managerial and professional workers.

Earnings losses appear to have worsened over time for managerial and professional workers who are displaced and find other jobs. As Chart 4 shows, until 1989–91, middle-aged managerial and professional workers experienced smaller-than-average wage losses. Beginning with the 1992 Displaced Worker Survey, managerial and professional workers experienced larger wage losses than the average middle-aged worker and than the average blue-collar middle-aged worker. Earnings losses among managerial and professional workers appear to have rebounded particularly slowly during the early phases of the 1990s recovery in comparison with blue-collar workers.

Conclusion

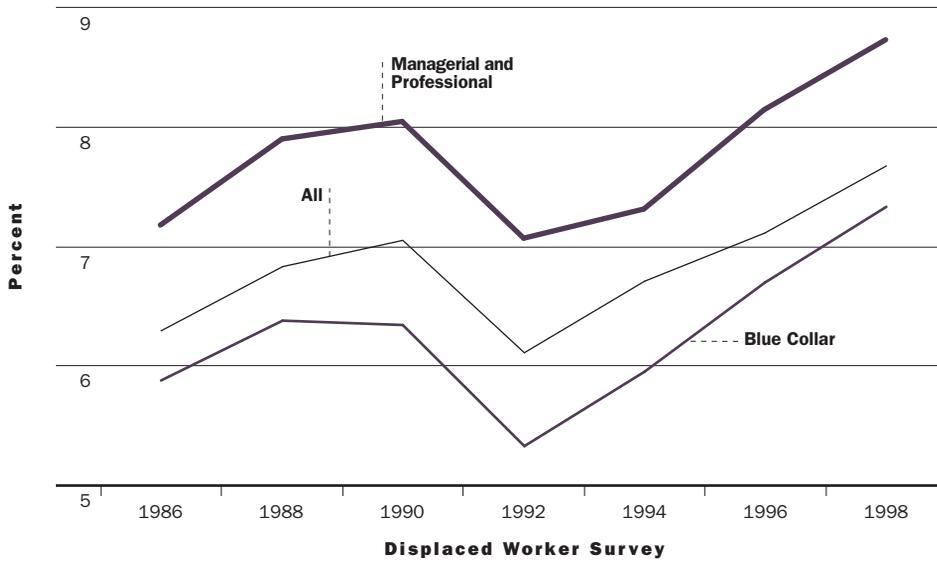
Displacement and corporate downsizing have received considerable attention from the media in recent years. The conventional

CHART 2
Displacement Rates, Workers Aged 40–54, by Occupation



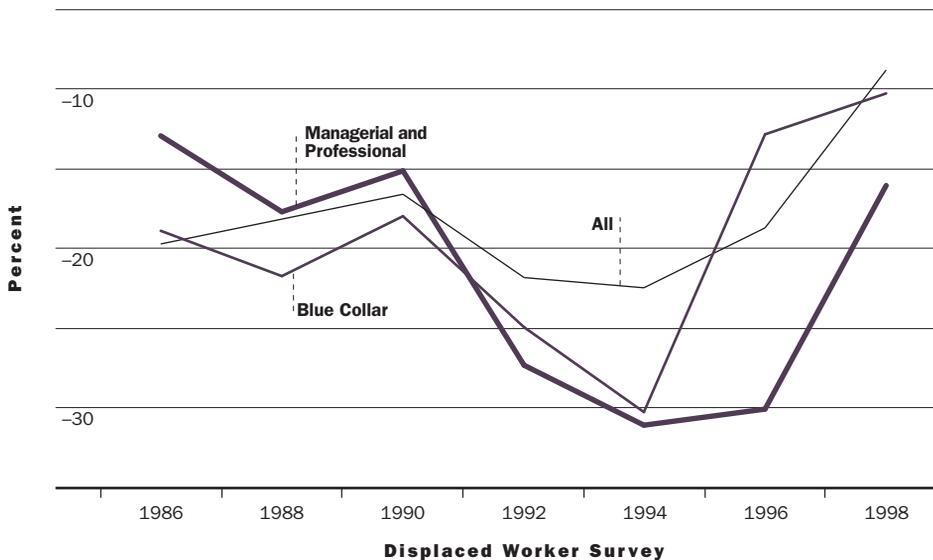
Note: Shown is the ratio of workers aged 40–54 at the time of the survey who were displaced during the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work to the average number of workers in that age and occupation group employed during the three-year period.

CHART 3
Reemployment Rates, Displaced Workers Aged 40–54, by Occupation



Note: Shown is the percent of workers aged 40–54 at the time of the survey who were displaced during the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work and were reemployed at the time of the survey.

CHART 4
Average Percentage Change in Real Earnings, Workers Aged 40–54, by Occupation



Note: Shown is the average percentage difference between real weekly earnings at the predisplacement job and the postdisplacement job for workers aged 40–54 at the time of the survey who were displaced during the three years prior to the Displaced Worker Survey because of plant closure, position abolished, or slack work and were reemployed at the time of the survey.

wisdom that middle-aged workers face an increased risk of being displaced and increased difficulties after displacement is partially borne out by this analysis. Displacement rates among middle-aged workers rose relative to younger workers during the 1990s recession, and the relative likelihood of displacement for middle-aged workers has not returned to the levels of the 1980s. Thus, workers in their 40s are relatively more likely to be displaced in the 1990s than they were in the 1980s. However, the two postdisplacement outcomes examined here, reemployment and earnings losses, have not changed significantly over time for older workers relative to younger workers. Middle-aged managerial and professional workers do not appear to face increased risks of displacement relative to middle-aged blue-collar workers, but their relative earnings losses following displacement and reemployment appear to have worsened over time.

Future research should examine why the relative likelihood of displacement has increased over time

for older workers and why relative earnings losses and the probability of reemployment have worsened over time for middle-aged managers. One potential explanation is increased use of technology in the workplace, which might create a relative disadvantage for older workers if technological change has rendered their human capital obsolete.

The data presented in this article also suggest that much of the concern about displacement may soon begin to abate. Displacement rates during 1995–97, the most recent period for which data are available, returned to levels similar to those during the 1980s expansion. Reemployment rates for workers displaced during 1995–97 were at their highest levels for all age groups since the Displaced Worker Survey began in 1984, and the gap between pre- and postdisplacement earnings has shrunk during the most recent period.

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Atlanta Fed Conference on Fiscal Policy in Latin America

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FISCAL POLICY IS AT THE VERY CORE OF THE PROFOUND ECONOMIC TRANSFORMATION UNDER WAY IN LATIN AMERICA. WHILE PRICE STABILIZATION AND LIBERALIZING REFORMS HAVE PLACED REGIONAL ECONOMIES IN A MUCH MORE COMPETITIVE POSITION OVER THE PAST TWO DECADES, THE NEED FOR ADDITIONAL REFORM EFFORTS—SO-CALLED SECOND-

generation reforms like those for fiscal policy—is increasingly apparent.

Because sound fiscal policy is key to viable monetary policy and sustainable economic growth, few issues are as critical to the region's economic future. This encompassing relevance is the reason the Federal Reserve Bank of Atlanta chose to sponsor a conference on sustainable public sector finance in Latin America, which took place in Atlanta on November 1 and 2, 1999. While the Federal Reserve's job is the supervision of the U.S. financial sector and the formulation of domestic monetary policy, the reality is that it is no longer possible to think of economic policy—be it monetary policy or supervisory policy—in purely domestic terms. The Federal Reserve's mandate is indeed domestic, but the setting in which that mandate is carried out is increasingly global.

In order to address these broad policy implications, participants in the conference "Sustainable Public Sector Finance in Latin America" were asked to explore the issue from various angles, employing different disciplinary approaches. The multidisciplinary approach allowed participants to examine the wide-ranging nature of fiscal policy. The following

overview of the papers and presentations from the conference provides insight into some of these perspectives on several important issues.

The basic policy elements of sustainable public sector finance were explored in a paper by Elizabeth McQuerry, Michael Chriszt, and Stephen Kay of the Atlanta Fed's Research Department. Economic fundamentals and the notion of policy credibility were presented through a review of existing research on fiscal policy and an overview of how Latin American governments have performed in achieving their fiscal policy objectives. The review highlighted a newfound appreciation of the role that institutions play in producing policy outcomes alongside the long-standing consensus about the deleterious impact of prolonged fiscal imbalances. The authors stressed that sustainable public sector finance is neither a purely financial nor institutional/political problem. Rather, the two dimensions of the problem are inextricably intertwined.

The paper by Larry Graham (University of Texas at Austin) presented a framework for thinking about fiscal-reform policies through a comprehensive, historical survey of the different developmental paths found in Argentina, Brazil, Mexico, and

Venezuela. Dr. Graham's analysis argued that an examination of these four distinct political trends, which to varying degrees have been manifested throughout the region, provides critical knowledge not only about the past but about how historical politics and economics in the region influence the path of reform today.

Ben Ross Schneider (Northwestern University) explored why administrative reform has been so problematic in the region. Varying types of administrative reform tend to stimulate different dynamics in terms of the policy process as well as the

While price stabilization and liberalizing reforms have placed regional economies in a much more competitive position over the past two decades, the need for so-called second-generation reforms like those for fiscal policy is increasingly apparent.

particular collection of reformers and allies behind the reform. Drawing insight from institutional economics to examine the specific political dynamics of the life cycle of reform—from elections to final implementation—Schneider's analysis has important policy implications for efforts to reform bureaucracies and public services as well

as for other types of economic and political reforms.

Juan Carlos Echeverry and Verónica Navas (Colombian National Planning Department) evaluated fiscal policy in Colombia, analyzing public sector net worth using both flow and stock approaches. The authors argued that the feasibility of a particular fiscal package depends on not only a sound economic approach but also the establishment of a new political and judicial approach to the decision-making process that would avoid the type of institutional conflicts that have occurred in some countries. Echeverry and Navas also argued that policy should be directed toward the pursuit of a dynamic equilibrium related to public sector net worth as opposed to explicit debt and deficit targets.

Deficit finance was the subject of a panel featuring remarks by two experienced practitioners of debt management in Latin America. Carlos Boloña, who served as Minister of Economy and Finance in Peru from 1991 to 1993, shared insight from his experiences reining in government expenditure during a very difficult period in the country's economic and political history. His tenure was also the period when Peru effectively came to terms with many public finance concerns.

The discussion by Fábio de Oliveira Barbosa, the Secretary of the Treasury in Brazil, mapped out the debt strategy being pursued by his government. His presentation demonstrated many of the choices facing countries seeking to establish and maintain access to international credit lines as they build domestic credit markets. The Brazilian experience also illustrates how fiscal policy and global economic conditions sometimes work at cross-purposes, presenting policymakers with even larger budgetary challenges.

The final panel featured a discussion of international lending and capital flows by Francisco Gil-Díaz, formerly the vice governor of the Banco de México, and Graham Stock, a vice president with Chase Securities. In his review of capital flows to developing countries, Gil-Díaz asserted that all foreign debt in emerging market economies—whether held by the government or in private hands—is, in essence, a sovereign liability, providing a sobering reminder that the rapid increase in capital flows and international markets has wide-ranging implications.

Graham Stock traced the evolution of international lending in the 1990s from the perspective of both the borrower and the lender, providing insight into capital flows, credit fundamentals, and commercial bank lending. Stock noted that beyond the many changes in capital flows and markets lies a fundamental certainty: credit analysis of emerging market economies is essentially the same as other credit analysis, and countries that meet these criteria will find ready access to international capital markets while those that fail to meet them must resort to much more onerous terms.

The conference also featured two individual speakers. Ann Helwege (Tufts University) shared her research on how Latin American governments have fared with poverty alleviation efforts and outlined the prospects for future efforts in an environment of resource constraints. Helwege noted several improvements in social policies in the region but also warned that privatization and decentralization have thus far done little to improve the region's inequalities. Cláudia Costin provided the keynote address from her first-hand experience with state reform as Brazil's secretary of state for administration and government property. The Brazilian example illustrates many of the multifaceted challenges facing reformers.

The conference also benefited from a knowledgeable and engaged group of participants—encompassing viewpoints from academia, banking, government, and the private sector—who shared their perspectives and first-hand experiences in

designing fiscal policy. This depth allowed participants to discuss public sector finance along a broad spectrum during the two-day conference.

At the end of the proceedings, participants were asked to identify the primary areas on which further research on fiscal policy would most fruitfully be focused. Three areas figured prominently in this discussion: (1) the need for greater understanding of the role of institutions in fiscal policy reform, espe-

cially in regard to constitutional reform, Congress, and transparency of the policy process; (2) the need for further study and specification of several issues, such as tax reform, income distribution, foreign direct investment, hidden public debt, and pension liabilities, to determine the significance of their role in fiscal policy reform; and (3) the need for a greater understanding of the relationship between fiscal policy and dollarization.