

FILE COPY

# New England Economic Review

Federal Reserve Bank of Boston

Sept./Oct. 1993

---

*Katharine L. Bradbury*

*Shifting Patterns of Regional Employment  
and Unemployment: A Note*

*Lynn E. Browne*

*Banks' Venture into Real Estate:  
High Rollers, or Lemmings?*

*Daniel J. Richards*

*What Inflation Policy Do American Voters  
Want, and Do They Get It?*

*Geoffrey M.B. Tootell*

*Defaults, Denials, and Discrimination in  
Mortgage Lending*

FILE COPY

**President**

Richard F. Syron

**Senior Vice President and  
Director of Research**

Lynn E. Browne

*Research Department:***Banking Studies**

Eric S. Rosengren, Vice President

Joe Peek

Robert Tannenwald

**Financial Markets**

Richard W. Kopcke, Vice President

Richard E. Randall, Vice President

Stephen R. Blough

Katerina Simons

**International**

Norman S. Fieleke, Vice President

**Open Economy Macroeconomics**

Stephen K. McNees, Vice President

Jeffrey C. Fuhrer

Jane Sneddon Little

Geoffrey M. B. Tootell

**Regional**

Katharine L. Bradbury, Assistant Vice  
President

Yolanda K. Kodrzycki

Christopher J. Mayer

---

The **New England Economic Review** is produced in the Research Department and is edited by Joan T. Poskanzer. Heather Schofield coordinates the design and production. The views expressed are those of the individual authors, and do not necessarily reflect official positions of the Federal Reserve Bank of Boston or the Federal Reserve System. The authors will be glad to receive comments on their articles. The Review is available without charge. Requests to be placed on the mailing list or for additional copies should be sent to the Research Library-D, Federal Reserve Bank of Boston, P.O. Box 2076, Boston, MA 02106-2076. Articles may be reprinted if the source is credited. Please send copies of the reprinted materials to the editor.

# Contents

---

## **Shifting Patterns of Regional Employment and Unemployment: A Note**

*Katharine L. Bradbury*

The perception is widespread that the 1990–91 recession and the recovery to date differ in important ways from earlier U.S. business cycles. This note examines some of the evidence regarding these differences, focusing on shifts in the regional pattern of employment and unemployment, especially for New England.

The recovery from the recent recession has been unusually weak or gradual, especially in terms of employment. Moreover, the recession displayed an industry pattern noticeably different from earlier recessions. Partly as a result, white collar workers suffered more unemployment than is usual in a recession, and job losers were more likely to have been terminated from their jobs rather than temporarily laid off. In New England, where the slowdown has been longer and deeper, labor markets appear to be responding to the downturn in an unprecedented way, with sizable declines in dual job-holding and an increase in self-employment. A key question is whether these apparent changes in the operation of the job market will be reversed as the recovery continues to unfold.

3

## **Banks' Venture into Real Estate: High Rollers, or Lemmings?**

*Lynn E. Browne*

During the 1980s, commercial banks expanded their mortgage lending more rapidly than other financial institutions. This article examines the factors responsible for the variations in commercial banks' real estate lending, in an attempt to determine whether banks pursued real estate loans in a high-risk, high-return strategy, or simply were caught up in the general enthusiasm for real estate lending.

The author's regression analysis provides some support for the argument that banks looked to real estate loans to bolster their financial performance. She also finds that in New England, where banks were particularly aggressive in increasing their real estate lending and suffered a much higher failure rate than banks nationwide, pursuit of real estate loans was also pursuit of growth. And in New England, where most banks grew rapidly, those that grew fastest proved most vulnerable to failure.

13

# Contents

---

## **What Inflation Policy Do American Voters Want, and Do They Get It?**

*Daniel J. Richards*

## **Defaults, Denials, and Discrimination in Mortgage Lending**

*Geoffrey M.B. Tootell*

Inflation at the time of the 1992 election was at its lowest level in 20 years. This fact might have been expected to give the incumbent Administration a significant advantage, since most previous research regarding voters' economic preferences has found that American voters have a strong preference for low inflation and a great willingness to tolerate unemployment to reduce inflation. Thus, the 1992 election results raise the possibility that voter preferences either have changed or were mistakenly estimated earlier.

The author's goal is to obtain some estimates of the policies and inflation goals that voters deem optimal. He then uses these estimates of voters' preferred policy outcomes to determine the price that voters are willing to pay to achieve their desired inflation rate. His findings suggest that strong anti-inflation policies are politically quite feasible. 33

The results of the study of discrimination in mortgage lending by Munnell, Browne, McEneaney, and Tootell (1992) have been questioned by some who claim that the authors failed to control adequately for the expected profitability of each loan. Critics assert that an examination of default rates for minorities and whites would explain the disparate treatment minorities received in obtaining mortgage loans.

This article will demonstrate that studies of denials are a valid approach to testing for discrimination and that, in fact, examination of defaults cannot, in general, reveal much about the issue. Since studies of defaults leave out the observations that are most important to the examination of discrimination, denied applications, they cannot compare the profitability of rejected minority applications to accepted white ones. Only by including these observations, as is done in studies of denials, can definitive evidence about discrimination be found. 45

# *Shifting Patterns of Regional Employment and Unemployment: A Note*

**T**he perception is widespread that the 1990–91 recession and the recovery to date differ in some important ways from earlier U.S. business cycles. This note examines some of the evidence regarding these differences, focusing on shifts in the regional pattern of employment and unemployment, especially for New England. As it turns out, many of the observed differences between this and earlier business cycles can be attributed to two key characteristics: While the recent recession, nationally, was not extraordinarily long or deep, the recovery has been unusually weak or gradual, especially in terms of employment. Moreover, this recession has displayed an industry pattern noticeably different from earlier recessions. Specifically, employment in manufacturing did not shrink as much as it typically does in recessions, while retailing and finance, insurance, and real estate were harder hit than usual. In New England, where this slowdown has been longer and deeper than usual, labor markets appear to be responding to the character and duration of the downturn in an unprecedented way. The New England experience may shed light on some much-discussed national developments.

*Katharine L. Bradbury*

*Assistant Vice President and Economist, Federal Reserve Bank of Boston. The author is grateful to Lynn Browne, Karl Case, Jane Little, and Geoffrey Tootell for provocative conversations on this subject as well as comments on earlier drafts, to Anthony Ferrara for helpful comments, and to Catherine Jew for research assistance.*

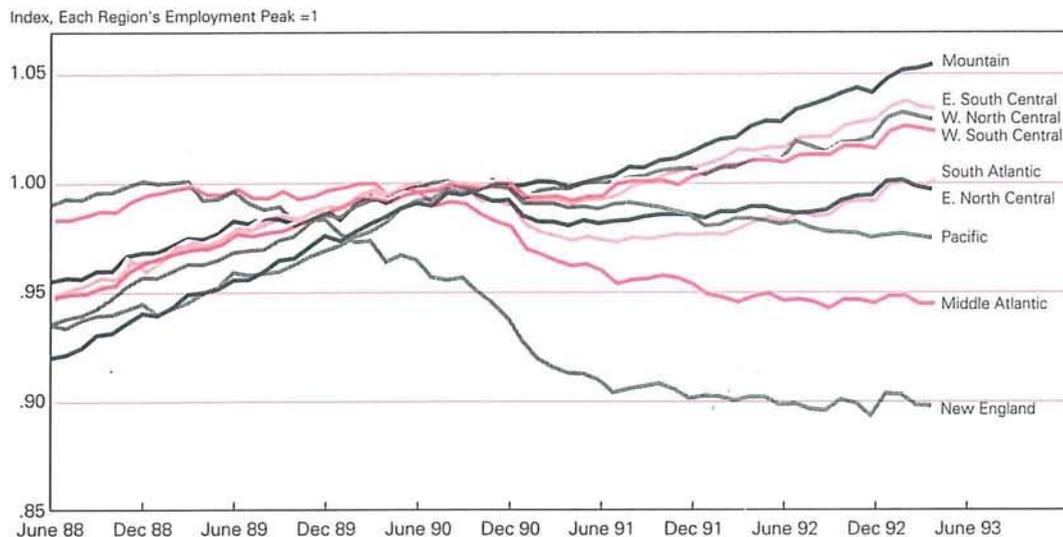
## *The Impact of the 1990–91 Recession on New England*

New England's economy turned down sooner and suffered considerably greater overall job losses in the recent recession than any other region of the country (Figure 1), losing 10.5 percent of nonfarm jobs between February 1989 (when the region's downturn began) and December 1992 (New England's most recent employment trough). This prolonged decline contrasts quite sharply with the nation's loss of 1.7 percent of jobs over a shorter period from June 1990 through February 1992. Since that national employment trough, the nation has regained more jobs than it lost, but employment in New England has just recently begun to stabilize.

The recession came later to the Middle Atlantic states, second

Figure 1

*Nonfarm Payroll Employment during the 1990 - 91 Recession,  
by Census Region*



Source: U.S. Bureau of Labor Statistics.

hardest-hit in this recession. That region lost over 5 percent of peak 1990 employment by the fall of 1992, when the job count stabilized. The economy worsened most recently in the Pacific region, which has continued to lose employment as the rest of the nation, other than the Northeast, has inched upward. Thus, the latest recession is bi-coastal, as was the boom of the 1980s. (See the Appendix for definitions of the Census regions.)

The downturn brought with it a more than doubling of the unemployment rate in New England; joblessness rose over 5 percentage points, from around 3 percent in most of 1988 to a high above 8 percent in late 1992 (Figure 2). Nationally, unemployment rose from 5 to 7.7 percent. This moderate increase in unemployment contrasts sharply with the nation's experience in the last recession (1981-82), when the U.S. unemployment rate exceeded 10 percent.

**Regional Patterns of the New Unemployment<sup>1</sup>**

While the national increase in unemployment has been relatively mild in the recent recession, a

greater share of the job loss has been *permanent* than is typical in recessions. "Permanent" job losses are defined as job losses other than layoffs; that is, the unemployed in this category have been told not to expect a callback to their last job. Recessions are typically dominated by rising layoffs—temporary job losses—but layoffs were lower than usual in the recent recession.

New England had the highest fraction of permanent job losers in its labor force in 1991, and again in 1992 (Figure 3).<sup>2</sup> With 8 percent of the New England labor force unemployed in 1992, over one-half of the unemployed had lost a job to which they could not expect to be recalled, and were still looking.

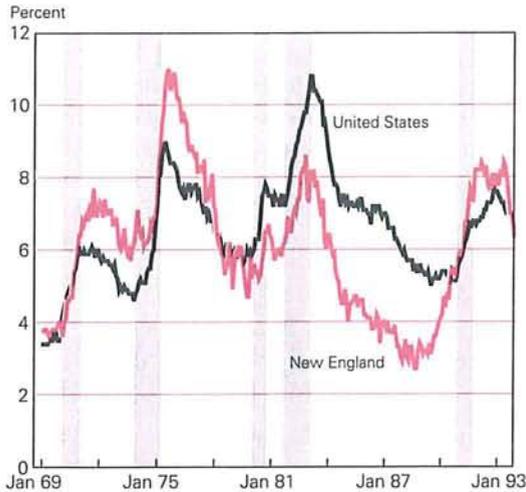
Those who are let go, not expecting to be called back, typically experience a considerably longer du-

<sup>1</sup> Some of the discussion in this section adds regional detail to U.S. findings reported by James L. Medoff in "The New Unemployment" (1992).

<sup>2</sup> Data reporting the characteristics of the unemployed at the regional or state level are released only on an annual basis, in the U.S. Bureau of Labor Statistics report, *Geographic Profile of Employment and Unemployment*.

Figure 2

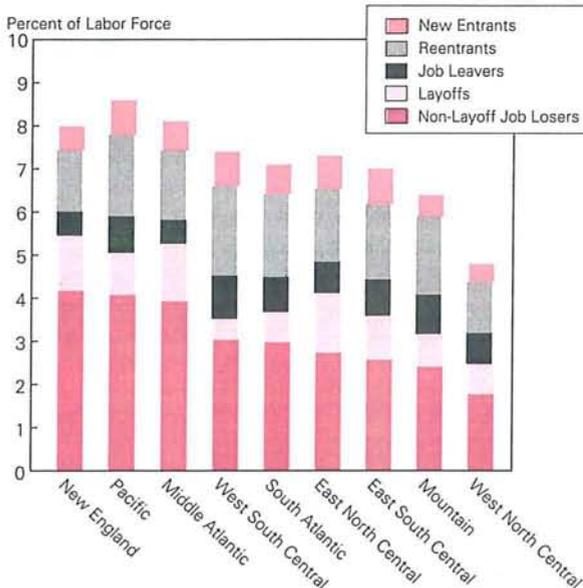
### Unemployment Rate



Source: U.S. Bureau of Labor Statistics.

Figure 3

### Reasons for Unemployment and Rate, 1992



Source: U.S. Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment*.

Table 1  
*Duration of U.S. Unemployment, by Reason for Unemployment*  
Annual Averages

Reason for Unemployment	Percentage with Unemployment Duration of:			
	15 Weeks and Over		Less than 5 Weeks	
	1992	1983	1992	1983
All Unemployed, 16 and Older	35.7	39.3	34.9	33.3
Job Losers on Layoff Other "Permanent"	27.0	37.2	43.5	36.0
Job Losers	49.3	52.3	22.6	21.5
Job Leavers	28.9	30.5	41.3	40.2
Reentrants	25.0	26.9	44.2	45.2
New Entrants	20.9	25.0	47.7	44.7

Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, January 1993, p. 187, and January 1984, p. 170.

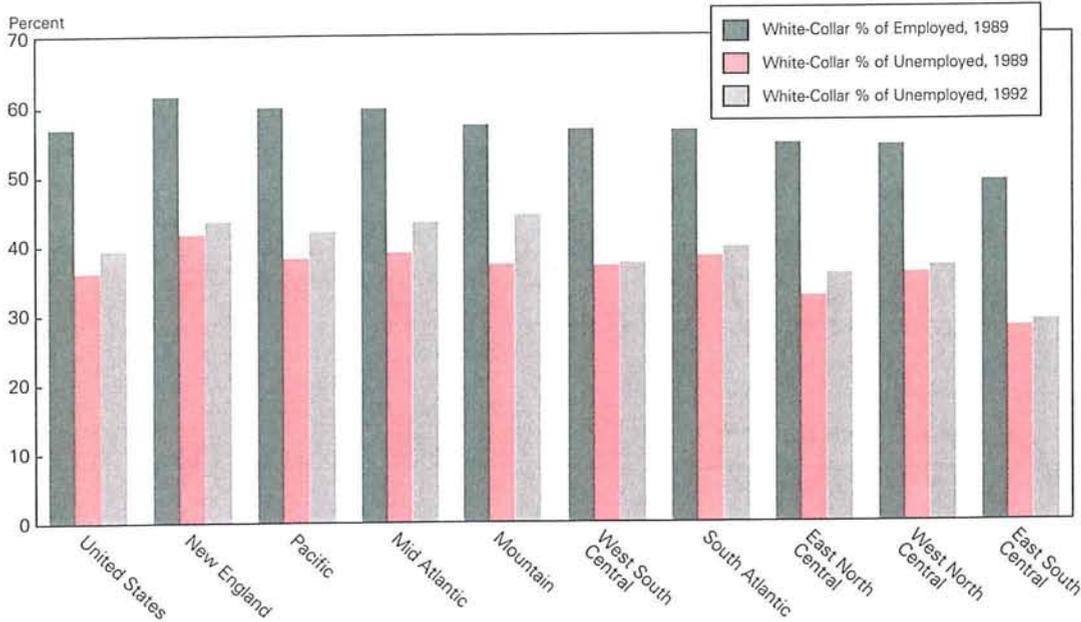
ration of unemployment than those who are laid off. Nationwide, almost half of the non-layoff job losers spent 15 or more weeks unemployed in 1992, while a smaller 27 percent of those laid off spent that long (Table 1). In 1983, when layoffs were more widespread, 37 percent of those laid off spent 15 or more jobless weeks, but still more than half of the "other" job losers also had a long jobless spell.

New England's greater permanent job loss in 1992 undoubtedly reflects, at least in part, the region's long-term loss of manufacturing jobs, which stretches back to 1985. Over the past eight years, the region has lost 29 percent of its 1984 manufacturing jobs. Having begun well before the recent recession, these losses are not cyclical and hence are not likely to be recovered as the economy resumes growth.

Figure 3 also shows that the Pacific region follows closely after New England in the percentage of its labor force unemployed by reason of a permanent job loss. In contrast with New England, manufacturing employment in the Pacific region was *growing* before the recession, and the recession came later there, so its job losses might have been expected to be cyclical rather than secular, taking the form of layoffs rather than permanent job losses. Nonetheless, these data show that a sizable fraction of employers in the West do not plan to rehire the workers they are letting go. A key factor in the economy on the West Coast as well as in New England is defense contracts,

Figure 4

*White-Collar Fraction of Jobs and Unemployment*



Source: U.S. Bureau of Labor Statistics, *Employment and Earnings* and *Geographic Profile of Employment and Unemployment*.

and defense cutbacks may be one explanation for the increasingly permanent nature of job loss in the last few years. Recessions do not typically affect defense contractors, but this time the nation was stepping up defense cuts in response to the end of the Cold War just as the economy moved into recession. Another industry concentration common to New England and the Pacific region is computers, an industry that has been restructuring heavily in recent years.

A second, and related, phenomenon in this recession has been an increase in the *white-collar* fraction of job losses. The white-collar fraction of the unemployed increased in all the regions from 1989 to 1992 (Figure 4). Nationally, the fraction of the unemployed wearing white collars rose from 36 percent in 1989 to 39 percent in 1992. Typically in recessions, blue-collar unemployment rises more than white-collar. In the early 1980s, for example, the white-collar fraction of the unemployed fell 2 percentage points, from 33 percent of U.S. jobless individuals in 1979 to 31 percent in 1983.

This shift in the mix of unemployment might be cause for comfort (except among white-collar workers themselves) if, as some observers assume, the relatively well-educated and flexible white-collar unem-

Table 2  
*Duration of U.S. Unemployment, by Occupation*  
Annual Averages

Occupation	Median Duration (Weeks)		Number Unemployed (000)	
	1992	1983	1992	1983
All Unemployed, 16 and Older	8.8	10.1	9,384	10,717
Experienced Unemployed:				
White Collar				
Managerial and Professional	13.1	11.8	1,007	795
Technical, Sales, and Administrative	9.2	9.1	2,268	2,116
Service Occupations	6.9	8.7	1,420	1,697
Blue Collar				
Precision Production, Craft, and Repair	10.8	12.9	1,273	1,466
Operators, Fabricators, and Laborers	9.5	13.6	2,093	2,955
Farming, Forestry, and Fishing	6.1	7.4	305	407
No Previous Work Experience	4.9	6.2	969	1,218

Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, January 1993, pp. 188-89, and January 1984, pp. 171-72.

ployed typically find it easier than the blue-collar unemployed to secure a new job after termination. But this is not so in the current recession. White-collar occupations were the only occupational groups to suffer longer average durations of unemployment in 1992 than in 1983 (Table 2). Indeed, managers and professionals are taking about as long to find a new job in 1992 as blue collars did in 1983.

### New England's Growing Employment "Discrepancy"

The basic employment data available at the regional level hint at one other job market development, specifically in New England, that probably grows out of these changes in the permanent and white-collar fractions of unemployment. Figure 5 plots the two available measures of employment for New England (upper panel) and the United States (lower panel); shaded areas are recessions. The top line in each panel is the number of people reporting themselves employed in the household survey used to estimate unemployment rates. The lower line is the number of employees reported by establishments.

The key difference between these measures is that the establishment survey includes only wage and salary employees on the payrolls of nonfarm establishments, while the household survey also includes proprietors, the self-employed, and unpaid volunteers and family workers. They also differ in that when one person holds two jobs, the establishment survey will count the two jobs separately while the household survey will count one employed person.<sup>3</sup>

The puzzle in these data is the very noticeable divergence between the two measures during the recent downturn and early recovery in New England. This divergence is not matched in other recessions or

Figure 5

## Employment Data Comparisons



Source: U.S. Bureau of Labor Statistics.

recoveries in New England's history or in the national data. The household survey employment measure for

<sup>3</sup> Several other differences between the two counts are much smaller in magnitude for New England: (1) The household survey refers to place of residence while the establishment survey is by place of work. (2) The payroll jobs of those 15 years old and younger are counted in the establishment survey but the household survey data refer to persons 16 and older. (3) People with a job but not at work and unpaid for the entire pay period surveyed, such as strikers, are counted as employed in the household survey but not in the establishment data. (4) Farm workers are included in the household survey but not in the establishment figures, which refer to nonagricultural payroll jobs.

Table 3  
*Employment Data for New England*  
 Thousands

Date	Establishment Payroll Employment	Household Survey				Labor Force Participation Rate (Percent)	
		Number of Employed Persons	Civilian Labor Force	Number Unemployed	Unemployment Rate (Percent)		
Employment Peak: February 1989	6,633.2	6,791.7	7,007.2	215.5	3.1	10,085.0	69.5
Household Survey Employment Trough: August 1991	6,007.7	6,397.0	6,967.2	570.2	8.2	10,172.0	68.5
Establishment Payroll Employment Trough: December 1992	5,934.3	6,530.0	7,123.0	593.0	8.3	10,236.0	69.6
Most Recent Month: May 1993	5,937.2	6,536.0	7,006.0	470.0	6.7	10,243.0	68.4
Change, February 1989 to August 1991							
Number	-625.5	-394.7	-40.0	354.7	5.1 <sup>a</sup>	87.0	-1.0 <sup>a</sup>
Percent	-9.4	-5.8	-0.6	164.6		.9	
Change, February 1989 to December 1992							
Number	-698.9	-261.7	115.8	377.5	5.2 <sup>a</sup>	151.0	.1 <sup>a</sup>
Percent	-10.5	-3.9	1.7	175.2		1.5	
Change, February 1989 to May 1993							
Number	-696.0	-255.7	-1.2	254.5	3.6 <sup>a</sup>	158.0	-1.1 <sup>a</sup>
Percent	-10.5	-3.8	-0.0	118.1		1.6	

<sup>a</sup>Percentage point change.

Source: U.S. Bureau of Labor Statistics; Federal Reserve Bank of Boston, *New England Economic Indicators* data base.

New England declined less precipitously at the start of the downturn and then began rising in September 1991, while the establishment-based measure did not pick up noticeably until January 1993—more than a year later. According to the establishment data, close to 700,000 jobs have been lost in the region since early 1989; by contrast, the household data indicate a net decline of only 256,000 in the number of employed individuals (Table 3). What accounts for this 440,000 job discrepancy?

One of the reasons the two measures diverged is undoubtedly dual job-holding. During the boom, many New Englanders took on two jobs; as the slowdown got underway in the region in 1989 and 1990, the loss of some of those second jobs would have caused a greater falloff in payroll employment. Indeed, after shrinking in the region's boom years, 1984 to 1988, the gap between the two employment

measures returned to its historical average in early 1991. But then it kept expanding.

Two plausible explanations for this continued and more pronounced widening in New England recently are statistical discrepancies between the two surveys and growing self-employment and unpaid volunteer and family work.<sup>4</sup> With regard to the

<sup>4</sup> The other factors outlined in the preceding footnote might influence the expansion of the gap between the two measures as follows: (1) Increased commuting by New England residents to jobs outside the region might be important if the economies of New York and Canada were booming, but both have actually been slow. (2) When 14- and 15-year-olds lose their payroll jobs in the slowdown, it decreases the establishment job count but leaves the household tally unchanged; they are a very small fraction of all workers, however. (3) Job actions are not likely to increase in importance during recession. (4) The gap would expand if the farm sector were increasing relative to the nonfarm economy, but only very slightly since farm workers account for a below-average

former, data collection procedures differ because of the nature of the two surveys, so random factors or systematic biases may cause them to diverge. In particular, the establishment survey is thought to miss much of the employment growth that occurs in new, small, and often fast-growing firms. To the degree that this occurs, however, annual benchmark revisions to the payroll data (based on the establishment employment "universe" rather than a sample) should be expected to erase some of the gap. Nevertheless, the payroll employment data for 1989, 1990, and 1991 have already been revised twice without eliminating the gap. Next spring, the 1992 data will be revised for the second and final time and the 1993 data will be revised for the first time. As is likely for the 1993 data, the first 1992 revisions were positive, which is consistent with the hypothesis that the initial payroll survey estimates missed some growth in small businesses as the regional economy began to stabilize. Nevertheless, even after the revisions, the gap continued to grow in 1992. Another form of data discrepancy might be attributable to misreporting by some individuals let go from payroll jobs who are loath to admit to survey interviewers that they are unemployed.

Unpublished data suggest that the number of self-employed individuals in New England grew during the last few years, but only enough to account for a small fraction of the observed growth in the gap. Nonetheless, as payroll jobs continue to decline, the fraction of the region's employment accounted for by the self-employed has risen noticeably, and anecdotes about New England's "new" self-employed are widely told. Self-employment might represent a growing fraction of all employment for two reasons. One, the industries that are growing are those in which self-employment is more important: Both construction and services industries (excluding private household services) have above-average fractions of self-employed workers (Table 4), and those are the only two broad industry categories in which New England's employment has grown in the last year. While contributing, however, this shift in industry mix appears to account for very little of the gap, under reasonable assumptions.<sup>5</sup>

The second explanation for increased self-employment is that some of the people let go by establishments, unable to find another payroll job,

fraction of economic activity in New England. In sum, some of these survey differences may have contributed to New England's growing gap, but none of them could be responsible for more than a very small fraction of the observed expansion.

Table 4  
*U.S. Self-Employment, by Industry, 1992*

Industry	Total Employed <sup>a</sup> (000)	Self-Employed (Percent)
All Civilians in Nonagricultural Industries	114,390	7.5
Mining	664	3.5
Construction	7,013	20.9
Manufacturing	19,972	2.0
Transportation and Public Utilities	8,245	4.1
Wholesale and Retail Trade	24,354	7.3
Finance, Insurance, and Real Estate	7,764	8.1
Services	40,758	9.8
Private Households	1,127	.9
Other Service Industries	39,631	10.1
Business and Repair	6,553	18.3
Personal, except Private Household	3,273	20.9
Entertainment and Recreation	1,957	12.1
Professional	27,677	6.6
Forestry and Fisheries	172	27.3
Public Administration	5,620	.0

<sup>a</sup>Employed civilians in nonagricultural industries; annual averages. Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, January 1993, p. 202.

have gone into business for themselves. Sometimes they have embarked on a new line of work; sometimes they are doing the same kind of work as before, but now on a free-lance basis. At least a few firms in the region are known to have terminated a sizable number of workers and then hired some back as consultants or independent contractors doing the same work. In addition to these firm-initiated shifts, skilled professionals, like computer or software engineers laid off by one of the big New England computer firms, are consulting on their own time and initiative, and express no interest in payroll employment again. Some former payroll employees have started small "mom and pop" establishments, and others may be unpaid family workers<sup>6</sup> in those small

<sup>5</sup> A calculation using the data shown in Table 4 and New England's establishment employment mix in the third quarter of 1991 (when the household survey employment numbers started to grow) and the first quarter of 1993 suggests that growth in construction added almost 2,000 to self-employment and, hence, to the gap, while growth in services added about 6,000 more. The total gap expanded by 130,000 over that six-quarter period, however.

<sup>6</sup> Unpaid family work is likely to pick up in hard times as family members lose payroll jobs. Unpaid family workers are counted as employed (but not self-employed) in the household survey, but they are not included in the payroll count.

start-ups or ongoing family enterprises. In any case, these self-employed and unpaid individuals are not on establishment payrolls but are nonetheless averting unemployment.

Why might employers be shifting away from permanent payroll employees and toward free-lancers? Two reasons come to mind, both of which raise concerns about the future evolution of the region's labor market. First, firms might take this course to shift the volatile or uncertain aspects of the workload outside the firm and onto the worker. This route allows the firm to avoid or at least minimize the sometimes-heavy financial and institutional costs of future layoffs. Second, the cost of fringe benefits moves from the firm to the consultant/employee with this kind of arrangement. While consultants' fees at any time could reflect the higher costs the loss of fringe benefits imposes on them, the consultants (rather than the firm) bear the risk of uncertain future increases in the costs of such fringe benefits, particularly health care. And in tough economic times, free-lance compensation may be lower.

Why would this trend show up more in New England than in the nation? To the degree that loss of second jobs and growing self-employment are the reasons for New England's growing gap, the simplest explanation is that the recession has been so much longer and deeper here that (a) employers evaluated more seriously the structure of their operations and (b) former employees had fewer alternatives. In 1991, New England had the highest unemployment rate among all regions for both white-collar and blue-collar workers; at the same time, help-wanted advertising hit an all-time low, and consumer confidence in the region was extremely weak.

### *Some Explanations and Implications*

All of these changes in the labor market—more permanent job losses, more white collar unemployment, and, at least in New England, apparently sizable declines in dual job-holding and an increase in self-employment—suggest the labor market operated differently in this recession. One part of the explanation is that this recession had a very different industry pattern from earlier recessions. Nationwide, manufacturing was less hard hit this time around. Indeed, manufacturing's share of national unemployment in 1992 was in line with its share of the labor force; usually its share of unemployment is higher in recessions (Table 5). Meanwhile, trade and finance, insur-

Table 5  
*Industry Composition of U.S. Labor Force and Unemployed*  
Percent

Industry	1992		1983	
	Labor Force	Unem- ployed	Labor Force	Unem- ployed
Construction	6.3	13.7	6.7	12.4
Manufacturing	22.2	22.4	27.0	30.3
Transportation and Public Utilities	7.1	5.1	7.1	5.2
Trade	25.8	28.0	26.1	26.0
Finance, Insurance, and Real Estate	7.6	4.5	7.5	3.4
Services	30.2	25.5	24.3	20.5

<sup>a</sup>Base for percentages is experienced nonagricultural wage and salary civilian labor force or unemployed; mining is included but is not shown separately.

Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, January 1993 and January 1984.

ance and real estate shrank more than is typical. Presumably these differences explain why some observers characterized this recession as debt-induced or a financial restructuring and others opined that the lack of consumer confidence—and consequent weakness in the retail sector—was not consistent with the relative health of the rest of the economy.

Higher-than-usual white-collar unemployment follows rather directly from these changes in the industry concentration of the slowdown. The industry pattern probably also explains at least some part of the higher share of permanent job loss as well, since layoffs rather than terminations are more common in manufacturing, an industry more accustomed to wide cyclical swings in demand.

Furthermore, in New England, this "recession" was much more than a recession; the region has clearly been making structural adjustments as well as participating in the national business cycle. While there is no simple explanation for the region's difficulties, most analysts agree that part of the story is that costs—wages, land and housing costs, consumer prices—got out of line during the 1980s boom period, reducing the region's attractiveness to industries and firms that were not directly benefiting from the boom. Consistent with the possible importance of relative costs as an explanation for the depth of the recession is the observation that the other regions

hardest hit in this recession, the Middle Atlantic and Pacific, also had above-average wages and prices.<sup>7</sup>

Contract payroll wages and benefits are notoriously "sticky" in a downward direction, even in difficult economic times. Data currently available do not reveal whether recently self-employed workers in New England are compensated (including fringe benefits) more or less than comparable payroll employees. The use of independent consultants clearly gives the employer more flexibility to adjust hours and hence weekly or monthly compensation, compared with the use of full-time payroll employees. And some formerly unemployed individuals may be glad enough to find a job that they accept lower pay than they received as establishment employees, even without considering fringe benefits. That is, hiring outside the payroll track may provide an alternative way for firms to reduce otherwise "sticky" compensation.

A key question, looking forward, is whether these apparent changes in the operation of the job market will be reversed as the recovery continues to unfold. To a large degree, the prognosis depends on the pace and nature of that recovery. If employment growth, nationally, remains sluggish and unsteady, it seems possible that New England's "mixed signals," if attributable to its earlier and deeper recession, will spread. Indeed, initial signs can be seen in recent

employment data for California, which (as in New England) show an expanding number of employed persons but ongoing declines in establishment payroll jobs.

Whether "white-collar" and "permanent" unemployment will revert to their usual levels when aggregate demand finally picks up enough to bring improvement in the national unemployment rate depends on whether this recession's industry pattern reflects simply the idiosyncrasies of its genesis, including difficulties in financial services, real estate, computers, and defense industries, or deeper ongoing changes in the economy. One possibility, for example, is that the relatively greater slowdown in nonmanufacturing grew out of continued economy-wide "unbundling"—more contracting out, from legal services, design and engineering, protection, and consulting, to temporary employment agencies. Another possible contributor to employment downsizing and restructuring is the increased use of computers across many industries. Such secular shifts, if that is what they are, are not likely to be fully reversed, even as the economy resumes steady growth.

---

<sup>7</sup> The Middle Atlantic, New England, and Pacific regions had the highest private sector wages and salaries per employee in 1988 and 1991, even after adjusting for industry mix.

Appendix  
*List of States in Census Regions and Divisions*

Region and Division	State	Region and Division	State
Northeast:		South: continued	
New England	Connecticut	East South Central	Alabama
	Maine		Kentucky
	Massachusetts		Mississippi
	New Hampshire		Tennessee
	Rhode Island		
	Vermont	West South Central	Arkansas
Middle Atlantic	New Jersey		Louisiana
	New York		Oklahoma
	Pennsylvania		Texas
Midwest:		West:	
East North Central	Illinois	Mountain	Arizona
	Indiana		Colorado
	Ohio		Idaho
	Michigan		Montana
	Wisconsin		Nevada
West North Central	Iowa		New Mexico
	Kansas		Utah
	Minnesota		Wyoming
	Missouri		
	Nebraska	Pacific	Alaska
	North Dakota		California
	South Dakota		Hawaii
South:			Oregon
South Atlantic	Delaware		Washington
	District of Columbia		
	Florida		
	Georgia		
	Maryland		
	North Carolina		
	South Carolina		
	Virginia		
	West Virginia		

## References

- Blanchard, Olivier Jean, and Lawrence F. Katz. 1992. "Regional Evolutions." *Brookings Papers on Economic Activity*, No. 1, pp. 1-75.
- Federal Reserve Bank of Boston. 1993. *New England Economic Indicators*. Machine-readable data base.
- Green, Gloria P. 1969. "Comparing Employment Estimates from Household and Payroll Surveys." *Monthly Labor Review*, December, pp. 9-20.
- Medoff, James L. 1992. "The New Unemployment." Paper prepared for the use of Senator Lloyd Bentsen, Chairman of the Subcommittee on Economic Growth, Trade and Taxes, Joint Economic Committee. April (revised April 9, 1993).
- . 1993. "Middle-Aged and Out-of-Work: Growing Unemployment Due to Job Loss Among Middle-Aged Americans." *DSC Report Series*. Washington, D.C.: Democratic Study Center, April 15.
- Perry, George L., and Charles L. Schultze. 1993. "Was This Recession Different? Are They All Different?" *Brookings Papers on Economic Activity*, No. 1, pp. 145-211.
- U.S. Department of Labor, Bureau of Labor Statistics. 1993, 1984. *Geographic Profile of Employment and Unemployment, 1992 and 1983*. Bulletins 2428 and 2216. Washington, D.C.: Government Printing Office.
- . 1993, 1984. "Household Data—Annual Averages." *Employment and Earnings*, Vol. 40, No. 1 and Vol. 31, No. 1 (January issues).

## *Banks' Venture into Real Estate: High Rollers, or Lemmings?*

**A**t a conference on real estate and the credit crunch in the fall of 1992 sponsored by the Federal Reserve Bank of Boston, participants hotly debated whether banks "knew what they were doing" when they became so deeply committed to real estate loans in the mid 1980s (Browne and Rosengren 1992). Some argued that banks had aggressively pursued real estate loans in a high-risk, high-return strategy intended to offset competitive pressures in more traditional lending areas. While banks may have underestimated the risks of real estate lending, they were aware that the risks were substantial. Other participants countered that banks truly did not appreciate the magnitude of the risks they were taking; to paraphrase Robert Litan's description, "lemming-like," they followed one another to destruction. Advocates of the lemming theory pointed to the pervasiveness of banks' involvement in real estate as evidence supporting their argument: pursuit of real estate loans was not limited to institutions so financially troubled that they had nothing to lose.

This article attempts to shed light on the debate by examining the factors responsible for variations in commercial banks' real estate lending in the mid 1980s. The issue is shown to be complicated by the difficulty of defining—in advance—what constitutes a risky strategy. Also, bank motivations are not limited to the alternatives of lemming-like behavior and "betting the bank" in a desperate gamble to survive. Regression analysis provides some support for the argument that banks looked to real estate loans to bolster their financial performance: increases in real estate lending between 1984 and 1988 tended to be larger for banks with low capital ratios at the start of the period. In addition, in New England, where banks were particularly aggressive in increasing their real estate lending and suffered a much higher failure rate than banks nationwide, pursuit of real estate loans was also pursuit of growth. While rapid growth elsewhere was not problematic, in New England, where most banks grew rapidly, those that grew fastest proved most vulnerable to failure.

*Lynn E. Browne*

*Senior Vice President and Director of Research, Federal Reserve Bank of Boston. The author would like to thank David Mann for providing valuable research assistance.*

## Bank Pursuit of Real Estate Loans

During the 1980s, the nation's mortgage debt outstanding increased more than 10 percent per year, while nominal GDP rose at an annual rate of less than 7 percent. Growth was most rapid between 1984 and 1988, especially for commercial mortgages. The primary sources of mortgage funds were commercial banks, thrift institutions, insurance companies, and federally related mortgage pools (Figure 1). The last, which purchase primarily home mortgages, were not much of a factor at the start of the decade but grew rapidly. Much of the pools' growth was funded by banks, thrift institutions, and insurance companies' purchases of the pass-through securities issued by the pools.<sup>1</sup> In other words, banks, thrifts, and insurance companies not only financed the expansion in mortgage debt directly, but also did so indirectly through the mortgage pools.

Excluding the mortgage pools, commercial banks expanded their mortgage lending more rapidly than other financial institutions. Commercial banks were particularly aggressive in making loans on commercial property. Their share of commercial mortgages outstanding rose from just over 30 percent in 1980 to 37 percent in 1984 and to 44 percent in 1988. Commercial banks also added to their holdings of home mortgages, maintaining their share of this market even as the mortgage pools expanded.

Commercial banks' pursuit of real estate loans was reflected in the composition of their portfolios. Based on call report data, the share of U.S. commercial bank assets consisting of loans backed by real estate rose from 15 percent to 21 percent in just four years, from 1984 to 1988 (Table 1).<sup>2</sup> New England banks were even more aggressive in pursuit of real

<sup>1</sup> The Flow of Funds Accounts combine the securities of the mortgage pools with those of other government-sponsored agencies when showing agency securities as assets held by different sectors. Together, banks, thrift institutions, and insurance companies held about one-half of total agency debt through most of the 1980s. The bank share exceeded 20 percent at the start of the 1980s, fell to 15 percent in the years 1984 to 1988, then rose to 20 percent at the end of the decade. The mortgage pools represent the greater part of these agency securities; they accounted for over 70 percent of total sponsored agency issues at the end of 1990 compared to 40 percent in 1980.

<sup>2</sup> The increase in real estate concentrations may be somewhat overstated by the tendency in the 1980s to reclassify some business loans backed by real estate as real estate loans. Bank acquisitions of thrift institutions, which generally have high residential real estate concentrations, would also tend to raise the share of bank assets devoted to real estate. In deciding to acquire a thrift institution, however, a bank would be making a conscious decision to enlarge the real estate component of its portfolio.

Figure 1A

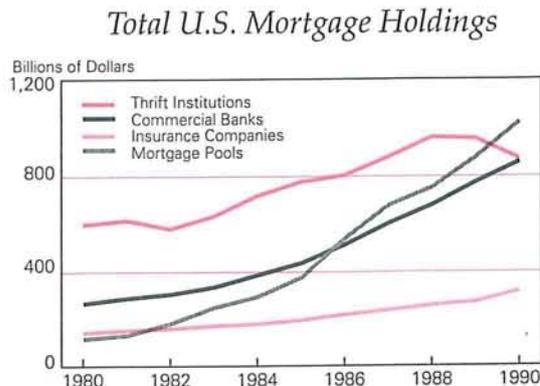


Figure 1B

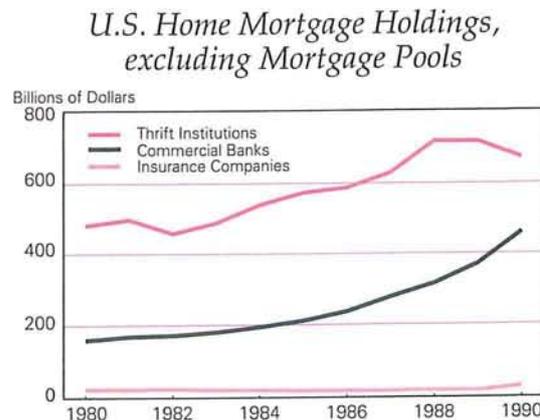
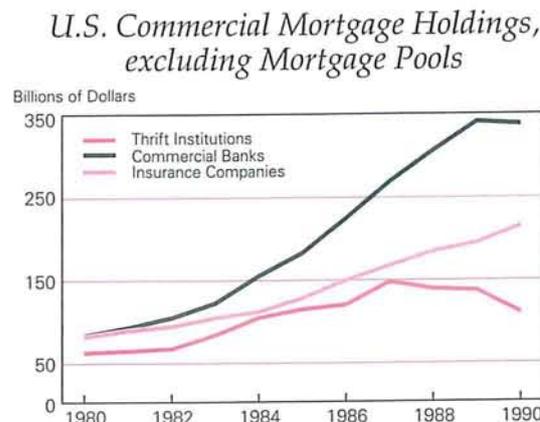


Figure 1C



Note: Data represent levels at the end of the period.  
Source: Board of Governors of the Federal Reserve System,  
*Flow of Funds, Accounts Flows and Outstandings*, First Quarter 1993.

Table 1  
*Commercial Banks' Real Estate Lending*  
 Percent of Assets

Loans	1980	1984	1988	1990	1992
<u>United States</u>					
All Loans Backed by					
Real Estate	14.1	14.9	20.9	23.7	24.1
One- to Four-Family	7.9	7.2	9.6	11.7	13.1
Multifamily	.3	.4	.6	.6	.8
Land Acquisition and Construction	2.0	3.0	4.2	3.8	2.3
Nonresidential	3.4	3.8	6.1	7.1	7.4
<u>New England</u>					
All Loans Backed by					
Real Estate	17.2	17.0	30.8	30.3	28.0
One- to Four-Family	9.9	8.3	12.8	13.5	15.6
Multifamily	.5	.3	.8	.9	.8
Land Acquisition and Construction	1.3	3.0	7.3	4.5	1.8
Nonresidential	5.4	5.3	9.9	11.3	9.8

Source: Federal Deposit Insurance Corporation, call reports.

estate loans than their national counterparts. Loans backed by real estate rose from 17 percent of New England commercial bank assets in 1984 to 31 percent in 1988. Residential mortgages, nonresidential real estate loans, and land acquisition and construction loans all grew as shares of New England commercial bank assets. Compared to banks nationwide, the increase in lending for land acquisition and construction, generally considered the riskiest category of real estate loans, was especially striking. In 1984, these loans accounted for 3 percent of New England bank assets; four years later they represented over 7 percent of bank assets.

This enthusiasm for real estate loans, particularly nonresidential and construction loans, proved to have dire consequences for New England banks. In a recent article, Richard Randall argues that real estate lending was the cause of most of the bank failures in New England (Randall 1993). Of 87 failures of New England commercial and savings banks, he attributes 77 primarily to excessive nonresidential real estate and construction lending.

### *Possible Explanations*

Why did banks pursue real estate loans so vigorously? The obvious answer is that they thought real

estate loans offered better returns than alternative investments. Banks were not alone in viewing real estate as a good investment. A number of scholarly studies appeared in the 1970s and early 1980s showing that real estate investments had outperformed both stocks and bonds over extended periods (Sirmans and Sirmans 1987; Zerbst and Cambon 1984). Also, changes in federal tax laws in 1981 had stimulated the demand for rental real estate for tax shelter purposes, increasing the pool of potential buyers of rental properties. Finally, in New England and other eastern states, rapidly rising home prices fostered a general impression that real estate was a good investment. Bankers, like almost every one else, may have been caught up in the enthusiasm for real estate.

In his paper for the Fed conference, Robert Litan suggests that this last was the principal reason for banks' involvement in real estate. They increased real estate lending because "everyone" was doing it. In particular, banks saw their peers investing successfully in real estate and blindly followed their lead.

The alternative view, voiced by Peter Aldrich, is that banks pursued a high-risk strategy in an effort to achieve high returns. Many experts attribute an extreme version of such a strategy to the thrift institutions in the Southwest. The argument runs as follows: high interest rates in the early 1980s drove up the cost of funds for many savings and loan associations, leaving them insolvent or close to insolvency. Faced with a high probability of failure if they followed business as usual, these financially troubled institutions took advantage of legislation expanding their lending powers to pursue a strategy of rapid growth and risky but potentially high-return investments.

While the failure of such a strategy could result in even higher losses and a quicker demise of the institution, success offered the possibility of restoring the institution to financial health. Moreover, the gains from success would flow primarily to shareholders; managers would retain their positions. In contrast, the larger losses arising from the strategy's failure would fall primarily on the deposit insurance funds, as shareholders' losses were limited to their equity stake.<sup>3</sup> And for management, the consequences of a big failure versus a small one probably seemed the same—dismissal.<sup>4</sup>

<sup>3</sup> Uninsured depositors were also at risk, although past practice may have fostered the impression that they would be protected.

<sup>4</sup> The magnitude of the savings and loan collapse has resulted in criminal charges against some managements for fraudulent practices, so that the consequences of a larger failure may have been more severe than a small failure after all.

The term "moral hazard" is commonly applied to the temptations facing decision-makers in such circumstances. And it is this moral hazard version of the high-risk, high-return strategy that Litan and others emphasize—and dismiss—when they argue that banks were lemmings. In support of their view, they observe that increased real estate lending was not confined to deeply troubled institutions that had little to lose and everything to gain from taking large risks.

---

*The problem in assessing bank motivations is that the alternatives are not limited to lemming-like behavior and betting the bank.*

---

The problem in assessing bank motivations is that the alternatives are not limited to lemming-like behavior and betting the bank. Aldrich and others do not argue that commercial banks were desperate; rather, they see banks facing a long-term need to find higher-return investments because of the loss of their large industrial borrowers to the commercial paper market and foreign banks. Such an argument would apply primarily to the larger banks, which served the larger borrower. Problems with foreign, energy, and farm loans have also been cited as factors pushing banks towards real estate lending (Downs 1991).

It is also possible that a high-risk strategy might have been followed by managements who did not face unusual competitive pressures but who were simply more aggressive in pursuit of high returns than their fellows. The 1980s was a period of financial innovation and expansion. Wall Street flourished for much of the decade. People spoke with (grudging) admiration of financial gunslingers and junk bond kings. A wave of mergers and acquisitions in banking, as in other sectors, told managers to acquire or be acquired. The result may have been that a macho mentality slipped into banking, resulting in some managements and directors who were a little less fearful of risks than their predecessors. And in a world in which most actors are averse to risk, such institutions would be expected to earn higher returns, on average, to compensate their shareholders

for the higher risks. Thus, if a move into real estate was part of an aggressive institution's search for high returns, increased real estate lending could be associated with a stronger-than-average financial performance, rather than weaker.

The bottom line is that the question "Did the banks know what they were doing?" is not so simple as it first appears. Behavior that began with careful evaluations of risk and return on the part of some institutions could degenerate into follow-the-leader as other institutions observed the initial successes. An added factor in New England was the conversion of many mutual savings banks to stock charters, endowing these institutions with very high levels of equity that then had to be put to work. These newly converted thrifts looked to real estate to generate the returns needed to satisfy their new shareholders. The infusion of funds bolstered an already buoyant New England real estate market, and the aggressive pursuit of deals is thought to have contributed to a general relaxation in lending standards.

### *Risks of Real Estate*

Complicating the question of whether banks understood the risks they were taking is the fact that the risks of a particular investment or a particular portfolio are not adequately captured along simple dimensions such as industry or asset type. The general perception among bankers and regulators is that a spectrum of credit risk exists, with one- to four-family mortgages at the low end of the risk spectrum and construction and development loans and highly leveraged transactions at the high-risk end. But for the most part, no rules of thumb evaluate small business loans as, say, twice as risky as commercial mortgages, or construction loans as three times as risky as loans backed by existing properties.

The exception that proves the rule is the Basle Accord, which establishes international standards for capital adequacy. In calculating banks' required capital, consideration is given to the riskiness of bank assets. But the evaluation of risk developed to implement the Accord is very simplistic. Loans backed by one- to four-family homes are assigned to the 50 percent risk category, meaning they are multiplied by a risk weight of 0.5, while almost all other loans are assigned to the 100 percent risk category. Thus, residential mortgages are judged to be less risky than other loans, but no distinctions are made between nonresidential real estate loans and commercial and

industrial loans, or between a mortgage on mom and pop's grocery store and a loan to IBM.

Upon reflection, the absence of easily quantified measures of risk is not surprising. Risk depends upon time and place as well as type of loan. A loan to a small business is less risky in a cyclical expansion than in a recession. A construction loan for an office building in Boston in 1980 was much less risky than a loan at the end of the decade when the office market was saturated. And a nonresidential loan in Minneapolis today is probably less risky than one in Los Angeles.

Concentrations of loans of a particular kind are frequently viewed with concern because of the possibility that an adverse shock could affect a large fraction of the bank's loans in the same way at the same time (Tannenwald 1991). A diversified portfolio of individually risky investments might be less risky overall than a portfolio dominated by one relatively safe asset, if the risks to the elements of the diversified portfolio are offsetting or at least unrelated. Indeed, the whole concept of hedging is based on offsetting one risk by assuming another risk that is activated by the same circumstances but in the opposite direction.

While concentrations may be risky, exceptions can be found. The thrift industry's primary reason for existence is to provide home mortgages and, thus, most savings banks and savings and loan associations have very high concentrations of residential mortgages in their portfolios. Thrift institutions have had their difficulties ever since the high inflation rates of the 1970s drove their cost of funds above the return on their long-term assets, but before then they prospered despite their high real estate concentrations. Moreover, among the factors blamed for the savings and loan failures of the 1980s was the attempt by many of these institutions to move into lines of business about which they knew little. While diversification may be desirable, getting there also carries risks.

Regardless of the inherent risk of a particular investment, a careless lender is more vulnerable than one who carefully evaluates the borrower's character and guarantees, sets terms and conditions to reflect the loan's risks, and monitors performance closely. A sufficiently careful lender might operate successfully in areas traditionally regarded as risky, while a less diligent lender could run into difficulty despite investing in supposedly safer assets.<sup>5</sup>

Partly for this reason, rapid growth is sometimes viewed as evidence of risky behavior. An institution that is expanding very rapidly will not be able to

review loan applications carefully or monitor the performance of its outstanding loans closely. Loan production staff will be stretched too thin or will be too new on the job. This applies more to institutions that are growing rapidly through internal expansion than to institutions growing through mergers and acquisitions. But acquisitions can also be disruptive. Combining different cultures can take much of senior management's attention, and even if acquired institutions are left largely intact, turnover may occur at the top.

### *What Do the Data Show?*

The hypothesis that banks' increased real estate concentrations in the 1980s represented a knowing assumption of greater risk does not lend itself readily to testing. The extreme version, that greater real estate concentrations were a desperate gamble to survive on the part of weak institutions, would imply a negative relationship between banks' financial performance *at the start of the period* and their subsequent increase in real estate lending. In contrast, if some banks were simply a little more willing to assume higher risk for the prospect of higher return, one might observe no relationship between beginning period financial performance and increased real estate lending—or even a positive one if the banks had successfully pursued high-risk, high-return policies in the past.

The expected link between banks' expansion into real estate and their non-real-estate lending is also ambiguous. The argument that banks were forced into greater risk-taking because of increased competition in serving their traditional, non-real-estate customers suggests a negative relationship between the changes in real estate and other types of lending.<sup>6</sup> However, rapid growth in both real estate and other lending could be consistent with a bank pursuing an aggressive policy of expansion.

Despite these ambiguities, regressions relating the change in real estate lending to various financial

<sup>5</sup> If loans have long terms, a careful lender may be adversely affected by the actions of careless latecomers. In this regard, it is often pointed out that the overbuilding of office space in New England drove up vacancy rates and reduced values for all properties, not just the last to be completed or those in the most marginal locations.

<sup>6</sup> Extensive reclassification of business loans with real estate collateral as real estate loans would also tend to produce a negative relationship between real estate and other lending activity.

variables and to banks' non-real-estate lending permit some inferences about whether banks knew what they were doing when they expanded real estate loans rapidly—or at least whether they should have. While regressions are usually interpreted as implying causal relationships, these results might be more accurately characterized as suggestive associations.

The regressions were run over all commercial banks in the United States with more than \$10 million in 1984 assets (1987 dollars) that had some real estate loans in 1984 and that were continuously in existence between 1982 and 1988. The data were not adjusted for mergers and acquisitions. Such an adjustment is very difficult and requires a great deal of judgment on the part of the researcher.<sup>7</sup> Moreover, for the question at hand, whether banks were engaged in deliberate risk-taking, it is not clear that adjusting for past mergers is the preferred approach. To do so gives the impression that the organization has not changed, whereas it may have changed quite markedly and in ways that could expose the institution to risk.

The regressions took two forms. In the first, the dependent variable was the change in the ratio of real estate loans to assets, between 1984 and 1988. This was expressed as a function of:

- 1) equity/total assets in 1984;
- 2) real estate loans/assets in 1984;<sup>8</sup>
- 3) net income/assets in 1984;
- 4) growth in total assets, 1984 to 1988;
- 5) dummy variables for the institution's size, according to 1984 assets (1987 dollars);<sup>9</sup>
- 6) dummy variables indicating the extent of other real estate owned (OREO)/real estate loans in 1984 (note that the base is institutions that did not have any OREO in 1984); and
- 7) a dummy variable for the state in which the bank was located.

Regressions were also run with the dependent variable as the change in real estate loans between 1984 and 1988 relative to 1984 assets, substituting the change in non-real-estate loans between 1984 and 1988 relative to 1984 assets for the growth in total assets. Thus, the first set of regressions looks at increases in real estate concentrations, while the second looks at the actual expansion in real estate loans. Although one would expect increases in real estate loans outstanding and increases in the proportion of assets devoted to real estate to go together, this need not be the case. An institution might increase its real estate lending very rapidly but not experience an increase in its real estate concentration, if non-real-estate assets also grew rapidly.

For both specifications of the dependent variable, separate regressions were run for one- to four-family real estate loans and for real estate loans backed by other than one- to four-family properties. These are subsequently referred to as residential and nonresidential real estate loans, respectively, although the latter includes loans for multifamily properties and construction loans. Regressions were also run excluding those banks for which the increase in either real estate or non-real-estate loans relative to 1984 assets exceeded 100 percent (referred to as rapid-growth banks).

The results are presented in Tables 2 and 4, with the regressions for the change in real estate concentration ratios appearing in Table 2 and the regressions for the changes in real estate lending in Table 4. Tables 3 and 5 present the corresponding regressions for banks of three different sizes; to the degree that banks of different sizes serve different markets, the relationships among the variables may differ. As can be seen from these tables, most banks are small.

The first thing to recognize about the regressions in Table 2 is that they explain less than one-fifth of the variation in the change in concentration ratios. This low explanatory power may reflect the extreme variation in the changes. Although banks, on average, increased their real estate concentrations by 6 percentage points, changes ranged from a decrease of 49 percentage points to an increase of 66 percentage points.

With the caveat that factors not appearing in the equations had a major influence on real estate concentrations, increases in the proportion of assets backed by real estate loans were associated with lower 1984 real estate concentrations and lower 1984 equity-to-asset ratios (also referred to as capital ra-

<sup>7</sup> Researchers must either put together a detailed paper trail of mergers and acquisitions or examine quarterly call report data for unusual jumps in size and the disappearance of institutions and then attempt to reconcile them.

<sup>8</sup> The regressions were also run with  $(1 - \text{real estate loans/assets})$  squared replacing the ratio of real estate loans to assets. Such a formulation recognizes that real estate concentrations cannot exceed 1 and implies that the effect of higher real estate concentrations on subsequent increases in concentration diminishes as concentration approaches 1. Using just the ratio of real estate loans to assets assumes that an increase in initial concentration from 0.1 to 0.2 has the same effect as an increase from 0.4 to 0.5. Although the alternative version has some theoretical appeal, the regression results were not materially improved or changed and, thus, the simpler version appears in the tables.

<sup>9</sup> Regressions were also run in which the dummy variables for size were replaced by continuous variables. Assets, assets squared, and the log of assets were examined and found not to have a material effect on the results.

Table 2  
*Change in Real Estate Loan Concentrations at U.S. Commercial Banks,<sup>a</sup> 1984 to 1988*

Variable	Excluding Rapid Growth Banks <sup>b</sup>					
	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate
Constant	17.0 (23.9)	9.7 (19.0)	7.6 (15.2)	16.6 (23.5)	9.5 (18.7)	7.3 (14.8)
Equity/Assets, 1984	-.5 (-14.4)	-.3 (-10.0)	-.3 (-10.5)	-.5 (-14.9)	-.3 (-10.9)	-.3 (-10.1)
Real Estate Loans/Assets, 1984 <sup>c</sup>	-.2 (-24.2)	-.2 (-23.0)	-.3 (-28.9)	-.2 (-24.8)	-.2 (-22.6)	-.3 (-29.9)
Income/Assets, 1984	.3 (3.1)	.1 (2.1)	.1 (2.3)	.3 (3.1)	.2 (2.6)	.1 (1.7)
Percent Change in Total Assets, 1984-88	-.0003 (-1.2)	-.001 (-5.5)	.0008 (3.8)	.01 (6.1)	.005 (3.0)	.01 (5.5)
Dummy if 1984 Assets:						
> \$1 billion	-3.2 (-5.1)	-2.5 (-5.6)	-.8 (-1.7)	-3.2 (-5.1)	-2.5 (-5.5)	-.7 (-1.7)
≥ \$100 million and < \$300 million	1.5 (3.4)	1.4 (4.4)	.04 (.1)	1.6 (3.5)	1.6 (4.9)	-.09 (-.3)
< \$100 million	2.0 (4.7)	2.5 (8.2)	-.7 (-2.2)	2.0 (4.8)	2.6 (8.6)	-.8 (-2.7)
Dummy if OREO/Real Estate, 1984						
> 0 and ≤ 1.0	-.3 (-1.4)	-.3 (-2.0)	.1 (.7)	-.2 (-1.0)	-.2 (-1.6)	.1 (.8)
> 1.0 and ≤ 2.5	-.3 (-1.3)	-.1 (-.9)	-.06 (-.3)	-.3 (-1.2)	-.1 (-.8)	-.06 (-.4)
> 2.5 and ≤ 5.0	.1 (.5)	-.1 (-.7)	.3 (1.8)	.3 (1.0)	-.05 (-.3)	.4 (2.1)
> 5.0	.3 (1.2)	-.3 (-1.5)	.6 (3.1)	.4 (1.6)	-.2 (-1.2)	.6 (3.4)
Dummy Variables for States	yes	yes	yes	yes	yes	yes
R <sup>2</sup>	.18	.14	.17	.18	.14	.17
Observations	10,602	10,602	10,602	10,472	10,472	10,472

<sup>a</sup>Banks with over \$10 million in 1984 assets (1987 dollars) and continually in existence between 1982 and 1988.

<sup>b</sup>Banks at which increase in either real estate or other loans exceeded 100 percent between 1984 and 1988.

<sup>c</sup>Measure of 1984 concentration is consistent with dependent variable.

Note: All dollar figures, including size cutoffs, are in 1987 dollars.

t-statistics appear in parentheses.

tios). This negative link to capital might be seen as supporting the hypothesis that increased real estate concentrations were part of a strategy to bolster weak financial positions by assuming greater risk. The similarity of the coefficients for the capital ratios in the residential and nonresidential equations raises questions about such an interpretation, however.

Since nonresidential loans are generally regarded as riskier than residential, one would expect a conscious strategy of greater risk-taking to be reflected in a stronger negative link to capital for nonresidential real estate than for residential. Also, increased real estate lending was not associated with low 1984 earnings; if financial difficulties were a motivation for

increased real estate concentrations, they had their roots before 1984.

To clarify the relationship between banks' initial capital position and their subsequent movement into real estate, Appendix Tables A1 and A2 replace the continuous equity-to-asset variable with a series of dummy variables. These equations suggest that at least a small number of poorly capitalized banks may have been engaged in deliberate risk-taking along the lines associated with the thrifts in the Southwest. The banks with the lowest capital ratios (below 3.5 percent) had the largest increases in nonresidential real estate concentrations, but did not increase the fraction of their assets in the relatively safer residential loans more than other banks. Fewer than 1 percent of the banks had such low capital ratios, however, and the increase in nonresidential concentrations was significant only among the smallest banks.

The equations shed less light on the more general question of whether the vast majority of banks that increased their real estate lending did so as part of a higher-risk, higher-return strategy. Except for the most poorly capitalized banks, enthusiasm for both residential and nonresidential lending diminished as capital ratios increased. Such a pattern could be consistent with the view that banks went into real estate because of competitive pressures in other lines of business: the banks with higher capital ratios may have had more attractive non-real-estate lending opportunities than less well capitalized institutions. It is also possible that the banks with very high capital ratios were more conservatively managed than other banks and that they did, indeed, view real estate as risky. If so, their attitudes towards residential and nonresidential lending were similar and might, therefore, reflect a general aversion to the new or faddish as much as a careful weighing of the risks of real estate.<sup>10</sup>

Other real estate owned (OREO), which includes foreclosed properties, is an indicator of past problems with real estate loans and, thus, one might expect OREO to be a deterrent to further real estate lending. For residential real estate, the relationship between the ratio of OREO to real estate loans in 1984 and the subsequent increase in the share of assets devoted to real estate was negative, but generally statistically insignificant. OREO was not a deterrent to nonresidential lending, however; and very high ratios of OREO to real estate loans were positively, rather than negatively, associated with increases in nonresidential lending. This positive link between the riskier nonresidential real estate lending and an indicator of

past real estate problems again seems consistent with some institutions following a higher-risk strategy to extricate themselves from past difficulties. As can be seen from Table 3, this pattern applies only to small banks. OREO was not a significant factor in large banks' shift to real estate.

Competitive pressures arising from the loss of large industrial borrowers do not appear to have been the main factor behind banks' movement into real estate. Large industrial borrowers are primarily served by large banks, but large banks did not move into real estate more aggressively than smaller institutions. Indeed, increases in residential real estate concentrations were largest for the smallest institutions and smallest for the largest banks. For nonresidential lending, the link to size was not so strong; but the largest banks were again the least enthusiastic about real estate. (The question of whether banks were pushed into real estate by competitive pressures is explored further in the box on page 22.)

The state in which a bank was located generally had a significant effect on the increase in its real estate concentration. Banks in the New England states were especially aggressive real estate investors. Banks in other East Coast states also increased their real estate concentrations more than average, while banks in the oil-producing and Mountain states had the smallest increases in real estate in this period.

This state effect is attributable, in large part, to local construction and real estate conditions, although it could also reflect a local lemming effect. Regressions presented in Appendix Tables A3 and A4 replace the state dummies with the change in state construction employment relative to total employment and the rise in housing prices. The change in construction employment was strongly significant. It should be recognized that a circular relationship exists between construction and real estate activity and banks' collective willingness to lend in the local area. The influence of any one bank's activities on state construction employment is likely to be too small to bias the results; but if all banks in a state are enthusiastic about real estate loans, the availability of funding will buoy the market and encourage additional construction.

Lastly, increases in nonresidential real estate

<sup>10</sup> Bank enthusiasm for real estate diminished as 1984 equity capital increased for banks with less than \$100 million (1987 dollars) in 1984 assets and for banks with \$100 million to \$300 million in assets. Large banks exhibited a similar pattern but the differences among banks with different equity capital ratios were generally not statistically significant.

Table 3  
*Change in Real Estate Concentrations at Three Size Groups of U.S. Commercial Banks,<sup>a</sup>  
 1984 to 1988, Excluding Rapid Growth Banks<sup>b</sup>*

Variable	1984 Assets ≥ \$300 million			1984 Assets ≥ \$100 million and < \$300 million			1984 Assets < \$100 million		
	Total Real Estate	One- to Four- Family	Excl. One- to Four- Family	Total Real Estate	One- to Four- Family	Excl. One- to Four- Family	Total Real Estate	One- to Four- Family	Excl. One- to Four- Family
Constant	14.8 (7.3)	6.8 (5.4)	8.0 (5.5)	20.1 (12.1)	12.9 (11.5)	7.8 (6.6)	18.8 (23.3)	12.7 (21.6)	6.1 (11.3)
Equity/Assets, 1984	-.5 (-2.9)	-.3 (-2.4)	-.3 (-2.0)	-.7 (-5.1)	-.4 (-3.8)	-.4 (-3.5)	-.5 (-13.7)	-.3 (-10.0)	-.3 (-9.4)
Real Estate Loans/ Assets, 1984 <sup>c</sup>	-.2 (-4.8)	-.2 (-4.4)	-.2 (-4.9)	-.2 (-8.3)	-.2 (-10.1)	-.2 (-7.5)	-.2 (-22.9)	-.2 (-20.4)	-.3 (-29.1)
Income/Assets, 1984	-.1 (-.2)	.2 (.5)	-.3 (-.7)	.8 (2.1)	.5 (1.8)	.3 (1.1)	.2 (2.6)	.1 (1.9)	.1 (1.7)
Percent Change in Total Assets, 1984-88	.02 (2.1)	.004 (.7)	.01 (2.1)	.002 (.3)	-.006 (-1.2)	.008 (1.5)	.02 (5.8)	.007 (3.4)	.009 (4.6)
Dummy if 1984 Assets > \$1 billion	-3.1 (-4.7)	-2.0 (-4.9)	-1.0 (-2.1)						
Dummy if OREO/ Real Estate, 1984									
> 0 and ≤ 1.0	-.4 (-.4)	-.6 (-.9)	.2 (.3)	-.3 (-.6)	-.5 (-1.2)	.2 (.4)	-.2 (-.7)	-.2 (-1.0)	.1 (.7)
> 1.0 and ≤ 2.5	-.2 (-.2)	-.2 (-.3)	.008 (.01)	-.6 (-.8)	-.7 (-1.5)	.2 (.3)	-.2 (-.7)	-.04 (-.2)	-.03 (-.1)
> 2.5 and ≤ 5.0	.05 (.04)	.07 (.09)	-.02 (-.02)	-.3 (-.3)	-1.1 (-2.1)	.8 (1.4)	.4 (1.4)	.06 (.3)	.4 (2.1)
> 5.0	-.5 (-.4)	-.05 (-.05)	-.5 (-.4)	.01 (-.02)	-.6 (-.9)	.5 (.7)	.6 (2.0)	-.2 (-.9)	.7 (3.8)
Dummy Variables for States	yes	yes	yes	yes	yes	yes	yes	yes	yes
R <sup>2</sup>	.26	.17	.22	.23	.20	.18	.17	.14	.16
Observations	642	642	642	1,421	1,421	1,421	8,409	8,409	8,409

<sup>a</sup>Banks with over \$10 million in 1984 assets (1987 dollars) and continually in existence between 1982 and 1988.

<sup>b</sup>Banks at which increase in either real estate or other loans exceeded 100 percent between 1984 and 1988.

<sup>c</sup>Measure of 1984 concentration is consistent with dependent variable.

Note: All dollar figures, including size cutoffs, are in 1987 dollars.

t-statistics appear in parentheses.

loan concentrations were associated with higher rates of total asset growth between 1984 and 1988. Increased nonresidential lending could, by generating high returns, enable an institution to fund a higher rate of overall growth. It is also possible that the banks that had the greatest propensity to engage in

nonresidential real estate lending had the greatest propensity to grow in other aspects of their business as well. The links between real estate lending and growth are explored in Tables 4 and 5, which present regressions for the change in real estate loans relative to 1984 assets. Among the independent variables, the

### *Pushed or Pulled into Real Estate?*

Those who argue that banks "knew what they were doing" when they moved into real estate see banks as pressured to engage in riskier activity by the loss of market share in other lines of business. Reference is often made to the loss of large industrial customers to the commercial paper market and to problems with farm, energy, and overseas loans. Implicit in the lemming hypothesis, in contrast, is the view that banks pursued real estate loans because they were caught up in a general enthusiasm for what they perceived as attractive investments. In other words, they were pulled into real estate expecting high returns, rather than pushed by a lack of other opportunities.

The table in this box attempts to distinguish between the push and pull motivations by comparing changes in real estate concentrations with changes in the fractions of assets devoted to non-real-estate lending and securities holdings. Specifically, the table shows the mean values of the changes in concentration ratios for each quintile of banks, ranked according to the change in real estate concentrations. (The banks are those used in the regression analysis.)

Whether pushed or pulled, one would expect the banks that increased their real estate concentrations most to be the ones with the greatest shrinkage in non-real-estate loan concentrations. But one would not necessarily expect banks that were pushed into real estate because of a lack of alternative loan opportunities to reduce the fraction of their assets devoted to securities. Indeed, increased securities holdings could be an alterna-

tive way of coping with a dearth of lending opportunities. In contrast, banks that were drawn to real estate loans as attractive investments might be expected to reduce the proportions of their assets in securities as well as in non-real-estate loans.

### *Mean Change in Asset Concentration Ratios at U.S. Commercial Banks, 1984 to 1988*

Percentage Points

Quintiles Ranked by Enthusiasm for Real Estate	Real Estate Loans	Non-Real-Estate Loans	Securities
Least 1	-4.7	-2.6	5.3
2	1.3	-5.1	3.8
3	4.8	-5.1	1.3
4	9.0	-5.8	-1.4
Most 5	18.5	-8.7	-5.8

As the table shows, the banks with the largest increases in real estate loans relative to assets had the greatest contractions in both the fraction of assets in non-real-estate loans and the fraction held in securities. And in comparison with banks that did not increase their real estate concentrations or increased them only slightly, the movement out of securities was actually more pronounced than the shift from non-real-estate lending. This pattern suggests that banks were pulled into real estate more than they were pushed. Since securities are generally the safest investment, banks' shift from securities to real estate does suggest an increased propensity to incur risk.

change in non-real-estate loans relative to 1984 assets replaces the growth in total assets.

As in the regressions in Table 2, increases in real estate lending were negatively related to 1984 equity capital ratios, although positively related to 1984 income. Referring to Appendix Table A2, which replaces the ratio of equity to assets with a series of dummy variables, one sees a pattern similar to that observed for real estate concentrations. Bank enthusiasm for expanding both residential and nonresidential real estate loans fell off with higher capital ratios, although the very small number of banks with equity capital ratios below 3.5 percent seem to have been

more interested in nonresidential real estate than residential.

The smallest banks tended to have the largest increases in residential real estate loans (relative to their size), while the largest banks had the smallest; but again, size had little bearing on banks' propensity to expand nonresidential lending. Banks with some OREO in 1984 tended to increase their residential real estate lending less than banks with no OREO. A little OREO was as much a deterrent as a lot, however; and OREO was not a deterrent to increases in nonresidential real estate loans. That OREO was more a deterrent to increases in residential real estate loans

Table 4  
*Change in Real Estate Lending at U.S. Commercial Banks,<sup>a</sup> 1984 to 1988, Relative to 1984 Assets*

Variable	Excluding Rapid Growth Banks <sup>b</sup>					
	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate
Constant	16.1 (7.8)	11.4 (8.2)	3.9 (2.2)	21.9 (18.6)	12.8 (16.6)	9.5 (12.9)
Equity/Assets, 1984	-.7 (-6.2)	-.3 (-4.0)	-.3 (-3.6)	-.7 (-12.0)	-.4 (-9.8)	-.4 (-9.1)
Real Estate Loans/Assets, 1984 <sup>c</sup>	-.009 (-.3)	.03 (1.1)	.01 (.3)	-.05 (-3.0)	-.009 (-.7)	-.2 (-11.1)
Income/Assets, 1984	-.006 (-.02)	-.3 (-1.8)	.3 (1.3)	.8 (5.7)	.4 (4.4)	.4 (4.4)
Change in Non-Real-Estate Loans 1984-88/1984 Assets	.7 (318.0)	.3 (166.0)	.5 (225.3)	.2 (27.2)	.1 (19.7)	.1 (21.9)
Dummy if 1984 Assets:						
> \$1 billion	-6.5 (-3.6)	-4.4 (-3.6)	-2.0 (-1.2)	-5.0 (-4.9)	-3.7 (-5.4)	-1.4 (-2.1)
≥ \$100 million and < \$300 million	3.5 (2.7)	2.0 (2.3)	1.3 (1.1)	1.8 (2.5)	1.9 (4.0)	-.2 (-.4)
< \$100 million	6.4 (5.3)	4.2 (5.1)	2.1 (1.9)	3.3 (4.7)	3.7 (7.9)	-.7 (-1.5)
Dummy if OREO/Real Estate, 1984:						
> 0 and ≤ 1.0	-2.7 (-4.3)	-1.3 (-3.2)	-1.4 (-2.6)	-1.1 (-3.1)	-.9 (-3.6)	-.09 (-.4)
> 1.0 and ≤ 2.5	-1.9 (-2.8)	-1.6 (-3.5)	-.4 (-.7)	-1.9 (-5.0)	-1.0 (-4.1)	-.7 (-2.9)
> 2.5 and ≤ 5.0	-1.4 (-1.9)	-1.5 (-3.0)	.1 (.1)	-1.7 (-3.9)	-1.2 (-4.3)	-.3 (-1.2)
> 5.0	.8 (1.1)	-.7 (-1.5)	1.6 (2.4)	-.9 (-2.0)	-.9 (-3.3)	.07 (.3)
Dummy Variables for States	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	.91	.73	.83	.33	.25	.25
Observations	10,602	10,602	10,602	10,472	10,472	10,472

<sup>a</sup>Banks with over \$10 million in 1984 assets (1987 dollars) and continually in existence between 1982 and 1988.

<sup>b</sup>Banks at which increase in either real estate or other loans exceeded 100 percent between 1984 and 1988.

<sup>c</sup>Measure of 1984 concentration is consistent with dependent variable.

Note: All dollar figures, including size cutoffs, are in 1987 dollars.

t-statistics appear in parentheses.

than to increases in residential real estate *concentrations* may be attributable to banks burdened with high levels of OREO in 1984 being constrained from subsequently expanding their non-real-estate activity and total assets, and thus being unable to reduce the proportion of their assets in real estate.<sup>11</sup>

The most striking feature of Table 4 is the very strong association between increases in real estate

lending and increases in non-real-estate lending. Some institutions grew very rapidly—in some cases, very, very rapidly—and, thus, had very large in-

<sup>11</sup> Banks with high OREO would probably not have been permitted to acquire other banks by their regulators and, thus, would not have any expansion in their real estate loans attributable to acquisitions.

Table 5

*Change in Real Estate Lending at Three Size Groups of U.S. Commercial Banks,<sup>a</sup> 1984 to 1988, Relative to 1984 Assets, Excluding Rapid Growth Banks<sup>b</sup>*

Variable	1984 Assets ≥ \$300 million			1984 Assets \$100 million and < \$300 million			1984 Assets < \$100 million		
	Total Real Estate	One- to Four-Family	Excl. One- to Four-Family	Total Real Estate	One- to Four-Family	Excl. One- to Four-Family	Total Real Estate	One- to Four-Family	Excl. One- to Four-Family
Constant	16.3 (4.4)	7.9 (3.7)	9.1 (3.8)	26.2 (9.7)	16.2 (9.9)	11.0 (6.2)	26.1 (19.7)	18.0 (20.2)	8.1 (10.4)
Equity/Assets, 1984	-.9 (-2.8)	-.4 (-2.0)	-.6 (-2.6)	-1.5 (-6.4)	-.7 (-5.0)	-.8 (-5.0)	-.7 (-10.4)	-.4 (-8.7)	-.3 (-7.6)
Real Estate Loans/Assets, 1984 <sup>c</sup>	-.1 (1.3)	.1 (1.7)	-.008 (-.1)	.009 (.2)	-.01 (-.3)	-.04 (-1.0)	-.07 (-4.3)	-.03 (-2.1)	-.2 (-12.4)
Income/Assets, 1984	1.7 (1.6)	.6 (.9)	1.1 (1.5)	3.6 (5.9)	1.6 (4.3)	2.0 (4.7)	.6 (4.0)	.3 (3.0)	.3 (3.1)
Percent Change in Non-Real-Estate Loans 1984-88/1984 Assets	.3 (11.3)	.1 (6.8)	.2 (10.9)	.1 (6.2)	.07 (4.6)	.08 (4.8)	.2 (24.6)	.1 (18.7)	.1 (19.0)
Dummy if 1984 Assets > \$1 billion	-4.6 (-3.8)	-2.7 (-3.9)	-2.0 (-2.6)						
Dummy if OREO/Real Estate, 1984:									
> 0 and ≤ 1.0	-1.6 (-.9)	-1.5 (-1.4)	.03 (.02)	.2 (.2)	-.6 (-.9)	.9 (1.3)	-1.3 (-3.2)	-.8 (-3.0)	-.3 (-1.2)
> 1.0 and ≤ 2.5	-1.9 (-.9)	-1.3 (-1.1)	-.5 (-.4)	-.8 (-.7)	-1.2 (-1.7)	.5 (.6)	-1.9 (-4.5)	-.9 (-3.4)	-.8 (-2.9)
> 2.5 and ≤ 5.0	-1.9 (-.8)	-1.2 (-.8)	-.7 (-.4)	-1.0 (-.7)	-1.9 (-2.3)	1.0 (1.0)	-1.5 (-3.2)	-1.1 (-3.5)	-.3 (-.9)
> 5.0	-3.4 (-1.2)	-1.9 (-1.2)	-1.5 (-.8)	.3 (.2)	-.4 (-.5)	.7 (.7)	-.7 (-1.5)	.9 (-2.9)	.2 (.7)
Dummy Variables for States	yes	yes	yes	yes	yes	yes	yes	yes	yes
R <sup>2</sup>	.50	.33	.45	.40	.31	.29	.31	.26	.21
Observations	642	642	642	1,421	1,421	1,421	8,409	8,409	8,409

<sup>a</sup>Banks with over \$10 million in 1984 assets (1987 dollars) and continually in existence between 1982 and 1988.

<sup>b</sup>Banks at which increase in either real estate or other loans exceeded 100 percent between 1984 and 1988.

<sup>c</sup>Measure of 1984 concentration is consistent with dependent variable.

Note: All dollar figures, including size cutoffs, are in 1987 dollars.

t-statistics appear in parentheses.

creases in both real estate and non-real-estate loans. This linkage raises the question of whether banks were pursuing real estate loans purely for their own sake or whether their goal was growth.

Growth can be internally generated or achieved

through mergers and acquisitions. Although moderately high rates of internal growth could be a mark of superior management and service quality, very high rates of internal growth are often seen as a red flag by bank regulators. Mergers and acquisitions are an

Table 6

*Commercial Bank Failures, 1984 to 1988*

Item	All Commercial Banks			Rapid-Growth Banks <sup>a</sup>			Excluding Rapid-Growth Banks		
	United States	New England	United States less New England	United States	New England	United States less New England	United States	New England	United States less New England
Failed Banks	343	28 <sup>b</sup>	315	13	7	6	330	21 <sup>b</sup>	309
Total Sample	10,602	206	10,396	130	19	111	10,472	187	10,285
Failed as a Percent of Total	3	14	3	10	37	5	3	11	3

<sup>a</sup>Rapid-Growth Banks are defined as those with an increase of over 100 percent in either real estate or other loans between 1984 and 1988.

<sup>b</sup>Six Massachusetts Bank of New England subsidiaries that were separate banks in 1988 are included individually as failures. They merged in 1991 into Bank of New England NA, which subsequently failed. Individually, they were not "rapid-growth banks."

Source: Failures for New England were taken from Randall (1993); failures for the country excluding New England are all banks classified as failures in the NIC (National Information Center, Board of Governors of the Federal Reserve System) data base with bank identification numbers matching those in the sample.

other story. In theory, the merging institutions could function as they always did; the surviving entity would appear to have grown but nothing would have changed operationally. Risks might even be reduced if the acquisition permitted geographic or product diversification or cost reductions because of economies of scale. But while mergers need not expose institutions to increased risk, they can. Monitoring large acquisitions can strain management capabilities, and organizations with different cultures and ways of doing business may not work well together, resulting in turnover and poor communications. Also, aggressive pursuit of mergers may be indicative of an expansionist mentality that could affect other aspects of bank operations.

To provide some insight into the riskiness of rapid growth, Table 6 compares the failure rates of banks that experienced very rapid growth with the failures of banks generally. Failure rates for New England banks are presented separately. Outside of New England, rapid growth was not associated with unusually high failure rates. The 5 percent failure rate for rapid-growth banks is not significantly different from the 3 percent rate for other banks. Within New England, however, very rapid growth did carry substantial risks. More than one-third of the region's most rapidly growing banks failed, compared to 11 percent of other banks—a statistically significant difference.

As will be shown below, growth rates in New England banks were generally much higher than those of banks in other parts of the country. Thus, one possible interpretation of the results in Table 6,

particularly given the relatively high failure rate experienced by all New England banks, is that any dangers arising from rapid growth are greatest when everyone is growing rapidly. One bank may be able to grow rapidly through acquisition, tapping underserved markets, or gaining market share through better customer service. But if many banks in a region are attempting to do the same thing at the same time, the outcome may be a general lowering of lending standards and a bidding up of the prices of acquired institutions. Under such circumstances, the most rapidly growing banks may be the most vulnerable.

Obviously, such a conclusion has to be tempered by considering local economic conditions. A prosperous region can support a more rapid expansion in credit without a relaxation of credit standards. But here the circularity between credit availability and local economic activity becomes problematic. Increased credit availability may provide a stimulus to the economy beyond that supported by economic fundamentals. And if lenders are unable to perceive their role in stimulating growth, they may conclude that further expansion is warranted.

### *What Set New England Banks Apart?*

New England banks were particularly aggressive in making real estate loans during the mid 1980s. Table 7 presents the mean values of the dependent and independent variables of the equations in Tables 2 and 4, for both U.S. and New England banks.

New England banks, on average, increased both

Table 7

*Comparison of Real Estate Lending Variables for Commercial Banks in the United States and New England*

Variable	All Commercial Banks		Excluding Rapid Growth Banks <sup>b</sup>	
	United States <sup>a</sup>	New England	United States <sup>a</sup>	New England
<u>Dependent Variables (mean values)</u>				
Changes in Loan Concentrations, 1984 to 1988				
Total Real Estate	5.8	18.0	5.7	16.9
One- to Four-Family	2.8	7.5	2.8	7.2
Excluding One- to Four-Family	3.0	10.5	2.9	9.8
Changes in Real Estate Lending 1984 to 1988/ Assets 1984				
Total Real Estate	13.2	52.9	10.3	41.3
One- to Four-Family	6.6	24.6	5.3	20.1
Excluding One- to Four-Family	6.6	28.3	4.9	21.2
<u>Independent Variables (mean values except where noted)</u>				
Equity/Assets—1984	8.5	6.9	8.5	6.8
Total Real Estate/Assets—1984	18.6	26.1	18.6	25.9
One- to Four-Family/Assets—1984	10.6	15.8	10.5	15.9
Excluding One- to Four-Family/Assets—1984	8.1	10.2	8.0	10.0
Income/Assets—1984	.8	1.0	1.0	1.0
Change in Non-Real-Estate Loans 1984 to 1988/ Assets 1984				
	2.0	17.5	-1.4	14.5
Percent Change in Total Assets 1984 to 1988	23.6	75.2	14.4	58.3
Percent of Banks with 1984 Assets:				
> \$1 billion	2.5	7.3	2.5	8.0
≥ \$300 million and ≤ \$1 billion	3.6	16.5	3.6	18.2
≥ \$100 million and < \$300 million	13.7	21.4	13.6	20.9
< \$100 million	80.2	54.9	80.3	52.9
Percent of Banks with 1984 OREO/Real Estate:				
0	32.0	57.3	31.8	56.1
> 0 and ≤ 1.0	24.2	35.9	24.2	36.9
> 1.0 and ≤ 2.5	17.4	5.3	17.5	5.3
> 2.5 and ≤ 5.0	12.2	.5	12.3	.5
> 5.0	14.2	1.0	14.2	1.1
Percent Change in State Home Prices 1984 to 1988 (Deflated)	19.2	53.7	19.1	53.1
Change in Construction Employment 1984 to 1988/Total Employment 1984	.3	2.6	.3	2.6

<sup>a</sup>U.S. banks include New England banks.

<sup>b</sup>Rapid-growth banks had increases of over 100 percent in either real estate or other loans between 1984 and 1988.

Note: All dollar figures, including size cutoffs, are in 1987 dollars.

their volume of real estate lending and their concentrations in real estate more than banks nationwide. The expansion in non-real-estate loans and total assets was also much more rapid at New England banks than banks nationally. In other words, New England banks' pursuit of real estate was a pursuit of growth. They were not driven into real estate loans by a lack of opportunities in non-real-estate lending.

The average equity capital ratio of New England

banks was lower than that of the average bank nationwide;<sup>12</sup> and according to the equations above,

<sup>12</sup> The low equity capital ratio for New England banks was partially attributable to size. Small banks tend to have higher capital ratios than large banks, and New England banks were larger, on average, than banks nationwide. Even so, within each of the size categories examined in this article, a much larger proportion of New England banks had capital ratios below the U.S. average of 8.5 percent than banks nationwide.

lower capital ratios were associated with larger increases in real estate loans and higher real estate concentrations. New England banks were not in serious trouble in 1984, however. The average bank would have been considered adequately capitalized at the time by bank supervisors and analysts; no New England bank had a capital ratio below 3.5 percent in 1984, while the lowest national values were negative. New England banks also had substantially lower ratios of OREO to real estate loans in 1984 than banks nationally. New England banks were not driven to take chances in real estate by fears of insolvency.

The economic environment in New England was particularly conducive to real estate lending. Construction employment grew much more rapidly in the New England states than in the country as a whole and home prices soared in the region. Other things equal, banks in Massachusetts increased their real estate lending and real estate concentrations more than banks in any other state. Banks in Connecticut, New Hampshire, and another northeastern state, New Jersey, ranked second, depending on the equation.

### *Conclusions*

Was the enthusiasm of banks for real estate in the 1980s a deliberate attempt to achieve higher returns by taking greater risks, or simply a case of banks blindly following one another to financial difficulty? An examination of some of the factors associated with banks' real estate lending provides some support for the view that at least a few banks followed higher-risk, higher-return strategies in order to improve their financial performance. Increases in real estate concentrations and loan growth were greater for banks that had low capital ratios at the beginning of the period. In addition, high levels of OREO, an

indicator of past real estate difficulties, do not seem to have been a deterrent to increased nonresidential lending. The primary motivation for the movement into real estate was not the loss of large industrial customers, however; the large banks that would have served such customers did not increase their real estate lending as much as did the smaller institutions.

In addition, it is clear that the New England banks, which were particularly aggressive in increasing their real estate loans and subsequently paid the price in a very high failure rate, were not forced into real estate lending by poor financial performance or by a lack of lending opportunities in other lines of business. Rather, their real estate expansion was part and parcel of rapid growth overall.

Should rapid growth be viewed as an indication of risk-taking? In New England, the failure rate was considerably higher for the institutions with the fastest growth. Nationwide, however, the failure rate for rapid-growth institutions was not significantly different from that of other banks. Perhaps the lesson here is that the dangers of growth are greatest when everyone is growing. Perhaps, too, the dangers of real estate lending—or any other form of lending—are greatest when everyone is doing it.

And perhaps the problem with the banks' pursuit of real estate loans in the 1980s was not that they deliberately took on excessive risks or that they, lemming-like, ignored risks and blindly followed one another, but that they failed to recognize that the risks they incurred as individual banks were affected by the actions of their fellows. New England banks were not driven to real estate by fears of insolvency or by a lack of other opportunities. Rather they—along with many others—seem to have been seduced by the growth opportunities presented by the buoyant New England real estate market, not realizing that this buoyancy was partly a product of their own collective enthusiasm for real estate.

Appendix Table A1

*Change in Real Estate Loan Concentrations at U.S. Commercial Banks,<sup>a</sup> 1984 to 1988*

Variable	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate	Excluding Rapid Growth Banks <sup>b</sup>		
				Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate
Constant	13.5 (20.5)	8.0 (16.9)	5.6 (12.2)	13.0 (19.9)	7.6 (16.2)	5.5 (11.9)
Equity/Assets, 1984						
< 3.5	1.2 (1.1)	-1.1 (-1.4)	2.2 (2.9)	1.4 (1.3)	-1.0 (-1.4)	2.3 (3.0)
≥ 3.5 and < 6.0	.6 (2.0)	.3 (1.4)	.3 (1.6)	.5 (1.8)	.3 (1.5)	.3 (1.2)
≥ 8.5 and < 11.0	-1.8 (-9.7)	-.9 (-6.8)	-.9 (-6.8)	-1.8 (-9.9)	-1.0 (-7.3)	-.9 (-6.6)
≥ 11.0 and < 14.5	-2.8 (-10.3)	-1.6 (-8.2)	-1.3 (-6.5)	-2.9 (-10.7)	-1.7 (-8.6)	-1.2 (-6.4)
≥ 14.5	-4.4 (-8.7)	-2.0 (-5.6)	-2.5 (-6.8)	-4.8 (-9.6)	-2.5 (-6.8)	-2.4 (-6.7)
Real Estate Loans/Assets, 1984 <sup>c</sup>	-.2 (-24.1)	-.2 (-23.0)	-.3 (-28.7)	-.2 (-24.7)	-.2 (-22.6)	-.3 (-29.7)
Income/Assets, 1984	.2 (1.9)	.05 (.7)	.1 (2.0)	.2 (1.9)	.08 (1.1)	.1 (1.5)
Percent Change in Total Assets, 1984-88	-.0003 (-1.2)	-.001 (-5.5)	.0008 (3.8)	.01 (6.2)	.005 (3.0)	.01 (5.5)
Dummy if 1984 Assets:						
> \$1 billion	-3.0 (-4.8)	-2.4 (-5.3)	-.7 (-1.4)	-2.9 (-4.7)	-2.4 (-5.3)	-.6 (-1.4)
≥ \$100 million and < \$300 million	1.5 (3.3)	1.4 (4.4)	.01 (.05)	1.5 (3.4)	1.6 (4.8)	-.1 (-.4)
< \$100 million	1.9 (4.5)	2.5 (8.1)	-.7 (-2.4)	1.9 (4.5)	2.6 (8.5)	-.9 (-2.9)
Dummy if OREO/Real Estate, 1984						
> 0 and ≤ 1.0	-.3 (-1.1)	-.3 (-2.0)	.1 (.8)	-.2 (-.9)	-.2 (-1.6)	.1 (.9)
> 1.0 and ≤ 2.5	-.3 (-1.3)	-.1 (-.8)	-.03 (-.2)	-.3 (-1.1)	-.1 (-.7)	-.04 (-.2)
> 2.5 and ≤ 5.0	.1 (.5)	-.1 (-.8)	.3 (1.8)	-.2 (-1.0)	-.07 (-.4)	.4 (2.1)
> 5.0	.3 (1.1)	-.3 (-1.6)	.6 (3.1)	.4 (1.5)	-.2 (-1.3)	.6 (3.4)
Dummy Variables for States	yes	yes	yes	yes	yes	yes
R <sup>2</sup>	.18	.14	.17	.18	.14	.17
Observations	10,602	10,602	10,602	10,472	10,472	10,472

<sup>a</sup>Banks with over \$10 million in 1984 assets (1987 dollars) and continually in existence between 1982 and 1988.

<sup>b</sup>Banks at which increase in either real estate or other loans exceeded 100 percent between 1984 and 1988.

<sup>c</sup>Measure of 1984 concentration is consistent with dependent variable.

Note: All dollar figures, including size cutoffs, are in 1987 dollars.

t-statistics appear in parentheses.

Appendix Table A2

*Change in Real Estate Lending at U.S. Commercial Banks,<sup>a</sup> 1984 to 1988, Relative to 1984 Assets*

Variable	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate	Excluding Rapid Growth Banks <sup>b</sup>		
				Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate
Constant	11.0 (5.8)	9.3 (7.3)	1.2 (.7)	16.8 (15.5)	10.1 (14.2)	6.9 (10.1)
Equity/Assets, 1984						
< 3.5	-.9 (-.3)	-2.5 (-1.2)	1.5 (.6)	.9 (.5)	-1.8 (-1.6)	2.6 (2.2)
≥ 3.5 and < 6.0	2.8 (3.3)	1.2 (2.0)	1.6 (2.1)	1.5 (3.0)	.9 (2.7)	.7 (2.1)
≥ 8.5 and < 11.0	-1.9 (-3.5)	-.9 (-2.4)	-.9 (-1.9)	-2.5 (-8.2)	-1.2 (-6.2)	-1.3 (-6.5)
≥ 11.0 and < 14.5	-2.7 (-3.5)	-1.5 (-2.7)	-1.2 (-1.6)	-3.6 (-8.0)	-2.1 (-7.2)	-1.5 (-5.4)
≥ 14.5	-5.8 (-3.9)	-2.2 (-2.2)	-3.4 (-2.6)	-6.0 (-7.2)	-3.2 (-5.8)	-3.0 (-5.5)
Real Estate Loans/Assets, 1984 <sup>c</sup>	-.005 (-.2)	.03 (1.1)	.01 (.3)	-.04 (-2.9)	-.008 (-.6)	-.2 (-11.0)
Income/Assets, 1984	-.09 (-.3)	-.4 (-2.2)	.3 (1.3)	.7 (4.8)	.3 (3.2)	.4 (4.1)
Change in Non-Real-Estate Loans 1984-88/1984 Assets	.7 (317.7)	.3 (165.9)	.5 (225.0)	.2 (27.2)	.1 (19.7)	.1 (21.9)
Dummy if 1984 Assets:						
> \$1 billion	-6.9 (-3.8)	-4.6 (-3.7)	-2.2 (-1.3)	-5.0 (-4.8)	-3.7 (-5.4)	-1.4 (-2.0)
≥ \$100 million and < \$300 million	3.6 (2.8)	2.1 (2.4)	1.4 (1.2)	1.9 (2.5)	2.0 (4.0)	-.2 (-.4)
< \$100 million	6.6 (5.4)	4.3 (5.2)	2.2 (1.9)	3.3 (4.7)	3.7 (7.9)	-.7 (-1.5)
Dummy if OREO/Real Estate, 1984						
> 0 and ≤ 1.0	-2.6 (-4.2)	-1.3 (-3.2)	-1.4 (-2.5)	-1.1 (-3.0)	-.8 (-3.6)	-.05 (-.2)
> 1.0 and ≤ 2.5	-1.9 (-2.8)	-1.6 (-3.4)	-.4 (-.6)	-1.9 (-4.8)	-1.0 (-4.0)	-.7 (-2.8)
> 2.5 and ≤ 5.0	-1.4 (-1.8)	-1.5 (-3.0)	.1 (.2)	-1.7 (-3.9)	-1.2 (-4.3)	-.3 (-1.2)
> 5.0	.8 (1.1)	-.8 (-1.5)	1.7 (2.4)	-.9 (-2.0)	-.9 (-3.4)	.09 (.3)
Dummy Variables for States	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	.91	.73	.83	.33	.25	.25
Observations	10,602	10,602	10,602	10,472	10,472	10,472

Notes: See Appendix Table 1.

Appendix Table A3

*Change in Real Estate Loan Concentrations at U.S. Commercial Banks,<sup>a</sup> 1984 to 1988,  
with State Economic Variables*

Variable	Excluding Rapid Growth Banks <sup>b</sup>					
	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate
Constant	12.8 (23.0)	5.2 (13.3)	8.1 (20.7)	12.4 (22.6)	4.9 (12.6)	7.9 (20.4)
Equity/Assets—1984	-.6 (-14.9)	-.3 (-10.3)	-.3 (-10.9)	-.6 (-15.3)	-.3 (-11.0)	-.3 (-10.3)
Real Estate Loans/ Assets, 1984 <sup>c</sup>	-.2 (-19.8)	-.2 (-18.2)	-.2 (-23.7)	-.2 (-21.5)	-.2 (-18.1)	-.3 (-25.7)
Income/Assets—1984	.3 (3.5)	.2 (3.4)	.1 (1.3)	.3 (3.1)	.2 (3.5)	.04 (.6)
Percent Change in Total Assets 1984-88	-.0001 (-.3)	-.001 (-4.6)	.0009 (4.2)	.03 (11.1)	.01 (6.0)	.02 (9.6)
Dummy if 1984 Assets: > \$1 billion	-2.5 (-3.9)	-2.0 (-4.3)	-.5 (-1.2)	-2.5 (-4.0)	-2.0 (-4.2)	-.6 (-1.3)
≥ \$100 million and < \$300 million	.6 (1.2)	.9 (2.6)	-.4 (-1.2)	.7 (1.6)	1.1 (3.2)	-.5 (-1.4)
< \$100 million	.5 (1.2)	1.5 (4.8)	-1.2 (-3.8)	.8 (1.8)	1.7 (5.5)	-1.2 (-3.9)
Dummy if OREO/ Real Estate, 1984 > 0 and ≤ 1.0	-.6 (-2.7)	-.1 (-.8)	-.4 (-2.5)	-.4 (-1.7)	-.02 (-.1)	-.3 (-2.0)
> 1.0 and 2.5	-1.1 (-4.6)	-.3 (-2.0)	-.7 (-4.0)	-.9 (-3.7)	-.3 (-1.5)	-.6 (-3.3)
> 2.5 and ≤ 5.0	-.7 (-2.6)	-.6 (-2.9)	-.06 (-.3)	-.3 (-1.2)	-.4 (-2.0)	.1 (.7)
> 5.0	-.5 (-2.0)	-.9 (-4.9)	.4 (2.1)	-.2 (-.7)	-.8 (-4.1)	.6 (3.3)
Change in Home Prices 1984 to 1988 (Deflated)	.006 (1.2)	.007 (2.1)	-.002 (-.6)	.002 (.5)	-.006 (1.8)	-.004 (-1.4)
Change in Construction Employment 1984 to 1988/ Total Employment 1984	2.1 (28.0)	1.0 (18.5)	1.0 (19.0)	1.8 (23.9)	.9 (16.1)	.8 (15.0)
R <sup>2</sup>	.11	.06	.11	.12	.06	.12
Observations	10,602	10,602	10,602	10,472	10,472	10,472

Notes: See Appendix Table 1.

Appendix Table A4

*Change in Real Estate Lending at U.S. Commercial Banks,<sup>a</sup> 1984 to 1988, Relative to 1984 Assets, with State Economic Variables*

Variable	Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate	Excluding Rapid Growth Banks <sup>b</sup>		
				Total Real Estate	One- to Four-Family Real Estate	Excluding One- to Four-Family Real Estate
Constant	16.0 (10.1)	7.2 (7.0)	8.2 (5.9)	16.8 (18.0)	7.1 (12.0)	10.5 (17.7)
Equity/Assets—1984	-.8 (-7.8)	-.4 (-5.3)	-.4 (-4.5)	-.8 (-12.7)	-.4 (-10.7)	-.4 (-9.4)
Real Estate Loans/Assets, 1984 <sup>c</sup>	.04 (1.8)	.07 (3.0)	.08 (2.2)	.02 (1.5)	.04 (3.1)	-.06 (-4.0)
Income/Assets—1984	.05 (.2)	-.2 (-.9)	.2 (.9)	.8 (5.5)	.5 (5.3)	.3 (3.1)
Change in Nonreal Estate Loans 1984–88/1984 Assets	.7 (310.9)	.3 (163.8)	.5 (223.2)	.3 (29.0)	.1 (22.5)	.1 (22.5)
Dummy if 1984 Assets:						
> \$1 billion	-5.9 (-3.2)	-3.6 (-2.9)	-2.1 (-1.3)	-3.1 (-2.9)	-2.5 (-3.5)	-.7 (-1.0)
≥ \$100 million and < \$300 million	1.5 (1.1)	1.0 (1.2)	.4 (.3)	-.1 (-.2)	1.0 (1.9)	-1.2 (-2.3)
< \$100 million	3.5 (2.8)	2.6 (3.2)	.8 (.7)	.3 (.4)	2.0 (4.2)	-1.9 (-4.0)
Dummy if OREO/Real Estate, 1984						
> 0 and ≤ 1.0	-4.0 (-6.3)	-1.5 (-3.6)	-2.6 (-4.6)	-2.2 (-5.9)	-1.0 (-4.0)	-1.1 (-4.6)
> 1.0 and ≤ 2.5	-4.0 (-6.0)	-2.5 (-5.5)	-1.6 (-2.6)	-3.8 (-9.5)	-1.8 (-6.9)	-1.9 (-7.4)
> 2.5 and ≤ 5.0	-3.2 (-4.3)	-2.6 (-5.2)	-.6 (-.9)	-3.3 (-7.3)	-2.1 (-7.3)	-1.1 (-3.7)
> 5.0	-.5 (-.7)	-1.9 (-3.8)	1.5 (2.3)	-2.1 (-4.9)	-2.0 (-6.8)	-.2 (-.8)
Change in Home Prices 1984 to 1988 (Deflated)	.03 (2.3)	.02 (2.2)	.01 (1.0)	.01 (1.7)	.01 (2.5)	-.0008 (-.2)
Change in Construction Employment 1984 to 1988/ Total Employment 1984	2.2 (10.3)	1.5 (10.0)	.7 (3.7)	3.7 (28.2)	1.8 (20.7)	1.8 (21.7)
R <sup>2</sup>	.90	.72	.83	.24	.17	.16
Observations	10,602	10,602	10,602	10,472	10,472	10,472

Notes: See Appendix Table 1.

## References

- Browne, Lynn E. and Eric S. Rosengren, editors. 1992. *Real Estate and the Credit Crunch*. Proceedings of a Conference Held in September 1992. Federal Reserve Bank of Boston, Conference Series No. 36.
- Downs, Anthony. 1991. "From Flood to Drought: The 1990s Shift in Real Estate Finance." *The Brookings Review*, Summer, pp. 48-53.
- Randall, Richard E. 1993. "Lessons from New England Bank Failures." *New England Economic Review*, May/June, pp. 13-38.
- Simons, Katerina. 1992. "Mutual-to-Stock Conversions by New England Savings Banks: Where Has All the Money Gone?" *New England Economic Review*, March/April, pp. 45-53.
- Sirmans, G. Stacy and C.F. Sirmans. 1987. "Corporate Capital Budgeting Practices and the Effects of Tax Policies on Investment." In Martin Feldstein, editor, *The Effects of Taxation on Capital Accumulation*. Chicago: University of Chicago Press.
- Tannenwald, Robert. 1991. "Cyclical Swing or Secular Slide? Why Have New England's Banks Been Losing Money?" *New England Economic Review*, November/December, pp. 29-46.
- Zerbst, H. Robert and B.R. Cambon. 1984. "Real estate: Historical returns and risks." *Journal of Portfolio Management*, Spring, pp. 5-31.

# *What Inflation Policy Do American Voters Want, and Do They Get It?*

**F**or those scholars who have examined the impact of macroeconomic conditions on political support for the President, the 1992 election results were somewhat surprising. Inflation at the time of the election was at its lowest level in 20 years. The vast bulk of previous research regarding voters' economic preferences would have led one to expect that this achievement would have given the incumbent Administration a significant advantage.<sup>1</sup> A typical and oft-cited example is the Fair (1978a) model, which predicted reelection of the President in 1992, primarily because of the high level of voter aversion to inflation estimated in that study.<sup>2</sup> Thus, the 1992 Presidential election raises the possibility that voter preferences either have changed or were mistakenly estimated earlier. In turn, if the American electorate cannot be counted upon to support a policy of low inflation, the political feasibility, and hence, credibility, of announcing and implementing such a policy becomes questionable.<sup>3</sup>

The primary goal of this study is to obtain some estimates of the policies and inflation goals that voters deem optimal. Estimates of voters' preferred policy outcomes will then be used to determine the price that voters are willing to pay in order to achieve their desired inflation rate. The lower voters' long-run inflation target and the greater their willingness to pay for low inflation, the more politically feasible and credible will an anti-inflation policy be.

The empirical results are also used to explore, briefly, two additional issues. One of these is the role played by economic factors in the 1992 election. The second is whether or not macroeconomic policy is afflicted by a positive inflationary bias. Much recent theoretical literature, for example, Barro and Gordon (1983) and Canzoneri (1985), argues that discretionary policy will exhibit such a bias and persistently aim at producing more inflation than the electorate truly wants. A necessary step in testing this thesis is the actual determination of voter preferences.

The approach taken here is the "sophisticated voter" model pio-

*Daniel J. Richards*

*Associate Professor of Economics, Tufts University, and Visiting Scholar, Federal Reserve Bank of Boston. The author wishes to express his thanks to Lynn Browne, Jeffrey Fuhrer, Geoffrey Tootell, and Eric Rosengren for many helpful comments.*

neered by Chappell (1983) and Chappell and Keech (1985). This model does not require that voters be "super" rational. But it does assume that they have some rudimentary knowledge of the economy's structure and, as a result, are aware of some of the limitations of economic policy. Of course, as with all studies on the influence of economic events on political support, this approach also assumes that voters hold Presidents responsible for macroeconomic policy. It may be questioned whether or not it is sensible for voters to do this. Much research, however, does find that the incumbent Administration has an influence on policy.<sup>4</sup>

Two models of the sophisticated voter approach, described in the next section, will be used to examine the political feasibility of a policy of low inflation. The results suggest that the American electorate, at least in the past 30 years, would have supported a policy of maintaining inflation at roughly 3 percent, even if such a policy precluded attempts to stabilize output.

### *I. Two Models of "Sophisticated" Voters and Macroeconomic Outcomes*

It is perhaps easiest to understand what is meant by a "sophisticated" voter model in the context of macroeconomic policy by first describing the "unsophisticated" voter approach implicitly taken by much of the work in this area. To this end, consider the following model, which is a simple, composite representation of a number of those used in prior research such as Fair (1978a) and Beck (1991):

$$POP_t = a_1 INF_t + a_2 \Delta GDP_t + X_t b + e_t. \quad (1)$$

Here  $POP_t$  is a measure of political support for the incumbent President;  $INF_t$  is a measure of inflation;  $\Delta GDP_t$  is a measure of GDP growth;  $X_t$  is a variety of other identifiable factors affecting Presidential popularity; and  $e_t$  reflects the influence of unidentifiable, random events, all at time  $t$ . As some consideration will reveal, such a model severely restricts voter preferences and implicitly treats voters as uninformed regarding basic macroeconomic relationships.

The model suggests a somewhat strange voter attitude regarding inflation. If, as is typical, the estimate of  $a_1$  is negative, the equation implies that any positive inflation rate will decrease Presidential support and, conversely, that support will rise as inflation becomes more and more negative. Indeed,

the model suggests that popularity could be maximized by achieving very large (in the limit, infinite) deflations. Yet nothing in economic theory suggests that a large rate of deflation is optimal.<sup>5</sup>

What theoretical research has done is to identify the considerations important for determining the optimal inflation rate. Society's preferred long-run inflation target will depend on the importance it attaches to these considerations. The researcher cannot know in advance the outcome of this complex judgment, and should not impose, a priori, any specific target, such as negative infinite inflation as in equation (1) or zero inflation, as is done in other models. Voters' preferred inflation target should be deduced from the data.

A further problem with equations such as (1) lies in the GDP term. As written, the equation does not permit voters to be aware of or respond to the fact that GDP cannot be indefinitely raised above potential. Not only is such a high level of GDP incapable of being sustained in the long run, but even achieving it in the short run may be suboptimal. A temporary surge of GDP above trend may bring painful inflation costs later. Moreover, in many macro models, outputs both above and below trend reflect decisions based on misperceived relative prices. That is, these decisions are suboptimal ones that, with hindsight, will be regretted. In short, models like equation (1) carry the implication that if inflation were at the voters' desired rate and GDP at its long-run potential, voters would still reward Administrations who raised GDP above potential. Reasonably sophisticated voters would instead recognize that such a policy is neither optimal nor sustainable.

If voters are to be treated as sensible, economi-

<sup>1</sup> See, for example, Fair (1978a); Hibbs (1979); Chappell (1983); Chappell and Keech (1985); Richards (1988); and Garman and Richards (1989).

<sup>2</sup> See, for example, the article by Schiller (1992).

<sup>3</sup> Technically, the analysis herein is limited to polling data on Presidential popularity and does not examine election results per se. However, such polls are quite close predictors of actual election outcomes. Indeed, Chappell (1990) finds that one cannot reject the hypothesis that election results can be treated as observations from the polling data series.

<sup>4</sup> See, for example, Kane (1980); Wooley (1984); and Havrilesky (1988).

<sup>5</sup> A small amount of deflation may be desirable, at least in a world with lump-sum taxes, as suggested by Milton Friedman's (1969) classic paper. But Phelps's (1973) equally classic work suggests that some positive amount of inflation may be appropriate when distortionary taxation is necessary. These two articles have spawned a number of subsequent papers, but none of this literature can be read as implying that large-scale deflation is optimal.

cally speaking, then voter support must be modeled so that it does not necessarily increase with every increase in GDP, as equation (1) implies. Such "sophisticated" voters understand the constraints under which the economy operates. They will not reward policymakers who attempt to push the economy beyond those bounds.

Note that none of the objections just mentioned rely on rational expectations and the ability of citizens both to forecast and to offset government policies. The informational requirements of such "super" rationality can be quite extensive and, perhaps, not realistic.<sup>6</sup> At the same time, the above arguments do strongly suggest the desirability of treating voters as at least somewhat knowledgeable about the economy, even if not super-rational. In other words, it is sensible at the outset to set the following conditions: 1) voters' long-run inflation target may be positive, or at least different from zero<sup>7</sup> or negative infinity; 2) voters understand the long-run requirement that GDP equal its potential; and 3) voters recognize the limited ability of policy to arbitrarily set the level of GDP independent of inflation considerations, even in the short run. This is the modeling perspective taken here.

### *The Sophisticated Voter Approach*

One version of the sophisticated voter approach simply assigns voters a preference or utility function of exactly the same form that the theoretical literature assumes. An example of this approach is that of Garman and Richards (1989) in which voter preferences and, in turn, voters' perception of the President's economic performance,  $EP_t$ , are given by the following equation:

$$EP_t = -b_1(Q_t - QNAT_t)^2 - b_2(\Pi_t - \Pi^*)^2 \\ = -b_1VAR_t - b_2BIAS; b_1, b_2 > 0 \quad (2)$$

where  $Q_t$  is real GDP (in logs);  $QNAT_t$  is trend or natural GDP (again in logs);<sup>8</sup>  $\Pi_t$  is inflation; and  $\Pi^*$  is voters' preferred or desired inflation rate.

As noted, equation (2) is the loss or welfare function commonly used in macroeconomic literature. Using such a function in a political support equation is thus a way of allowing voters to form their evaluations in the same manner that economic theory often assumes. Using  $EP_t$  also avoids many of the problems that attend the "unsophisticated" voter models discussed earlier. An evaluation of perfor-

mance based on (2) will penalize officials who fail to keep GDP close to trend, regardless of whether such deviations are above or below trend. Hence, this term permits voters to recognize that excessive output growth is neither sustainable nor desirable. This specification also focuses voter attention on the variance of GDP, which policy may well affect, rather than on the level of GDP, on which the effects of policy are more debatable.

---

*"Sophisticated" voters understand the constraints under which the economy operates, and will not reward policymakers who attempt to push the economy beyond those bounds.*

---

The second term in equation (2) implies that political support for an Administration will not continually increase as inflation gets lower and lower but, instead, will be (negatively) related to the deviation between actual inflation and that inflation rate deemed optimal by voters,  $\Pi^*$ . This term thus permits voters to have a preferred inflation rate other than negative infinity or zero. It also allows voters to recognize that too little inflation can be as bad as too much.

One difficulty remains, however, in assuming that  $EP_t$  as presented in equation (2) is the record that a sophisticated voter would use to evaluate economic performance. The measure ignores any preferences voters may have as to how quickly deviations of  $\Pi_t$  from  $\Pi^*$  are eliminated. If wages and prices are flexible, then this objection is irrelevant. But if prices

<sup>6</sup> See Beck (1991) for a discussion as to why assuming rational expectations in this context may impose considerable information burdens on voters.

<sup>7</sup> Neither Chappell (1983) nor Chappell and Keech (1985) permits the voters' preferred inflation rate to be determined by the data. Like much of the literature, they arbitrarily assume that this rate is zero. This may account for some of the estimation problems that they have encountered; for example, see Chappell and Keech (1991).

<sup>8</sup> The terms trend GDP, natural GDP, and potential GDP are used interchangeably in this paper. As described below, the actual measure of this value is taken from Gordon (1993). It is also worth noting that macro policy may affect potential GDP. Such effects are more or less ignored in this study.

are "sticky," so that a short-run trade-off exists between output and inflation, the speed with which policy brings  $\Pi_t$  in line with  $\Pi^*$  will matter to voters.

When an output-inflation trade-off exists in the short run but not in the long run, the determination of optimal policy may be viewed as the solution to an optimal control problem in which the control variable is output relative to potential. A solution to such a problem provided by MacRae (1977) is the following policy rule:<sup>9</sup>

$$Q_t - QNAT_t = -\alpha(\Pi_{t-1} - \Pi^*); \alpha > 0. \quad (3)$$

In words, the rule calls for policy to hold GDP below its long-run trend by a proportionate amount depending on the extent to which recent inflation has exceeded the long-run target. The key parameters of the rule are  $\Pi^*$ , the inflation rate desired in the long run, and  $\alpha$ , the adjustment coefficient. If one assumes that such a rule makes sense, then it is equally sensible to assume that voters will base their evaluations of macroeconomic policy on such a yardstick. That is, sophisticated voters will form their opinion as to the appropriate values for  $\alpha$  and  $\Pi^*$ , and then judge officials on the basis of how closely actual performance adheres to this preferred rule. Hence, an alternative to the  $EP_t$  measure above (equation 2), but one that may still be consistent with voter sophistication, is the measure  $EPA_t$ , given by:

$$\begin{aligned} EPA_t &= -c[(Q_t - QNAT_t) - \alpha(\Pi^* - \Pi_{t-1})]^2 \\ &= -cDEV_t; c > 0. \end{aligned} \quad (4)$$

The bracketed terms reflect the deviation of the actual output gap from that called for by voters' preferred policy. As before, squaring this term implies that voter support declines with deviations from that policy in either direction.

As with  $EP_t$ , voters who use  $EPA_t$  are sophisticated in that they recognize the long-run constraint that real GDP equal potential. Hence, the only true long-run issue is the optimal steady-state inflation rate,  $\Pi^*$ . As with the  $EP_t$  measure, the value of  $\Pi^*$  in  $EPA_t$  is not restricted a priori, but instead taken as one of the parameters to be revealed by the data. The  $EPA_t$  measure in equation (4) has an advantage relative to the  $EP_t$  measure in equation (2) in that it allows voters to consider adjustment costs associated with eliminating deviations of  $\Pi$  from  $\Pi^*$ . But the  $EPA_t$  measure also has a disadvantage in that it explicitly assumes an exploitable short-run trade-off

between GDP and inflation—an issue of considerable debate in recent macroeconomic theory. In the empirical work below, both of these sophisticated voter approaches will be used to examine the political feasibility of a policy of low inflation.

## II. Empirical Modeling and Evidence

### Data and Initial Findings

The measure of Presidential popularity used in this study is the percentage of respondents answering "yes" to the Gallup Poll question, "Do you approve of the way President \_\_\_\_\_ is handling his job?" This is the variable most commonly used in political support studies. Quarterly data on this variable were collected for the period 1961:I through 1992:III.

The actual and trend real GDP variables used in constructing the  $EP_t$  and the  $EPA_t$  measures are taken from Gordon (1993). The actual inflation rate component of these measures is the quarterly measure of the annualized rate of change in the GDP deflator.<sup>10</sup> Two further adjustments were made on the grounds that, in evaluating a President's economic performance, voters will likely consider not just the current quarter, but the Administration's record since coming to office. The first adjustment recognizes that observations further in the past may receive less weight in the voters' evaluative process than more recent observations. In other words, voters may attach greater value to performance in the most recent quarter than to performance from 10 quarters earlier. A second and related adjustment assumes that voters consider a record based on, say, 14 quarters to be more informative than one based on, say, two. For these

<sup>9</sup> A number of optimal rules for macroeconomic policy have been derived over time. The one used here, taken from MacRae (1977), is only one of these. It is, however, similar to many others and, in particular, is a quite close approximation to the rule derived by Fair (1978b). Among the alternative policy rules would be one that targets nominal income, as suggested by McCallum (1984).

<sup>10</sup> Inflation was measured as the percentage change in the GDP deflator rather than the somewhat more familiar Consumer Price Index (CPI) because the GDP deflator is both a broader and a less volatile inflation measure. In any case, using the CPI measure would not materially change these results. Over any significant amount of time, the two measures are nearly identical. For example, the average inflation rate from 1960 through 1992 measured by the GDP deflator is 4.89 percent, while that measured by the CPI is 4.98 percent. Over this same period, the correlation ratio between the two measures is 0.96.

reasons, the  $VAR_t$  and  $BIAS_t$  terms in  $EP_t$  and the  $DEV_t$  term in  $EPA_t$  are adjusted as follows:

$$VAR_t = 100 \cdot \sqrt{T} \cdot \left[ \sum_{k=0}^{31} \delta^k (Q_{t-k} - QNAT_{t-k})^2 \cdot D_{t,t-k} \right] / \left[ \sum_{k=0}^{31} \delta^k \cdot D_{t,t-k} \right]$$

$$BIAS_t = 100 \cdot \sqrt{T} \cdot \left[ \sum_{k=0}^{31} \delta^k (\Pi_{t-k} - \Pi_{t-k}^*)^2 \cdot D_{t,t-k} \right] / \left[ \sum_{k=0}^{31} \delta^k \cdot D_{t,t-k} \right] \quad (5)$$

$$DEV_t = 100 \cdot \sqrt{T} \cdot \left[ \sum_{k=0}^{31} \delta^k [(Q_{t-k} - QNAT_{t-k}) - \alpha(\Pi^* - \Pi_{t-k})]^2 \cdot D_{t,t-k} \right] / \left[ \sum_{k=0}^{31} \delta^k \cdot D_{t,t-k} \right]$$

Here,  $\delta$  is a decay parameter with a value presumably between 0 and 1. This parameter serves to give less weight to older observations.  $T$  is the number of quarters the current Administration has been in office and, hence, the number of observations voters have on which to judge the incumbent's economic performance. The inclusion of  $\sqrt{T}$  thus permits voters to give increasing value to their evaluations as the number of observations on which those judgments are based increases. The  $D_{t,t-k}$  term is a dummy variable equal to 1 if the current Administration was in office  $k$  quarters earlier and 0 otherwise. This term ensures that voters' evaluation of any Administration will be based only on economic outcomes occurring while that Administration is in office.

If economic variables were all that mattered for public opinion, one could simply estimate a voter support function based on  $VAR_t$  and  $BIAS_t$ , or on  $DEV_t$ , above, and leave it at that. But noneconomic factors are also important. Each President likely has a different appeal to voters based on his personality. Second, important "honeymoon" effects exist such that all Presidents appear to enjoy high popularity early in their time in office. Finally, events such as the

Vietnam War, the Watergate crisis, the Iran-Contra affair, and Operation Desert Storm affect Presidential popularity independent of economic performance.

Table 1 shows two alternative specifications of a sophisticated voter support function, each of which attempts to include these various factors relevant to political support. The first specification assumes that voters use the  $EP_t$  criterion. The second specification assumes that the voters' evaluation is based on the alternative measure,  $EPA_t$ .

---

*In evaluating a President's economic performance, voters will likely consider not just the current quarter, but the Administration's record since coming to office.*

---

As stated above,  $POP_t$  is the percentage of respondents who approve of the way the current President is handling his job. The first seven variables in each specification are dummies intended to pick up differences in the personal appeal of each of the last seven Presidents. Similarly, H1 through H6 are dummy variables meant to pick up any "honeymoon" effects in the first six quarters of an Administration. The dummies  $VIETNAM_t$ ,  $WATERGATE_t$ ,  $CONTRA_t$ , and  $STORM_t$  try to reveal the impact of important noneconomic events. The lagged popularity term,  $POP_{t-1}$ , is included to capture any dynamics in the popularity-generating process. However, including this term complicates the interpretation of the decay parameter,  $\delta$ . The variables  $e_t$  and  $u_t$  are random error terms.

$VAR_t$ ,  $BIAS_t$ , and  $DEV_t$  are the economic variables defined exactly as in equation (5).  $VAR_t$  and  $BIAS_t$  are the constituent elements of the sophisticated voter measure,  $EP_t$ .  $DEV_t$  is a direct representation of the alternative measure,  $EPA_t$ . By their definition in equation (5), each of the three variables includes the unknown decay parameter,  $\delta$ . In addition, the definition in equation (5) implies that: 1) both  $BIAS_t$  and  $DEV_t$  contain the unknown long-run inflation rate,  $\Pi^*$ ; and 2)  $DEV_t$  includes an additional unknown parameter,  $\alpha$ , from the voters' preferred policy rule. Because these parameters are not

Table 1

*Two Alternative Specifications of a "Sophisticated" Voter Model of Presidential Popularity*

Specification 1:

$$\begin{aligned} \text{POP}_t = & a_1\text{KENNEDY}_t + a_2\text{JOHNSON}_t + a_3\text{NIXON}_t + a_4\text{FORD}_t + a_5\text{CARTER}_t + a_6\text{REAGAN}_t + a_7\text{BUSH}_t \\ & + a_8\text{VIETNAM}_t + a_9\text{WATERGATE}_t + a_{10}\text{CONTRA}_t + a_{11}\text{STORM}_t + b_1\text{H1}_t + b_2\text{H2}_t + b_3\text{H3}_t + b_4\text{H4}_t \\ & + b_5\text{H5}_t + b_6\text{H6}_t + c_1\text{VAR}_t + c_2\text{BIAS}_t + d_1\text{POP}_{t-1} + e_t. \end{aligned} \quad (6)$$

Specification 2:

$$\begin{aligned} \text{POP}_t = & a_1\text{KENNEDY}_t + a_2\text{JOHNSON}_t + a_3\text{NIXON}_t + a_4\text{FORD}_t + a_5\text{CARTER}_t + a_6\text{REAGAN}_t + a_7\text{BUSH}_t \\ & + a_8\text{VIETNAM}_t + a_9\text{WATERGATE}_t + a_{10}\text{CONTRA}_t + a_{11}\text{STORM}_t + b_1\text{H1}_t + b_2\text{H2}_t + b_3\text{H3}_t + b_4\text{H4}_t \\ & + b_5\text{H5}_t + b_6\text{H6}_t + c_1\text{DEV}_t + d_1\text{POP}_{t-1} + u_t. \end{aligned} \quad (7)$$

POP <sub>t</sub>	=	percentage of respondents who approve of the way that the current President is handling his job;
KENNEDY <sub>t</sub>	=	a dummy variable equal to 1 when Kennedy is President and 0 otherwise;
JOHNSON <sub>t</sub>	=	a dummy variable equal to 1 when Johnson is President and 0 otherwise;
NIXON <sub>t</sub>	=	a dummy variable equal to 1 when Nixon is President and 0 otherwise;
FORD <sub>t</sub>	=	a dummy variable equal to 1 when Ford is President and 0 otherwise;
CARTER <sub>t</sub>	=	a dummy variable equal to 1 when Carter is President and 0 otherwise;
REAGAN <sub>t</sub>	=	a dummy variable equal to 1 when Reagan is President and 0 otherwise;
BUSH <sub>t</sub>	=	a dummy variable equal to 1 when Bush is President and 0 otherwise;
H1 <sub>t</sub>	=	a dummy variable equal to 1 in the first quarter of a new Administration, and 0 otherwise;
H2 <sub>t</sub>	=	a dummy variable equal to 1 in the second quarter of a new Administration, and 0 otherwise;
H3 <sub>t</sub>	=	a dummy variable equal to 1 in the third quarter of a new Administration, and 0 otherwise;
H4 <sub>t</sub>	=	a dummy variable equal to 1 in the fourth quarter of a new Administration, and 0 otherwise;
H5 <sub>t</sub>	=	a dummy variable equal to 1 in the fifth quarter of a new Administration, and 0 otherwise;
H6 <sub>t</sub>	=	a dummy variable equal to 1 in the sixth quarter of a new Administration, and 0 otherwise;
VIETNAM <sub>t</sub>	=	number of U.S. soldiers (thousands) killed in Vietnam in quarter t;
WATERGATE <sub>t</sub>	=	a dummy variable equal to 1 from the fourth quarter of 1973 (the time of the "Saturday Night massacre") through Nixon's resignation, and 0 otherwise;
CONTRA <sub>t</sub>	=	a dummy variable equal to 1 in the last quarter of 1986 when the Iran-Contra scandal became public and 0 otherwise;
STORM <sub>t</sub>	=	a dummy variable equal to 1 in the first quarter of 1991 at the time of Operation Desert Storm, and 0 otherwise;
VAR <sub>t</sub>	=	the variance of actual GDP about its trend during the current Administration as defined in equation (5);
BIAS <sub>t</sub>	=	the variance of actual inflation from voters' preferred long-run rate as defined in equation (5); and
DEV <sub>t</sub>	=	the variance of actual GDP around the level called for by the voters' preferred short-run policy rule as defined in equation (5).

known, neither of the two specifications in Table 1 can be estimated directly by Ordinary Least Squares (OLS). Instead, these regressions are estimated by maximum likelihood, nonlinear least squares techniques. Such a procedure provides not only an estimate of the linear coefficients in these two specifications but also estimates of these unknown parameters, including the long-term inflation goal.

Table 2 presents the results of estimating both models of political support over the period 1961:I through 1992:III. In general, these results provide strong support for modeling voters as at least some-

what sophisticated when it comes to judging economic performance. All the variables enter with the correct sign and virtually all are significant. The goodness-of-fit statistics are reasonably high and comparable to those achieved in other studies.<sup>11</sup>

<sup>11</sup> Because of the presence of a lagged dependent variable, the Durbin-Watson statistic is not, strictly speaking, an appropriate test of serial correlation in the residuals. It is shown, nevertheless, because it so clearly implies that the residuals are serially uncorrelated. A more appropriate Lagrange Multiplier test confirms what the DW statistic suggests. The regression residuals are white noise. This too heightens confidence in these specifications.

Table 2  
*Results of Estimating "Sophisticated"  
 Voter Models of Political Support, 1961:I  
 to 1992:III*

Variable	Specification 1		Specification 2	
	Coefficient	t-Statistic	Coefficient	t-Statistic
KENNEDY <sub>t</sub>	34.121	(5.86)	28.410	(7.25)
JOHNSON <sub>t</sub>	31.482	(5.54)	25.945	(5.30)
NIXON <sub>t</sub>	28.921	(5.51)	23.459	(5.04)
FORD <sub>t</sub>	36.500	(5.91)	28.058	(5.43)
CARTER <sub>t</sub>	26.765	(5.32)	19.565	(4.76)
REAGAN <sub>t</sub>	29.800	(6.10)	25.032	(5.65)
BUSH <sub>t</sub>	28.000	(5.12)	23.002	(5.02)
H1 <sub>t</sub>	15.146	(6.38)	16.167	(6.94)
H2 <sub>t</sub>	6.587	(2.73)	6.037	(2.48)
H3 <sub>t</sub>	3.422	(1.40)	3.202	(1.28)
H4 <sub>t</sub>	5.347	(2.39)	4.940	(2.19)
H5 <sub>t</sub>	4.615	(2.07)	5.686	(2.46)
H6 <sub>t</sub>	.706	(.31)	.339	(.14)
VIETNAM <sub>t</sub>	-.539	(-.65)	-.879	(-1.34)
WATERGATE <sub>t</sub>	-8.108	(-1.95)	-12.082	(-2.91)
CONTRA <sub>t</sub>	-4.266	(-.75)	-4.224	(-.74)
STORM <sub>t</sub>	11.063	(3.54)	11.014	(3.42)
VAR <sub>t</sub>	-.047	(-2.75)	...	...
BIAS <sub>t</sub>	-.073	(-2.21)	...	...
DEV <sub>t</sub>	...	...	-.034	(-2.31)
δ	.620	(1.90)	.275	(.75)
II*	3.286	(2.05)	3.000	(1.64)
α	...	...	.694	(2.37)
POP <sub>t-1</sub>	.486	(5.86)	.557	(7.25)
Adjusted R <sup>2</sup>	.79		.79	
Log-likelihood	-381.65		-383.46	
Durbin-Watson	1.95		1.98	

Presidents clearly enjoy significant popularity gains, or honeymoon effects, during the early quarters of their Administration and particularly the first quarter. These effects tend to diminish over time. By the sixth quarter, they are no longer either sizable or statistically significant.

The models indicate that political support for the President was seriously diminished by the Watergate crisis and considerably bolstered by the Desert Storm success. The impacts of the Vietnam War and the Iran-Contra scandal are less clear. Neither appears to have significantly diminished Presidential support. In part, this simply reflects the fact that the political fortunes of the two Presidents concerned were more powerfully influenced by other events, such as Watergate. Moreover, it is necessary to remember that the lagged popularity coefficient implies important dynamics in the political support process. That is, the

coefficient on each event variable measures only the immediate, short-term effect. The long-run effects are typically more substantial.<sup>12</sup>

The second apparent anomaly shown in Table 2 is the small estimated value of the decay parameter,  $\delta$ , especially in Specification 2. Previous researchers, including Chappell and Keech (1985) and Garman and Richards (1989), estimated  $\delta$  values on the order of 0.8. The estimates here range from 0.27 to 0.62. The lower estimate of  $\delta$  is to be expected given that, unlike the prior studies cited, the two models here include a lagged popularity term. In both regressions, the large and significant coefficient on  $POP_{t-1}$  implies that the political impact of economic performance continues to persist for several quarters despite the low estimates of  $\delta$ . Indeed, accounting for the combined persistence effects of both  $\delta$  and the coefficient on  $POP_{t-1}$  implies that, in either specification, it is over two years before the influence of economic events is eliminated.

#### *The Importance of Economic Variables*

The economic variables are, of course, of particular interest. The coefficients on  $VAR_t$  and  $BIAS_t$  in Specification 1, and on  $DEV_t$  in Specification 2, have the predicted signs and are statistically significant. Administrations that fail to keep output near potential and inflation close to the voters' preferred long-run target, or fail to follow the voters' preferred policy rule, suffer significant loss in political support.

To obtain evidence on just how politically important the failure to achieve the economic results deemed optimal by voters has been, each specification was dynamically simulated under two alternative scenarios. In the first of these, each Administration was assumed to have achieved a perfect record with respect to voters' preferred outcomes; in other words, each maintained output at potential and inflation at the desired long-run target. In the second simulation, the model was used to generate a popularity series based on setting the economic variables at their actual values. The difference between the two simulations measures the loss in voter support due to economic misperformance.

For Specification 1, the average loss in political

<sup>12</sup> When the dynamic effects are fully counted, the results obtained here for the impact of the VIETNAM variable are similar to those found by Beck (1991). Incidentally, a dummy variable for the Iranian hostage crisis was originally included but later dropped because it received the wrong sign and was not statistically significant.

Table 3  
*Estimated Loss in Voter Support of  
 Incumbent Administration because of  
 Economic Performance at Time of Election*  
 Percent

Year, Quarter	Specification 1	Specification 2
1964:IV	2.28	1.35
1968:IV	13.62	5.16
1972:IV	3.05	.26
1976:IV	15.76	12.84
1980:IV	25.02	15.99
1984:IV	5.80	4.38
1988:IV	2.02	.29
1992:III	2.08	1.27

support implied by the foregoing simulations is 6.1 percent. For Specification 2, it is 4.5 percent. That is, Administrations have on average lost on the order of 4.5 to 6.1 percentage points in political support as a result of economic misperformance. These loss estimates are sufficiently large to alter the outcome of virtually all of the last nine elections. Indeed, estimates of the Election Day impact of economic misperformance are often much larger than these mean values. Table 3 presents the results of the simulations with respect to the loss in voter support at the time of each election since 1964. A poor economic performance, as judged by voters, contributed substantially to the defeat of the incumbent party in 1968, in 1976, and again in 1980. The results also suggest that an absence of major errors in economic policy was a major reason for the re-election of the incumbent President in 1964 and 1972, and for the Republican Party's succession in 1988.<sup>13</sup>

### *The 1992 Election*

The results shown in Table 3 suggest that the 1992 election was anomalous. Those results reveal that the incumbent entered the 1992 election with very nearly the best record of any President since 1960, in terms of achieving the economic outcomes preferred by voters. Hence, his defeat raises the possibility that the voter preferences estimated here are not stable. The alternative is that the election outcome was an outlier, the result of special events.

The stability of the estimates shown in Table 2 was checked using two statistical tests. In the first,

the sample was split at its midpoint, 1976:III, and the popularity regression was estimated separately over each half of the data. These results were then used to perform a likelihood ratio test to determine whether constraining the coefficients to be constant over the entire sample was justified. The chi-square statistics for this test were 0.97 and 0.98 for Specifications 1 and 2, respectively. Neither is at all close to being statistically significant. Thus, on the basis of this test, the hypothesis that the regression parameters are constant throughout the sample cannot be rejected.

A second test of parameter stability was also conducted. This time the focus was exclusively on the long-run inflation target rather than on the stability of all parameters simultaneously. It is sometimes argued that the OPEC price shocks of the 1970s generated institutional changes that made it easier to live with inflation, such as bank deregulation, widespread use of cost-of-living adjustment clauses, and tax indexation. In turn, this may have led the public to raise its estimate of the acceptable long-run inflation target. To test this, Specifications 1 and 2 were reestimated after including a dummy variable to test for a switch in  $\Pi^*$  after 1976:III. The estimated effect is of the proper sign. It suggests that  $\Pi^*$  rose from 2.81 percent to 3.51 percent (Specification 1), or from 2.91 percent to 3.01 percent (Specification 2), between the first and second halves of the sample. But these results are far from statistically significant. The t-statistics for the estimates range from 0.04 (Specification 2) to 0.55 (Specification 1).

Dynamic simulation of either specification does overpredict the popular support for the Administration in 1992 by as much as 12 percentage points. But forecast errors of similar magnitude occasionally occur in the dynamic simulations for earlier Administrations. Of course, the stability tests discussed above cannot rule out the possibility that the more recent prediction errors reflect a change in voters' preferred policy settings that occurred in 1992. But in light of the strong evidence that voter preferences have been stable for 33 sample years, it seems more prudent to interpret the 1992 election as the result of economic and social factors not captured by the models used here.

<sup>13</sup> As noted earlier, election vote and popularity poll results are not identical. This is particularly the case for candidacies in which an incumbent Vice-President attempts to succeed his President since, strictly speaking, popularity polls only refer to an incumbent President. The election analysis here assumes that incumbent Vice-Presidents are, as Presidential candidates, held accountable for the macroeconomic policy that prevailed during their stay in office.

### *The Political Feasibility of Anti-Inflation Policy*

Assuming that the regression estimates shown in Table 2 are stable, what do those estimates imply about the political will to pursue a policy of low inflation? The Table 2 estimates of the long-run inflation rate preferred by voters are 3.3 percent in Specification 1 and 3.0 percent in Specification 2. The first of these estimates is significantly different from zero. The second estimate does not quite achieve standard levels of significance, but it comes close. Overall, these findings suggest that the American electorate, at least in the past 30 years, has regarded roughly 3 percent as the optimal long-run rate of inflation. In fact, the insignificant difference of the second estimate from zero suggests that an even lower target may have been desired.

A further question is, how much pain is the public prepared to bear in order to achieve its long-run inflation target? Given the differences in the two specifications, this question must be answered separately for each. For Specification 1, some measure of the public's commitment to its inflation target is provided by the relative coefficients on  $VAR_t$  and  $BIAS_t$ . The latter is more than one and one-half times as large as the former, indicating that voters place considerably more weight on hitting the inflation goal than on achieving output stability. An indication of the actual magnitude of this trade-off is provided by the following calculation. For the sample period considered here, the variance of inflation around the desired rate of 3.29 percent is 11.76, the major part of which is made up of rates well above the target. Suppose a policy that could eliminate this suboptimal inflation were available, but it could do so only by increasing the output variance. What rise in the instability of output would leave the public evaluation of economic performance unchanged while eliminating the inflation variance? Given the estimated coefficients, the answer is that the public would have tolerated a rise in VAR of 18.23 percentage points, to a value of 27.51. That is, voters would have accepted a rise in the standard deviation of output from 3.13 to 5.24 percentage points, if it eliminated the typically excessive inflation of the past 30 years.

The foregoing result implies that voters would have supported a policy of maintaining inflation at roughly 3.0 percent constantly, even if such a policy precluded any and all attempts to stabilize output. This implication derives from the available evidence on the historic impact of stabilization policy. Using various detrending techniques and alternative data

series, Backus and Kehoe (1992) found that, abstracting from the interwar years, the standard deviation of real GDP in the United States was anywhere from 1.29 to 1.9 times larger before World War I than it has been in the post-World War II years. Thus, if active stabilization policy is considered a phenomenon only of the postwar era, a good guess would be that without such a policy, the standard deviation of real GDP would have been 1.6 (the midpoint of the Backus-Kehoe estimates) times as great as in the sample used here. Similarly, the evidence reported by Modigliani (1977) suggests that the standard deviation of real GDP would have been 1.5 times its actual value absent active stabilization policy. Together, these estimates suggest that abandoning attempts to stabilize output would have raised the standard deviation of real GDP in the sample used here from 3.13 percent to 4.7 or possibly 5.0 percent. Either estimate is less than the 5.24 percent that the Specification 1 results show the electorate would have tolerated in order to achieve a constant 3.3 percent rate of inflation.

Specification 2 also gives a measure of the public's willingness to sacrifice in order to achieve its long-run inflation target of 3 percent. The estimate of the adjustment parameter,  $\alpha$ , in voters' preferred short-run policy rule is 0.69. That is, the combined results for this alternative model imply that voters considered the following reaction function to be the appropriate guide for short-run macro policy:

$$Q_t - QNAT_t = -.69(\Pi_{t-1} - 3.0). \quad (6)$$

Hence, voters regarded the optimal policy to be one that holds output seven-tenths of a percentage point below potential for every 1 percentage point by which inflation exceeds 3 percent.

To obtain some insight as to what these numbers might actually mean, the public's preferred disinflation path has been calculated starting from an inflation rate of 10.76 percent, the rate in the last quarter of 1980, assuming a natural rate of unemployment of 6.0 percent, an Okun's Law coefficient relating GDP movements to unemployment rates of 2.25, and Friedman's (1984) most optimistic view that each permanent reduction of 1 percentage point in inflation requires a rise in unemployment of 2 percentage points above the natural rate. Table 4 shows the output, unemployment, and inflation outcomes for the first eight years of this path.

As Table 4 shows, voters would have been prepared to tolerate a fairly prolonged slowdown in

Table 4  
*First Eight Years of Public's Preferred  
 Disinflation Path, Starting from 10.76  
 Percent Inflation*

Year	Percent Output Gap	Unemployment Rate	Inflation Rate
1	5.06	8.25	10.01
2	4.33	7.92	9.02
3	3.71	7.65	8.15
4	3.17	7.41	7.40
5	2.71	7.20	6.77
6	2.32	7.03	6.22
7	1.98	6.88	5.75
8	1.69	6.75	5.35

economic activity in order to bring inflation down from the high rates of the late 1970s. Based on the assumptions used here, the voters' preferred policy rule would not have entirely eliminated the excessive inflation with which the 1980s began, even after eight years. To do so would have required an even longer slowdown, over which the cumulative loss of GDP would have been 35 percent. In actuality, the cumulative GDP loss from 1981 to 1992—the point at which it appears the long-run preferred inflation rate was achieved—was only 21 percent. Thus, the results for Specification 2 suggest that voters would have regarded the actual cost of the 1980s disinflation, substantial though it was, to have been a bargain.

#### *Evidence of a Pro-Inflation Policy Bias*

An important question raised by the theoretical macroeconomic literature of the past 10 years concerns the existence of a policy bias in favor of an inflation rate greater than the public actually desires.<sup>14</sup> The above estimates of voter preferences may be used to provide some evidence on this point, as well.

A rough-and-ready test of the inflation bias hypothesis is a comparison of the actual average rate of inflation over the sample period with the long-run desired rate estimated here. Temporary shocks will, of course, make it impossible for policymakers to hit their own inflation target in each and every quarter. But over a period as long as the 127 quarters sampled here, such shocks can be expected to cancel out, and the average inflation rate achieved will predominantly reflect policy goals.

The evidence from such a test is mixed. The average inflation rate from 1961:I through 1992:III is 4.96 percent. This is higher than either model's estimate of the public's preferred rate, 3.29 and 3.00 percent, respectively, offering some support for the pro-inflation hypothesis. But the standard deviations on these estimates are sufficiently large that the differences are not statistically significant. Hence, this test is inconclusive.

Stronger evidence that an inflationary bias has characterized macro policy is provided by a number of alternative test statistics. For example, actual inflation has exceeded the Specification 1 estimate of the preferred inflation rate in 80 of the 127 sample quarters. It has exceeded the Specification 2 estimate 92 times. When the magnitude and frequency of these deviations are compared using a Mann-Whitney rank sum test, the results are significant at beyond the 1 percent level.

A further examination of the Specification 2 results also provides evidence of an inflationary policy bias. Recall that the public's preferred policy rule estimated for that specification is:  $Q_t - QNAT_t = -.69(\Pi_t - 3.0)$ . In this connection, a natural question is what the actual, historic relationship between the GDP gap and lagged inflation has been, and how this compares with the preferred relationship estimated above.

A regression of the quarterly GDP gap on the lagged inflation rate for the sample period produced the following results (t-statistics in parentheses):

$$Q_t - QNAT_t = .613 - .2\Pi_{t-1} \quad (7)$$

(1.07)    (-1.97)

This may be rearranged to yield:

$$Q_t - QNAT_t = -.2(\Pi_{t-1} - 3.06). \quad (8)$$

Equation (7) or its equivalent (8) may be taken to represent the systematic relationship of output and lagged inflation over the sample years. Again, it must be recognized that policymakers cannot accurately achieve their goals all of the time. However, their policy errors will be both positive and negative. Over a long period of time, such errors will cancel out. Hence, it is reasonable to expect the systematic relationship between the GDP gap and lagged inflation estimated over a substantial time period to reflect

<sup>14</sup> See, for example, Barro and Gordon (1983) and Canzoneri (1985).

primarily the influence of policy. That is, equation (8) may be viewed as the actual policy rule, to be compared with the voters' preferred rule as shown in equation (6).

Such a comparison reveals that the long-run inflation target of policymakers has been quite close to the 3.0 percent target desired by the electorate. Officials and voters differ, however, in terms of the short-run output sacrifice to be made to combat excessive inflation. While voters are willing to sacrifice 0.7 percentage points of output for every percentage point of excessive inflation, actual policy appears to have called for only a 0.2 percentage point output loss. The F-statistic from comparing these two rules is quite high, 8.97. Its value implies that one can decisively reject the hypothesis that the public's preferred rule and the policymakers' actual rule are the same, at the 1 percent significance level. In short, the evidence from Specification 2 strongly suggests that in the past policy has responded to inflation with a smaller reduction in aggregate demand than voters wished. As a result, inflation has persistently been greater than the electorate desired. The extent of this excess can be estimated, again relying on the assumptions used to generate Table 4. Such a calculation reveals that, typically, the short-run inflation target has been about 0.6 percentage points higher than the public wanted. One may regard this as a lower estimate, while the upper estimate would be the 1.9 percentage point difference found earlier between actual average inflation over the sample and the 3.0 percent target that voters have preferred over the past 30 years.

### III. Summary and Conclusions

Economic theory typically assumes rational and knowledgeable agents. In the context of examining voter preferences, this assumption should imply voters who understand some basic macroeconomic relationships. This is not to say that voters need be as fully informed about both the economy and policy as some rational expectations models assume. But they will understand that output must, in the long run, equal potential, so that any deviation from trend GDP is not sustainable. Reasonably sophisticated voters will also understand that the optimal long-run inflation rate may not be zero.

This study has assumed that the electorate is sophisticated in the foregoing sense. Consequently, if the electorate regards the Administration as ulti-

mately responsible for macroeconomic policy, then measures of voter approval of the President should be related to how closely the Administration achieves the inflation and output targets that voters consider

---

*The findings of this study suggest that strong anti-inflation policies are politically quite feasible.*

---

optimal. Two alternative models of such sophisticated voters have been estimated. Both sets of results fit the data well. They also reveal much regarding the American electorate's attitude toward inflation and cyclical stability.

The findings suggest that strong anti-inflation policies are politically quite feasible. The results for either model indicate that, at least in the past, voters have considered about 3 percent to be the optimal long-run inflation rate. The results also indicate a considerable willingness to tolerate output instability and temporary recession in order to achieve this target. Such evidence in support of the political feasibility of a strong anti-inflation policy also suggests that the announcement of such a policy is credible. This credibility is important. The costs of any disinflation are likely to be smaller, the more agents believe that such a policy will truly be enacted.

The results also suggest that the 1992 election results should not necessarily be attributed to voter dissatisfaction with the Administration's record on inflation and GDP growth. Judged by the standards that voters are typically found to use, the incumbent Administration's performance regarding these targets was good. Since substantial evidence that voter preferences have been stable was also presented, it seems that the 1992 election probably turned on other economic and social issues.

The findings also tend to support the hypothesis that macroeconomic policy has been characterized by a pro-inflation bias. Actual inflation has exceeded the voters' long-run target in anywhere from two-thirds to three-fourths of the 127 sample quarters. On a systematic basis, this difference is between 0.6 and 1.9 percentage points. Why Administrations do not maximize voter support by eliminating this bias is an item of future research.

## References

- Backus, David and Patrick Kehoe. 1992. "International Evidence on the Historical Properties of Business Cycles." *American Economic Review*, vol. 82, no. 3, pp. 864-88.
- Barro, Robert and David Gordon. 1983. "Rules, Discretion, and Reputation in a Positive Model of Monetary Policy." *Journal of Monetary Economics*, vol. 12, no. 2, pp. 101-21.
- Beck, Nathaniel. 1991. "The Economy and Presidential Approval: An Information Theoretic Approach." In H. Norpoth, M. Lewis-Beck, and J. Lafay, editors, *Economics and Politics: The Calculus of Support*, pp. 85-101. Ann Arbor: University of Michigan Press.
- Canzoneri, Matthew. 1985. "Monetary Policy Games and the Role of Private Information." *American Economic Review*, vol. 75, no. 4, pp. 1056-70.
- Chappell, Henry W., Jr. 1983. "Presidential Popularity and Macroeconomic Performance: Are Voters Really So Naive?" *Review of Economics and Statistics*, vol. 65, no. 3, pp. 385-92.
- . 1990. "Economic Performance, Voting, and Political Support." *Review of Economics and Statistics*, vol. 72, no. 2, pp. 313-20.
- Chappell, Henry and William Keech. 1985. "A New View of Political Accountability for Economic Performance." *American Political Science Review*, vol. 79, no. 2, pp. 10-27.
- . 1991. "Explaining Aggregate Evaluation of Economic Performance." In H. Norpoth, M. Lewis-Beck, and J. Lafay, editors, *Economics and Politics: The Calculus of Support*, pp. 207-220. Ann Arbor: University of Michigan Press.
- Fair, Ray C. 1978a. "The Effects of Economic Events on Votes for President." *Review of Economics and Statistics*, vol. 69, no. 2, pp. 159-73.
- . 1978b. "The Use of Optimal Control Techniques to Evaluate Economic Performance." *International Economic Review*, vol. 19, no. 2, pp. 289-309.
- Friedman, Benjamin. 1984. "Lessons from the 1979-82 Monetary Policy Experiment." *American Economic Review, Papers and Proceedings*, vol. 74, pp. 382-87.
- Friedman, Milton. 1969. *The Optimum Quantity of Money and Other Essays*. Chicago: Aldine Press.
- Garman, David and Daniel J. Richards. 1989. "Policy Rules, Inflationary Bias, and Cyclical Stability." *Journal of Money, Credit and Banking*, vol. 21, no. 4, pp. 409-21.
- Gordon, Robert. 1993. *Macroeconomics*. Sixth Edition. New York: HarperCollins Publishers.
- Havrilesky, Thomas. 1988. "Monetary Policy Signaling from the Administration to the Federal Reserve." *Journal of Money, Credit and Banking*, vol. 20, no. 1, pp. 83-101.
- Hibbs, Douglas. 1979. "The Mass Public and Macroeconomic Performance: Dynamics of Public Opinion Toward Unemployment and Inflation." *American Journal of Political Science*, vol. 26, no. 4, pp. 705-31.
- Kane, Edward J. 1980. "Politics and Fed Policy-Making: The More Things Change, The More They Remain The Same." *Journal of Monetary Economics*, vol. 6, no. 2, pp. 199-211.
- MacRae, C. Duncan. 1977. "A Political Model of the Business Cycle." *Journal of Political Economy*, vol. 85, no. 2, pp. 239-63.
- McCallum, Bennet. 1984. "Monetarist Rules in the Light of Recent Experience." *American Economic Review, Papers and Proceedings*, vol. 74, pp. 388-91.
- Modigliani, Franco. 1977. "The Monetarist Controversy, Or Should We Forsake Stabilization Policies." *American Economic Review*, vol. 67, no. 1, pp. 1-19.
- Phelps, Edward S. 1973. "Inflation in the Theory of Finance." *Swedish Journal of Economics*, vol. 75, no. 1, pp. 67-82.
- Richards, Daniel J. 1988. "Some Evidence on the Inflationary Bias of Macroeconomic Policy." *Journal of Macroeconomics*, vol. 10, no. 2, pp. 435-47.
- Schiller, Bradley. 1992. "The Forecasts That Favor Bush." *The Wall Street Journal*, October 19, p. A14.
- Wooley, John T. 1984. *Monetary Politics: The Federal Reserve and the Politics of Monetary Policy*. Cambridge: Cambridge University Press.

# *Defaults, Denials, and Discrimination in Mortgage Lending*

**T**he results of the study of discrimination in mortgage lending by Munnell, Browne, McEneaney, and Tootell (1992) have been questioned by some in both the popular press and academia. Both non-economists (Brimelow and Spencer 1993), and economists (Becker 1993), have registered similar complaints about the study's methodology. These authors assert that a cursory examination of default rates for minorities and whites would explain the disparate treatment minorities received in obtaining mortgage loans. Specifically, they claim Munnell, Browne, McEneaney, and Tootell (MBMT) failed to control adequately for the expected profitability of each loan. This article will demonstrate that their criticisms are invalid: not only are studies of denials a valid approach to testing for discrimination but, in fact, examinations of defaults cannot, in general, reveal much about the issue.

All empirical examinations of loan denials attempt to model the mortgage lending decision. Whether an application is accepted or denied depends on its expected profitability. Thus, tests for discrimination in studies of denials compare the treatment of equally profitable minority and white applications. Only when rejected minority applications have the same expected profitability as accepted white applications is there clear evidence of discrimination.<sup>1</sup>

Empirically measuring expected profitability can be extremely complicated, however. If the researcher fails to model this expected profitability correctly, and a variable important in the calculation of creditworthiness and correlated with race is omitted from the statistical analysis, then a false-positive finding of discrimination can occur. For example, if minorities tend to have higher loan-to-value ratios than whites, and this variable is not included in the estimation of the probability of being denied a loan, then the effect of higher loan-to-value ratios will be incorrectly ascribed to race; the coefficient on race in this estimation will be overstated. Since it is difficult to collect all the variables relevant to the lending decision, these critics argue that any

*Geoffrey M.B. Tootell*

*Economist, Federal Reserve Bank of Boston. The author thanks Fed colleagues Lynn Browne, Eric Rosengren, and Joe Peek for helpful comments.*

study examining denials is suspect because of possible omitted variable bias. In fact, some observers view a finding of a significant coefficient for race in these studies as proof that an important variable has been omitted, rather than as evidence for discrimination.

---

*Not only are studies of denials a valid approach to testing for discrimination but, in fact, examinations of defaults cannot, in general, reveal much about the issue.*

---

The above-mentioned authors have recently proffered studying default rates as a way to avoid the problems with omitted variable bias. The inability to include every relevant variable in a study of mortgage lending, the argument goes, compels researchers to sidestep an exploration of the determinants of mortgage lending decisions and instead examine the direct effects of discrimination: are the by-products of discrimination visible in the data? If minorities are being treated unfairly, then lenders are not profit-maximizing; less profitable loans to white borrowers are being selected over more profitable applications from minorities. As a result, the argument goes, applications from whites with higher default probabilities are being accepted over minority applications with less chance of a default; thus, minority default rates will be lower than white rates.

This argument implicitly assumes that default studies do not suffer from the same problem with omitted variables as studies of denials. The assumption is that any variables missed by the researcher but utilized by the profit-maximizing lender will ensure that profitability is the same for the two groups when no discrimination is occurring. If, on the other hand, minorities are being discriminated against, then their loans will be more profitable since their default rate will be lower; lower default rates would then constitute evidence to support the conclusion of discrimination.<sup>2</sup>

Several additional assumptions must hold for this line of reasoning to be valid. First, the above argument assumes that discrimination in the mort-

gage market takes the form of forcing minority applicants to jump higher hurdles; minorities are, for example, forced to produce a larger down payment or lower obligation ratio than similarly situated whites. Discrimination can, however, take other forms. If, for example, redlining of minority neighborhoods were occurring, and minority and white profitability were identical, more profitable minority loans in minority areas would be turned down in favor of less profitable white and minority loans in white areas. The default rates of the accepted white and minority applicants would be identical, but minorities with profitable loans in minority areas would still be discriminated against. An examination of denials would uncover this discrimination, where an analysis of defaults would not.<sup>3</sup>

Yet the argument for examining defaults makes a much more restrictive assumption than the exact form discrimination takes; it also assumes that the distributions of accepted applicants' creditworthiness, or profitability, are identical for minorities and whites. If these two distributions are not the same, then comparing average white and minority default rates reveals nothing about the existence of discrimination. Just as comparisons of the average wage from two different groups reveal nothing about discrimination in the labor market because the education, job training, and other forms of human capital of each group are unknown, the different distributions of creditworthiness among minorities and whites would make it impossible to say anything about discrimination by examining average default rates.

As a result, any analysis of defaults must account for all the variables that affect the profitability of the loan. Default studies suffer from the same omitted variable problems as examinations of denials. If, for example, the rates of default differ between minori-

---

<sup>1</sup> Note that legal discrimination may be different from economic discrimination. The law can state that certain data, like race, cannot be used in the lending decision whether it is independently correlated with profitability or not.

<sup>2</sup> Other elements of the loan are important to the expected profitability of the loan besides the probability of default. The probability that the loan will be paid back early and the costs of a default may vary between loans and affect the expected profitability of the loan.

<sup>3</sup> A study of denials would show that minorities were being treated differently from whites. If the racial composition of the neighborhood where the property is located is included in the examination of denials, evidence would be found for redlining. Looking only at default data would show no evidence for discrimination unless tract variables were included in the analysis, but in that case one is no longer examining average default rates.

ties and whites but the loan-to-value ratio of each applicant is not accounted for in the analysis, the different default rates may simply be due to the fact that minorities tend to have higher, though acceptable, loan-to-value ratios than whites.

The problem with examining average default rates is fairly well known in the literature. What is more problematic to default analysis, however, is the fact that holding the creditworthiness of each defaulted application constant is not sufficient to perform a test for discrimination. This article will show that even when all relevant variables are included in the analysis, the examination of defaults reveals very little about whether discrimination is occurring. Since studies of defaults leave out the observations that are most important to the examination of discrimination, denied applications, they cannot compare the profitability of rejected minority applications to accepted white applications. Only by including these observations, as is done in studies of denials, can definitive evidence about discrimination be found.

The next section provides a model for lender behavior that allows empirical tests for discrimination. The following section discusses the difficulties with discerning discrimination using an analysis of defaults. The third section presents some empirical evidence relevant to the issue, and a conclusion follows.

## I. The Model

Lenders maximize profits by choosing whether to lend capital equal to the desired mortgage or invest that capital at the going market interest rate,  $r_s$ . Assume that the interest rate lenders charge each borrower is the same; the lender faces a take-it-or-leave-it offer from the borrower at the market mortgage rate. This assumption is innocuous; lenders are unlikely to alter the interest rate between applicants of varying default probabilities since they fear that charging different borrowers different rates could be construed as evidence of discrimination.<sup>4</sup>

Lenders make the mortgages that maximize profits,

$$\text{Max}_M M(1 - P_d)r_M + MP_d(\alpha - 1) - Mr_s, \quad (1)$$

where  $M$  is the mortgage amount,  $P_d$  is the probability that the loan will default,  $r_M$  is the market interest rate for mortgages, and  $\alpha - 1$  is the percentage of the mortgage that is lost if the borrower defaults.<sup>5</sup> Note

that the probability of default depends on the applicant's credit and employment histories, the expense-to-income ratio, the loan-to-value ratio, and a host of other variables assumed to be exogenous to the lender in this simplified model.

The expected return to the lender equals a weighted average of the mortgage rate and the losses from a default. If the lender is risk neutral, profit maximization ensures that the lender makes the loan if

$$r_M(1 - P_d) + P_d(\alpha - 1) > r_s, \quad (2)$$

the expected return from the loan is greater than the return from the safe asset. The probability of default is a vital determinant of the mortgage's expected return, and since the mortgage rate for each borrower is identical, the probability of default for each applicant determines the relative profitability of each loan.<sup>6</sup> A rearrangement of equation (2) illustrates that profit maximization compels the lender to grant every loan where the probability of default is below some threshold level,

$$P_d < P_d^T = \frac{r_M - r_s}{r_M + (1 - \alpha)}. \quad (3)$$

As a result, to examine the expected profitability of each loan, it is sufficient to model the expected probability of default; by doing so, lenders maximize risk-adjusted expected profits by granting all mortgages whose expected rate of return is greater than the return on a safe asset.

The profit-maximizing rule that results from this simple model is very close to reality. Theoretically,

<sup>4</sup> In fact, King (1980) found no evidence that interest rates varied between racial groups. As will be shown later, this finding suggests that interest rates do not vary over applications with different default probabilities. Lenders can alter the "price" of the loan in other ways, however; decreasing the loan-to-value ratio of a loan is one common way the price of the loan is altered.

<sup>5</sup>  $\alpha$  is the percent of the mortgage that is recovered.  $\alpha - 1$  includes the costs to the lender of recovering the property. Actually the profit maximization decision is much more complicated than that represented in equation (1). In reality it is a multi-period decision that depends, for example, on expectations of future rates, probabilities of early buy-backs, and any fixed costs. The model above is selected because it is most advantageous to the use of information on loan defaults. The strongest possible case for defaults is modeled in order to examine its usefulness at its best.

<sup>6</sup> The other variables that affect profitability, like the probability of an early buy-back, can be captured in the empirical model by including the variables that determine an early buy-back. This paradigm abstracts from these additional determinants in order to place default studies in their best light.

the interest rate charged on each loan could differ but, as mentioned before, there is little evidence that interest rates vary between applicants, and particularly over race. Furthermore, any individual pricing can be accomplished by altering the loan-to-value or income ratios and thus changing the probability of default. As a result, the probability of default is sufficient to capture the profitability of the loan.

This model is designed to make default analysis as relevant as possible for detecting discrimination. If other variables besides the default probability were relevant to the profitability of the loan, and default probabilities were not sufficient statistics for loan profitability, then researchers could not look at default rates alone.

## II. Defaults versus Denials

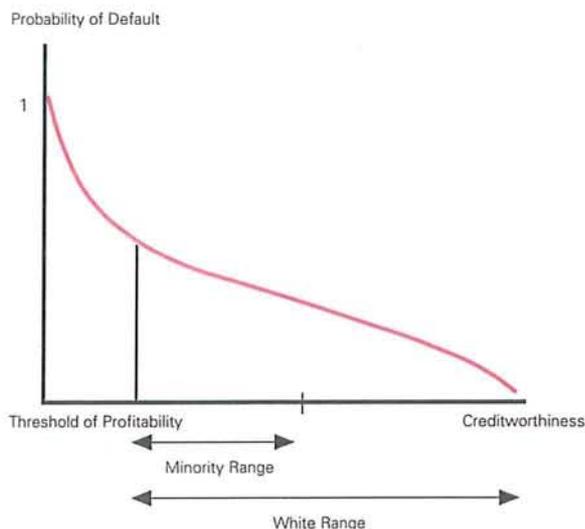
Since the expected profitability of each loan depends on its default probability, empirical comparisons of default probabilities might be valid. Examining average default rates, however, reveals nothing about the existence of discrimination. Even if no discrimination exists, and the threshold level of creditworthiness is the same for both minorities and whites, the average default rates for the two groups will be identical if, and only if, the two groups also have identical distributions of accepted applications over the expected creditworthiness spectrum. Furthermore, knowing the expected default probability of each accepted loan is only a necessary, not sufficient, condition to test for discrimination.<sup>7</sup> The next two subsections illustrate the last two statements in detail.

### *Case Where Distribution of Creditworthiness Not Considered*

Contrary to the recent criticism in the popular press of the methodology used in MBMT (1992), if the two specified groups of borrowers do not have the same distributions of creditworthiness, then average default rates reveal nothing about the existence of discrimination. Figure 1 illustrates this point. In Figure 1, accepted minority loans are assumed to cluster toward the threshold of the acceptable range of creditworthiness, while applications by whites are more evenly distributed over the acceptable spectrum. A loan is granted to every applicant, minority or white, whose level of creditworthiness or expected probability of default is to the right of the threshold

Figure 1

### *A Case Where Minority Applicants Cluster toward Threshold of Profitability*



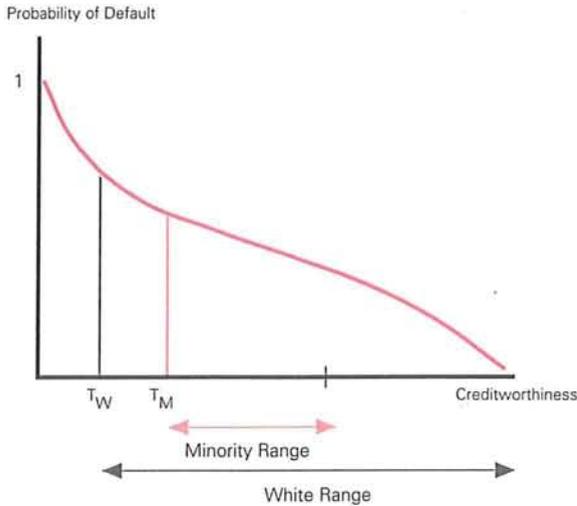
level of default probability. Even though each group is treated similarly, the average minority default rate will be higher than the average rate for whites.

Whites, however, are not being discriminated against, since their threshold for acceptance is the same as that for minorities. Because the economic fundamentals of minority acceptances such as their loan-to-value ratios, obligation ratios, and the like tend to skew toward the threshold relative to those of whites, the average default rate for minorities will be higher than the average rate for whites. As a result, average default rates say nothing about discrimination. Any examination of defaults must control for the different creditworthiness of each applicant in order to examine the importance of race as a factor in determining defaults.

<sup>7</sup> It is important to point out that studies of loan denials examine ex ante default probabilities, which lenders actually use, not the ex post or actual default rates examined in work on defaults. To argue that ex post defaults equal ex ante probabilities requires a very long time series on ex post defaults. This paper, however, does not concern itself with that specific problem in default analysis. Instead, it considers the difficulties with examining ex post default rates even if they are accurate instruments for ex ante default probabilities.

Figure 2

*A Case of Discrimination*

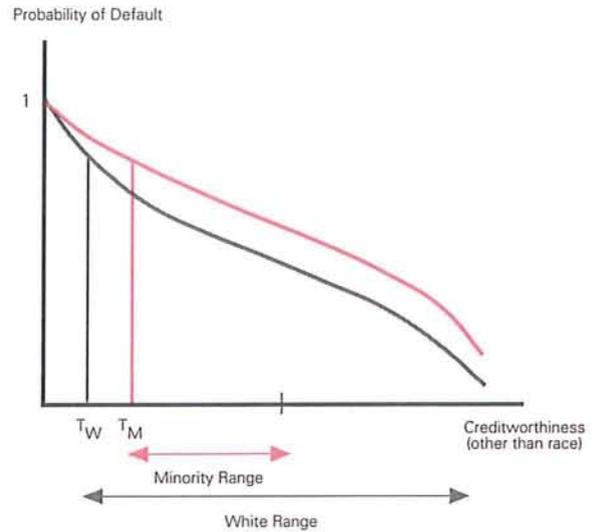


*Case Where Variables Relating to Creditworthiness Are Included*

But would a default study, even one controlling for creditworthiness, provide evidence consistent with discrimination if discrimination were taking place? Figure 2 depicts a case where minority applications must be more creditworthy at the margin to get a loan. A default study holding creditworthiness constant, so as to avoid problems with different distributions between the two groups, still will not be able to discern discrimination. The default experience of whites and minorities over the range of minority acceptances will be identical when all other creditworthiness variables are held constant. Over the areas where only whites have acceptances, from  $T_W$  to  $T_M$ , no data will exist on minority loans to reveal that minority applications with lower probabilities of default, just to the left of  $T_M$ , were being rejected in favor of less profitable white applications, just to the right of  $T_W$ . A default study would show no racial effect, no differences in default rates holding creditworthiness constant, when discrimination was, in fact, taking place. Further, the average default rate of minorities in this case could be higher or lower than that for whites depending on the different distributions of creditworthiness of the two groups. Since no

Figure 3

*A Case with Omitted Variable Correlated with Race*



minority denials are included in the default data, the sample cannot reveal where discrimination is actually occurring, from  $T_W$  to  $T_M$ .

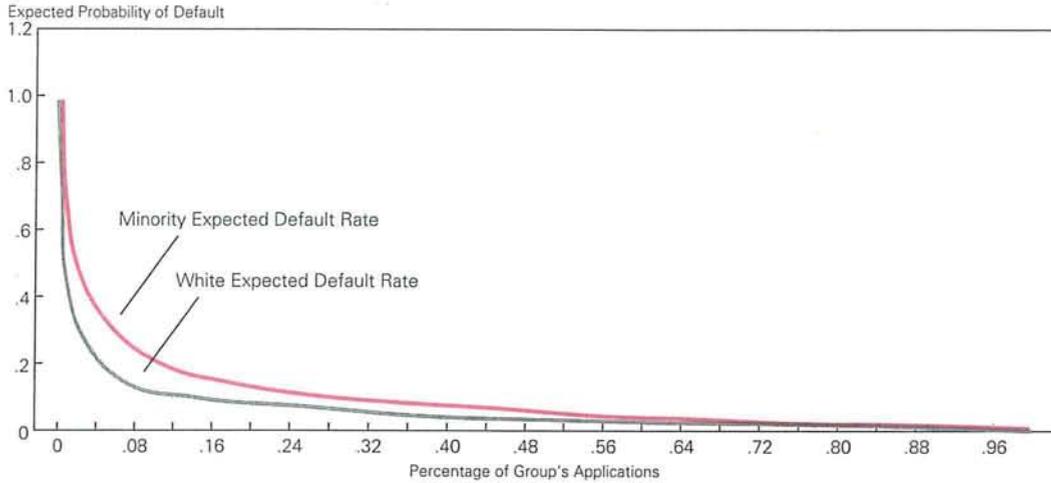
*Case Where a Relevant Variable Is Omitted*

What if minorities, for some reason not related to the measure of creditworthiness, tend to default more frequently than whites? Here it is assumed that an omitted variable exists, one that is correlated with race and increases the probability of minority defaults. As a result, the probability of default is higher for minorities than for whites, even given the measure of creditworthiness. This case is illustrated in Figure 3. Again, the lender maximizes profit by selecting the threshold for the marginal, not the average, loan. The higher minority default distribution will produce a positive coefficient on race in an equation of defaults on race and all the other creditworthy variables, yet, again, discrimination against whites is not occurring.

In fact, discrimination against minorities takes place even with a positive race coefficient, if the threshold for minorities is to the right of the actual  $T_M$  shown in Figure 3. At  $T_M$ , the marginal probability of

Figure 4

### Minority and White Probabilities of Default



Source: Data on creditworthiness of mortgage applications from Munnell, Browne, McEneaney and Tootell (1992).

default would be the same for both groups, and no discrimination would be occurring. However, if the actual minority threshold is to the right of  $T_M$ , the marginal white loan has a higher probability of default than the marginal minority loan. Even with a minority threshold to the right of  $T_M$  so that discrimination is occurring, the coefficient on race in a regression of defaults on creditworthiness would be positive, and at a given level of measured creditworthiness minority default probabilities would be higher. Since minority observations on defaults occur only to the right of this threshold, the data will not reveal that at the margin whites with higher default rates are getting accepted.

Finally, assume that Figure 3 shows the perceived, but incorrect, default probabilities of the lender. The number of loans granted will be the same as in Figure 3. This time, for the same measure of creditworthiness, the default probabilities will be equal, and race will have no independent effect. In this case, Figure 3 simply condenses to Figure 2. Yet, just because race has no effect in the regression of defaults on creditworthiness does not mean discrimination has not occurred, as the minority threshold is higher.

### III. Some Evidence

Default studies shed little light on the issue of discrimination in mortgage lending. Given that the groups being examined have different distributions of creditworthiness, default studies suffer from the same problem of omitted variable bias that afflicts analyses of denials. Even if they included every relevant variable, however, these studies are unable to discern discrimination.

Ultimately the questions raised by Figure 1 are empirical. Do the distributions of white and minority acceptances over the range of creditworthiness look the same? Figure 4 charts the pattern of minority and white creditworthiness found by MBMT (1992). The applications for each group were ordered by their expected probability of default, or their creditworthiness. The horizontal axis gives the percentage of each group's applications while the vertical axis is a measurement of the expected probability of default. The curves indicate the percentage of each group's applications that is greater than or equal to the probability of default given on the vertical axis.

A much higher proportion of the minority applications are clustered at the low end of the creditwor-

thiness spectrum than white applications. The distributions of white and minority creditworthiness are very different, and credit history, a variable omitted by, for example, the Van Order, Weston, and Zorn (1993) study of default rates, is one important reason. Since all current evidence suggests that white and minority distributions of creditworthiness are not identical, a study of average defaults is unable to uncover discrimination. And given the problems with default analysis in general, depicted in Figures 2 and 3, the ability of default analysis to uncover discrimination is suspect, even if creditworthiness is accounted for.

#### IV. Conclusion

Default analysis suffers from the same difficulty with possible omitted variable bias as does the study of denials. Figure 1 reveals that no magic solution to the problem of omitted variable bias is to be found in empirical work on mortgage lending. Studies of both denials and defaults must account for all

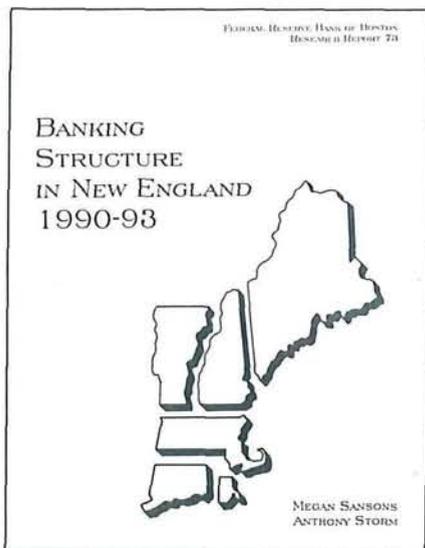
relevant explanatory variables that might be correlated with race in order to detect discrimination in lending.

Even if default studies do account for all relevant variables, however, an analysis of defaults is a poor approach to examining discrimination. If discrimination in mortgage lending is occurring, it is occurring against minority applications that are rejected, the very observations that default studies do not examine. In order to test for discrimination using default analysis, the profitability of the marginal minority loan must be compared to that of the marginal white loan. Studies of denials are much more effective at making these comparisons than analyses of defaults. Since denial data include both accepted and rejected applications, they permit comparisons of rejected minority applications with accepted white applications. The criticisms leveled at studies of mortgage denials by those who advocate studies of defaults are basically unfounded, and their claims about the importance of default analysis are significantly overstated.

#### References

- Becker, Gary. 1993. "The Evidence Against Banks Doesn't Prove Bias." *Business Week*, April 19, p. 18.
- Brimelow, Peter and Leslie Spencer. 1993. "The Hidden Clue." *Forbes*, Jan. 4, p. 48.
- King, Thomas A.. 1980. "Discrimination in Mortgage Lending: A Study of Three Cities." Federal Home Loan Bank Board, Working Paper no. 91.
- Munnell, Alicia H., Lynn E. Browne, James McEneaney, and Geoffrey M. B. Tootell. 1992. "Mortgage Lending in Boston: Interpreting the HMDA Data." Federal Reserve Bank of Boston, Working Paper no. 92-7.
- Van Order, Robert, Margrett Weston, and Peter Zorn. 1993. "Racial Discrimination in the Mortgage Credit Market: Evidence from Default Behavior." Photocopy. Cornell University.

## Research Report



Research Report No. 73 has just been issued: *Banking Structure in New England 1990-93*, by Megan Sansons and Anthony Storm. This report provides a comprehensive update of banking structure developments in New England since 1989. It presents local banking market data; rankings of commercial banking and thrift organizations by deposits; and lists of the mergers and acquisitions, bank holding company formations, bank openings, name changes, and bank failures during the period from October 1, 1989 to June 30, 1993. The report also summarizes the Justice Department's antitrust guidelines as applied to bank mergers.

Research Report No. 73 is available without charge. Requests should be sent to the Research Library—D, Federal Reserve Bank of Boston, P.O. Box 2076, Boston, MA 02106-2076. Or telephone (617) 973-3397.

Federal Reserve Bank of Boston  
P.O. Box 2076  
Boston, Massachusetts 02106-2076

Address Correction Requested

Bulk Rate  
U.S. Postage  
**PAID**  
Richmond, VA  
Permit No. 930